UPPER FEATHER RIVER
INTEGRATED REGIONAL WATER MANAGEMENT PROGRAM
Regional Water Management Group

Sharon Thrall, Plumas County Flood Control and Water Conservation District
Paul Roen, Sierra County
Terry Swofford, Plumas County
Russell Reid, Feather River Resource Conservation District
Bill Nunes, Sierra Valley Resource Conservation District
Jim Roberti, Sierra Groundwater Management District
Roger Diefendorf, Plumas County Community Development Commission
Trina Cunningham, Maidu Summit Consortium
Jeffrey Greening, Public Member
Joe Hoffman, Plumas National Forest (Advisory)
Carol Thornton, Lassen National Forest (Advisory)
Quentin Youngblood, Tahoe National Forest (Advisory)

AGENDA FOR REGIONAL WATER MANAGEMENT GROUP MEETING OF FEBRUARY 26, 2016 TO BE HELD AT 1:00 P.M. IN THE PLUMAS COUNTY PLANNING CONFERENCE ROOM, 555 MAIN STREET, QUINCY, CALIFORNIA

www.featherriver.org

AGENDA

The Regional Water Management Group of the Upper Feather River Integrated Regional Water Management Program welcomes you to its meetings, which are regularly held on the fourth Wednesday of every other month, and your interest is encouraged and appreciated.

Any item without a specified time on the agenda may be taken up at any time and in any order.

Any person desiring to address the Board shall first secure permission of the Regional Water Management Group Chair. Any public comments made during a regular Regional Water Management Group meeting will be recorded. Members of the public may submit their comments in writing to be included in the public record.

CONSENT AGENDA: These matters include routine administrative actions. All items on the consent calendar will be voted on at some time during the meeting under "Consent Agenda." If you wish to have an item removed from the Consent Agenda, you may do so by addressing the Chairperson.

REASONABLE ACCOMMODATIONS: In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting please contact Randy Wilson at 530-283-6214. Notification 72 hours prior to the meeting will enable the County to make reasonable arrangements to ensure accessibility. Auxiliary aids and services are available for people with disabilities.

STANDING ORDERS

1:00 P.M. **CALL TO ORDER/ROLL CALL**

ADDITIONS TO OR DELETIONS FROM THE AGENDA

PUBLIC COMMENT OPPORTUNITY
Matters under the jurisdiction of the RWMG, and not on the posted agenda, may be addressed by the general public at the beginning of the regular agenda and any off-agenda matters before the RWMG for consideration. However, California law prohibits the RWMG from taking action on any matter which is not on the posted agenda unless it is determined to be an urgency item by the RWMG. Any member of the public wishing to address the RWMG during the "Public Comment" period will be limited to a maximum of 3 minutes.

ANNOUNCEMENTS/REPORTS
Brief announcements.

CONSENT AGENDA
These items are expected to be routine and non-controversial. The RWMG will act upon them at one time without discussion. Any RWMG members, staff member or interested party may request that an item be removed from the consent agenda for discussion.

A) RWMG

Approve RWMG Meeting Summary for the regular meeting held on January 22, 2016.

ACTION AGENDA

1. PROJECT STATUS UPDATE

Update on project schedule, task and budget. Informational.

2. STAKEHOLDER OUTREACH UPDATES

a. Tribal outreach updates. Informational.
b. Workgroup updates. Informational.

3. PROPOSITION 1 DISADVANTAGED COMMUNITY INVOLVEMENT DRAFT FUNDING PACKAGE

Presentation and discussion of Proposition 1 Draft 2016 Request for Proposals Disadvantaged Community Involvement. Discussion and/or direction to staff.

4. PROPOSITION 1 CHANGES TO INTEGRATED REGIONAL WATER MANAGEMENT GUIDELINES

Review of changes to the IRWM Guidelines from the Proposition 84 standards to the new Proposition 1 standards. Request for discussion and/or direction to staff.

5. DRAFT GOVERNANCE, STAKEHOLDER INVOLVEMENT, COORDINATION CHAPTER

Presentation and discussion of the Draft Governance, Stakeholder Involvement, Coordination chapter. Request for discussion and direction to staff.

6. DRAFT REGION DESCRIPTION CHAPTER

Presentation and discussion of the Draft Region Description chapter. Request for discussion and direction to staff.

7. NEXT MEETING

Approve tentative topics for next RWMG meeting or provide direction to staff.

ADJOURNMENT

Upper Feather River IRWM
Regional Water Management Group

DRAFT SUMMARY MINUTES

January 22, 2016

Meeting materials and video recording link are available on the website at:
http://featherriver.org/rwmg_meetings/

Call to Order and Roll Call
Sherrie Thrall called the meeting to order on January 22, 2016 at 1 pm at the Plumas County Planning Conference Room, 555 Main Street, Quincy, California.

Members Present:
Sherrie Thrall, Plumas County Flood Control and Water Conservation District
Paul Roen, Sierra County
Jim Roberti, Sierra Groundwater Management District
Bill Nunes, Sierra Valley Resource Conservation District
Russell Reid, Feather River Resource Conservation District
Terry Swofford, Plumas County
Trina Cunningham, Maidu Summit Consortium
Jeffrey Greening, Public Member
Joe Hoffman, Plumas National Forest (Advisory)

Members Absent:
Roger Diefendorf, Plumas County Community Development Commission
Quentin Youngblood, Tahoe National Forest (Advisory)
Carol Thornton, Lassen National Forest (Advisory)

Staff Present:
Randy Wilson, Plumas County Flood Control and Water Conservation District
Uma Hinman, Uma Hinman Consulting
Zeke Lunder, Deer Creek Resources, Inc.
Leah Wills, Uplands and Forest Management Workgroup Coordinator
Terri Rust, Floodplains, Meadows, and Waterbodies Management Workgroup Coordinator

Additions or Deletions from the Agenda
None noted

Announcements / Reports
Randy Wilson noted that we are working to get better sound for the video recordings and reminded everyone to speak up for better recordings.

CONSENT AGENDA **(Video 1, 00:3:12)**

a. RWMG Approval of Meeting Minutes for October 23, 2015
Upon motion by Paul Roen and second by Terry Swofford, the RWMG Meeting Minutes for October 23, 2015 were unanimously approved.

REGULAR AGENDA

1. Project Status Updates (Video 1, 00:3:35)

Uma Hinman presented an overview of task progress and an update on schedule and budget. We are in month 18 of the 2-year project, have completed approximately 60 percent of project tasks, and expended approximately 60 percent of the overall budget. The project remains on target to finish by June 2016. Uma noted that the budget summary spreadsheet didn't print properly in the agenda packet and offered to email it to the RWMG.

2. Stakeholder Outreach Updates (Video 1, 00:6:10)

Trina Cunningham provided an update of Tribal outreach efforts and meeting attendance. Trina noted that they are continuing to outreach to as many tribal members in the region as they can. She noted that everyone has jobs and this process has been a lot of work above and beyond their normal workload. Trina noted that they continue to send emails and meeting notes to Tribal members in the Butte County portion of the region, but have yet to receive any responses. Trina and Sherri Norris will revisit the Butte County projects and see if there is interest in coordinating on those projects.

Uma Hinman provided an update on workgroup efforts, which include development of resource management strategy (RMS) recommendations and further development of project submittals. The final presentation will be during the meeting today. The Workgroup Coordinators continue to support project proponents to ensure the applications address the required review factors and include completed climate change assessments. Uma noted that we anticipate having a summary of the projects at the March RWMG meeting. She also reported that the first three chapters have been through an initial public review and will be brought to the RWMG next meeting.

Several special studies are included in the Plan Update, including the Forest-Water Balance Study and the Community Vulnerability Assessment, both of which are being prepared by Burkhard Bohm. The Forest-Water Balance Study is about 75 percent completed. The Community Vulnerability Assessment is getting underway and will be ongoing over the next few months. Additionally, a disadvantaged community (DAC) assessment is being prepared by Sierra Institute and we anticipate having a draft for the RWMG to review at the next RWMG meeting.

3. Disadvantaged Community Capacity Building Presentation and Discussion (Video 1, 00:9:50)

At the beginning of the item, Sherrie Thrall and Jeffrey Greening suggested that one of the things the RWMG members are hearing from project proponents is that they have good projects but no capacity to seek funding and do the grant writing. It was suggested that we should look into outreaching to CSU Chico to find some student interns to help with grant writing. Sherrie suggested to Trina Cunningham that she might have some contacts at CSU Chico. Trina agreed that she might know some students and professors she could approach with the idea.

Randy Wilson noted that the Sierra Nevada Conservancy recently brought in a grant writer to host a local training on grant writing. He also noted that the SNC is looking at the possibility of having an office in the County building.

Uma introduced Katie Burdick, Burdick and Associates, to present on the upcoming Proposition 1 DAC Involvement funding opportunity (Round 1). Her specialty is DAC involvement and project development in IRWM programs. She offered to help the UFR jumpstart their relationship with DWR for this Round 1 opportunity. Katie advised that her DWR contact indicated the draft DAC Involvement RFP would be out later this month. Katie noted that the average grant application costs can be $35,000-$55,000, which marginalizes DACs and largely excludes them from grant opportunities.

Katie's DWR contacts have indicated to her that this Round will not be a competitive process, however, the guidelines have not yet been released and may change. Rather, DWR will interview and assign funding within each IRWM region. Katie is meeting with IRWM regions up and down the Sierra, which are commonly rural regions with low population densities and significant infrastructure deficiencies. She offered pro-bono assistance to position the region to be competitive with DWR. She urged the RWMG to get ahead of the process and be ready with DAC needs.

Round 1 will be targeted to DAC Involvement and can be used to address 1) capacity needs and 2) project development. Capacity needs could include hiring a representative for several regions, per diem to attend meetings, etc. Katie noted that she had lots of experience with water and wastewater infrastructure projects. She envisions a three step process for DACs: 1) needs assessment, 2) prioritize needs, and 3) design support for highest priority projects. The goal would be to develop competitive projects to a level they are ready to submit for grants.

Katie discussed identifying and profiling the DACs within the region. She advocates jumpstarting the preparation for the upcoming Round 1, think through who the DACs in the regions are, and be prepared for DWR's interview and process. Katie offered to come and help DACs through this process. She is continuing to talk with various other IRWMs (Upper Pit, Yuba County, etc.) about similar processes.

Leah asked whether DWR will be changing the processing of invoices to be more timely because DACs can't float the upfront money for the projects while they wait 90+ days for reimbursement from the state. With Proposition 1, DACs can get an advance of up to 50 percent to help with that problem. Katie noted that DWR is looking for multiple benefit projects.

Randy encouraged Katie to review the project list that we are working on for the UFR region. Katie would suggested she would be willing to meet with a group of UFR folks to review the projects together so as to help build capacity in the region. Katie also suggested coordinating with the other Mountain Counties IRWM regions to discuss the possibility of establishing a "DAC Swat Team" to help with the three tasks noted above.

Katie Burdick's contact information is katie@burdico.net or (530) 906-1335.

4. Resource Management Strategies – Agricultural Land Stewardship Workgroup (Video 1, 00:39:00)

Willo Vieira presented the Agricultural Land Stewardship Workgroup resource management strategy recommendations for each assigned RMS:

- RMS-1: Agricultural Water Use Efficiency
- RMS-5: Conveyance – Local/Regional
- RMS-8: Conjunctive Management
- RMS-17: Pollution Prevention
- RMS-20: Agricultural Land Stewardship

- RMS-23: Land Use Planning and Management
- RMS-25: Sediment Management
- RMS-28: Outreach and Education
- RMS-31: Other Strategies

Willo, Chair of the workgroup, explained the process the workgroup went through in developing the recommendations. The workgroup connected their workgroup's projects with the RMS recommendations. Additionally, they pulled in other workgroups' recommendations that were relevant to their assigned RMS.

Sherrie Thrall commended the workgroup on tying their projects to the RMS recommendations.

5. Resource Management Strategies – Uplands and Forest Workgroup and Tribal Advisory Committee (Video 1, 00:42:15)

John Sheehan, Alternate Chair for the Uplands and Forest Workgroup, presented the RMS recommendations for the following RMS:

- RMS-21: Ecosystem Restoration
- RMS-22: Forest Management
- RMS-23: Land Use Planning and Management
- RMS-25: Sediment Management
- RMS-26: Watershed Management
- RMS-27: Economic Incentives
- RMS-28: Outreach and Engagement
- RMS-31: Other Strategies

John focused his presentation on the more unusual recommendations.

RMS 21: recommendations addressing the interaction between the water system and road system – recommends reducing culvert barriers and improve culverts under all ownerships (federal and private).

RMS-22: pointed out recommendations regarding burn frequencies and severity. Encouraged reviewing continuum of fire effects, both the good and bad, to come up with an overall approach. Recommended pressing the issue of carbon and carbon sequestration and various types of fire.

RMS-22: recommends directing development away from undeveloped meadows. Recognize importance of these open areas.

RMS-25: recommends post burn assessments to look at immediate, mid-range, and long-term effects.

Randy asked about coordinating with the National Forests in their land management planning. John noted that working within the framework of the IRWM will be really important to address region-wide needs.

RMS-26: advance the use of fire. John noted that liabilities pose an issue with this recommendation.

RMS-27: Biomass for local, regional, Tribal projects.

RMS-28: recognizes the excellent local watershed education program and recommends promoting it outside the region in the areas receiving water from the Upper Feather River watershed.

RMS-31: recommends proven techniques for fire mitigation, snow enhancement, and wildland urban interface (WUI) management.

Trina Cunningham reported that the TAC integrated with the Uplands and Forest workgroup, working together on the RMS recommendations.

Trina discussed the role or Traditional Ecological Knowledge (TEK) and noted the inclusion of TEK into RMS 27 and 31, as well as utilizing TEK as a monitoring tool for water quantity and quality. She noted that we are integrating Tribal engagement into the process more so than anywhere in the state; it is unique to the UFR IRWM Plan. Trina also highlighted the additional recommendations regarding reintroducing low and moderate intensity fire management into the system and daylighting meadow systems. Also unique to our IRWM Plan, the TAC has included two goals: Beneficial Use and TEK.

Sherrie expressed her appreciate for the recommendations on fire management, beneficial use and TEK. Trina discussed how to start introducing fire management such as using small scale burns, etc. Zeke Lunder shared Deer Creek Resources' collaboration with The Nature Conservancy and various other groups up in the Trinity and Siskiyou areas training and managing burns in the WUI areas. They are working with CSU and The Nature Conservancy to bring some of that training to the northern Sierra. Sherrie noted the complaints the county supervisors receive regarding air quality concerns during control burn operations. Terri Rust noted that there is a current collaboration between private land owners, Sierra Nevada Conservancy, Greenville Rancheria, and Forest Service in the Genesee Valley area.

6. Resource Management Strategies – Tribal Advisory Committee (Video 1, 00:01:13)

This presentation and discussion was covered under the previous item.

7. Plan Performance, Implementation and Monitoring (Video 2, 0:00:15)

Uma presented an overview of the requirements of the Proposition 84 Guidelines for addressing Plan performance, implementation and project monitoring within the IRWM Plan.

The discussion started with how often the RWMG plans to meet post-Plan adoption. Uma clarified that the Plan is scheduled for completion in May 2016. Russell asked when the money would become available. Sherrie suggested that the RWMG should meet every other month for the first year post-Plan adoption, and quarterly thereafter so as to keep people engaged. Jeffrey asked when grant solicitations might be coming, IRWM and other funding opportunities. Uma noted that all funding opportunities and project implementations should be tracked by the RWMG, regardless of funding source.

Sherrie noted that now we have staff support under contract. After the contract is up, how will that support continue? Randy noted that the standard needs to be realistic. The Plan should include the

Leah noted that we are building from existing organizations, and integrate with those organizations and planning efforts.

Randy noted that the Governor's Office of Planning and Research encourages land use and water planning, and encourages coordination and integration with IRWMs. The IRWM should include the

minimum intent and more meetings could occur as needed. Sherrie clarified the RWMG would commit to quarterly meetings, post-Plan.

John Sheehan suggested a two-page spreadsheet of projects that is kept up to date and provided at each meeting. Sherrie noted that those projects will likely obtain other funding and may drop off the IRWM implementation list.

The RWMG intends to appoint representatives to evaluate and report to the RWMG on Plan performance. Sherrie asked who will be the representatives and who will pay for them. Randy relayed the process for developing the regional acceptance process (RAP) and that it was funded through the Plumas County general fund. Sherrie noted that the RWMG is setting goals that they ultimately don't have funding to carry out. The public needs to understand that there is limited resources to pay for this ongoing process.

Leah asked what DWR's strategy is for supporting DACs. Katie encouraged involvement in the Roundtable of Regions. They are developing strategies for policy changes to support DACs, such as the $250,000 per IRWM region for administration strategy within the Water Plan Strategy.

Sherrie noted her concern that the county supervisors would need to be on board and work it into annual county budgets, which would be precarious.

Katie noted that a strategy used by other IRWM regions is a set agenda that incorporates the reporting requirements. That way the meeting minutes meet the requirements of an implementation report.

Katie suggested pursuing funding in Round 1 to extend RWMG administration and encourage wider participation in the IRWM Program. Meanwhile, the Roundtable of Regions will be continuing to work to change policy that will result in more stable and long-term funding for the Program.

Sherrie discussed identification of DACs and asked how we are going to be sure we meet the criteria for DWR. Katie suggested the DWR DAC mapping tool and noted that Melissa Sparks at DWR will consider other methodologies for identifying DACs. Katie offered to assist with that process. Sherrie discussed the discrepancies in the Almanor Basin and expressed her concern that the region as a whole would meet the DAC definition because of the pockets of wealth in the region.

Randy noted that Jonathan Kusel is on the consulting team and is looking into the identification of DACs in the region. Debbie Spangler (DWR) is aware of the concerns in the region.

The current website could hold the project monitoring reports, Plan implementation and performance reports, etc. Sherrie again expressed concern about capacity but suggested that Plumas County is the likely host for continuing the website. We are currently paying Deer Creek Resources $75/month to maintain the website. Sherrie asked who would keep the website updated in the future. Russell Reid suggested there might be a way to incorporate those costs into individual grants. Katie noted that may be possible but it all depended on how it was stated/presented in the grant application.

Uma presented the Guideline requirements for project-specific monitoring plans. Third party monitoring was discussed and Sherrie suggested that "subject to approval of the RWMG" be added to the third bullet. Leah asked for clarification of where the third party monitor would come in. Sherrie clarified that the third party would be doing the actual monitoring. Trina asked how some of the projects would be monitored (i.e., TEK or the region-wide thinning projects). Sherrie responded that those unique

circumstances should be built into the monitoring plan itself. Sherrie stressed that there needs to be separation between those doing the work and those reviewing the work. Measurements and monitoring targets will be developed by the project proponents for individual projects.

Sherrie clarified that it should read "Statement in the PSMP that monitoring will be conducted by a third party, subject to approval of the RWMG."

The RWMG had no changes to the minimum content of the PSMPs.

Next steps will be for staff to draft up the chapter on Plan performance and monitoring with today's discussion incorporated.

8. Sierra Nevada Watershed Improvement Program **(Video 2, 0:51:52)**

Uma presented the item, noting it was the consideration of endorsing the WIP as requested by the RWMG at the last meeting. Sherrie expressed her support of the program, saying that a number of the RWMG members had been involved in the SNC and pushed for support in the program.

Upon motion by Paul Roen and second by Jeffrey Greening, the RWMG unanimously approved endorsement of the WIP.

Leah expressed gratitude for all the outreach and collaboration that Lynn Campbell is putting into region. Sherrie commended the Workgroup Coordinators for all their work in the Plan Update process.

9. Next Meeting **(Video 2, 0:55:30)**

Uma suggested monthly meetings until the end of the Plan in order to get through all the chapter presentations. The next meeting is scheduled for Friday, February 26th at 1pm. The following meeting will be Friday, March 18th at 1pm.

Adjournment **(Video 2, 1:08:00)**

The meeting was adjourned at 3:40 pm.

ITEM NO. 1

Upper Feather River
Integrated Regional Water Management

RWMG Meeting No. 9
February 26, 2016

To: Upper Feather River Regional Water Management Group

From: Uma Hinman, Uma Hinman Consulting

Subject: UFR IRWM Plan Update Project Schedule, Task and Budget Update

Date: February 17, 2016

SCHEDULE

Based on the contract date between DWR and the Plumas County Flood Control and Water Conservation District, we are currently in the 18th month of the 2-year project. All Workgroups have held at least five meetings; consistent with the grant work plan. The next few months will be focused on the projects and chapter development. See attached schedule.

MEMORANDUM OF UNDERSTANDING (MOU)

The MOU is posted on the website and has been presented at each of the Workgroup meetings. Additionally, copies have been provided to requesting agencies and organizations through the Workgroups. To date, 34 signed MOUs have been returned.

On September 16, 2015, Randy Wilson, Uma Hinman, and Trina Cunningham met with Butte County representatives to discuss an MOU to address planning and management in the overlap area, determine areas of responsibility, and provide for appropriate consultation as needed. The MOU has been drafted and is currently being reviewed by Plumas County counsel.

BUDGET AND TASK UPDATE

The overall expenditures on the grant project to date are consistent with the project accomplishments, and demonstrate very efficient use of funds.

In October 2014, Plumas County and its partners provided documentation of $237,489 in match funds, which fulfills the match requirement for the grant contract in its entirety. To date, Uma Hinman Consulting has submitted 17 invoices to DWR totaling $435,297.22 in reimbursable services, equipment purchases, and operating expenses. Approximately 64 percent of project work has been completed and

the $385,267.18 invoiced to date for professional and consultant services represents 64 percent of the $605,708 budget for those services. Additionally, the total grant amount invoiced to date includes county equipment and operating costs, for an overall billing of 64 percent of the total grant budget. See attachment 2 for budget summary.

The following are summaries of work completed or initiated by task.

Task 1: Stakeholder Outreach/RWMG/Workgroups/Tribal Engagement/IRWM Coordination

The Stakeholder Outreach efforts have included coordinating, publicizing, and preparing outreach materials and presentations for–and conducting–the first five regular RWMG meetings; conducting a special meeting to review, discuss and approve the Draft Monitoring Policy and the Draft Project Selection and Scoring Criteria; and reviewing and vetting the first phase of Conceptual Project Summary submittals. Past tasks and efforts have included developing the Stakeholder Outreach Plan (SIP); drafting the stakeholder contact lists and an MOU; updating the tribal contact list and drafting the Tribal Engagement Plan; developing and discussing the draft Project Eligibility Worksheet to vet Conceptual Projects; reviewing and discussing project selection and ranking criteria; and coordinating and scheduling individual workgroup meetings. The workgroups have held five to six meetings, focused recently on developing projects proposed for implementation in the IRWM region and recommending resource management strategies. In addition a fifth working group was recognized in May: the Tribal Advisory Committee has held six meetings to date.

The first Joint Workgroup Integration Workshop/Climate Change Workshop was held August 21, 2015 from 9am to 4:30pm in the Mineral Building at the Plumas County Fairgrounds. The workshop had excellent attendance and very productive discussion/participation in both the morning and afternoon sessions.

Staff continues to post articles of interest under the NEWS section on the website, and maintains the calendar and meeting pages with meeting schedules and materials. Please remember to check the website periodically for new posts and information. On the website, DRAFT IRWM PLAN, a subcategory under the section, DOCUMENTS, contains the staff Draft Plan chapters for review and includes deadlines for comments.

Task 2: Baseline Technical Study

The administrative draft Baseline Technical Study has been posted on the website and includes a database of background materials collected and catalogued to date. The draft report is available at http://featherriver.org. Staff continues to update the document database as the project progresses. The consultant team has developed a database that is linked via GIS to a map that provides a visual catalog of studies and projects in the region. Time was spent compiling, categorizing, summarizing, and uploading baseline studies. The administrative draft Baseline Technical Study Report was presented at the March 27, 2015 RWMG meeting.

Task 3: Data Management Strategy, System Development and Implementation
The website/web portal of the UFR IRWM Project (http://featherriver.org/) is up-to-date and kept current. The RWMG meeting agendas, packets, and archived videos of the meetings are and will be available on the site, as will project information and updates.

During May and June 2015, consultants attended the emergency planning committee meeting regarding the Feather River geographic response plan and communicated with California Department of Fish and Wildlife (CDFW) about parallel data collection efforts; added a Tribal Advisory Committee Workgroup page to the website; and wrote a manual on how to record and video stream meetings. Staff tasks included incorporating new layers into maps (such as land managers, precipitation, fire hazard and severity zone, and fire threat layers).

The consultant team has developed an online, map-based catalog of studies and projects in the region. The database is linked via GIS to a map that provides a visual catalog of studies and projects in the region (similar to the SWIM site). Time was spent compiling, categorizing, summarizing, and uploading baseline studies. The catalog is available on the website at: http://featherriver.org/catalog/index.php.

The Step 2 project submittal data have been incorporated into an online map, http://featherriver.org/proposed-projects/. The database includes a summary of the information submitted for each project.

Task 4: Climate Change
The August 21, 2015 Climate Change Workshop consisted of a working session to present and discuss climate change scenarios, regional vulnerabilities, and recommended adaptation strategies. The workshop had excellent attendance and very productive discussion/participation in both the morning and afternoon sessions. Workgroup comments, and those received during the August 21, 2015 workshop, were incorporated into the vulnerability assessment. The Consultant team has completed the vulnerability to climate change assessment, a project worksheet for calculating GHG emissions, and the draft climate change chapter. Remaining work is developing resource management strategy recommendations to address climate change vulnerabilities.

Task 5: Project Development Process
The deadline for the first stage of the project submittal process was June 1, 2015 at 5:00 p.m. Approximately 80 conceptual projects submittals were received. The eligible conceptual project proposals were reviewed by the RWMG during a special meeting on June 15, 2015.

The deadline for Step 2 IRWM Project Information Forms was Monday, August 3, 2015 at 5:00 p.m. Eight-one (81) projects were received. The Step 2 project submittals were discussed during the August 21, 2015 Workgroup Integration and Climate Change Workshop with a focus on recommendations for project integration.

Workgroup Coordinators continue to support project proponents in the further development of the project applications. Staff remains in contact with project proponents, providing updates on process and next steps. The Workgroup Coordinators are working with project proponents to ensure project applications address the required review factors and include completed GHG emission worksheets. We anticipate having a summary of the project review process and results for the next RWMG meeting.

Task 6: IRWM Plan Update

Based on collected information and what is generated through the workgroup meetings, chapters will be drafted by staff and reviewed by workgroups, stakeholders and the RWMG. The following table indicates the status and progress of chapter development.

Chapter Review

The first staff draft Plan chapters have been released for review and comment: Governance, Stakeholder Involvement, and Coordination; Climate Change; Region Description; and Impacts and Benefits. Comments are due by 5:00pm on the date indicated in the table below. All comments should be submitted to UFR.contact@gmail.com. Chapters and timelines are posted on the website: http://featherriver.org/draft-irwm-plan/.

Staff Draft Chapter	Release Date/Status	Deadline for Comments
Governance, Stakeholder Involvement, Coordination	October 8, 2015	November 11, 2015
Climate Change	October 14, 2015	November 13, 2015
Region Description	December 7, 2015	January 11, 2016
Impacts and Benefits	January 17, 2016	March 18, 2016
Regional Water Issues, Integration and Capacity	In process	
Resource Management Strategies	In process	
Plan Implementation, Performance and Monitoring	In process	
Goals and Objectives	In process	
Project Development and Review Process		
Plan Development Process		
Finance	Drafted/on hold	
Water and Land Use Planning	Drafted/on hold	
Technical Analysis	Drafted/on hold	

Task 7: Grant Administration

Work under Task 7 has included the documenting of matching funds and polishing invoicing and reporting procedures. We have submitted 17 project progress reports and invoices to date.

SPECIAL STUDIES

Forest-Water Balance Study: Work on the Forest-Water Balances Study is expected to be completed in the next couple of months. A memorandum from Plumas Geo-Hydrology, dated February 16, 2015, draws attention to the significance of groundwater recharge related to forest canopy thinning. The memorandum indicates that forest management practices to reduce forest canopy closure will increase groundwater recharge, and thereby increase base flow in streams. It is anticipated that an update will be presented at the next RWMG meeting.

Community/Well Vulnerability Study: The Community Vulnerability Study is intended to better identify drinking water pollution risks for the approximately 40 percent of groundwater-dependent households in the region. In preparing the study, Plumas Geo-Hydrology will assess nitrate pollution risks to municipal and domestic drinking water in high groundwater table areas with septic systems and agricultural livestock production. There are also significant outreach efforts to Disadvantaged Communities (DAC) and Tribal communities associated with this study. The timeframe for this study is January through April 2016.

Disadvantaged Community Assessment: Sierra Institute is continuing to work on refining the DAC assessment. This is important work that will address some of the data gaps in DWR's DAC identification methodology and mapping. We anticipate having a draft assessment to present to the RWMG at the next RWMG meeting.

REQUEST

Informational.

Attachment: Budget Summary

Agreement No.: 4600010066
Grantee: Plumas County Flood Control and Water Conservation District
Awarding Body: California Department of Water Resources
Program: Prop 84
Encumbrance FY: 2012

Award Budget	Match
$679,657.00	$237,489.00

Invoice No.	Billing Period	Personnel Services	Operating Expenses	Equipment	Professional/ Consultant Services	Total	10% Withholding	Overhead	Match Total
Line Item Prop 84 Allotments		$[illegible]4,220.00	$[illegible]4,731.00	$[illegible]4,998.00	$[illegible]605,708.00	$[illegible]679,657.00			
1	10/1/08-9/30/14	$[illegible]	$[illegible]	$[illegible]4,853.84	$[illegible]30,510.98	$[illegible]35,364.82	$[illegible]3,536.48	$[illegible]0,224.98	$[illegible]237,489.00
2	9/1/14-10/31/14	$[illegible]	$[illegible]	$[illegible]	$[illegible]22,925.60	$[illegible]22,925.60	$[illegible]2,292.56	$[illegible]6,675.85	$[illegible]
3	9/1/14-11/30/14	$[illegible]	$[illegible]	$[illegible]	$[illegible]13,009.60	$[illegible]13,009.60	$[illegible]1,300.96	$[illegible]513.61	$[illegible]
4	12/1/14-12/31/14	$[illegible]	$[illegible]	$[illegible]	$[illegible]4,867.88	$[illegible]4,867.88	$[illegible]486.79	$[illegible]255.38	$[illegible]
5	10/1/14-1/31/15	$[illegible]3,892.97	$[illegible]	$[illegible]	$[illegible]25,774.11	$[illegible]29,667.08	$[illegible]2,966.71	$[illegible],383.10	$[illegible]
6	7/1/14-2/28/14	$[illegible]2,971.73	$[illegible]1,427.55	$[illegible]	$[illegible]7,285.95	$[illegible]11,685.23	$[illegible]1,168.52	$[illegible]225.20	$[illegible]
7	11/1/14-3/31/15	$[illegible]	$[illegible]	$[illegible]	$[illegible]40,142.35	$[illegible]40,142.35	$[illegible]4,014.24	$[illegible]2,656.35	$[illegible]
8	3/1/15-4/30/15	$[illegible]	$[illegible]	$[illegible]	$[illegible]12,887.40	$[illegible]12,887.40	$[illegible]1,288.74	$[illegible]585.90	$[illegible]
9	3/1/15-5/31/15	$[illegible]4,963.08	$[illegible]874.41	$[illegible]	$[illegible]15,654.75	$[illegible]21,492.24	$[illegible]2,149.22	$[illegible]638.00	$[illegible]
10	9/1/14-6/30/15	$[illegible]	$[illegible]	$[illegible]	$[illegible]42,778.71	$[illegible]42,778.71	$[illegible]4,277.87	$[illegible]2,806.45	$[illegible]
11	6/1/15-7/31/15	$[illegible]3,926.40	$[illegible]313.37	$[illegible]	$[illegible]18,565.35	$[illegible]22,805.12	$[illegible]2,280.51	$[illegible]0,014.35	$[illegible]
12	3/1/15-8/31/15	$[illegible]3,886.74	$[illegible]110.54	$[illegible]	$[illegible]21,676.15	$[illegible]25,673.43	$[illegible]2,567.34	$[illegible],458.33	$[illegible]
13	1/1/15-10/31/15	$[illegible]2,004.15	$[illegible]564.52	$[illegible]	$[illegible]65,808.38	$[illegible]68,304.15	$[illegible]6,830.42	$[illegible]4,372.28	$[illegible]
14	9/1/15-10/31/15	$[illegible]13,247.83	$[illegible]	$[illegible]	$[illegible]13,285.17	$[illegible]26,533.00	$[illegible]2,653.30	$[illegible],180.38	$[illegible]
15	8/1/15-11/30/15	$[illegible]2,125.99	$[illegible]68.09	$[illegible]	$[illegible]22,007.91	$[illegible]24,201.99	$[illegible]2,420.20	$[illegible],276.93	$[illegible]
16	12/1/15-12/31/15	$[illegible]	$[illegible]	$[illegible]	$[illegible]9,932.38	$[illegible]9,932.38	$[illegible]993.24	$[illegible]680.75	
17	1/1/16-1/31/16	$[illegible]4,815.07	$[illegible]56.66	$[illegible]	$[illegible]18,154.51	$[illegible]23,026.24	$[illegible]2,302.62	$[illegible]824.16	
Total Amount Spent		$[illegible]41,833.96	$[illegible]3,415.14	$[illegible]4,853.84	$[illegible]385,267.18	$[illegible]435,297.22	$[illegible]43,529.72	$[illegible]22,671.99	
Allotment Remaining		$[illegible]22,386.04	$[illegible]1,315.86	$[illegible]44.16	$[illegible]220,440.82	$[illegible]244,359.78			
% Budget Invoiced		65.14%	72.19%	97.12%	63.61%	64.05%			

ITEM NO. 2

Upper Feather River
Integrated Regional Water Management

RWMG Meeting No. 9
February 26, 2016

To: Upper Feather River Regional Water Management Group

From: Uma Hinman, Uma Hinman Consulting

Subject: Stakeholder Outreach Update

Date: February 17, 2016

INTRODUCTION

The following is a summary of stakeholder updates for the Upper Feather River IRWM Plan Update.

TRIBAL ENGAGEMENT

An update will be provided during the meeting.

WORKGROUPS

The workgroups have all held their fifth meetings and are working their way through the final stages of project development and reviewing draft chapters.

Project Development

Workgroup Coordinators continue to support project proponents in the further development of the project applications. Staff remain in contact with project proponents, providing updates on process and next steps. The Workgroup Coordinators are working with project proponents to ensure project applications address the required review factors and include completed GHG emission worksheets. We anticipate having a summary of the project review process and results for the next RWMG meeting.

Resource Management Strategies

All workgroups have presented their resource management strategy (RMS) recommendations. Staff is currently drafting the Resource Management chapter and will release it for review by mid-March. Workgroups will have the opportunity to provide comments on all recommendations through that review process.

Assignment/Task Strategy

A total of 32 workgroup meetings are identified in the Plan Update work program over the course of the two-year project; two are intended to be workgroup integration workshops. The first integration

workshop was held on August 21, 2015. It is anticipated that the remaining integration workshop will be focused on project integration and lists and Plan content.

The following table summarizes workgroup meeting schedules.

Workgroup	Chair	Alternate	Meeting Schedule
Agricultural Land Stewardship	Willo Vieira		January 22, 2015 March 11, 2015 May 26, 2015 July 20, 2015 November 16, 2015
Floodplains, Meadows and Waterbodies	Carl Felts	Cindy Noble	December 5, 2014 February 13, 2015 April 24, 2015 June 26, 2015 October 16, 2015
Municipal Services	Frank Motzkus	Robert Meacher	November 20, 2014 February 19, 2015 April 17, 2015 June 17, 2015 July 15, 2015 November 19, 2015
Uplands and Forest	Mike DeLasaux	John Sheehan	January 29, 2015 March 13, 2015 April 24, 2015 June 30, 2015 November 5, 2015
Tribal Engagement Committee	Trina Cunningham		January 13, 2015 March 20, 2015 May 18, 2015 July 13, 2015 November 2015 January 8, 2016

REQUEST

Informational.

ITEM NO. 3

Upper Feather River
Integrated Regional Water Management

RWMG Meeting No. 9
February 26, 2016

To: Upper Feather River Regional Water Management Group

From: Uma Hinman, Uma Hinman Consulting

Subject: Proposition 1 Disadvantaged Community Involvement DRAFT Funding Package

Date: February 20, 2016

INTRODUCTION

The first two rounds of Proposition 1 IRWM funding will be targeted to disadvantaged community (DAC) involvement and implementation (projects); each has been allocated 10 percent of the funding regions' total. Round 1 will be focused on DAC involvement and a draft solicitation package was released for public comment on January 22, 2016 with comments due on March 18th. The intent of this first round is to help ensure involvement of DACs, economically disadvantaged areas (EDAs), or underrepresented communities within the regions.

Milestone/Activity	Schedule
Release of Draft DAC Involvement RFP and public comment period opens	January 22, 2016
Public workshops (Sacramento)	February 22, 2016
Public comment period closes	March 18, 2016
Release of Final DAC Involvement RFP	*April 2016*
Funding Area coordination meetings	*July 2016*
Approval of funding awards	*September 2016*

Source: http://www.water.ca.gov/irwm/grants/docs/p1DACinvolvement/2016Prop1IRWM_DACI_RFP_PublicReviewDraft.pdf

The Proposition 1 2016 IRWM Guidelines establish the general process, procedures, and criteria that Department of Water Resources (DWR) will use to implement the IRWM DAC Involvement Program. The DAC Involvement Request for Proposals (RFP) provides the details for the proposal and award process. Please see attached draft DAC Involvement RFP.

DISCUSSION

Statewide, DWR is making not less than $51 million available for Funding Areas to develop DAC Involvement proposals that ensure the involvement of DACs in the IRWM planning efforts. DWR is seeking a single Funding Area-wide proposal from each of the 12 Proposition 1 Funding Areas. The Upper Feather River Region is located within the Mountain Counties Funding Area, which has an allotment of $1.3 million for this round. There are 10 IRWM regions wholly or partially within the

Mountain Counties Funding Area [Upper Feather River, Northern Sacramento Valley (partial), Yuba County (partial), Cosumnes-American-Bear-Yuba, American River Basin (partial), Mokelumne-Amador-Calaveras, Tuolumne-Stanislaus, Yosemite-Mariposa, Madera (partial), Southern Sierra (partial)].

Entities eligible for receiving funding include the following:

- Public agencies
- Non-profit organizations
- Public utilities
- Federally recognized Indian Tribes
- State Indian Tribes listed on the Native American Heritage Commission's Tribal Consultation list
- Mutual Water Companies

Activities eligible for funding for this solicitation are identified in the following table (excerpted from Table 3 of the attached Draft RFP):

General Activity	**Examples of Activity**
Technical Assistance	Service provider trainings, local circuit rider programs to train water and wastewater staff
Needs assessments	Surveys or meetings with community members to identify water management needs
Project development activities	Planning activities, environmental compliance, or pre-construction engineering/design activities
Site assessment	Water quality assessments, median household income surveys, data and mapping activities
Engagement in IRWM efforts	DAC regional engagement coordinator role, DAC Advisory Committee to RWMG, DAC representatives in governance
Governance Structure	Evaluation of existing governance structures and related plan financing efforts, assessments of the level of DAC involvement in decision making processes
Community outreach	Public project meetings open to community members, door-to-door outreach
Education	Translation or interpretive services for information sharing, water education campaigns for community members, education for RWMGs on DAC needs
Facilitation	Facilitated RWMG meetings, facilitated project development meetings
Enhancement of DAC aspects in IRWM Plans	Development of Funding Area-wide DAC plan to be utilized as a unified approach for all IRWM plans

A possible application of Round 1 funds could be to help each DAC prepare a capital improvement plan (CIP)/needs assessment so as to realistically prioritize their projects, with the intent of putting DACs on an even par with other groups and entities within the region for future funding opportunities. An option to achieve this goal could be the development of a core team to work with the DACs and EDAs in the region to develop the CIPs/needs assessments, which would then be used to help prioritize projects within each DAC. Priority projects would then be technically advanced with the assistance of the core team to be ready for upcoming funding opportunities.

In order to be prepare for the Round 1 RFP, it would benefit the region to scrutinize its DACs and their needs and to start coordinating with other RWMGs in the Funding Area. Staff anticipates completing the DAC report with identification of DACs and EDAs in early March, with presentation to the RWMG at its March 18th meeting.

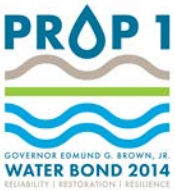
REQUEST

Information, discussion, and/or direction to staff regarding coordination with other IRWM regions.

Attachment: Draft Disadvantaged Community Involvement Request for Proposals

DRAFT 2016 Request for Proposals Disadvantaged Community Involvement

Integrated Regional Water Management
January 2016



CALIFORNIA NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
DIVISION OF
INTEGRATED REGIONAL WATER MANAGEMENT

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FOREWORD

This document contains the California Department of Water Resources' (DWR) Integrated Regional Water Management (IRWM) Grant Program Request for Proposal (RFP) for the Proposition 1 Disadvantaged Community Involvement funding.

This document is not a standalone document and the applicant will need to refer to the 2016 IRWM Program Guidelines (2016 IRWM Guidelines) for additional information. The 2016 IRWM Guidelines can be found at http://www.water.ca.gov/irwm/grants/prop1index.cfm.

Grant Program Website

DWR will use the internet as a communication tool to notify interested parties of the status of the grant funding opportunities and to convey pertinent information. DWR will post information at the following website: http://www.water.ca.gov/irwm/grants/prop1index.cfm.

See the 2016 Proposition 1 IRWM Grant Program Guidelines (2016 IRWM Guidelines), Volume 1, Appendix A for other useful web links and Appendix B for common usage of terms and definitions.

Mailing List

In addition to the above-referenced website, DWR will distribute information via e-mail. If you are not already on the IRWM e-mail distribution list and wish to be placed on it, please visit the following site: http://www.water.ca.gov/irwm/grants/subscribe.cfm.

Contact Information

For questions about the 2016 IRWM Guidelines, how to submit a Proposal, or other issues, please contact DWR's Financial Assistance Branch at (916) 651-9613 or by e-mail at DWR_IRWM@water.ca.gov.

For questions about this RFP, please contact:

- Craig Cross at (916) 651-9204 or Craig.Cross@water.ca.gov
- Melissa Sparks at (916) 651-9221 or Melissa.Sparks@water.ca.gov

I. Introduction

This document contains the California Department of Water Resources' (DWR) Request for Proposals (RFP) for the Disadvantaged Community Involvement Program (Program) authorized by the Water Quality, Supply, and Infrastructure Improvement Act (Proposition 1). The 2016 IRWM Guidelines can be found at the link listed in the Foreword.

Water Code §79745 requires DWR to expend not less than 10 percent of the Proposition 1, Chapter 7 funds authorized for the IRWM Grant Program, $51 million, for the purpose of ensuring involvement of disadvantaged communities (DACs), economically distressed areas (EDAs), or underrepresented communities (in this document collectively referred to as DACs) in IRWM planning efforts. DWR is establishing this Program to support the following objectives:

1) Work collaboratively to involve DACs, community-based organizations, and stakeholders in IRWM Planning efforts to ensure balanced access and opportunity for participation in the IRWM planning process
2) Increase the understanding, and where necessary, identify the water management needs of DACs on a Funding Area basis
3) Develop strategies and long-term solutions that appropriately address the identified DAC water management needs

DWR will call for and evaluate Funding Area level proposals designed to support the above-referenced objectives. It is DWR's intent to move forward efficiently with the RFP process so that the needs of DACs can be more fully included in IRWM planning efforts and future funding opportunities through the IRWM Grant Program or other financial assistance programs.

DWR is seeking a single Funding Area-wide proposal from each of the 12 Proposition 1 Funding Areas. DWR will work with IRWM region(s), within each Funding Area, to develop proposals to perform activities that involve DACs in IRWM planning, including helping define, understand, and address DAC water management needs through a collaborative approach.

II. Funding

The funding dispersed by this RFP will be allocated and awarded with not less than 10 percent by Funding Area, as shown in Table 1.

Because the Program is focused on involvement of or benefits to DACs, DWR is waiving the local cost share requirement of 50 percent of the total proposal costs.

Table 1 – DAC Involvement Funding

Proposition 1 Funding Areas	Minimum Available Funds
North Coast	$2,650,000
San Francisco Bay Area	$6,500,000
Central Coast	$4,300,000
Los Angeles	$9,800,000
Santa Ana	$6,300,000
San Diego	$5,250,000
Sacramento River	$3,700,000
San Joaquin River	$3,100,000
Tulare/Kern	$3,400,000
Lahontan	$2,450,000
Colorado River	$2,250,000
Mountain Counties	$1,300,000

III. Program Schedule

The schedule in Table 2 outlines the timeframe for this Program. Updates for the events listed in this schedule may be required. Any schedule updates will be posted on the DWR website listed in the Foreword.

Table 2 – DAC Involvement Program Schedule	
Milestone or Activity	**Schedule**
Release of Draft DAC Involvement RFP and Public Comment Period Opens	January 22, 2016
Public Workshops: February 22, 2016, 1:30pm California EPA Building 1001 I Street, Byron Sher Auditorium Sacramento, CA 95812 This meeting will be web broadcast via the following link: http://www.calepa.ca.gov/broadcast/ March 9, 2016,10:00am Visalia Branch of the Tulare County Library 200 West Oak Avenue, Blue Room Visalia, CA 93291 March 16, 2016, 10:00am California Tower 3737 Main Street, Highgrove Room #200 Riverside, CA 92501	February/March 2016
Draft DAC Involvement RFP Public Comment Period Closes	March 18, 2016
Release of Final DAC Involvement RFP	*April 2016*
Funding Area Coordination Meetings	*July 2016*
Approval of Funding Awards	*September 2016*

Italics denote a specific date that may vary dependent on previous activity deadline.

IV. Eligible Costs

Costs incurred after the award of grant funds are eligible for reimbursement. Eligible costs include, but are not limited to, expenditures for involvement activities identified in Table 3. Grantees are encouraged to limit direct administrative costs to no more than 5 percent of the total grant share amount.

V. Proposal Process

DWR is requesting that one entity act as the Applicant, and subsequently as the Grantee, on the behalf of the DACs and Regional Water Management Group(s) (RWMG(s)) within the Funding Area. That entity must be an eligible applicant as defined in the 2016 IRWM Guidelines Sections III.A and Appendix B and shown below:

- Public agencies
- Non-profit organizations
- Public utilities
- Federally recognized Indian tribes
- State Indian tribes listed on the Native American Heritage Commission's Tribal Consultation list
- Mutual Water Companies

The Applicant will act as a single point of contact and will work with DWR, the DACs, RWMG(s), community based organizations, and stakeholders in the Funding Area to develop a proposal that is responsive to this RFP.

A. Funding Area Coordination

Prior to submitting a proposal to DWR, prospective applicants should, at a minimum, undertake the following actions, in conjunction with the DACs, RWMG(s), community based organizations, and stakeholders:

- Discuss interest in being the Grantee for the execution and management of the DAC Involvement agreement
- Develop an initial list of potential involvement activities

- Evaluate whether the initial list of potential involvement actives aligns with the eligible activities listed below or whether those activities are ineligible

B. Eligible Activities

Table 3 provides guidance to Applicants on the types of activities that are eligible for State reimbursement under this Program. Proposed activities submitted that fall outside of this guidance will need to be justified in the proposal for DWR to approve of the proposed activity and intended outcome.

For examples of previous DAC pilot projects funded by the IRWM grant program and other DAC Reports and Studies, See Appendix A of the 2016 IRWM Guidelines. Applicants are encouraged to review the documents and build off the prior works and general recommendations to the extent feasible.

Table 3 – Eligible DAC Involvement Activities

General Activity	Examples of Activity	Desired Outcome
Technical assistance	Service provider trainings, local circuit rider programs to train water and wastewater staff	Technical, financial or managerial assistance that results in community staff that are able to support local water resource decision making, gain knowledge, and retain technical skills within the Funding Area
Needs assessments	Surveys or meetings with community members to identify water management needs	Needs assessments provide a better understanding of water management needs of the community to help direct resources and funding
Project development activities	Planning activities, environmental compliance, or pre-construction engineering/design activities	Project development activities for future implementation/construction funding
Site assessment	Water quality assessments, median household income surveys, data and mapping activities	Site assessment that results in extensive knowledge gained by staff and DAC members on specific water management needs, data, and development for future water-related project(s)
Engagement in IRWM efforts	DAC regional engagement coordinator role, DAC Advisory Committee to RWMG, DAC representatives in governance	Engagement activities should result in increased activity and roles of DACs in RWMG decision making and increased participation in IRWM efforts
Governance Structure	Evaluation of existing governance structures and related plan financing efforts, assessments of the level of DAC involvement in decision making processes	Development or implementation of RWMG governance structures that ensure participation in IRWM efforts regardless of the ability to contribute financially to the IRWM plan
Community outreach	Public project meetings open to community members, door-to-door outreach	Outreach should result in increased participation of DACs in project development activities and IRWM planning activities
Education	Translation or interpretive services for information sharing, water education campaigns for community members, education for RWMGs on DAC needs	Education and interpretive services should result in the better understanding by community members of their water management needs
Facilitation	Facilitated RWMG meetings, facilitated project development meetings	Facilitation services should result in community participation and stakeholders being able to resolve or overcome obstacles in communicating water management needs
Enhancement of DAC aspects in IRWM Plans	Development of Funding Area-wide DAC plan to be utilized as a unified approach for all IRWM plans	IRWM Plan DAC-related changes should result in tangible changes to the IRWM plan that support the IRWM's understanding of their DAC water management needs in the region

C. Ineligible Activities and Costs

Ineligible activities and costs are not reimbursable by this Program and include, but are not limited to, the following items:

- Application preparation costs for funding opportunities not consistent with the purposes of the Proposition 1 IRWM funding
- Meals not directly related to travel
- Payment of stipends

D. Proposal Review and Approval

Complete proposals must be submitted in PDF format to DWR via email listed in the Foreword. Once proposals are submitted, DWR, in coordination with the State Water Resources Control Board (SWRCB), will review the materials for its responsiveness to this RFP and then contact the Funding Area applicant to schedule, if necessary, a coordination meeting. At this meeting, DWR may ask general questions regarding the proposal development process and discuss comments pertaining to the submittal. DWR may hold subsequent meetings with the Funding Area applicant regarding eligibility information and any needed proposal changes to ensure the proposed activities are appropriate for the Program. Throughout proposal development and implementation, DWR expects broad participation by the Applicant, members of DACs or community-based organizations, RWMG representatives, and stakeholders.

Once all requirements of the RFP are met and DWR approves the proposal, DWR will announce awards by issuing a commitment letter on a per Funding Area basis. If an acceptable proposal is not developed in a timely manner, DWR may directly expend the funds to support DAC involvement actions within the relevant Funding Area or the Funding Area funds will remain un-awarded until such time that a responsive proposal is submitted. The approval of the grant award has been delegated from DWR's Director to the Chief of the Division of IRWM, modifying the 2016 Program Guidelines, Section V.C for this Program only.

VI. Responding to this RFP

Applicants must submit the following information to DWR.

A. Applicant

Provide the Applicant contact information and a short statement (500 characters or less) of how the Applicant was selected by the DACs, RWMG(s), community based organizations, and stakeholders within the Funding Area.

B. DAC Background

Provide a baseline understanding on DAC water management needs from each Funding Area's perspective. This section must not exceed 5,000 characters and shall include the following:

- A description of the known DAC water management needs in the Funding Area
- An outline of the existing Funding Area strategy(ies) to address DAC water management needs across the Funding Area
- A discussion of whether the Funding Area has or has not been able to involve or engage DAC members in past IRWM activities; if not, identify the barriers encountered
- A map that identifies and distinguishes all known DAC, EDA, and underrepresented communities within the Funding Area. Please show on the map all IRWM region boundaries and all proposed involvement activity boundaries. DWR's DAC and EDA mapping tools may be useful references and can be found at the links listed in the 2016 IRWM Program Guidelines, Volume I, Appendix A
- A discussion of the underrepresented communities within the Funding Area

C. Activity Descriptions

Provide a detailed description of the proposed activities. There is no page or character limit on this section, but applicants are encouraged to be clear and concise. The description should include the following:

- Provide a title, description, and task outline for the proposed activities
- Justify how the proposed activities meet one or more of the intended outcomes in Table 3; or other potential intended outcomes not listed in Table 3
- Include a list of deliverables that will result from the proposed activities, including the development of a Funding Area-wide assessment final report (discussed below in Section VII, Reporting Requirement)
- A description of the key milestones of proposed activities and any related assumptions for the proposal schedule

D. Statement of Qualifications

The proposal must include a discussion of the entities that are anticipated to be tasked to undertake the proposed activities. The discussion must include a statement of qualifications for each activity that demonstrates that each entity tasked possesses the appropriate qualifications to interface and work with DAC members. This section must not exceed 5,000 characters and should include the following:

- List the necessary qualifications of staff, community-based organizations, or consultants that are needed to work on the proposed activities
- Identify participants, if known, including the Applicant, RWMG representatives, community-based organizations, or consultants who currently work with DACs. If known, describe the existing participant's qualifications with the following criteria:
    - Past performance on similar projects
    - Qualifications and expertise in involvement activities listed in Table 1
    - Ability to proactively manage the proposed activities to ensure a timely and successful completion

E. Schedule

Provide a schedule of the key milestones for the proposed activities. Gantt charts, bar charts, or other graphic displays are acceptable. The schedule should assume a start date of no earlier than June 1, 2016 and not exceed two years in duration. The schedule should show the anticipated overall start date and end date of each proposed activity and also show quarterly and final reporting obligations. Activity tasks and sub-task schedule dates are not required.

F. Budget

Provide a budget in tabular form for the Proposal. This budget must include the anticipated overall budget for each proposed activity and the basis of estimate for the activities described within the budget. The budget must also include the estimate for all administrative costs, if any.

VII. Reporting Requirements

Funds will not be disbursed until there is an executed grant agreement between DWR and the Grantee. As part of the grant agreement, the Grantee will be required to submit quarterly progress reports and invoices. DWR may request formal visits or meetings to monitor activities through the duration of the agreement.

As part of the grant agreement, a final grant completion report that includes a Funding Area-wide assessment and other deliverables will be required to be submitted. The following are required topics that must be included in the Funding Area-wide assessment section of the grant completion report:

- Description of water-related needs of the DACs, EDAs, and underrepresented communities in the Funding Area
- Map(s) identifying all DACs, EDAs, and underrepresented communities in the Funding Area with the IRWM regions overlaid
- Discussion of DACs, EDAs, and underrepresented communities, and other interested stakeholders engaged and involved in Program efforts
- Description of successful involvement activities performed in this Program
- Identification of projects developed through the DAC involvement activities, if applicable
- Identification ongoing barriers for DAC involvement in IRWM efforts
- Recommendations for water managers on future DAC involvement activities

Funding Areas may be requested by DWR to provide a presentation of completed activities near the end of the agreement. If requested, presentations will occur prior to termination of the agreement.

ITEM NO. 4

Upper Feather River
Integrated Regional Water Management

RWMG Meeting No. 9
February 26, 2016

To: Upper Feather River Regional Water Management Group

From: Uma Hinman, Uma Hinman Consulting

Subject: Proposition 1 Changes to IRWM Guidelines

Date: February 20, 2016

INTRODUCTION

The Grant Agreement for the preparation of the Upper Feather River (UFR) IRWM Plan is funded under Proposition 84 and requires compliance with those guidelines, which has guided our Plan update process to date. However, with the development and release of Proposition 1 funding opportunities, new guidelines require additional standards to be eligible for Proposition 1 funding. Those IRWM regions with adopted Plans will be required to amend or revise their Plans so as to meet the new standards for funding eligibility. Proposition 1 provides $5 million in Planning funding to assist regions with necessary updates to bring the plans up to the new standards.

DISCUSSION

The following discussion identifies the increase in standards with the Proposition 1 Guidelines, focusing on those changes that are in addition to Proposition 84 standards. The full Draft Proposition 1 Guidelines can be viewed online: http://www.water.ca.gov/irwm/grants/docs/p1Guidelines/2016Prop1IRWM_GuidelinesPublicReviewDraft.pdf.

1. AB 1249 compliance: Requires IRWM Plans in regions with nitrate, arsenic, perchlorate, or hexavalent chromium contamination to include a description of each of the following:

- *The location and extent of that contamination in the region,*
- *The impacts caused by the contamination to communities within the region,*
- *Existing efforts being undertaken in the region to address the impacts, and*
- *Any additional efforts needed to address the impacts.*

It also requires grant applications from these regions to include information regarding how the project(s) in their grant application helps to address the contamination or an explanation why the application does not include such project(s).

2. Water Code 79742(e): Requires applicants seeking Prop 1 IRWM funds to demonstrate that the IRWM Plan the applicant's project implements contributes to addressing the risks in the region to water supply and water infrastructure arising from climate change.

3. Groundwater Management Compliance: DWR acknowledges that things are changing with SGMA. During this transition period, grant program eligibility will have to consider both Groundwater Management Plan eligibility and Groundwater Sustainability Agency/Groundwater Sustainability Plan progress. Specific project solicitation packages (PSPs) will have specific instructions on what to submit for groundwater management eligibility. Groundwater project proponents must demonstrate how they are involved with Sustainable Groundwater Management Act efforts in the basin including formation of a Groundwater Sustainability Agency and development of a Groundwater Sustainability Plan.

4. Storm Water Resource Plans: The Storm Water Resource Plan (SWRP) – *if* one has been developed – must be incorporated into the IRWM Plan. If not SWRPs have been developed within the IRWM region, it should be noted and explained in the IRWM Plan.

6. Economically Distressed Areas: This is new since Prop 84 – defined as 85 percent of MHI.

7. The **match requirement** is now a minimum of 50 percent (non-State) of the total project costs. However, the local cost-sharing requirement may be waived or reduced for projects that directly benefit a DAC or EDA.

6. Program Preferences and Statewide Priorities have changed somewhat. Priority will be given to projects that achieve the following:

- Projects that leverage private, federal, or local funding or produce the greatest public benefit.
- Projects that employ new and innovative technology or practices, including decision support tools that support integration of multiple jurisdictions.
- Projects that implement IRWM Plans with greater watershed coverage.
- Projects that achieve multiple benefits.

Statewide Priorities include the following (see detailed descriptions on pp. 9-10 of Volume 1 of the Guidelines):

- Make Conservation a California Way of Life (building on current water conservation efforts and promoting the innovation of new systems for increased water conservation)
- Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
- Achieve the Co-Equal Goals for the Delta (providing a more reliable water supply for California and to protect, restore and enhance the Delta ecosystem)
- Protect and Restore Important Ecosystems
- Manage and Prepare for Dry Periods
- Expand Water Storage Capacity and Improve Groundwater Management
- Provide Safe Water for All Communities (the right to safe, clean, affordable and accessible water adequate for human consumption, cooking, and sanitary purposes)
- Increase Flood Protection
- Increase Operational and Regulatory Efficiency

8. Eligible Projects: The following is a list of eligible projects under Prop 1:

- Water reuse and recycling for non-potable reuse and direct and indirect potable reuse.
- Water use efficiency and water conservation.
- Local and regional surface and underground water storage, including groundwater aquifer cleanup or recharge projects.
- Regional water conveyance facilities that improve integration of separate water systems.
- Watershed protection, restoration, and management projects, including projects that reduce the risk of wildfire or improve water supply reliability.
- Stormwater resource management, including but not limited to, the following:
  - Projects to reduce, manage, treat, or capture rainwater or stormwater.
  - Projects that provide multiple benefits such as water quality, water supply, flood control, or open space.
  - Decision support tools that evaluate the benefits and costs of multi-benefit stormwater projects.
  - Projects to implement a stormwater resource plan.
- Conjunctive use of surface and groundwater storage facilities.
- Water desalination projects.
- Decision support tools to model regional water management strategies to account for climate change and other changes in regional demand and supply projections.
- Improvement of water quality, including drinking water treatment and distribution, groundwater and aquifer remediation, matching water quality to water use, wastewater treatment, water pollution prevention, and management of urban and agricultural runoff.
- Regional projects or programs as defined by the IRWM Planning Act.

Eligible projects must also (among other things):

- Provide multiple benefits.
- Assist water infrastructure systems adapt to climate change.
- Provide incentives for water agencies throughout each watershed to collaborate in managing the region's water resources and setting regional priorities for water infrastructure.
- Improve regional water self-reliance, while reducing reliance on Sacramento-San Joaquin Delta.
- Promote State planning priorities and sustainable community strategies.
- Wherever possible, preserve California's working agricultural and forested landscapes.

9. Water Code 10551: This doesn't affect content of the IRWM Plan, but is a new addition with Prop 1. It requires a RWMG, within 90 days of notice that a grant has been awarded, to provide DWR with a list of projects that benefit a DAC or where the project proponent is a nonprofit organization or a DAC. Within 60 days of receiving the project information, DWR is to provide advanced payment of 50 percent of the grant award.

10. The Following Sections of the IRWM Plan Have Added Requirements, as follows:

Governance: The IRWM governance structure description must include a discussion of whether or how Native American tribes will participate in the RWMG.

Regional Description: It appears DWR is requesting the AB 1249 plan for nitrate, arsenic, perchlorate, and chromium 6 as part of the "water quality" description.

Objectives: The Plan Objectives must address the following climate change adaptations and mitigation requirements:

- Address adapting to changes in the amount, intensity, timing, quality and variability of runoff and recharge.
- Consider the effects of sea level rise (SLR) on water supply conditions and identify suitable adaptation measures.
- Reduce energy consumption, especially the energy embedded in water use, and ultimately reducing GHG emissions.
- Consider, where practical, the strategies adopted by California Air Resources Board (CARB) in its AB 32 Scoping Plan, when evaluating different ways to meet IRWM plan objectives.
- Consider options for carbon sequestration and using renewable energy where such options are integrally tied to supporting IRWM Plan objectives.

Resource Management Strategies: Some new RMSs from the CA Water Plan Update 2013 (which must be considered) have been added:

- Sediment Management
- Outreach and Engagement
- Water and Culture

The effects of climate change on the IRWM region must factor into the consideration of RMS. The IRWM Plan must identify and implement, using vulnerability assessments and tools such as those provided in the Climate Change Handbook, RMS and adaptation strategies that address region-specific climate change impacts, including:

- Demonstrate how the effects of climate change on its region are factored into its RMS.
- Reducing energy consumption, especially the energy embedded in water use, and ultimately reducing GHG emissions.
- An evaluation of RMS and other adaptation strategies and ability of such strategies to eliminate or minimize those vulnerabilities, especially those impacting water infrastructure systems.

Project Review: Review factors must include:

- Whether the project proponent has adopted or will adopt the IRWM Plan.
- For IRWM regions that receive water supplied from the Sacramento-San Joaquin Delta, how the project or program will help reduce dependence on the Sacramento-San Joaquin Delta for water supply.

Review factors must also include the following climate change considerations:

- Include potential effects of Climate Change on the region and consider if adaptations to the water management system are necessary.
- Consider the contribution of the project to adapting to identified system vulnerabilities to climate change effects on the region.
- Consider changes in the amount, intensity, timing, quality and variability of runoff and recharge.
- Consider the effects of sea level rise on water supply conditions and identify suitable adaptation measures.
- Consider the contribution of the project in reducing GHG emissions as compared to project

alternatives
- Consider a project's ability to help the IRWM region reduce GHG emissions as new projects are implemented over the 20-year planning horizon.
- Reduce energy consumption, especially the energy embedded in water use, and ultimately reducing GHG emissions.

Impacts and Benefits: The discussion must include both impacts and benefits within the IRWM Region, between regions, and those directly affecting DAC, environmental justice (EJ) related concerns, and Native American Tribal communities.

Relation to Local Water Planning: Upon development of a Storm Water Resource Plan, the RWMG shall incorporate it into the IRWM Plan. The IRWM Plan should discuss the processes that it will use to incorporate such plans. (If a region doesn't have and doesn't plan to have a SWRP that should be explained in this section.)

Native American Tribes and Stakeholder Involvement: In Prop 84 this section was just "Stakeholder Involvement." Nothing substantive has changed in this section besides explicitly stating "Native American Tribes" in addition to "stakeholders" throughout the section.

Climate Change: *Vulnerabilities and Adaptation Strategies:* The section provides several additional options of tools for assessing vulnerabilities, though it doesn't say which tool a RWMG must use to assess vulnerabilities. Once vulnerabilities have been assessed, the RWMG needs to prioritize them and to determine the feasibility of addressing them. Section 4.4 of the *Climate Change Handbook* provides several factors the RWMG might want to consider when prioritizing vulnerabilities. RWMGs should incorporate strategies to eliminate or minimize the prioritized vulnerabilities into a broader planning context that considers the uncertainties associated with climate change.

Climate Change Mitigation: Where practical, RWMGs should consider the mitigation strategies adopted by California Air Resources Board in its *Climate Change Scoping Plan*.

Many of these new standards can be worked into the Plan update without too much additional work on behalf of the staff. However, staff is still assessing what, if any additional work, will be required to incorporate the new standards for climate change in regards to vulnerabilities, adaptations, and project assessments.

REQUEST

Staff is requesting discussion and direction regarding meeting the new Proposition 1 standards, which are out of scope with the current Grant Agreement.

ITEM NO. 5

Upper Feather River
Integrated Regional Water Management

RWMG Meeting No. 9
February 26, 2016

To: Upper Feather River Regional Water Management Group

From: Uma Hinman, Uma Hinman Consulting

Subject: Draft Governance, Stakeholder Involvement, Coordination Chapter

Date: February 20, 2016

INTRODUCTION

The IRWM Plan must document a governance structure that ensures the IRWM Plan will be updated and implemented beyond existing State grant programs. The Governance Standard is to ensure that an IRWM Plan has the structures and procedures that maximize functionality, participation in the Plan, and Plan longevity.

Per the Proposition 84 IRWM Guidelines, the governance chapter should include a comprehensive discussion of the following:

- The name of the RWMG responsible for development and implementation of the Plan.
- A description of the RWMG and explanation of how the makeup of the RWMG meets CWC §10539 and is sufficient in breadth of membership and participation to develop and implement the IRWM Plan.

  "RWMG means a group in which three or more local agencies, at least two of which have statutory authority over water supply or water management, as well as those other persons who may be necessary for the development and implementation of a plan that meets the requirements of CWC §10540 and §10541, participate by means of a joint powers agreement, Memorandum of Understanding (MOU), or other written agreement, as appropriate, that is approved by the governing bodies of those local agencies."
- The RWMG and individual project proponents who adopted the Plan
- A description of the IRWM governance structure
- A description of the how the chosen form of governance addresses and ensures the following:
  - Public outreach and involvement processes
  - Effective decision making
  - Balanced access and opportunity for participation in the IRWM process
  - Effective communication – both internal and external to the IRWM region

- Long term implementation of the IRWM Plan
- Coordination with neighboring IRWM efforts and State and federal agencies
- The collaborative processes used to establish plan objectives
- How interim changes and formal changes to the IRWM Plan will be performed
- Updating or amending the IRWM Plan

The Governance, Stakeholder Involvement, Coordination Chapter addresses most of the topics listed above; however, Plan implementation, changes, and updates will be included in the Plan Performance and Monitoring chapter, which is currently being drafted.

PROCESS AND NEXT STEPS

The Governance, Stakeholder Involvement, Coordination Chapter was drafted by staff based on the IRWM MOU, approved Stakeholder Involvement Plan, the Tribal Engagement Plan, RWMG meetings and input from Workgroup Coordinators. The draft chapter was released to the workgroups, stakeholders, and posted on the website on October 8, 2015 for a 30 day review and comment period. The deadline for comments was November 11, 2015. No comments were received on the draft chapter.

The next step in the process will be to address any comments received by the RWMG at the February 26th meeting. Upon completing this process with the other draft chapters, the chapters will be incorporated into a comprehensive Public Review Draft Plan, which will be the next opportunity for public input and comment. Once the Public Review Draft Plan is ready and made available, there will be two public meetings scheduled within the public review period to present the Draft Plan and to receive comments.

REQUEST

Discussion and direction to staff.

Attachment: Draft Governance, Stakeholder Involvement, Coordination Chapter

3. Governance, Stakeholder Involvement, Coordination

Introduction

This chapter describes the governance and stakeholder outreach process and procedures that will be followed during the update and implementation of the Upper Feather River (UFR) Integrated Regional Water Management (IRWM) Plan. Effective governance of the IRWM Plan process will ensure that all stakeholders as well as the public will have access to the planning process, have opportunities to participate and comment during the planning process, and continue their involvement after the Plan is adopted.

3.1 Governance

3.1.1 Memoranda of Understanding and Entities Adopting the UFR IRWM Plan

In June 2005, the County of Plumas, the Plumas County Flood Control and Water Conservation District, the Sierra Valley Groundwater Management District (SVGMD), and the United States Forest Service Plumas National Forest entered into a Memorandum of Understanding (MOU) to adopt an initial IRWM Plan for the UFR Watershed. These entities, collectively known as the Feather River Regional Watershed Initiative, collaborated in the development of a UFR IRWM Plan under California Department of Water Resources Proposition 50 Guidelines and Standards. The primary goals were to increase coordination and collaboration among stakeholders in the UFR Watershed and to ensure that an appropriate share of IRWM funding available to the Sacramento River funding area would be allocated to the UFR Watershed[1]. The parties also were seeking to ensure that objectives, data and project outcomes for the UFR Watershed were incorporated into these plans:

- State Water Plan, as revised every five years by the Department of Water Resources (DWR);
- Water Quality Control Plan (Basin Plan) for the Sacramento and San Joaquin River Basins;
- Hydroelectric licenses and adaptive management processes of the Federal Energy Regulatory Commission (FERC); and
- California Air Resources Board Scoping Plan (AB 32).

In order to remain eligible for DWR's IRWM Grant Funding opportunities it is necessary to update the existing UFR IRWM Plan to Proposition 84 standards. Consequently, to better reflect the increased collaboration throughout the region and to further define the intent of the UFR IRWM Program, a subsequent MOU was signed in November 2014, which established the Upper Feather River Regional Water Management Group (RWMG) as the successor to the 2005 Feather River Regional Watershed Initiative. Authorized by the IRWM Act (California Water Code Sections 10530 to 10547), the formation of the RWMG is necessary to carry out the UFR IRWM Program and further develop, implement, and periodically update the UFR IRWM Plan. In addition to carrying out the Program, the RWMG is required to:

[1] The region was successful in obtaining subsequent Proposition 50 grant funds amounting to approximately $7 million.

- Support the objectives of the California Department of Water Resources IRWM Program that seeks to ensure sustainable water uses, reliable water supplies, better water quality, environmental stewardship, efficient development, protection of agriculture, and strong economies.
- Promote communication and collaboration in the Upper Feather River Region to identify and implement resource management strategies and projects with broad-based stakeholder support.
- Facilitate local investment in projects that can maximize regional benefits through economies of scale and through projects with compound resource benefits.
- Establish values for ecosystem services that are provided through water and watershed management actions.
- Develop investment mechanisms to increase financial support from extra-regional beneficiaries of improvements in water supply, water quality, flood control, hydroelectric generation, recreational opportunities, forest health, habitat and species preservation, and carbon sequestration.
- Coordinate advocacy and communication efforts among the regional stakeholders.
- Coordinate planning and actions with neighboring or otherwise connected IRWM Regions.

The MOU also encourages California state agencies--the Department of Water Resources, the Central Valley Regional Water Quality Control Board, the Department of Conservation, and the Department of Fish and Wildlife--to designate liaisons in order to promote coordination with State plans and actions with the work of the UFR RWMG.

3.2 Plan Governance Structure

The MOU sets forth the governance structure for the IRWM planning, adoption and implementation processes. The basic structure of how the RWMG communicates with its members, its workgroups and the public is depicted in Figure 3-1. In general, the RWMG is the decision-making body for the IRWM Plan Update process, with support and recommendations provided by the workgroups.

3.2.1 Regional Water Management Group

Per the Integrated Regional Water Management Act (California Water Code Section 10539), a RWMG is composed of three or more local agencies, two of which have statutory authority over water supply or water management, as well as those other persons who may be necessary for the development and implementation of an IRWMP. The Upper Feather River RWMG consists of twelve (12) member agencies (Table 3-1), all signatories of the MOU, with seven (7) of the agencies having statutory authority over water supply or management. The composition of the RWMG provides a broad representation of water resource, natural resource and land-use management activities for the Upper Feather River region. All members have agreed to work together to serve as the Upper Feather River Regional Water Management Group and to carry out the IRWM Program in the region throughout the planning and implementation phases.

Figure 3-1. Upper Feather River IRWM Plan Governance Structure

PLACEHOLDER

TABLE 3-1. REGIONAL WATER MANAGEMENT GROUP (RWMG)

Agency/Entity/Workgroup	Representing	Statutory Authority over Water
County of Plumas	Local government and disadvantaged communities	X
County of Sierra	Local government and disadvantaged communities	X
Feather River Resource Conservation District	Watershed issues and private landowner interests	
Sierra Valley Resource Conservation District	Watershed issues and private landowner interests	
Maidu Summit Consortium - Native American Representative	Tribes and Native American interests	
Plumas County Flood Control and Water Conservation District	Local government and disadvantaged communities	X
Sierra Valley Groundwater Management District	Sierra Valley Groundwater Management District	X
Plumas County Community Development Commission	Disadvantaged communities, infrastructure, and housing issues	
Representative from the Almanor Basin[a]	Watershed issues of the Almanor Basin	
Plumas National Forest – USDA Forest Service[b]	Plumas National Forest	X
Lassen National Forest, Almanor Ranger District[b]	Lassen National Forest	X
Tahoe National Forest, Sierraville Ranger District[b]	Tahoe National Forest	X

a. The representative from the Almanor Basin is a public member appointed by the Plumas County Board of Supervisors.

b. Federal entities serve in an advisory role only; they are not voting members.

The governing body of each of the RWMG member agencies or entities has appointed a member representative, a first alternate, and a second alternate. The first alternate member representative may sit and vote with the RWMG in the absence of the primary member, and the second alternate may sit and vote in the absence of the primary member and first alternate. Once appointed, the RWMG member representative or alternate serves a two-year term or until a successor is appointed. Both the primary member representative and the alternates may be reappointed to successive terms and they may be replaced at any time by the appointing authority for the agency.

The RWMG selects from its members a Chair and a Vice-Chair, each serving a one-year term. The Chair will preside over the meetings of the RWMG; the Vice-Chair assumes the duties of the Chair in the absence of the Chair.

3.2.2 Workgroups

Any stakeholder or member of the public may participate in the workgroups. The workgroups provide input on project selection and prioritization criteria, receive and present comments on draft IRWMP chapter reviews, and invite and schedule presentations by technical experts, scientists, and other interested parties for Workgroup and RWMG meetings. Five workgroups have been established[2] to focus discussions and to make recommendations for long-term stakeholder interest within the UFR IRWM region.

The workgroups (below) are focused on the resource areas identified in the California Water Plan, and on issues in the UFR region:

TABLE 3-2 Workgroups of the Upper Feather River IRWM Planning Process

Workgroup	Resource Areas of Focus
Agricultural Land Stewardship	Irrigated lands, water quality issues, agricultural water supply reliability, and agricultural water use efficiency
Floodplains, Meadows, and Waterbodies Management	Recharge area protection, flood risk management, pollution prevention, ecosystem restoration, and conjunctive management and groundwater
Municipal Services	Recycled municipal water, urban water use efficiency, groundwater and surface water pollution prevention, water system reoperation, drinking water treatment and distribution, and perhaps groundwater and aquifer remediation, urban runoff management, and matching water quality to use
Tribal Advisory Committee	Cultural and environmental issues that cross all workgroup categories; topics such as Traditional Ecological Knowledge (TEK) toward restoration and stewardship
Uplands and Forest Management	Pollution prevention (wildfires, roads), watershed management (forest-water interactions), forest ecosystem restoration, upland recharge area protection, flood risk reduction (through wildfire risk reduction), precipitation enhancement (better groundwater infiltration and less evapotranspiration through forest stand density reduction), and other general issues

To encourage ownership and participation in the process, each workgroup's participants select a chair and alternate amongst themselves to assist the Workgroup Coordinator with meetings and to act as liaison to the RWMG. Workgroups review proposals for plans, projects, and any other actions and provide input to each of the Workgroup Chairs. A Workgroup Coordinator, provided by the IRWM Plan Update Consultant Team, coordinates and facilitates meetings, supports the workgroups with baseline

[2] Four workgroups were originally identified in the MOU. The RWMG added a fifth working group, identified as the Tribal Advisory Committee, at its May 29, 2015 meeting.

data and information, and performs continuous outreach efforts throughout the Plan process. The Workgroup Coordinator and Chairs collaborate on workgroup meetings, coordinate workgroup tasks, and present proposals and recommendations for consideration to the RWMG members.

Decision-making

The Plan Update process includes decision-making criteria at two levels. A majority of the RWMG membership constitutes a quorum for the transaction of business and decisions. The affirmative votes of at least a majority of the RWMG members shall be required for any action by the RWMG.

A process for decision-making at the workgroup level is also established in the MOU. Decision-making by workgroup members is structured to seek consensus (approval) through super majority agreement. In this context, consensus does not necessarily mean that all workgroup members support an action, but rather no workgroup member should be opposed to the action that is forwarded to the RWMG for consideration.

The ultimate decision-making authority lies with the RWMG. In general, the nine voting members[3] of the RWMG participate in the decision-making process without hierarchical differentiation, and all major IRWM planning decisions and milestones are decided by vote during the meetings. For any action or major decision, a majority vote of the RWMG members (present or via conference call) is required

Plan Adoption

In accordance with Proposition 84 Guidelines, the governing bodies of each of the 12 participating agencies of the RWMG are responsible for the development of the IRWM Plan, have responsibility for implementation of the IRWM Plan, and must formally adopt the IRWM Plan. Signatories of the MOU are expected to adopt the IRWM Plan after it is approved by the RWMG. Proof of adoption is a resolution (or other written documentation) with signatory blocks for each governing body adopting the Plan.

3.3 Stakeholder Participation in the Plan Process

The governance structure and the processes of the RWMG are intended to elicit public participation and involvement in developing the IRWM Plan Update, project selection criteria, and other RWMG activities. To this end, all RWMG meetings are open to the public, in person or by video conference, and each meeting includes scheduled time for public input. Information regarding the Plan Update process and RWMG meetings is available on the Plan website (http://featherriver.org). Interested parties may sign up through the website or via e-mail at UFR.contact@gmail.com to receive meeting notices and materials, attend meetings via teleconferencing, participate in discussions, and receive invitations to UFR project development activities.

3.3.1 Stakeholder and Public Involvement

Stakeholders are integral to identifying issues, developing resource management strategies (RMS), and defining objectives. Stakeholders in the UFR region include water management agencies, conservation groups, counties, federal entities, Tribal communities, regional watershed groups and councils,

[3] The three National Forests represented on the RWMG (Plumas, Tahoe, and Lassen) serve in an advisory role and are not voting members.

agricultural interests, disadvantaged communities (DAC), and the public. Stakeholders were initially identified (Appendix XX) by working with recent and existing regional planning efforts and organizations (i.e., Plumas County General Plan Update, Collaborative Forest Landscape Restoration Act, Plumas County Special Districts Association, Cattleman's Association, etc.). A Stakeholder Involvement Plan (SIP) adopted by the RWMG in November 2014 sets forth outreach efforts to encourage a diverse group of informed local stakeholders throughout the UFR region (Appendix XX) to participate. Stakeholders may take part in the IRWM Plan update process through the workgroups as well as by attending RWMG meetings and workshops. All stakeholders are added to contact lists; they then receive Plan Update communications and notices.

Stakeholder outreach began long before the Plan Update process started in September 2014 through informal discussions with various agencies and entities throughout the region. To initiate the Plan Update process, in accordance with §6066 of the Government Code, the RWMG published a notice of intent to prepare the Plan on October 22 and 29, 2014. The RWMG will publish a notice of intention to adopt the Plan in a public meeting of the RWMG governing board on XXXX, XX, 2016 (CWC §10543).

3.3.2 Outreach to Disadvantaged Communities

During the UFR IRWM Plan update process, DAC service providers were surveyed regarding their water issues and needs (see Region Description Chapter for list of DACs in the region). A Community Vulnerability Assessment is being prepared in coordination with the Plumas County Department of Environmental Health, County staff, and IRWM Plan consultants who work closely with disadvantaged community members to identify ground water well vulnerability. The information will be used to better identify drinking water pollution risks for the approximately 40 percent of groundwater-dependent households in the DAC-dominated region that rely on individual wells and septic systems for their water and wastewater needs. The study will assess nitrate pollution risks to municipal and domestic drinking water wells in high groundwater table areas with septic systems and agricultural livestock production.

3.3.3 Outreach to Native American Tribes

Tribal outreach is led by the California Indian Environmental Alliance (CIEA) and includes a local Tribal member as an outreach coordinator. The local Tribal member is a designated representative for the Maidu Summit Consortium, a signatory of the MOU, and is a member of the RWMG. The outreach efforts have resulted in formation of a Tribal Advisory Committee (TAC). The TAC meets approximately every other month to review and discuss IRWM process tasks, to review and discuss project proposal development and implementation, and to coordinate feedback and input on the process and Plan. The TAC's input is relayed to the RWMG through the designated Tribal member of the RWMG.

3.4 Communication Plan

3.4.1 Methods, Technology and Information Access

The overall communications strategy for the UFR IRWM Plan Update is designed to be accessible, inclusive and transparent. RWMG members and stakeholders receive timely and consistent updates and information regarding Upper Feather River IRWM Program activities and goals. Extensive

communication efforts ensure that stakeholders, project proponents, and the public remain well informed of the latest UFR IRWM activities and accomplishments through:

- Traditional media
- Press releases, distributed to local newspapers
- Press releases, posted on the UFR IRWM website (www.featherriver.org)
- Notice of public meetings, meeting summaries and videos, reports, background information, a document library, GIS mapping tool, and information on the Plan process and content, posted on the UFR IRWM website
- Contact lists, including e-mail, mail, or phone numbers
- Personal communications
- Printed materials, available at meetings and workshops, such as IRWM Plan pamphlets and educational handouts

The Stakeholder Involvement Plan (Appendix XX) contains a detailed communication strategy for the UFR IRWM Plan update process.

The MOU requires that public education opportunities be solicited on behalf of the Plan Update process, such as presentations to community organizations and at community functions, media interviews and the distribution of educational materials to the MOU signatories, or at conferences and workshops. All meetings of the RWMG, except those closed sessions authorized by the "Brown Act" (California Government Code Section 54950, et seq.), are open to the public and noticing of such meetings shall be in accordance with the Brown Act.

3.5 Coordination

3.5.1 Adjacent IRWM Regions

Neighboring IRWM planning regions include Lahontan, Tahoe-Sierra, Cosumnes-American-Bear-Yuba (CABY), Upper Pit, Yuba County, and Northern Sacramento Valley IRWM groups. The RWMG and consultant team members communicate with neighboring IRWMs to share lessons learned, process feedback, and share resources where appropriate. Additionally, members of the UFR IRWM Plan update team regularly attend and are involved in the Sierra Water Workgroup, a group that works to coordinate local and regional water planning efforts in the Sierra.

3.5.2 State and Federal Agencies

The three National Forests represented on the RWMG--Lassen, Tahoe and Plumas—manage approximately 70 percent of the region. California state agencies--the Department of Water Resources, the Central Valley Regional Water Quality Control Board, the Department of Conservation, and the Department of Fish and Wildlife—also have significant management interests in the region; the RWMG has encouraged them to designate liaisons to attend and participate in meetings. Outreach also includes communicating with energy and water supply utilities, such as Pacific Gas and Electric (PG&E) and local municipal services providers. For example, PG&E presented information and data developed for the current efforts to relicense its Feather River hydroelectric development, which runs from Lake Almanor nearly to Lake Oroville (known as the "Staircase of Power").

ITEM NO. 6

Upper Feather River
Integrated Regional Water Management

RWMG Meeting No. 9
February 26, 2016

To: Upper Feather River Regional Water Management Group

From: Uma Hinman, Uma Hinman Consulting

Subject: Draft Region Description Chapter

Date: February 20, 2016

INTRODUCTION

The Region Description chapter of the IRWM Plan is a presentation of the baseline conditions in the watershed. The intent of the Region Description Standard is to document that the IRWM planning Region is defined by the combination of the water systems being managed; common water issues; and that there is sufficient variety of interested parties included in the planning region. The region description contained in the IRWM Plan should closely follow the information required in the Regional Acceptance Process (RAP) whereby DWR accepts IRWM regions into the grant program.

Per the Proposition 84 IRWM Guidelines, the Region Description should include a comprehensive discussion of the following:

- Description of watersheds/water systems
- Description of internal boundaries
- Water supply and demand
- Water quality
- Description of the social and cultural makeup of the regional community
- Description of major water related objectives and conflicts
- Explanation of regional IRWM boundary
- Identification of neighboring or overlapping IRWM regions

PROCESS AND NEXT STEPS

The Region Description Chapter was drafted by staff with input from Workgroup Coordinators. The 2005 IRWM Plan and the 2009 RAP application was used as the basis in developing the chapter, as well as numerous reports and studies identified and collected through the "Call for Studies" in early 2015. The draft chapter was released to the workgroups, stakeholders, and posted on the website on December 7, 2015 for a 30 day review and comment period. The deadline for comments was January 11, 2016. Staff received 14 sets of comments in total. The comments were reviewed internally and with Randy Wilson,

Project Manager, and revisions made accordingly. The version included in this agenda item is the revised chapter.

Please note that the draft maps included in the attached draft chapter have not yet been reviewed by the workgroups and stakeholders. We are continuing to refine the maps as we progress through development of the remaining chapters.

The next step in the process will be to address comments received by the RWMG at the February 26th meeting. Upon completing this process with the other draft chapters, the chapters will be incorporated into a comprehensive Public Review Draft Plan, which will be the next opportunity for public input and comment. Once the Public Review Draft Plan is ready and made available, there will be two public meetings scheduled within the public review period to present the Draft Plan and to receive comments.

REQUEST

Discussion and direction to staff.

Attachment: Draft Region Description Chapter

Draft Region Description

Table of Contents

4. Region Description

4.1. Introduction

The Upper Feather River watershed encompasses 2.3 million acres in the northern Sierra Nevada, where that range intersects the Cascade Range to the north and the Diamond Mountains of the Great Basin and Range Province to the east. The watershed drains generally southwest to Lake Oroville, the largest reservoir of the California State Water Project (SWP). Water from Lake Oroville enters a comprehensive system of natural and constructed conveyances to provide irrigation and domestic water as well as to supply natural aquatic ecosystems in the Lower Feather River, Sacramento River, and the Sacramento-San Joaquin Delta. Lake Oroville is the principal storage facility of the SWP, which delivers water to over two-thirds of California's population and provides an average of 34.3 million acre-feet (AF)/year of agricultural water to the Central Valley.

Lands to the east of the Upper Feather River watershed drain to Eagle and Honey Lakes that are closed drainage basins in the Basin and Range Province, while lands to the north, west, and south drain to the Sacramento River via the Pit River, Yuba River, Battle Creek, Thomas Creek, Big Chico Creek, and Butte Creek. Mount Lassen, the southernmost volcano in the Cascade Range, defines the northern boundary of the region. Sierra Valley, the largest valley in the Sierra Nevada, defines the southern boundary. At the intersection of the Great Basin, the Sierra Nevada Mountains, and the Cascade Range, the region supports a diversity of habitats including an assemblage of meadows and alluvial valleys interconnected by river gorges and rimmed by granite and volcanic mountains. The wild and scenic Middle Fork of the Feather River plunges through granite walls and boulders for nearly 80 miles. The granitic North Fork of the Feather River is headwaters for some of the most important hydroelectric and water supply

Upper Feather River IRWM Planning Area

Figure 4-1

- Hydroelectric Plant
- Dam
- Gaging Station
- Forest/Region HeadQtrs Office
- Forest Service Facility
- Lookout - Permanent
- Ranger District Office
- Major Stream or River
- Other Streams
- Artificial Path
- Canal Ditch
- Connector
- Pipeline, Aqueduct, Penstock, or Siphon
- Major Powerlines
- Railroad
- State Highway
- Primary Road
- Trail - Nat Rec., Scenic, Historic
- Lake/Pond
- Playa
- Reservoir
- Sewage Treatment Pond
- Swamp/Marsh
- National Forest
- National Park
- USFS Wilderness Area
- NPS Wilderness Area
- County
- Upper Feather River IRWM Planning Area

N

0 1 2 4 6 8

Miles

Cartography by Deer Creek GIS
www.deercreekgis.com

developments in California, and during winter storm events is ringed by over 50 waterfalls plunging to the river and roadway from the cliffs and tributary streams.

4.2. Explanation of Regional IRWM Boundary

4.2.1. Jurisdictional Boundaries

Land ownership in the Integrated Regional Water Management (IRWM) Plan Area is approximately 64 percent Federal, 1 percent State, and 35 percent private. Federal lands are managed primarily by the U.S. Forest Service (USFS) except for less than 1 percent of the watershed that is within Lassen Volcanic National Park and some Bureau of Land Management lands in the Sierra Valley. Approximately 50 percent of the National Forest System lands in the watershed are administered by the Plumas National Forest, with the remainder administered by the Tahoe and Lassen National Forests. The private land in the watershed is primarily used for commercial timber and agriculture, and is interspersed with historic community settlements and recreational developments. The region is also entirely within the boundary of the Central Valley Regional Water Quality Control Board (Central Valley RWQCB).

The entire IRWM Plan Area is within the portion of the Feather River watershed that drains to Lake Oroville. The boundary of the watershed largely corresponds to the boundary of Plumas County, but also includes portions of six neighboring counties (Table 1-1, Figure 1-2).

Table 4-1. Counties within the Upper Feather River Watershed

County	Total Size (ac.)[1]	Area in Watershed (ac.)[2]	Percentage in Watershed	Percent of Watershed
Butte	1,073,340	345,850	32.2	14.9
Lassen	3,021,050	119,394	3.9	5.2
Plumas	1,672,640	1,653,456	98.9	71.7
Shasta	2,462,340	13,574	0.6	0.6
Sierra	615,680	172,367	27.9	7.5
Tehama	1,895,870	136	<0.1	<0.1
Yuba	411,970	1,780	0.4	<0.1
Total	--	2,306,557	--	100

[1]Source: http://www.dof.ca.gov/html/FS_DATA/STAT-ABS/documents/A1.pdf
[2]Source: Plumas County 2009

There are two incorporated cities in the IRWM Plan Area: the City of Portola in Plumas County and the City of Loyalton in Sierra County. There are approximately 37 unincorporated communities, including but not limited to Quincy, East Quincy, Delleker, Chester, Greenville, Taylorsville, Westwood, Sierraville, and Graeagle.

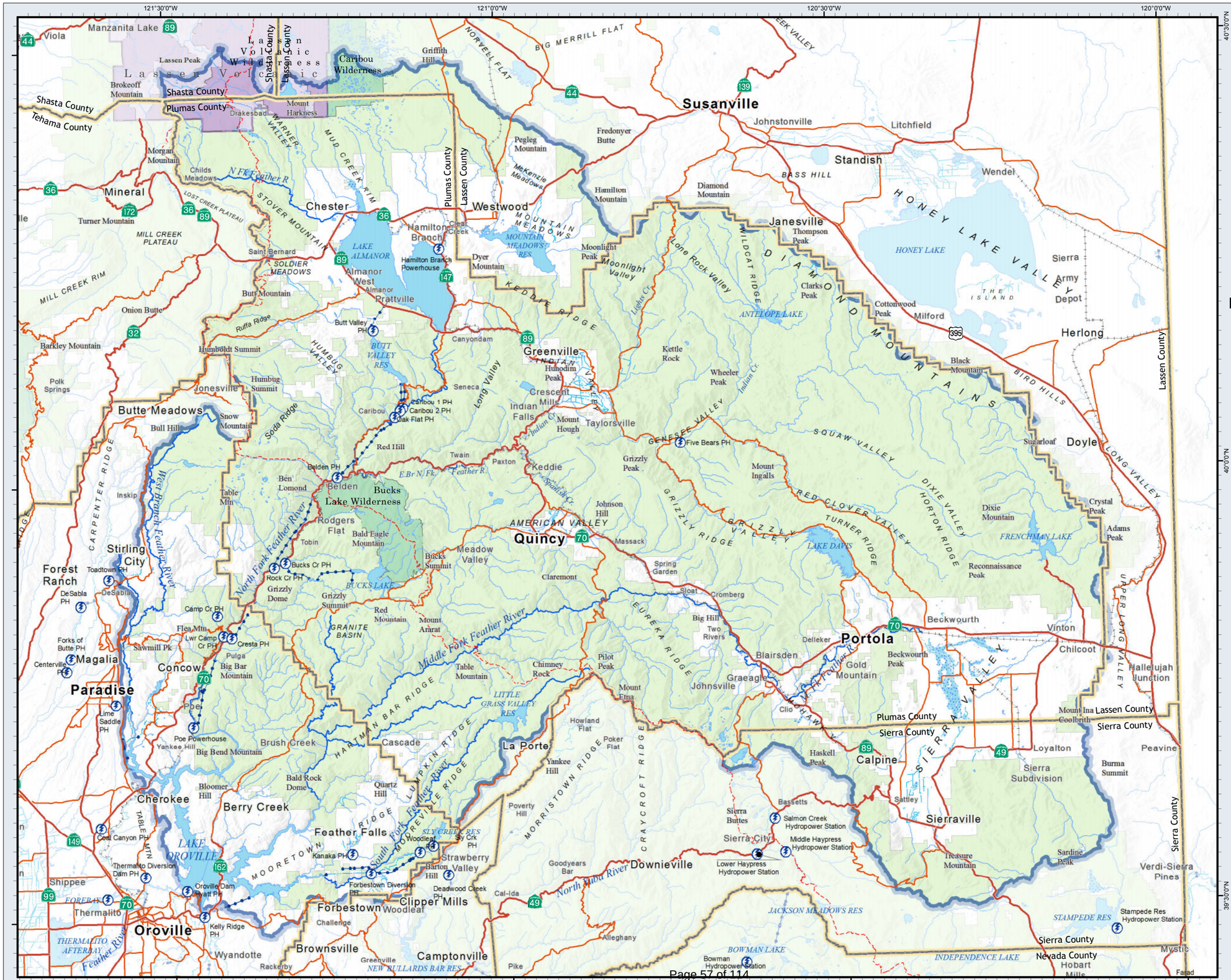
A total of 27 water, wastewater, conservation, irrigation, and flood control districts are located entirely within the IRWM Plan Area (Table 1-2, Figure 1-3). These individual district service areas do not significantly affect the land management of the Upper IRWM Planning Area.

Upper Feather River Integrated Regional Water Management Planning Area

Administrative Boundaries

Sierra County Data Not Available From FEMA

Figure 4-2 Map of Counties within the Upper Feather River Region



Cartography by Deer Creek GIS
www.deercreekgis.com

Table 4-2. Agency Services within the Upper Feather River IRWM Plan Area

Agency/District[a]	Water	Wastewater	Irrigation	Conservation	Flood Control	Groundwater
Plumas County Flood Control and Water Conservation District					X	X
Sierra Valley Groundwater Management District						X
Sierra Valley Mutual Water District[b]			X			
Last Chance Creek Water District			X			
Feather River Resource Conservation District				X		
Sierra Valley Resource Conservation District				X		
City of Loyalton	X	X				
City of Portola	X	X			X	
Chester Public Utility District	X	X				
East Quincy Community Services District	X	X				
Gold Mountain Community Services District	X	X				
Greenhorn Creek Community Services District	X	X				
Grizzly Lake Resort Community Services District	X	X				
Grizzly Ranch Community Services District	X	X				
Indian Valley Community Services District	X	X				
Plumas Eureka Community Service District	X	X				
Quincy Community Services District	X	X				
Walker Ranch Community Services District	X	X				
Westwood Community Services District	X	X				
Beckwourth County Service Area		X				
West Almanor Community Services District		X				
Clio Public Utilities District	X					
Clear Creek Community Services District	X					
Hamilton Branch Community Services District	X					
Johnsville Public Utilities District	X					
Graeagle Community Services District	X					
Feather River Canyon Community Service District	X					
Department of Water Resources: Indian Valley and Sierra Valley Water Master Service Areas			X			

[a] Source: Plumas, Sierra, and Lassen Local Agency Formation Commissions

[b] The Sierra Valley Mutual Water District is not a special district; it is a private irrigation district.

Upper Feather River Integrated Regional Water Management Planning Area

State Water Project Facilities and Private Water Districts

DRAFT - Needs Indian Valley CSD

Figure 4-3 Map of Water and Wastewater DIstricts in the Upper Feather River Region

- Upper Feather River IRWM Planning Area
- Major Stream or River
- Streams
- Pacific Crest Trail
- Railroad
- County
- Private Water Districts
- Lake/Pond
- SWP-Operated Reservoir
- Swamp
- National Park
- USFS Wilderness Area
- NPS Wilderness Area

0 2.5 5 10 15 Miles

Cartography by Deer Creek GIS
www.deercreekgis.com

It is important to note that approximately 40 percent[1] of the population in the Upper Feather River region relies on individual wells and septic systems and, therefore, are not served by municipal water and wastewater districts. Additionally, dependence on groundwater by municipal services providers and domestic households is a significant jurisdictional water management characteristic and a challenge for the region.

4.2.2. Physical Boundaries

The physical boundaries of the IRWM Plan Area are the Feather River watershed's mountain escarpments upstream of Oroville Dam. Lake Oroville, the downstream terminus of the Plan Area, provides a fixed point, where the effects of management actions in the upper watershed drain to infrastructure of statewide water importance. This reflects land and water management on a regional scale as it is monitored and measured as inflows to Lake Oroville, the SWP, and PG&E's "Stairway of Power." The Feather River is unique among Sierra Nevada streams in that it breaches the Sierra Crest of the Diamond Mountains and drains both the west and east slopes of the Sierra Range to the Sacramento River. The Feather River is one of the largest watersheds in the Sierra Nevada.

The northern boundary of the IRWM Plan Area runs southeast from Mount Lassen, through volcanic highlands separating the Feather River and Pit River watersheds, until intersecting the crest of the Diamond Mountains east of Lake Almanor. The boundary follows the Diamond Mountains south, crosses the historic Beckwourth Pass (the lowest pass in the Northern Sierra for the first European settlers to the region), and runs westward along the Sierra Crest which separates the Feather River watershed from the Truckee River watershed. The Sierra Crest also forms the southwest boundary of the IRWM Plan Area, where the Yuba River drains the western slope of the range and the Feather River drains the eastern slope. The region includes the western slope of the Sierra Nevada where the Middle and North Forks of the Feather River carve through the lava flows of the foothills, and follow the western slopes of the Sierra Nevada and the southern end of the Cascade Range to the base of Mount Lassen.

Because of the small population and limited municipal infrastructure in the IRWM Plan Area, water management issues in the Plan Area are predominantly defined by landscape-scale hydrologic processes and focus on the intersection of water and land management activities, such as watershed management, forest management, agricultural irrigation practices, and integrated surface and groundwater management. Despite the small population of the region, land and water management activities in the Plan area have significant implications for both upstream and downstream beneficiaries of flood control, water supply, and hydroelectric power values. The physical boundary of the IRWM Plan Area reflects the watershed- and landscape-scale issues that define the region, and provides a workable geographic scale for addressing those issues in an effective, efficient, and integrative manner for both local and downstream needs and values.

4.2.3. Neighboring/Overlapping IRWM Region Boundaries

The Upper Feather River IRWM Plan Area borders or overlaps with six adjacent IRWM plan areas (Figure 1-4).

[1] Plumas County. 2009. *Regional Acceptance Process Application.*

Upper Feather River Integrated Regional Water Management Planning Area

Neighboring IRWM Regions

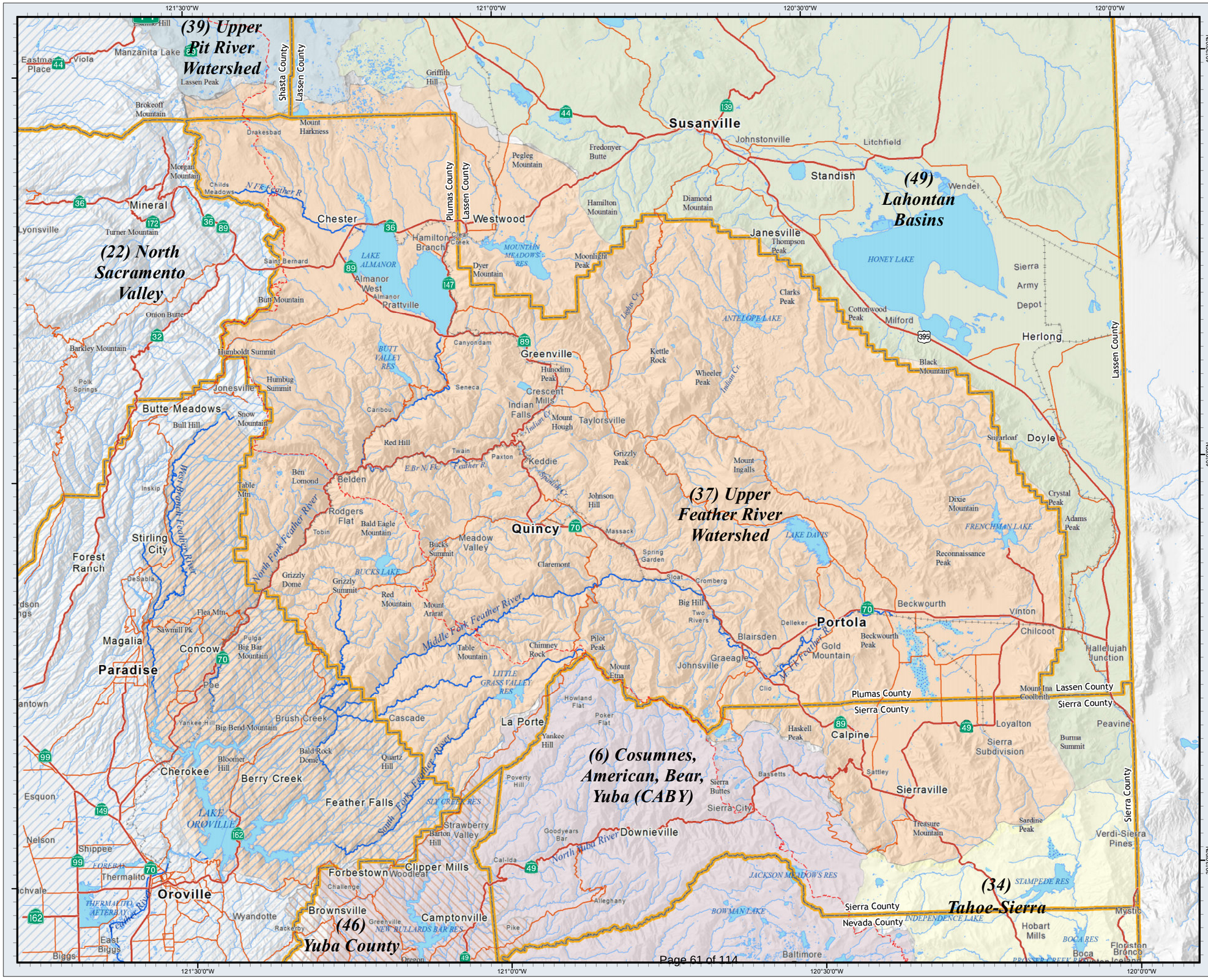


Figure 4-4 Map of Neighboring IRWM Regions

Cartography by Deer Creek GIS
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Upper Pit River Watershed IRWM Region

The Upper Pit River Watershed IRWM region lies to the north of the Upper Feather River IRWM Plan Area, and there is no overlap in plan area boundaries. The Pit River is the principal drainage of northeastern California and drains large portions of Modoc, Lassen, Shasta, and Siskiyou counties. The two plan areas share a short boundary east of Mount Lassen, mostly within Lassen Volcanic National Park.

Lahontan Basins IRWM Region

The Lahontan Basins IRWM region encompasses portions of the Susan River, Madeline Plains, and Smoke Creek watersheds in California, and lies within Lassen County and the extreme northeast corner of Sierra County, north and east of the Upper Feather River IRWM Plan Area. The divide between these watersheds and the Upper Feather River watershed also marks the boundary between the Central Valley RWQCB and the Lahontan RWQCB, and between IRWM funding areas. The Upper Feather River IRWM Plan Area does not overlap geographically with the Lahontan Basins IRWM Plan Area; however, there is jurisdictional overlap on the part of Sierra County.

Cosumnes, American, Bear, Yuba (CABY) IRWM Region

The CABY IRWM region encompasses the watersheds on the western slope of the Sierra Nevada between the Feather and Mokelumne Rivers, and borders the Upper Feather River IRWM Plan Area to the southwest along the divide between the Feather River and Yuba River watersheds. There is no overlap between the Upper Feather River and CABY IRWM Plan Areas.

Yuba County IRWM Region

Yuba County adopted an IRWM Plan in 2008, to manage the fisheries and riparian habitats on the Yuba River, which enters the Lower Feather River at Marysville. The plan area includes all of Yuba County, 1,780 acres of which is in the Upper Feather River IRWM Plan Area. This area of overlap lies in the extreme northeast of Yuba County, where the Yuba-Butte county line crosses the hydrologic divide between the Upper Yuba River and the Middle Fork Feather River.

Tahoe-Sierra IRWM Region

The Tahoe-Sierra IRWM region encompasses portions of the Tahoe Basin and the Truckee and Carson River systems in California, and borders the Upper Feather River IRWM Plan Area on the south. The divide between these watersheds and the Upper Feather River watershed also marks the boundary between the Central Valley RWQCB and the Lahontan RWQCB, and between IRWM funding areas. The Upper Feather River IRWM Plan Area does not overlap geographically with the Tahoe-Sierra IRWM Plan Area; however, there is jurisdictional overlap on the part of Sierra County and Tahoe National Forest. There is a hydrologic connection between the watersheds through a water diversion from the Little Truckee River to Sierra Valley.

Northern Sacramento Valley IRWM Region

The Northern Sacramento Valley IRWM region includes all of Sutter, Colusa, Glenn, Butte, and Tehama counties, and the southwestern half of Shasta County. The North Sacramento Valley IRWM Plan Area overlaps the Upper Feather River IRWM Plan Area in the eastern one-third of Butte County. Both plans consider the overlap area to be an important and appropriate part of their respective plan areas for the following reasons:

1. The Upper Feather River IRWM Plan Area is based on a watershed boundary that encompasses the entire Feather River watershed upstream of Oroville Dam;
2. It is important to include Lake Oroville and the western portion of the Upper Feather River watershed in the IRWM Plan Area because the impoundment at Lake Oroville integrates effects of management activities across the entire upper watershed, and provides a logical physical and institutional point of division between the Upper and Lower Feather River regions;
3. Plumas National Forest, which is a key partner in the Upper Feather River IRWM Plan and manages nearly half of the land in the Upper Feather River watershed, extends into Butte County in the vicinity of Lake Oroville, and;
4. The Northern Sacramento Valley IRWM Plan Area includes all of Butte County for practical administrative reasons, and the Butte-Plumas county line does not follow any natural or hydrologic divide and so represents an arbitrary division of the Feather River watershed upstream of the confluence of the major forks of the Feather River at Oroville Dam.

Primary issues within the Northern Sacramento Valley IRWM Plan Area relate to groundwater management and conjunctive use focused on the Sacramento Valley floor, while primary issues in the Upper Feather River IRWM Plan Area relate to management of watershed values for upstream and downstream recipients, and ecological integrity in headwaters areas. Butte County and the Upper Feather River IRWM Plan have entered into a Memorandum of Understanding regarding divisions of responsibility and coordination of land and water management activities in the overlap area.

Opportunities for Integration of Water Management

The RWMG and consultant team members communicate with neighboring IRWMs to share lessons learned, process feedback, and share resources where appropriate. Additionally, members of the UFR IRWM Plan update team regularly attend and are involved in the Sierra Water Workgroup, a group that works to coordinate local and regional water planning efforts in the Sierra. See *Chapter XX Land Use and Water Planning* for further discussion.

4.3. Social and Cultural Characteristics of the Regional Community

4.3.1. Population and Demographics

The Upper Feather River IRWM Plan Area is predominantly rural and mountainous, with a population density of approximately seven people per square mile not including the more densely populated parts of Butte County such as Oroville East and Concow. Population centers in the Plan Area include the communities of Chester, Westwood, Quincy, East Quincy, Delleker, Graeagle, Sierraville, Greenville, Taylorsville, Loyalton, Beckwourth, Chilcoot-Vinton, and Portola. The population of the Plan Area is approximately 33,200, with approximately 20,000 of those living in Plumas County, less than 2,000 in Lassen County, less than 2,000 in Sierra County, and none in Shasta, Tehama, and Yuba counties. The remainder, approximately 9,200 people, live in eastern Butte County. The Butte County communities are oriented toward Sacramento Valley cities such as Chico, and are economically and culturally distinct from the majority of the Plan Area with some significant exceptions discussed below. The population trend in Plumas and Sierra counties has been negative since 2005 and the California Department of Finance predicts continued population declines in those counties through 2030.

According to U.S. Census Bureau data, the majority of the inhabitants of the Plan Area are White persons not of Hispanic/Latino origin (91.1 percent). The next largest group is Hispanic/Latino (8.3 percent), followed by Native American and Alaska Native (3.2 percent), African American (1 percent), Asian (1 percent), and Native Hawaiian and other Pacific Islanders (0.1 percent). The population of the

Plan Area is older than the statewide average; all age groups under 20 years have declined since 2000, while all age groups between 45 and 75 years have increased. The timber industry in the region has been in decline since the late 1980s, which has led to a departure of working-age people with children. At the same time, the number of retirees and part-time residents has increased markedly. This trend is expected to continue for the next several decades.

4.3.2. Disadvantaged Communities

The Department of Water Resources defines a Disadvantaged Community (DAC) as one with an annual median household income (MHI) that is less than 80 percent of the statewide average MHI. Analysis of DACs in the Plan Area is based on data from the U.S. Census American Community Survey 5-Year Data: 2009-2013. U.S. Census geographies used to identify DACs include Census Designated Places, Tracts, and Block Groups. During the 5-year period used for this analysis, the statewide average MHI was $61,094; therefore, the threshold for defining a DAC was $61,094*0.8 = $48,875.

Water and/or wastewater services in most of the Plan Area are provided by 22 local districts (Table 2), in addition to individual private wells and septic systems. Most of these special districts serve rural communities where the tax base is declining due to population and job loss, and is already limited by a large proportion of the land being in federal ownership. Residents of these areas are increasingly challenged to maintain basic services as local and federal budgets shrink and the traditional pool of volunteers to serve on local district boards is lost. Nearly all of the communities in the portion of the Plan Area in Plumas, Lassen, and Sierra counties qualified as DACs for the period 2009-2013 (Table 1-3, Figure 1-5). Plumas and Sierra counties, which represent 79.2 percent of the region's population, have an overall MHI that falls below the threshold for DACs at $45,794 and $39,009, respectively.

Table 4-3. Disadvantaged Communities in the Upper Feather River IRWM Plan Area

Community[a]	Population	Households	Annual MHI[b]	Percent of Statewide MHI[c]	County
Westwood CDP	1,582	748	$28,158	46.1	Lassen
Clear Creek CDP	192	93	$33,542	54.9	Lassen
Warner Valley CDP	5	5	NA	--	Plumas
Chester CDP	1,908	891	$40,331	66.0	Plumas
Lake Almanor Peninsula CDP	482	220	$46,667	76.4	Plumas
Almanor CDP	10	10	NA	--	Plumas
Canyondam CDP	0	0	NA	--	Plumas
Greenville CDP	922	488	$30,129	49.3	Plumas
Crescent Mills CDP	233	70	$31,413	51.4	Plumas
Caribou	0	0	NA	--	Plumas
Indian Falls CDP	35	20	NA	--	Plumas
Twain CDP	21	11	NA	--	Plumas
Belden CDP	52	37	NA	--	Plumas
Tobin	11	11	NA	--	Plumas
Bucks Lake CDP	0	0	NA	--	Plumas
Quincy CDP	1,442	732	$44,417	72.7	Plumas
East Quincy CDP	2,560	1,158	$45,417	74.3	Plumas
Spring Garden CDP	0	0	NA	--	Plumas
Cromberg CDP	135	86	$31,111	50.9	Plumas
La Porte CDP	13	13	NA	--	Plumas
Little Grass Valley	19	9	NA	--	Plumas

Community[a]	Population	Households	Annual MHI[b]	Percent of Statewide MHI[c]	County
Johnsville CDP	8	5	NA	--	Plumas
Graeagle CDP	548	311	$42,688	69.9	Plumas
Blairsden CDP	26	16	NA	--	Plumas
Clio CDP	35	35	$25,250	41.3	Plumas
Whitehawk CDP	31	23	NA	--	Plumas
Gold Mountain CDP	25	14	NA	--	Plumas
Mabie CDP	0	0	NA	--	Plumas
Delleker CDP	824	310	$33,750	55.2	Plumas
Portola City	2,880	1,163	$34,942	57.2	Plumas
Lake Davis	38	25	NA	--	Plumas
Chilcoot-Vinton CDP	233	105	$47,607	77.9	Plumas
Calpine CDP	180	87	$17,472	28.6	Sierra
Sattley CDP	59	35	NA	--	Sierra
Sierraville CDP	105	29	NA	--	Sierra
Loyalton City	840	306	$34,063	55.8	Sierra
Sierra Brooks CDP	312	142	$32,685	53.5	Sierra

[a]CDP=Census Designated Place

[b]NA=no data available

[c]DAC threshold is 80 percent

Source: Data included in the table above was taken from the DWR's DAC mapping tool, which utilizes U.S. Census American Community Survey (ACS) 5-Year Data: 2009 - 2013 (with an MHI of $61,094 and hence a calculated DAC threshold of $48,875). Available at: http://www.water.ca.gov/irwm/grants/resources_dac.cfm

The data included in the table above is taken from the DWR DAC mapping tool, which utilizes the U.S. Census American Community Survey (ACS) 5-year data: 2009-2013. The ACS dataset did not include MHI information for the smaller CDPs, which resulted in "NA" for that category. The DWR methodology identifies these CDPs as being DACs. *Note: The UFR IRWM Update team continues to work on refining the DAC list for the region, which will be included in the Draft Plan.*

4.3.3. Native American Tribes

The Maidu Tribes traditionally inhabited the northern Sierra Nevada and southern Cascades between Lassen Peak and the American River. Three groups of closely related peoples are referred to as the Maidu: the Mountain Maidu of Plumas and Lassen counties, the Konkow of Butte and Yuba counties, and the Nisenan of Yuba, Nevada, Placer, Sacramento, and El Dorado counties. Maidu tribal interactions and cultural connections continue today, and interregional coordination among tribal groups and families is an important aspect of the Plan. The Maidu are a community of people who have lived upon this land for untold generations.[2] The ancestral homeland of the Mountain (Yamani) Maidu extends from Eagle Lake and Honey Lake in Lassen County east to Sierra Valley, south to the Feather River Canyon, and west to Mount Lassen.[3] Contemporary understanding of the traditional boundaries of tribal homelands is based on oral history and an incomplete archaeological record and so is necessarily approximated in published literature.

[2] Cunningham, F. 2007. *Maidu Summit Consortium Land Management Proposal;* page 28.

[3] Cunningham, Trina. 2015. Email correspondence, 15 August.

Figure 4-5 Map of disadvantaged communities within the Upper Feather River Region

PLACEHOLDER

The Yamani Maidu ancestral homeland includes a wide range of mountain, valley, lake, spring, and stream environments that were used seasonally by the people and by neighboring tribes through extensive trading networks, resource stewardship agreements, and shared cultural values and extended family ties.

Oral histories of Maidu families place the estimated population of Yamani Maidu in the Upper Feather River watershed at around 22,000 people at the time of European contact. This population was sustained by rigorous stewardship to maintain ecosystem health, species diversity, water resources, and beneficial interactions between people and place that provided for material well-being and spiritual progression. Stewardship of resources was coordinated by family units residing seasonally in various locations throughout the watershed.[4] Approximately 1,500 Maidu people remain at present.

Following the arrival of large numbers of Europeans in the Sierra Nevada during the California Gold Rush, local Native Americans were dispossessed of their ancestral lands throughout the region. The Upper Feather River watershed includes areas covered by one of 18 treaties made between California Indians and the United States between 1851 and 1852 that were not ratified by the U.S. Senate. The areas covered by the un-ratified treaty include western Genesee Valley, Mount Hough, and parts of Indian Valley and American Valley.[5] There are currently two federally recognized Tribes (Greenville Indian Rancheria and Susanville Indian Rancheria), three federally recognized Tribes – the Tsi-Akim Maidu, the United Nation and Honey Maidu – and numerous trust allotment lands in the Upper Feather River watershed. The Greenville Rancheria is a federally recognized Tribe of Maidu Indians of California, located east of Greenville. Susanville Indian Rancheria's (SIR) land base is 1,340.74 acres, including one property in Plumas County located within the Upper Feather River watershed. Tribes and bands associated with the SIR include Mountain Maidu, Northern Paiute, Washoe and Pit River whose ancestors lived in the northeastern California and northwestern Nevada region since time immemorial.

There are thousands of significant Maidu cultural sites in the watershed, including the strong cultural ties by surrounding tribal communities to Homer Lake, which drains into the Mountain Meadows area in the Lake Almanor basin. Survey data are on file at the Plumas National Forest and the Northeast Information Center at California State University, Chico.

4.3.4. Economic Conditions and Trends

Median household income in the rural portion of the Plan Area is lower than the statewide average. Overall, with the exception of a few pockets of development within the region, communities in the UFR region have a MHI less than 80 percent of the statewide average (Table 3). The 2013 median household income of $45,794 in Plumas County is lower than the statewide average of $61,094; MHI is lower for all levels of education, with the largest disparity among holders of graduate or professional degrees.[6] The continued decline in families with children and the increase in retirees living on fixed income is likely to widen the income disparity in the future. In recent history, the traditional economic base in Plumas County was the timber industry, which has been in decline since the late 1980s. Current trends are toward agriculture, tourism, seasonal recreational developments, retail, and health services. The departure of families and upward shift in the age structure of the population is reflected in the closing of three elementary schools, one middle school, and two high schools in Plumas County since 2000,[7] and is

[4] Cunningham, Trina. 2015. Email correspondence, 15 August.
[5] Ibid.
[6] Sierra Institute, 2012. *Upper Feather River Watershed Socioeconomic Assessment.*
[7] Ibid.

directly related to the decline of timber harvesting and wood processing jobs in beginning in the late 1990s.

Because most communities in the watershed are very small, large percentage shifts in economic patterns can result from changes of only a few jobs. Unemployment in the Plan Area was 13.1 percent in March of 2015, which was down from a peak of 23.9 percent in 2010. Employment in the region has shifted from predominantly timber and agriculture to education, government agencies, retail, and health services. Employment by sector differs markedly among communities in the Plan Area because of small population sizes. Retail services account for most of the employment in tourism-oriented communities such as Graeagle and Chester, while education is the principal sector in Quincy, which is the location of Feather River Community College.[8]

4.3.5. Social and Cultural Values

The Yamani Maidu traditionally lived in settlements throughout the Upper Feather River watershed, moving to seasonal locations. Some permanent villages remained in mountain locations during the winter. Others were located in valleys that provided shelter from winter storms and access to water and other natural resources. European settlements were at first highly ephemeral, concentrated at mining sites that were usually abandoned a few years after being established. Later settlements were more permanent, located at the most productive mines and around the timber mills and agricultural operations in the alluvial valleys and along railroad and stagecoach routes serving the mines and connecting agricultural and forest production enterprises to larger markets to the east and west.

Beginning in the early Twentieth Century, the potential of the Feather River for hydroelectric power generation was fully developed by Pacific Gas and Electric (PG&E); later the State Water Project began developing surface water storage in the watershed for water and hydroelectric needs statewide. This resulted in a complex and interconnected system of dams, powerhouses, and diversions, especially on the North Fork Feather River. More recent settlement patterns followed the development of tourism around the many lakes, valleys and free-flowing river segments in the region. Some of the largest lakes in the region, including Oroville, Almanor, and Butt Valley reservoir, were created by damming parts of the North, Middle and South Forks of the Feather River for hydroelectric generation and water storage.

With a few exceptions, the Upper Feather River region has maintained its rural character in the pre-automobile age through shared and cherished values around resource stewardship and community and individual self-reliance. The small population in the watershed has preserved a town-hall style of governance based on consensus-building, personal relationships, and informal lines of communication, as well as a relatively high level of civic engagement for its sparse population and lower-income status as compared to more urbanized regions in California.[9]

The predominant land use in Plumas County and the portion of Lassen County in the Plan Area is open space, with approximately 94 percent of the private lands managed for timber, agriculture, and other commodity and amenity “open space” uses. The federally managed parts of the region include the Bucks Wilderness area, the Lakes Basin recreation area and significant meadow, wetland, botanical and wildlife areas, which are conserved and managed for those purposes. State managed lands consist of the Plumas-Eureka State Park, which is managed primarily for passive recreation uses near the community of Blairsden. The Plumas County General Plan calls for land uses that facilitate recreation, community

[8] Sierra Institute. 2012. *Upper Feather River Watershed Socioeconomic Assessment.*
[9] Plumas County. 2009. *Regional Acceptance Process Application.*

and business development consistent with residents' values in relation to open space, preservation of landscape character, and resource protection and stewardship.

The portion of Sierra County in the Plan Area is mostly in Sierra Valley, a large complex of montane meadows the size of Lake Tahoe, which supports historic and modern agricultural and recreational developments and uses. Much of Sierra Valley is utilized for hay and livestock production.

The portion of Shasta County inside the Plan Area consists of parts of Lassen Volcanic National Park and has no residents. The portions of Tehama and Yuba counties inside the Plan Area are also unpopulated and consist of small pockets of back country where the county lines cross the topographic boundaries of the watershed. The portion of Butte County inside the Plan Area is mostly unpopulated and includes Plumas National Forest Lands, Lake Oroville, and the canyons of the North Fork and Middle Fork Feather River. Communities in Butte County located inside the Upper Feather River region are focused more toward Sacramento Valley cities such as Chico and Oroville, and have cultural affinities for the rural areas of the upper watershed that are defined by water-based recreation including snow sports, the seasonal movement of livestock between foothill winter ranges and summer pastures in the upland valleys, and by the diversity of wildlife species that migrate to and from the foothills to the upland portions of the watershed with the seasons.

4.4. Environmental Setting

4.4.1. Climate and Precipitation

The Upper Feather River IRWM Plan Area lies in the northern Sierra Nevada, and generally has a Mediterranean climate characterized by hot dry summers and wet winters. Local climate varies markedly, due to the diversity of elevation, terrain, and aspect in the Plan Area. Because the Upper Feather River watershed has the unique property of lying on both sides of the Sierra Crest, precipitation is much lower in the eastern portion of the watershed than in the western portion. The western slope of the watershed receives up to 90 inches of precipitation per year, while the Sierra Valley floor receives as little as 11 inches. Precipitation also varies across the region from north to south with the highest precipitation, runoff, and groundwater storage occurring as snow in the Cascade-Sierra zone.

4.4.2. Topography, Geology and Soils

Topography in the Plan Area is generally mountainous, but varied and complex. Elevation ranges from 900 feet at the surface of Lake Oroville, to over 10,400 feet at Lassen Peak. The crests of the Sierra Nevada and Diamond Mountains range from 6,000 to 7,000 feet, and the system of valleys forming the interior of the watershed generally slopes slightly upward to the southeast from 4,500 feet at Lake Almanor to approximately 5,000 feet in Sierra Valley. Peaks and ridges in this interior area are generally between 5,500 to 7,000 feet, but reach over 8,000 feet at Mount Ingalls.

The Upper Feather River watershed occupies the region of intersection between the Sierra Nevada, the Basin and Range, and the Cascades, all of which have very different geologic origins. The Sierra Nevada is characterized by granitic plutons formed by solidification of magma underground during the subduction under the Farallon Plate by the North American Plate, 115 to 87 million years before present, then uplifted by tilting of a block of crust between the Coast Ranges and the Basin and Range Province beginning approximately 10 million years before present.[10] The Sierra Crest runs unbroken for

[10] Schoenherr, Allan. 1995. *A Natural History of California*. Oakland: University of California Press. Available: http://www.ucpress.edu/book.php?isbn=9780520069220

over 400 miles from the northwest portion of the Plan Area to Tehachapi Pass in southern California, with continuous elevations between 8,000 and 14,000 feet for most of its length.

The Cascade Range is a series of active volcanoes formed by ongoing subduction of the Gorda and Juan de Fuca Plates by the North American Plate in the Cascadia Subduction Zone, which lies off the Pacific Northwest Coast between Cape Mendocino and Vancouver Island. Unlike the granitic Sierra Nevada, the volcanic Cascades consist of Andesitic and Basaltic lava that solidifies above-ground, forming high stratovolcanoes such as Mount Shasta, Mount Rainier, and Mount Lassen, or low, broad shield volcanoes such as the Medicine Lake highlands, depending on the chemical makeup of the erupting magma. In contrast to the Sierra Nevada, the Cascade Range is characterized by a generally elevated volcanic highland of 4,000 to 5,000 feet punctuated by isolated, conical peaks rising over 5,000 feet above the surrounding terrain. Most of the peaks in the Cascade Range are less than 2 million years old, and many are less than 100,000 years old.[11]

The Basin and Range Province is characterized by block faulting caused by crustal extension that results in a series of northwest trending, parallel mountain ranges separated by endorheic basins. These ranges contain a mix of granitic and sedimentary rocks, and the Province is associated with extensive volcanism. The Diamond Mountains are a western range of the Basin and Range, and formed through a process of block faulting along the eastern edge of the Sierra Nevada similar to that which formed the Carson Range and the Lake Tahoe Basin. Sierra Valley, which lies to the west of the Diamond Mountains, is a basin that once held a lake similar to Lake Tahoe, but is now filled with up to 2,000 feet of sediment.

The eastern escarpment of the Sierra Nevada south of the Middle Fork Feather River is formed by the Plumas Trench, which runs northwest from Sierra Valley, through Mohawk Valley, to the American Valley. The Plumas Trench is a graben, formed by faulting that raised the Sierra Nevada to the west and Grizzly Ridge and Beckwourth Peak to the east. East of Grizzly Ridge lie Grizzly Valley and Clover Valley, which are bounded on the east by the Diamond Mountains. Geology in the northern portion of the watershed is more complex, including the southern slopes of Mount Lassen, portions of the volcanic Modoc Plateau around Westwood, Wheeler Peak, Keddie Ridge, and the northern end of the Diamond Mountains.

South of the North Fork Feather River, the Sierra Crest divides the watershed into distinct western and eastern halves. The western half is dominated by the western slope of the Sierra Nevada, with streams flowing west through steep-sided, V-shaped, granitic canyons. The eastern half is dominated by the complex faulting and mix of granitic and volcanic geology described above, with streams flowing mainly northwest or southeast through broad, alluvial valleys formed by ice-age lakes. This part of the watershed contains numerous springs and montane wet meadow complexes that result from the flatter terrain and porous volcanic and alluvial soils.

Due to its complex geology, the watershed has diverse soils. In general, soils are deeper and more productive in the western portion, as a result of warmer temperatures and higher precipitation west of the Sierra Crest. Throughout the watershed, north-facing slopes tend to have deeper, more productive soils.

Many granitic soils are highly erosive. The erosion hazard to exposed soil is “high” on 29 percent of Plumas National Forest System lands; the majority of this high erosion hazard classification occurs in

[11] Harris, Stephen L. 2005. *Fire Mountains of the West: The Cascade and Mono Lake Volcanoes,* 3rd ed. Missoula: Mountain Press Publishing Company.

granitic soils. The volcanic rock and soils of the east side are susceptible to landslides; 14 percent of the Plumas National Forest is classified as "high" risk to landslides[12]. See Appendix XX for a more detailed discussion of soils within the region.

The complex intermountain and inter-province geology and soils in the region, in combination with the generally older and more weathered characteristics of mountains and valleys, is highly efficient at collecting and storing water; along with the Gold Rush, it has shaped the history of the region and continues to significantly influence current and future land and water planning and management in the region to this day.

4.4.3. Terrestrial Ecosystems

According to the USDA CALVEG project, 52.1 percent of the watershed is covered by vegetation types that are classified by the CDFW California Wildlife Habitat Relationships System as Sierran mixed conifer series, including ponderosa pine (*Pinus ponderosa*), foothill pine (*Pinus sabiniana*), Douglas-fir (*Pseudotsuga menziesii*) and incense cedar (*Calocedrus decurrens*) alliances. In the upper elevations, the Sierran mixed conifer series gives way to the red fir (*Albies magnifica*) alliance, which covers 18.6 percent of the watershed (Table 1-4, Figure 1-6).

The Urban-Agriculture cover-type is the third most extensive, covering 7.6 percent of the watershed. The majority of this cover type occurs as agriculture in Sierra Valley, Mohawk Valley, and the American Valley. Sagebrush (*Artemisia tridentata*) communities are found in east-side watersheds such as the Last Chance and Red Clover subwatersheds of the East Branch, and Sierra Valley in the Middle Fork. Sagebrush communities cover 4.9 percent of the watershed and are found on valley floors, where they are encroaching on meadows due to lowered water tables caused by stream incision and loss of riparian vegetation. Mixed chaparral, Jeffrey pine (*Pinus jeffreyi*), montane hardwood, and montane chaparral habitats occur throughout the watershed in small areas, cover between 2 and 4 percent of the watershed individually, and combine for approximately 13 percent cover. Lodgepole pine (*Pinus contorta*), blue oak (*Quercus douglasii*), juniper (*Juniperus* spp.), perennial grassland, annual grassland, and barren land cover less than 1 percent of the watershed each, and combine for approximately 2 percent total cover. The remaining 2 percent of the watershed is covered by open water in reservoirs and natural lakes.

Table 4-4. Vegetation and Land Cover in the Upper Feather River Watershed IRWM Plan Area

Community[1]	Area (ac.)[2]	Percent of Plan Area
Sierran Mixed Conifer	1,200,583	52.1
Red Fir	429,118	18.6
Urban – Agriculture	175,664	7.6
Sagebrush	114,575	4.9
Mixed Chaparral	87,827	3.8
Jeffrey Pine	83,815	3.6
Montane Hardwood	73,800	3.2
Montane Chaparral	50,370	2.2
Water	46,612	2.0
Lodgepole Pine	11,534	0.5
Perennial Grass	9,835	0.4

[12] Ecosystem Sciences Foundation (ESF). 2005. *Integrated Regional Water Management Plan, Upper Feather River Watershed,* vol. 1, p. 4-10. Available: http://www.feather-river-crm.org/pdf/MOU/IRWMP_063005.pdf

Community[1]	Area (ac.)[2]	Percent of Plan Area
Juniper	9,543	0.4
Barren	8,801	0.4
Blue Oak Woodland	4,156	0.2
Annual Grass	324	<0.1
Total	2,306,557	100.0

[1]Community names are from the **California Wildlife Habitat Relationships System**
[2]Area from **CALVEG Project**

All traditional species are important to Yamani Maidu. This includes direct human management and use, as companion plants for other plant species and pollinators, and as part of an integral ecological system including water health for the benefit of the entire ecosystem. The Yamani Maidu have maintained this landscape for untold generations both pre and post European contact. Restoration of species no longer present or in limited numbers is a desired condition from the tribal perspective of knowledge and place.

4.4.4. Aquatic Ecosystems and Fisheries

The Upper Feather River Watershed has a wide variety of aquatic habitats including natural ponds and lakes, reservoirs and canals, springs and meadows, small alpine streams, and large, canyon-enclosed rivers. The fisheries of the watershed are also varied with numerous species of native and non-native fish occupying the varied habitats. Fisheries in the watershed can be generalized into two categories: cold water streams and rivers, and warm water lakes and reservoirs.

Historically, the Upper Feather River Watershed provided spawning habitat to anadromous Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead (*Oncorhychus mykiss*), that migrated from the Pacific Ocean to spawn in the headwaters streams of the Feather River. The Oroville Dam now blocks this migration, and ocean-run salmonids are no longer present in the watershed above the dam. The Feather River Fish Barrier Dam, located just downstream of Oroville Dam, now diverts migrating salmon and steelhead to the Feather River Fish Hatchery Ladder, where they are collected for artificial spawning.

One-year-old hatchlings are released into the Feather River or transported downstream to the Delta where they migrate to the Pacific Ocean until returning to the Feather River to spawn as adults.[13]

Fisheries in the Upper Feather River Watershed are managed by the California Department of Fish and Wildlife (CDFW) and the DWR. Fisheries management has included stocking and removals at several locations in the watershed, and introduced game species have migrated into most streams and lakes in the watershed.

There are currently 17 common sport fish species known to occur in the Upper Feather River Watershed,[14] of which 13 are non-native (Table 1-5):

[13] ESF, 2005, p. 4-29.
[14] ESF, 2005.

Upper Feather River Integrated Regional Water Management Planning Area

Land Cover

Figure 4.6 Map of Vegetation Communities

Land Cover (2011)

- Barren Land
- Cultivated Crops
- Deciduous Forest
- Developed, High Intensity
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, Open Space
- Emergent Herbaceuous Wetlands
- Evergreen Forest
- Hay/Pasture
- Herbaceuous
- Mixed Forest
- Open Water
- Shrub/Scrub
- Woody Wetlands
- Upper Feather River IRWM Planning Area
- Major Stream or River
- Streams
- Railroad

0 2.5 5 10 15
Miles

Cartography by Deer Creek GIS
www.deercreekgis.com

Table 4-5 Sport fish species in the Upper Feather River Watershed IRWM Plan Area

Common Name	Scientific Name
Rainbow Trout	*Oncorhynchus mykiss*
Eagle Lake Rainbow Trout	*Oncorhynchus mykiss aquilarum*
Eagle Lake Rainbow Trout	*Oncorhynchus mykiss aquilarum*
Eastern Brook Trout	*Salvelinus fontinalis**
Brown Trout	*Salmo trutta**
Lake Trout (Mackinaw)	*Salvelinus namaycush**
Kokanee Salmon	*Oncorhynchus nerka**
Carp	*Cyprinus carpio**
Channel Catfish	*Ictalurus Punctatus**
Hitch	*Lavinia exilicauda*
Speckled Dace	*Rhinichthys osculus*
Brown Bullhead	*Ameiurus nebulosus**
Bluegill	*Lepomis macrochirus**
Redear Sunfish	*Lepomis microlophus**
Green Sunfish	*Lepomis cyanellus**
Black Crappie	*Pomoxis nigromaculatus**
Largemouth Bass	*Micropterus salmoides**
Northern Pike	*Esox lucius**
*Non-native	

There have been proposals by the National Marine Fisheries Services (NMFS) to reintroduce steelhead and salmon to the North Fork Feather River watershed through a trap and haul program, but the current Habitat Expansion Agreement between NMFS, DWR, and PG&E has moved away from the North Fork Feather River watershed.[15]

4.4.5. Endangered and Special-Status Species

The Upper Feather River IRWM Plan Area includes five special-status habitats, 25 special-status animal species, and 66 special-status plant species with reported occurrences in the California Natural Diversity Database (CNDDB; Table 1-6). Special-status animal species in the Plan Area include five invertebrates, four amphibians, one reptile, eight birds, and seven mammals. Special-status species are species that are listed or candidates for listing under the Federal or State Endangered Species Acts, species of special concern to federal or State resource management agencies, and plants that have a California Rare Plant Rank of 1B or 2B, indicating that they are rare, threatened, or endangered in California. Special-status habitats are either rare or contain a high concentration of special-status species.

There are CNDDB-reported occurrences in the Plan Area of three federally-listed animals and two federally listed plants: valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), California red-legged frog (*Rana aurora draytonii*), mountain yellow-legged frog (*Rana muscosa*), Webber's ivesia (*Ivesia webberi*), and slender orcutt grass (*Orcuttia tenuis*). There are CNDDB-reported occurrences for six species that are State-listed only, with no federal listing: willow flycatcher (*Empidonax traillii*; the

[15] Plumas Co. 2009. p. 20.

southwestern subspecies *E. t. extimus* is federally-listed), greater sandhill crane (*Grus canadensis tabida*), bank swallow (*Riparia riparia*), great grey owl (*Strix nebulosa*), California wolverine (*Gulo gulo*), and Sierra Nevada red fox (*Vulpes vulpes necator*).

Tribal representatives advocate for restoring salmon and other native fish species in the watershed of the Upper Feather River region. The Maidu people are proponents of working in collaboration to assist in fish restoration utilizing cultural and historical precedence fostering fish passage.

Habitat for the valley elderberry longhorn beetle extends to approximately the 3,000 foot elevation contour on the western slope of the Sierra Nevada; therefore, suitable habitat for this species in the Plan Area is restricted to the extreme western portion around Lake Oroville. Webber's ivesia is reported in the Plan Area only from Sierra Valley.

Special-status habitats in the Plan Area are: Darlingtonia seep, montane freshwater marsh, northern interior cypress forest, northern vernal pool, and Sphagnum bog. Darlingtonina seeps support rare insectivorous plants such as California pitcher plant (*Darlingtonia californica*) and sundews (*Drosera* spp.) that obtain Nitrogen by trapping and digesting insects, and occur in the Plan Area in the East Branch of the North Fork and Spanish Creek subwatersheds. Montane freshwater marsh habitats were once extensive in the high-elevation valleys in the Plan Area but have been reduced through draining for agriculture. Northern interior cypress forest is dominated by Baker cypress (*Hesperocyparis bakeri*), which has strong affinities for serpentine soils. Serpentine soils containing levels of iron and magnesium are toxic to most plants, are nutrient-poor, and have very low water retention, which has led to the evolution of a unique flora of serpentine endemic plant species able to tolerate the harsh conditions. Northern interior cypress forest occurs in the Lights Creek and Upper Indian Creek subwatersheds. Vernal pools are shallow seasonal wetlands that form under special conditions of heavy soils with a restrictive layer that retards drainage, and flat topography that forms micro-basins. Vernal pools form in the spring and retain water far longer than surrounding terrain. The seasonal inundation and gradual drying of vernal pools has resulted in the evolution of a unique endemic flora that is distinct from immediately surrounding areas. Sphagnum bogs support thick, spongy layers of living and dead moss (*Sphagnum* spp.) that form highly acidic, nutrient-poor, permanently waterlogged peat soils. A Sphagnum bog occurs in the southwest part of the Yellow Creek subwatershed.

Table 4-6. Special-Status Species and Habitats in the Upper Feather River IRWM Plan Area[1]

Life Form	Scientific Name	Common Name	Status[2]	Number of Occurrences[3]
Habitat	--	Darlingtonia seep	--/--	7
Habitat	--	montane freshwater marsh	--/--	2
Habitat	--	northern interior cypress forest	--/--	2
Habitat	--	northern vernal pool	--/--	4
Habitat	--	Sphagnum bog	--/--	1
Invertebrate	*Desmocerus californicus dimorphus*	valley elderberry longhorn beetle	FT/--	1
Invertebrate	*Ecclysomyia bilera*	Kings Creek ecclysomyian caddisfly	--/--	1
Invertebrate	*Hydroporus leechi*	Leech's skyline diving beetle	--/--	1
Invertebrate	*Neothremma genella*	golden-horned caddisfly	--/--	1
Invertebrate	*Parapsyche extensa*	Kings Creek parapsyche caddisfly	--/--	1

Life Form	Scientific Name	Common Name	Status[2]	Number of Occurrences[3]
Amphibian	*Rana aurora draytonii*	California red-legged frog	FT/--	2
Amphibian	*Rana boylii*	foothill yellow-legged frog	--/--	5
Amphibian	*Rana cascadae*	cascades frog	--/--	13
Amphibian	*Rana muscosa*	mountain yellow-legged frog	FE/--	16
Reptile	*Actinemys marmorata marmorata*	northwestern pond turtle	--/--	2
Bird	*Accipiter gentilis*	northern goshawk	--/--	46
Bird	*Cypseloides niger*	black swift	--/--	1
Bird	*Empidonax traillii*	willow flycatcher	--/SE	16
Bird	*Grus canadensis tabida*	greater sandhill crane	--/ST	43
Bird	*Haliaeetus leucephalus*	bald eagle	FDL/SE	30
Bird	*Pandion haliaetus*	osprey	--/--	40
Bird	*Riparia riparia*	bank swallow	--/ST	3
Bird	*Strix nebulosa*	great grey owl	--/SE	1
Mammal	*Gulo gulo*	California wolverine	--/ST	3
Mammal	*Lasiurus blossevillii*	western red bat	--/--	1
Mammal	*Lepus americanus tahoensis*	Sierra Nevada snowshoe hare	--/--	1
Mammal	*Martes americana*	pine marten	--/--	10
Mammal	*Martes pennanti pacifica*	Pacific fisher	FC/SC	13
Mammal	*Taxidea taxus*	American badger	--/--	9
Mammal	*Vulpes vulpes necator*	Sierra Nevada red fox	--/ST	5
Plant	*Agrostis hendersonii*	Henderson's bent grass	--/--	3
Plant	*Allium jepsonii*	Jepson's onion	--/--	15
Plant	*Astragalus lemmonii*	Lemmon's milk-vetch	--/--	2
Plant	*Astragalus lentiformis*	lens-pod milk-vetch	--/--	55
Plant	*Astragalus pulsiferae* var. *pulsiferae*	Pulsifer's milk-vetch	--/--	17
Plant	*Astragalus tener* ver. *ferrisiae*	Ferris's milk-vetch	--/--	1
Plant	*Astragalus webberi*	Webber's milk-vetch	--/--	11
Plant	*Balsamorhiza macrolepis* var. *macrolepis*	big-scale balsamroot	--/--	1
Plant	*Betula pumila* var. *glandulifera*	resin birch	--/--	2
Plant	*Boechera constancei*	Constance's rock-cress	--/--	50
Plant	*Bruchia bolanderi*	Bolander's brachia	--/--	2
Plant	*Calystegia atriplicifolia* ssp. *buttensis*	Butte County morning-glory	--/--	6
Plant	*Carex lasiocarpa*	slender sedge	--/--	6
Plant	*Carex limosa*	shore sedge	--/--	8
Plant	*Carex petasata*	Liddon's sedge	--/--	1
Plant	*Carex sheldonii*	Sheldon's sedge	--/--	14
Plant	*Clarkia biloba* ssp. *brandegeeae*	Brandegee's clarkia	--/--	2
Plant	*Clarkia gracilis* ssp. *albicaulis*	white-stemmed clarkia	--/--	6

Life Form	Scientific Name	Common Name	Status[2]	Number of Occurrences[3]
Plant	*Clarkia mildrediae* ssp. *mildrediae*	Mildred's clarkia	--/--	39
Plant	*Clarkia mosquinii*	Mosquin's clarkia	--/--	41
Plant	*Corallorhiza trifida*	northern coralroot	--/--	1
Plant	*Drosera anglica*	English sundew	--/--	9
Plant	*Eleocharis torticulmis*	California twisted spike-rush	--/--	2
Plant	*Epilobium howellii*	subalpine fireweed	--/--	1
Plant	*Epilobium luteum*	yellow willowherb	--/--	1
Plant	*Epilobium palustre*	marsh willowherb	--/--	1
Plant	*Erigeron nevadincola*	Nevada daisy	--/--	4
Plant	*Eriogonum spectabile*	Barron's buckwheat	--/--	2
Plant	*Fritillaria eastwoodiae*	Butte County fritillary	--/--	47
Plant	*Hulsea nana*	little hulsea	--/--	2
Plant	*Ivesia aperta* var. *aperta*	Sierra Valley ivesia	--/--	40
Plant	*Ivesia baileyi* var. *baileyi*	Bailey's ivesia	--/--	6
Plant	*Ivesia sericoleuca*	Plumas ivesia	--/--	34
Plant	*Ivesia webberi*	Webber's ivesia	FT/--	3
Plant	*Juncus leiospermus* var. *leiospermus*	Red Bluff dwarf rush	--/--	1
Plant	*Lewisia cantelovii*	Cantelow's lewisia	--/--	29
Plant	*Lomatium foeniculaceum* var. *macdougalii*	MacDougal's lomatium	--/--	2
Plant	*Lomatium hendersonii*	Henderson's lomatium	--/--	3
Plant	*Lupinus dalesiae*	Quincy lupine	--/--	158
Plant	*Mielichhoferia tehamensis*	Lassen Peak copper-moss	--/--	1
Plant	*Monardella douglasii* ssp. *venosa*	veiny monardella	--/--	1
Plant	*Monardella follettii*	Follett's monardella	--/--	28
Plant	*Monardella stebbinsii*	Stebbins's monardella	--/--	8
Plant	*Orcuttia tenuis*	slender orcutt grass	FT/SE	4
Plant	*Oreostemma elatum*	tall alpine-aster	--/--	10
Plant	*Penstemmon janishiae*	Janish's beardtongue	--/--	3
Plant	*Penstemmon personatus*	closed-throated beardtongue	--/--	22
Plant	*Potamogeton epihydrus* ssp. *nuttallii*	Nuttall's pondweed	--/--	1
Plant	*Potamogeton praelongus*	white-stemmed pondweed	--/--	1
Plant	*Pyrrocoma lucida*	sticky pyrrocoma	--/--	53
Plant	*Rhynchospora alba*	white beaked-rush	--/--	3
Plant	*Rhynchospora capitellata*	brownish beaked-rush	--/--	4
Plant	*Sagittaria sanfordii*	Sanford's arrowhead	--/--	1
Plant	*Scheuchzeria palustris* var. *americana*	American scheuchzeria	--/--	4
Plant	*Schoenoplectus subterminalis*	water bulrush	--/--	6
Plant	*Scutellaria galericulata*	marsh skullcap	--/--	3
Plant	*Sedum albomarginatum*	Feather River stonecrop	--/--	16

Life Form	Scientific Name	Common Name	Status[2]	Number of Occurrences[3]
Plant	*Senecio eurycephalus* var. *lewisrosei*	cut-leaved ragwort	--/--	30
Plant	*Silene occidentalis* ssp. *longistipitata*	long-stiped campion	--/--	1
Plant	*Silene suksdorfii*	Cascade alpine campion	--/--	2
Plant	*Solidago gigantea*	smooth goldenrod	--/--	1
Plant	*Stachys palustris* ssp. *pilosa*	marsh hedge nettle	--/--	1
Plant	*Stanleya viridflora*	green-flowered prince's plume	--/--	1
Plant	*Trimorpha acris* var. *debilis*	northern daisy	--/--	2
Plant	*Utricularia intermedia*	flat-leaved bladderwort	--/--	9
Plant	*Utricularia ochroleuca*	cream-flowered bladderwort	--/--	2

[1]**Source**: CNDDB, 2005, as reported in ESF, 2005.
[2]Status: F=Federal Listing; S=State Listing; E=Endangered; T=Threatened; C=Candidate; DL=Delisted
[3]Number of CNDDB reported occurrences as of 2005

4.4.6. Invasive Species

Invasive species and noxious weeds are found throughout the watershed. These species affect native communities and many are agricultural pests. Governing districts and local stakeholders have made control and eradication of non-native and invasive species a top priority. Invasive weeds are considered a major problem in the watershed for their potential to adversely affect the economy and natural environment. A number of invasive species have had significant negative impacts on the economy and environment in the watershed by outcompeting native plant and animal species, altering the natural fire frequency and severity, lowering crop production, decreasing available water supplies, reducing rangeland productivity, hindering recreational opportunities, and increasing the potential for erosion. Common noxious weeds found throughout the watershed include: yellow star thistle (*Centaurea solstitialis*), medusahead (*Elymus caput-medusae*), musk thistle (*Carduus nutans*), perennial pepperweed (*Lepidium latifolium*), and scotch broom (*Cytisus scoparius*). Table 1-7 lists the managed noxious weeds within the region.

Table 4-7. Noxious Weeds Managed by the Plumas-Sierra County Department of Agriculture

Common Name	Scientific Name
Musk thistle	*Carduus nutans*
Spotted knapweed	*Centaurea stoebe*
Diffuse knapweed	*Centaurea diffusa*
Russian knapweed	*Rhaponticum repens*
Russian thistle	*Salsola targus*
Dalmatian toadflax	*Linaria dalmatica*
Dyer's woad	*Isatis tinctoria*
Tall whitetop (aka perennial pepperweed)	*Lepidium latifolium*
Yellow star thistle	*Centaurea solstitialis*
Hoary cress	*Cardaria sp.*
Rush skeletonweed	*Chondrilla juncea*
Scotch thistle	*Onopordum acanthium*
Scotch broom	*Cytisus scoparius*
French broom	*Genista monspessulana*

Common Name	Scientific Name
Spanish broom	*Spartium junceum*
Stinkwort	*Dittrichia graveolens*
Canada thistle	*Cirsium arvense*
Bull thistle	*Cirsium vulgare*
Tree of heaven	*Ailanthus altissima*
Field bindweed	*Convolvulus arvensis*
Leafy spurge	*Euphorbia virgata* (nearly eradicated)
Salt cedar	*Tamerix sp.* (nearly eradicated)
Mediterranean Sage	*Salvia aethiopis* (nearly eradicated)
Medusahead	*Taeniatherum caput-medusae*
Sulfur cinquefoil	*Potentilla recta*
Klamath weed	*Hypericum perforatum* (mostly under biological control)
Barbed goatgrass	*Aegilops triuncialis*
Jointed goatgrass	*Aegilops cylindrica*
Ovate goat grass	*Aegilops ovata*
Puncture vine	*Tribulus terrestris*
Eurasian watermilfoil	*Myriophyllum spicatum*
Common tansey	*Tanacetum vulgare*
Fennel	*Foeniculum vulgare*
Poison hemlock	*Conium maculatum*
Russian olive	*Elaeagnus angustifolia*
Italian thistle (found only in Butte County portion of UFR Region)	*Carduus tenuiflorus*

Source: Plumas-Sierra Counties Agricultural Commissioner, November 2015.

4.4.7. Role of Wildfire

Forest and chaparral ecosystems in the northern Sierra Nevada region have evolved a natural fire ecology characterized by frequent, localized, low and moderate intensity fires. A central component to water management in the region is the reintroduction of low and moderate intensity fire. Indigenous peoples deliberately burned at regular intervals for optimal species enhancement which benefited the People and animals. The use of fire in this way had multiple benefits. It kept the forest open in a park-like setting, protecting the region from catastrophic forest fires, increased understory species, ensured rapid nutrient cycling, decreased diseases, and enhanced benefit for multiple plant and animal species (LMP pg. 29, F.Cunningham, 2007).[16] Many shrub species resprout from below-ground crowns following a fire, and many tree species require low-intensity fire to trigger seed germination. Forest management practices starting with the arrival of Europeans in the mid-1800s focused on fire suppression and resulted in substantial buildup of biomass over historic conditions. Drought, disease, and pests have combined to convert that increased biomass into volatile fuel in recent decades. Along with the ecological effects of more widespread and severe fires compared to natural conditions, there are serious threats to lives and property from severe wildfires due to the increase in residential development in forested areas. In the Plan Area, wind, steep terrain, and high fuel loads contribute to wildland fire hazard threat to communities and individual homes in forested areas. The California Department of Forestry and Fire Protection has designated a majority of the Plan Area as having a very high fire hazard rating.

[16] Cunningham, F. 2007. *Maidu Summit Consortium Land Management Plan;* page 29.

Figure 4-7 Historic fires in the Upper Feather River Region.

PLACEHOLDER

In a changing climate, the role of Traditional Ecological Knowledge (TEK) becomes even more important, specifically the reintroduction of fire as maintenance of water resources.

4.5. Description of Watersheds and Water Systems

4.5.1. Watersheds and Groundwater Basins

The Upper Feather River Watershed is divided into four main branches (Table 1-8): the West Branch, the North Fork, the Middle Fork, and the South Fork of the Feather River. The West Branch and South Fork are relatively small, comprising 8.1 percent of the watershed. The North Fork of the Feather River is the largest branch, draining 59.8 percent of the watershed. Its upper reaches are divided into two main branches: the Upper North Fork and the East Branch of the North Fork. The Middle Fork drains the remaining 32.1 percent of the watershed.[17] The Upper Feather River watershed discharges approximately 3.8 million AF of water per year into Lake Oroville, based on average daily flows measured at gauging stations on the four main branches of the River over periods ranging as far back as the 1930s. These data are a rough approximation and do not necessarily reflect recent drought conditions. The Middle Fork contributes proportionally less water by area, due to it draining the comparatively dry Sierra Valley and the eastern slope of the Sierra Crest. The West Branch and South Fork contribute proportionally more water by area, because both of those watersheds are entirely on the comparatively wet west side of the Sierra Crest.

Table 4-8. Major Divisions of the Upper Feather River Watershed[18]

Major Division	Area (ac.)	Percent of Watershed Area	Mean Daily Flow (cfs)[a]	Mean Daily Flow (gal. x 1,000)	Mean Annual Inflow to Lake Oroville (AF)	Percent of Annual Total
West Branch	106,102	4.6	350	226,210.9	253,388.8	6.6
North Fork	1,379,321	59.8	3,230	2,087,603.7	2,338,416.5	60.4
Middle Fork	740,405	32.1	1,500	969,475.4	1,085,951.9	28.1
South Fork	80,729	3.5	260	168,042.4	188,231.7	4.9
Total	**2,306,557**	**100.0**	**5,340**	**3,451,332.4**	**3,865,988.9**	**100.0**

[a]Source: California Department of Water Resources. Mean daily flows are calculated for different periods in each division, based on availability of data.

The Upper Feather River watershed comprises 23 subwatersheds, which are described below. The West Branch and South Fork each consists of a single subwatershed, as their watersheds are small and comparatively simple. The Middle Fork is divided into 6 subwatersheds, and the North Fork comprises the remaining 15 subwatersheds. Figure 1-8 depicts the subwatershed locations within the entire watershed.[19]

Watershed Descriptions

Each of the 23 subwatersheds of the Upper Feather River watershed, along with its component stream reaches, lakes, dams, diversions, and reservoirs, is discussed below. The descriptions are organized by location within each of the four main forks: the West Branch, the North Fork, the Middle Fork, and the South Fork. The North and Middle Forks are described generally before their subwatersheds are discussed.

[17] ESF, 2005, p. 4-12

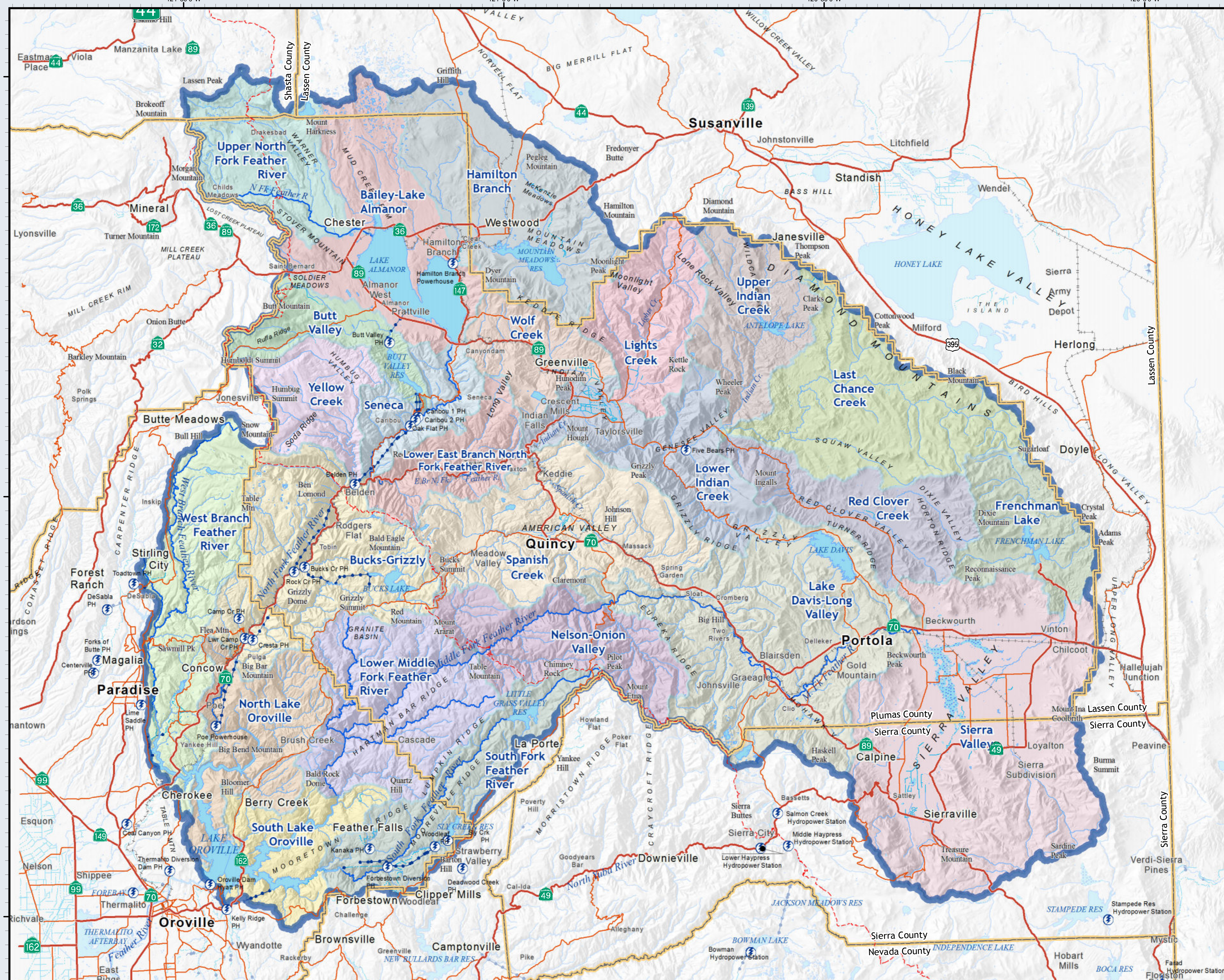
[18] Flow in gallons/day and AF/yr are based on 7.48052 gal/cf, 86,400 sec/day, 325851 gal/AF, and 365 days/yr.

[19] ESF, 2005, p. 4-12.

Upper Feather River Integrated Regional Water Management Planning Area

Sub Watersheds

Figure 4-8 Subwatersheds within the Upper Feather River Watershed



West Branch Feather River Subwatershed

The headwaters of the West Branch of the Feather River are along the western side of the Sierra Crest. The West Branch flows southward through a steep canyon into the west side of Lake Oroville, which floods its bottom reach.

There are no major dams or impoundments on the West Branch; however, there are three small dams. The Round Valley Dam is on the West Branch of the Feather itself, while Philbrook and Concow dams are on tributaries bearing those names. The Philbrook Dam, built in 1877, is the oldest existing dam within the watershed.

North Fork of the Feather River

The North Fork of the Feather River is the largest branch of the Upper Feather River. The large East Branch of the North Fork drains much of the east side of the Sierra Crest. Its headwaters flow from the Diamond Mountains in the north and east. Headwater streams originate in high alluvial valleys, while the lower reaches flow through steep canyons west of the Sierra Crest. There are several major dams along the North Fork that supply power and water for the large cities to the south and west.

The North Fork of the Feather River is divided into two main branches, the main stem of the North Fork, and the East Branch of the North Fork. The main stem of the North Fork is divided into five subwatersheds above its confluence with the East Branch. The East Branch is divided into eight subwatersheds above the confluence. Two subwatersheds are below the confluence, and these two reaches, Bucks-Grizzly and North Lake Oroville, are the subject of Federal Energy Regulatory Commission (FERC) License No. 1962.

Upper North Fork Feather River Subwatershed

The Upper North Fork of the Feather River subwatershed is in the extreme northwest portion of the Plan Area. The headwaters of the North Fork of the Feather River flow off the slopes of Mt. Lassen and Mt. Conrad, southwest of Lake Almanor. This section of the watershed receives high precipitation; over 90 inches per year near Lassen Peak. It has typical eastside stream characteristics, with streams flowing through alluvial valleys. The largest natural lake within the subwatershed is Juniper Lake in the northeast corner of the subwatershed, just north of Mt. Harkness.

The only major diversion within the subwatershed is the Chester Diversion on the North Fork just west of the town of Chester on the northwest shore of Lake Almanor. It diverts water south and west of the town of Chester and into Lake Almanor.

Bailey-Lake Almanor Subwatershed

Located between the Upper North Fork of the Feather River and Hamilton Branch subwatersheds, the Bailey-Lake Almanor subwatershed includes the drainage area of Bailey Creek and the catchment of Lake Almanor itself. Lake Almanor receives water from two major diversions, the Chester Diversion in the Upper North Fork subwatershed and from Hamilton Branch diversion from the Hamilton Branch subwatershed. Lake Almanor was created in 1914 and contains a hydroelectric facility (FERC No. 2105). In 1927, Lake Almanor Dam was constructed and increased the lake's capacity to 1.3 million AF. A tunnel connects Lake Almanor with Butt Lake to the southwest. Lake Almanor water levels, water quality, and recreation issues are managed by PG&E, under its FERC license.[20]

[20] ESF. 2005. p. 4-21.

Hamilton Branch Subwatershed

Bounded by the Diamond Mountains to the north, the Hamilton Branch subwatershed drains into Lake Almanor. In 1927, Indian Ole Dam was built along Hamilton Creek, creating Mountain Meadows Reservoir. The reservoir has a capacity of 24,800 AF, and is connected to Lake Almanor through a diversion canal. Mountain Meadows Reservoir is the only major water body within this subwatershed.

Butt Valley Subwatershed

Located southwest of the Lake Almanor subwatershed, the Butt Valley subwatershed flows southeast into the Seneca reach of the North Fork. The major stream is Butt Creek, which flows east from its headwaters along the eastern Sierra Crest and then south into Butt Valley Reservoir. Just before Butt Creek reaches the reservoir, a tunnel from Lake Almanor connects the two subwatersheds at a powerhouse on the northwest side of Butt Valley Reservoir. The reservoir covers 1,600 acres and has a capacity of 49,800 AF. PG&E manages Butt Valley Reservoir water levels, water quality, and recreation issues under its FERC License No. 2105.

Seneca Subwatershed

The Upper North Fork, Baily-Lake Almanor, Hamilton Branch, and Butt Valley subwatersheds flow into the Seneca subwatershed. The North Fork Feather River flows from the outlet below the Lake Almanor Dam south and west as it approaches the Sierra Crest. Just below the confluence of Butt Creek and North Fork Feather River, a tunnel connects Butt Valley Reservoir with the North Fork at Caribou Powerhouse. As the river flows southwest, the canyon becomes steeper and deeper, reaching over 3,000 feet deep at the bottom of this reach at the confluence with the East Branch North Fork.

PG&E operates a number of dams, diversions, penstocks, and powerhouses in this subwatershed; the operations of the facilities are the subject of the FERC No. 2105 document. Recreation management, reservoir operations, streamflow quantity and timing, stream habitat management, water quality in Lower Butt Creek and North Fork Feather River are dictated by the FERC No. 2105 document, which has statutory authority.

Bucks-Grizzly Subwatershed

The Bucks-Grizzly subwatershed is part of the North Fork Feather River Watershed, starting at the confluence of the East Branch North Fork Feather River and the North Fork Feather River, and extending downstream to the Poe Hydroelectric Project (FERC No. 2107) diversion dam on the North Fork Feather River. The Bucks-Grizzly subwatershed is bounded on the west by the West Branch Feather River subwatershed, and on the East by Spanish Creek subwatershed, Nelson-Onion Valley subwatershed, and Lower Middle Fork Feather River. State Highway 70 runs alongside the North Fork Feather River throughout this reach.

Bucks-Grizzly subwatershed includes numerous diversions and hydropower projects on the North Fork Feather River. Water is released from the Belden Powerhouse into Rock Creek Reservoir at the top of the reach. Water diverted at Rock Creek Dam enters a penstock and electricity is generated downstream where the water is again diverted at the Cresta Dam to produce electricity even farther downstream near the top of the Poe Hydroelectric Project. The Rock Creek and Cresta projects are collectively licensed by FERC. Water temperature, timing and quantity of flow, sediment management, and recreation management are addressed in the FERC License No. 1962, which has statutory authority over these issues.

The Bucks-Grizzly subwatershed also includes numerous dams on tributaries to the North Fork Feather River. Spring Valley Lake, operated by CDFW, is a 75 AF reservoir behind an earthen dam located in the

headwaters of Rock Creek at approximately 6,600 feet above sea level. PG&E operates Lower Three Lakes Dam on Milk Ranch Creek. It has a capacity of 606 AF and is adjacent to Bucks Lake Wilderness. Bucks Diversion and Bucks Storage are located on Bucks Creek, the largest tributary to the North Fork Feather River in the Bucks-Grizzly subwatershed. Both are operated by PG&E, and together impound more than 100,000 AF of water. Grizzly Forebay is also operated by PG&E, and is located on Grizzly Creek.

Bucks Lake Wilderness is situated in the Bucks-Grizzly subwatershed and encompasses approximately 21,000 acres. The Pacific Crest National Scenic Trail bisects the subwatershed and the Bucks Lake Wilderness. Elevations within Bucks Lake Wilderness range from 2,000 feet in the North Fork Feather Canyon to more than 6,900 feet at Spanish Peak.

North Lake Oroville Subwatershed

The North Lake Oroville subwatershed includes the most-downstream reach of the North Fork Feather River, starting downstream of the Poe Hydropower Project (FERC No. 2107) diversion dam, and extending downstream to include North Lake Oroville and Oroville Dam (FERC No. 2100). The North Lake Oroville subwatershed is bounded on the west by the West Branch Feather River subwatershed and on the east by the Lower Middle Fork Feather River subwatershed and South Lake Oroville subwatershed. State Highway 70 runs adjacent to the North Fork Feather River from Lake Oroville to the northern extent of the reach. Poe Powerhouse utilizes water from nine miles of the North Fork Feather River to generate electricity during peak demand periods. Lake Madrone Water District operates one small reservoir of 200 AF on Berry Creek in the southern portion of the subwatershed near Lake Oroville.

Wolf Creek Subwatershed

The Wolf Creek subwatershed, located southeast of Lake Almanor, is a tributary to Lower Indian Creek. The subwatershed is separated from the Hamilton Branch subwatershed to the north by Keddie Ridge, which runs northwest to southeast. Wolf Creek, the main stream in the watershed, runs east along Highway 89 through the community of Greenville. The stream has been the focus of restoration efforts in the past. Wolf Creek is somewhat incised for much of the reach along the highway and through Greenville. Past Greenville, it flows out into Indian Valley, where it empties into Indian Creek. Bidwell Lake Dam, on North Canyon Creek in the southern end of the watershed, is the only major impoundment within the subwatershed. There are also several irrigation diversions within the subwatershed.

Lights Creek Subwatershed

The headwaters of Lights Creek flow south off of Diamond Mountain and make their way into the upper end of North Arm of Indian Valley before entering Indian Creek. There are no major lakes, reservoirs, dams or diversions within this subwatershed. There was mining along Lights Creek, and tailings can be found within the valley bottom sediments. There are also several irrigation diversions within the subwatershed.

Upper Indian Creek Subwatershed

The Upper Indian Creek subwatershed is located east of the Lights Creek subwatershed. The headwaters of Indian Creek flow off the south side of Diamond Mountain. Several small creeks that run off of the southwest side of the Diamond Mountains join the main stream in the Antelope Lake area. Antelope Lake reservoir is created by Antelope Lake Dam, a 22,566 AF capacity dam built in 1964. From the reservoir, Upper Indian Creek flows south into the head of Genesee Valley, just below the confluence of Last Chance Creek and Red Clover Creek. All of these waters come together to form Lower Indian Creek.

The Upper Indian Creek subwatershed has been identified as a high priority watershed for restoration, with the main stem identified as a priority stream.

Last Chance Creek Subwatershed

This subwatershed drains the southwest slope of the Diamond Mountains from the Clarks Peak area in the north (adjacent to Upper Indian Creek), south to the Frenchman area. Last Chance Creek flows east to west along the Diamond Mountains. The Creek and its many small tributaries flow through a network of high meadow systems. Clarks Creek drains the north end of the subwatershed and then joins Last Chance Creek as the stream turns south toward Squaw Valley. Squaw Queen Creek flows east to west through the open meadows of Squaw Valley, roughly parallel to Last Chance Creek. Squaw Creek then flows into Last Chance Creek, and the waters flow west toward the confluence with Red Clover Creek and then Indian Creek. There are no major impoundments, lakes, or other large water bodies in this subwatershed. Meadow restoration projects have been implemented in the subwatershed.

Red Clover Creek Subwatershed

The Red Clover Creek subwatershed is a narrow catchment flowing from the Frenchman area at the edge of Sierra Valley. It runs west-northwest between Lake Davis and Squaw Queen Creek. Dixie Creek drains off of Dixie Mountain into a meadow system nearly connected to Squaw Valley; it then flows into Red Clover Creek in the larger Red Clover Valley. Red Clover Valley is a large open valley separated from Lake Davis by Crocker Mountain. Meadow restoration projects have been implemented in the subwatershed.

The waters of Red Clover Creek then flow west to the confluence with Last Chance Creek, and then into Lower Indian Creek. There are no major water bodies or substantial water infrastructure facilities within this subwatershed.

Lower Indian Creek Subwatershed

Lower Indian Creek begins when Last Chance and Red Clover Creeks, after coming together upon entering Genesee Valley, flow into Upper Indian Creek. The Creek flows west through Genesee Valley in a broad incised channel. Ward Creek, a tributary to Indian Creek, has a hydroelectric power plant on it. Two main tributaries enter at the bottom of Genesee Valley: Hosselkus Creek from the Kettle Rock-Eisenhower area to the north, and Little Grizzly Creek from the Lake Davis area to the south. Dolly Creek, a tributary to Little Grizzly Creek, was the site of Walker Mine. The USFS operates a small earthen dam at the Walker Mine tailings site.

After Hosselkus Creek and Little Grizzly Creek enter Indian Creek, Indian Creek leaves Genesee Valley and passes through a narrower valley between Mt. Jura and Grizzly Peak toward the community of Taylorsville and Indian Valley. Lights Creek enters into Indian Creek out of the North Arm of Indian Valley. At the west side of the valley, Wolf Creek enters just after flowing through Greenville. Indian Creek then flows south to its confluence with Spanish Creek to form the East Branch of the North Fork. There are no major waterbodies or substantial water infrastructure facilities in this subwatershed. There are several irrigation diversions within the subwatershed. Additionally, groundwater is pumped for irrigaton and domestic uses.

Spanish Creek Subwatershed

This subwatershed is centrally located within the Upper Feather River Watershed. Spanish Creek's headwaters are high on the eastern side of the Sierra Crest in the Spanish Peak area above Bucks Lake. There are two impoundments built on Silver Creek and Wampanusie Creek, which are tributaries of Spanish Creek. Spanish Creek and its tributaries flow east from the Sierra Crest, through Meadow Valley,

into the western end of American Valley, and past the town of Quincy. From the eastern part of the subwatershed, Greenhorn and Thompson Creeks flow west down the Plumas Trench into Thompson Valley, and then into Spanish Creek at the eastern end of American Valley.

Because the headwaters of Spanish Creek flow from high Sierra peaks, the western part of the subwatershed receives uncharacteristically high precipitation for the East Branch of the North Fork. It, therefore, has a large discharge compared to other subwatersheds of the East Branch.

Lower East Branch of the North Fork of the Feather River Subwatershed

The confluence of Spanish Creek and Lower Indian Creek form the East Branch of the North Fork of the Feather River. The river runs roughly east to west through Butterfly Valley. As the river approaches the Sierra Crest to the west, the river enters the approximately 1,000-yard Serpentine Canyon along a railroad grade and Highway 70. The East Branch of the North Fork of the Feather River meets the North Fork at the end of the canyon at French Bar, the western end of the subwatershed.

Middle Fork of the Feather River

The Middle Fork of the Feather River headwaters flows from the Frenchman area of the Diamond Mountains and the mountains surrounding Sierra Valley. The upper reaches lie in the large meadows of Sierra Valley, but after it flows through Mohawk Valley, the Middle Fork enters a wilderness canyon that is designated a Wild and Scenic River. The two subwatersheds that contain broad valleys, Sierra Valley and Lake Davis-Long Valley, have been identified as priority subwatersheds for restoration.

Frenchman Lake Subwatershed

This small subwatershed is located north of Sierra Valley, from the Diamond Mountains in the east to Dixie Mountain in the west. Little Last Chance Creek flows southeast from the divide with Last Chance Creek into Frenchman Lake, a 1,500-acre reservoir in Little Last Chance Valley. Frenchman Lake, at 55,000 AF, is managed primarily for recreation.

Sierra Valley Subwatershed

Sierra Valley is the largest valley in the IRWM Plan Area. The valley is a broad expanse of meadows crossed by a network of stream channels. Although there is only one small dam within the subwatershed (on Antelope Creek), there is a network of irrigation canals throughout the valley. Sierra Valley is an ancient lake basin, and contains several seasonal and perennial standing water bodies. The many stream channels, along with Little Last Chance Creek (from the Frenchman area), come together to form the Middle Fork of the Feather River in the northwest corner of the valley.

Lake Davis-Long Valley Subwatershed

The Middle Fork flows northwest out of Sierra Valley then northeast toward the Sierra Crest and the Nelson-Onion Valley subwatershed. In the northern part of the subwatershed, Big Grizzly Creek flows off of Grizzly Peak through Grizzly Valley and empties into Lake Davis, an 83,000-AF capacity reservoir. Below Lake Davis, there is a small private dam on Big Grizzly Creek before it flows into the Middle Fork.

Downstream of Big Grizzly Creek, the Middle Fork flows through the town of Portola and Humbug Valley. The river enters the Mohawk Valley and the community of Graeagle as it turns northwest to parallel the Sierra Crest. Above the Mohawk Valley to the southwest, four small dams exist up in the high lakes area. Several natural lakes exist in the vicinity, including the largest, Gold Lake. After following Mohawk valley northwest the river turns west and begins to cut through the high Sierra. This is the beginning of the Middle Fork Canyon, which is the Wild and Scenic portion of the Middle Fork, exceeding 3,000 feet from ridge to river in some places.

Nelson-Onion Valley Subwatershed

The Middle Fork flows west out of the Lake Davis-Long Valley subwatershed to be joined by Nelson Creek at the east end of the Nelson-Onion Valley subwatershed. Nelson Creek drains a basin between the north slope of the Sierra Crest and Eureka Ridge. After gaining the substantial flow of Nelson Creek, the Middle Fork enters the Middle Fork Canyon. There are no major waterbodies or substantial water infrastructure facilities in the subwatershed.

Lower Middle Fork Subwatershed

The Middle Fork flows from the northeast to southwest through the canyon as west-side tributaries such as the Little North Fork and South Branch of the Middle Fork add to its flow. It then empties into Lake Oroville just below Bald Rock Canyon in Feather Falls National Scenic Area. There are no major waterbodies or substantial water infrastructure facilities in the subwatershed.

South Lake Oroville Subwatershed

This small subwatershed encompasses the uplands surrounding the arm of Lake Oroville that floods the bottoms of the Middle Fork and South Fork canyons. Lake Oroville is the largest water body within the entire watershed, with a 3.5 million AF capacity. Its 15,805-acre surface spans the South Lake Oroville and North Lake Oroville subwatersheds.

South Fork of Feather River Subwatershed

Like the West Branch, the South Fork contains only one subwatershed. The South Fork subwatershed is a roughly linear northeast to southwest drainage off the western slope of the Sierra Nevada.

This small sub-watershed contains seven dams. The largest reservoir is Little Grass Valley Reservoir on the main stem of the South Fork. At 93,010 AF of capacity, Little Grass Valley is the fourth largest water body within the Upper Feather River Watershed. This reservoir is just west of Gibsonville Ridge, the southern edge of the Upper Feather River Watershed. Downstream of the South Fork Diversion (owned by the Oroville Wyandotte Irrigation District), the river passes between Lumpkin and Mooreville Ridge. Lost Creek drains the area east of Mooreville Ridge before entering at the deeper, 1,200 foot canyon south of Fields Ridge. Lost Creek passes through several reservoirs before entering the South Fork. The largest, Sly Creek, has over 65,000 AF of capacity. There is another small dam on Grizzly Creek, a small tributary to the south. After passing through Forbstown Diversion (owned by the Oroville Wyandotte Irrigation District), the South Fork spills into Ponderosa Reservoir, at the top of the southernmost arm of Lake Oroville.

Groundwater Basins

The water resources of the Upper Feather River watershed consist of surface waters (streams, rivers, lakes and reservoirs) as well as subsurface waters. The majority of the subsurface water resources of the Upper Feather River watershed are contained in groundwater basins. A groundwater basin is defined as an area underlain by permeable materials capable of furnishing a significant supply of groundwater to wells or storing a significant amount of water. A groundwater basin is three-dimensional and includes both the surface extent and also all of the subsurface fresh water-yielding materials.

Due to the steep V-shaped canyons of the western slopes of the Sierra Nevada, there are no large groundwater basins west of the Sierra Crest. Near Lake Oroville, the Sacramento Valley Eastside Groundwater Basin marks the edge of the underground storage reservoirs contained under the Sacramento Valley. The alluvial valleys of the eastside subwatersheds allow water to percolate into subsurface reservoirs. The watershed of the North Fork contains most of the groundwater basins in the

Upper Feather River Integrated Regional Water Management Planning Area

Groundwater Basins

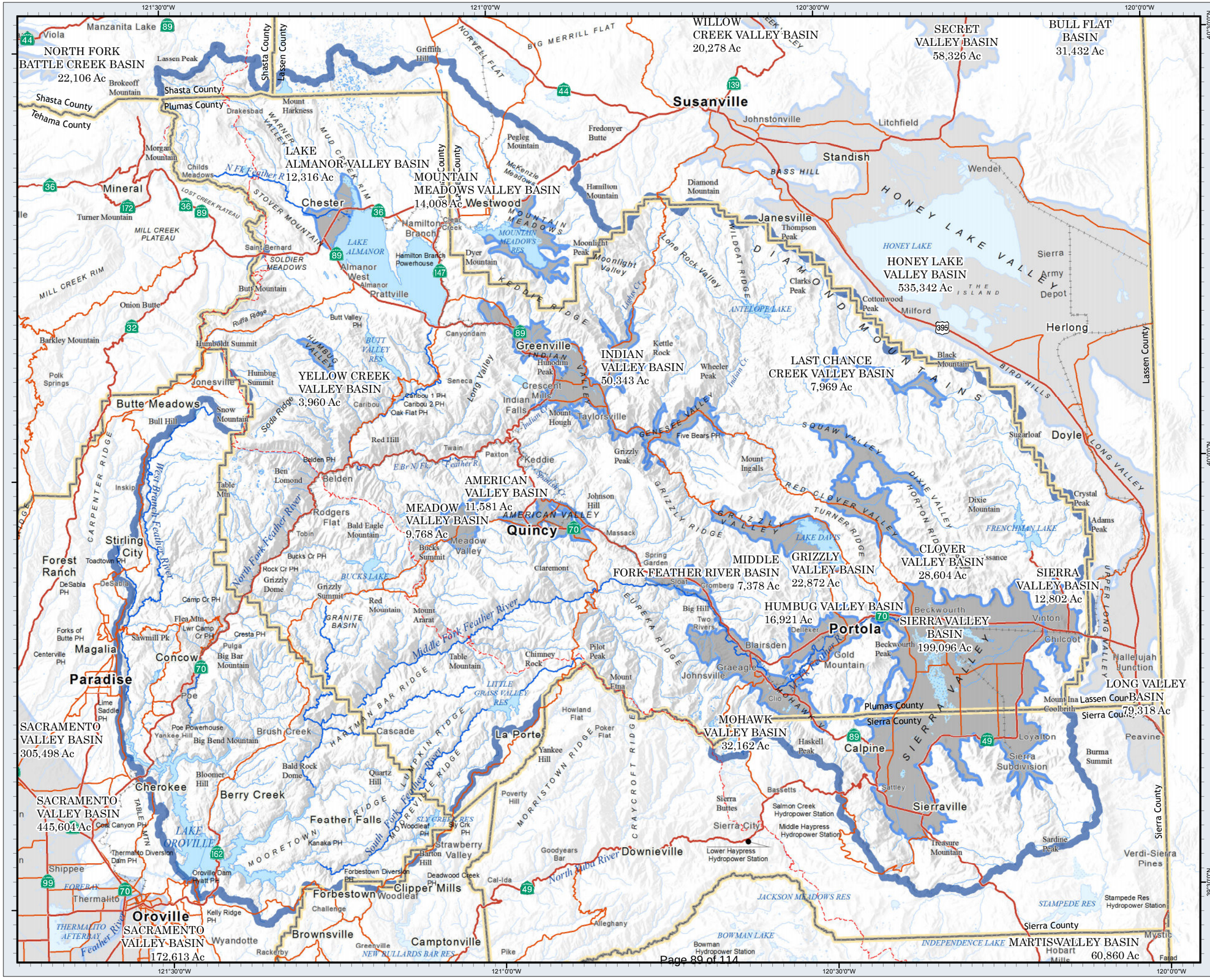


Figure 4-9 Groundwater basins within the Upper Feather River watershed

region; however, the largest groundwater basin in the Plan Area, the Sierra Valley Groundwater Basin, is in the watershed of the Middle Fork.

The DWR identifies 14 groundwater basins in the Plan Area (Figure 1-9):[21]

- 5-7 Lake Almanor Valley
- 5-8 Mountain Meadows Valley
- 5-9 Indian Valley
- 5-10 American Valley
- 5-11 Mohawk Valley
- 5-12 Sierra Valley (2 sub-basins)
- 5-56 Yellow Creek Valley
- 5-57 Last Chance Creek Valley
- 5-58 Clover Valley
- 5-59 Grizzly Valley
- 5-60 Humbug Valley
- 5-87 Middle Fork
- Modoc Plateau Pleistocene Volcanic Area (not described)

Lake Almanor Valley Groundwater Basin

The Lake Almanor Valley Groundwater Basin covers 7,150 acres along the northwest shore of Lake Almanor. The basin is bounded by Lake Almanor to the southeast and on all other sides by Pliocene basalt. The basin consists of Quaternary lake deposits and Pleistocene non-marine sediments. In 1960, the DWR estimated the storage capacity to be 45,000 AF for a saturated depth interval of 10 to 210 feet. There are no known groundwater management plans, groundwater ordinances, or basin adjudications associated with this groundwater basin. In 2014, DWR ranked the basin as an overall basin priority of very low.[22] However, the Maidu People would like to revist the management plan and the ranking decision previously made.

Mountain Meadows Valley Groundwater Basin

The 8,145-acre Mountain Meadows Valley Groundwater Basin is located to the northeast of Lake Almanor. The basin consists of Quaternary alluvium which encircles Mountain Meadows reservoir. The basin is bounded to the northeast by Jurassic to Triassic metavolcanic rocks and Tertiary non-marine sediments. The basin is bounded to the southeast by Miocene volcanic rocks and to the northwest by Pleistocene basalt. There are no known groundwater management plans, groundwater ordinances, basin adjudications, or monitoring programs in place. In 2014, DWR ranked the basin as an overall basin priority of very low.[23]

Meadow Valley Groundwater Basin

This 5,730-acre groundwater basin lies within the Melones Fault Zone of the Sierra Nevada. The basin is bounded on the west by the Mesozoic ultrabasic rocks, to the north by Pliocene pyroclastic rocks, and to the east by ultrabasic intrusive rocks and Paleozoic marine sediments. There is no information on groundwater storage or quality for this basin. In addition, there are no known groundwater management plans, groundwater ordinances, or basin adjudications. In 2014, DWR ranked the basin as an overall basin priority of very low.[24] As in Lake Almanor Valley Groundwater Basin above, the Maidu

[21] CA Department of Water Resources. 2003. *California's Groundwater*. Bulletin 118. Available at: http://www.water.ca.gov/pubs/groundwater/bulletin_118/california's_groundwater__bulletin_118_-_update_2003_/bulletin118_entire.pdf.

[22] CA Department of Water Resources, May 30, 2014. *CASGEM Basin Summary – Sacramento Hydrologic Region, Lake Almanor Valley.* Available at: http://www.water.ca.gov/groundwater/casgem/pdfs/basin_prioritization/NRO%20101.pdf

[23] ---. *CASGEM Basin Summary – Sacramento Hydrologic Region, Mountain Meadows Valley.* Available at: http://www.water.ca.gov/groundwater/casgem/pdfs/basin_prioritization/NRO%20102.pdf

[24] ---. *CASGEM Basin Summary – Sacramento Hydrologic Region, Meadow Valley Groundwater Basin.* Available at: http://www.water.ca.gov/groundwater/casgem/pdfs/basin_prioritization/NRO%20113.pdf

People would like to revist the management plan and the ranking decision previously made for the Meadow Valley Groundwater Basin.

Indian Valley Groundwater Basin

This 29,410-acre groundwater basin is an irregularly shaped basin bounded by Paleozoic to Mesozoic marine, volcanic, and metavolcanic rocks. This basin includes Genesee Valley, Indian Valley, and Bucks Valley. In 1960, the DWR (1960) estimated the storage capacity to be 100,000 AF for a saturated depth interval of 10-210 feet. There is no information about water quality for this basin. In addition, there are no known groundwater management plans, groundwater ordinances, or basin adjudications. In 2014, DWR ranked the basin as an overall basin priority of very low.[25]

Middle Fork of the Feather River Groundwater Basin

The Middle Fork of the Feather River Groundwater basin encompasses 4,340 acres and consists primarily of Quaternary lake and alluvial deposits. This region is dominated by northwest trending faults. One of these faults forms the basin boundary to the east, while the northern and southern boundaries are formed by Pliocene and Miocene volcanic rocks. The eastern boundary is formed by Paleozoic marine deposits. There are no known groundwater management plans, groundwater ordinances, or basin adjudications. In 2014, DWR ranked the basin as an overall basin priority of very low.[26]

Humbug Valley Groundwater Basin

This 9,980-acre basin is situated in the Penman Peak-Beckwourth Peak area northeast of Mohawk Valley. Humbug Valley is approximately six miles long by three miles wide, and is bounded to the north by the volcanic rocks of Penman Peak, to the southeast by Miocene volcanic rocks of Beckwourth Peak, and to the northeast by Mesozoic granitic rocks. The floor of the canyon is composed mainly of level alluvium and gently sloping lake deposits at the western end of the valley. In 1963 the DWR[27] estimated the storage capacity to be 76,000 AF to a depth of 100 feet. There are no known groundwater management plans, groundwater ordinances, or basin adjudications. In 2014, DWR ranked the basin as an overall basin priority of very low.[28]

Grizzly Valley Groundwater Basin

The Grizzly Valley Groundwater Basin lies within a graben bounded to the northeast by Grizzly Valley Fault and to the southwest by a series of northwest trending faults. The 13,440-acre basin is bounded to the north by Miocene volcanic rocks and to the south by Paleozoic marine sediments, Mesozoic granitic rocks, recent volcanics, and Tertiary intrusive rocks. Grizzly Creek drains the valley and is a tributary to the Middle Fork Feather River. There are no known groundwater management plans, groundwater

[25] CA Department of Water Resources, May 30, 2014. *CASGEM Basin Summary – Sacramento Hydrologic Region, Indian Valley Groundwater Basin.* Available at: http://www.water.ca.gov/groundwater/casgem/pdfs/basin_prioritization/NRO%20107.pdf

[26] ---. *CASGEM Basin Summary – Sacramento Hydrologic Region, Middle Fork of the Feather River Groundwater Basin.* Available at: http://www.water.ca.gov/groundwater/casgem/pdfs/basin_prioritization/NRO%20104.pdf

[27] CA Department of Water Resources (a). 1963. *Northeastern Counties Groundwater Investigation*, vol. 1, Text. Bulletin 98.

[28] ---CA Department of Water Resources, May 30, 2014. *CASGEM Basin Summary – Sacramento Hydrologic Region, Humbug Valley Groundwater Basin.* Available at: http://www.water.ca.gov/groundwater/casgem/pdfs/basin_prioritization/NRO%2094.pdf

ordinances, or basin adjudications. In 2014, DWR ranked the basin with an overall basin priority of very low.[29]

Clover Valley Groundwater Basin

The Clover Valley Groundwater Basin is an irregularly shaped basin of 16,780 acres that includes McReynolds Valley, Squaw Valley, Clover Valley, and Wakeynolds Valley. These valleys consist of alluvium deposits and lake sediments. The basin is bounded by Miocene volcanic rocks on the north, east, and south and by recent volcanic and Mesozoic granitic rocks to the west. Dixie Creek and Red Clover Creek drain the southern two thirds of the basin to the west, and Squaw Queen Creek drains the northern third of the basin to the northeast. There are no known groundwater management plans, groundwater ordinances, or basin adjudications. In 2014, DWR ranked the basin with an overall basin priority of very low.[30]

Last Chance Creek Valley Groundwater Basin

The Last Chance Creek Groundwater Basin is a narrow, east/west trending basin located at the southwestern foot of the Diamond Mountains and covers 4,660 acres. The basin is bounded to the south by Tertiary pyroclastic rocks and to the north by Miocene volcanics, Mesozoic granitic rocks, and Tertiary pyroclastic rocks. Eocene basalt borders the basin in the west. There are no known groundwater management plans, groundwater ordinances, or basin adjudications. In 2014, DWR ranked the basin with an overall basin priority of very low.[31]

Yellow Creek Valley Groundwater Basin

The Yellow Creek Groundwater Basin is a 2,310-acre basin located to the southwest of Lake Almanor and consists of Quaternary alluvium. The valley is drained to the south by Yellow Creek. The valley is bounded to the east by Mesozoic and Paleozoic marine sediments, to the north and west by Tertiary volcanic rocks, and to the south by recent volcanic and Paleozoic marine sediments. There are no known groundwater management plans, groundwater ordinances, or basin adjudications. In 2014, DWR ranked the basin with an overall basin priority of very low.[32]

Sierra Valley Sub-Basin

The 117,380 acre Sierra Valley Sub-basin covers the majority of the Sierra Valley Groundwater Basin. Sierra Valley is an irregularly shaped, complexly faulted valley in eastern Plumas and Sierra counties. The basin is bounded to the north by Miocene pyroclastic rocks of Reconnaissance Peak, to the west by Miocene andesite of Beckwourth Peak, to the south and east by Tertiary andesite, and to the east by Mesozoic granitic rocks. The primary water-bearing formations in Sierra Valley are Holocene sedimentary deposits, Pleistocene lake deposits, and Pleistocene lava flows.

The aquifers of the valley are mainly alluvial fan and lake deposits. The alluvial fans grade laterally from the basin boundaries into course lake and stream deposits. The deposits of silt and clay act as aquitards or aquicludes in the formation. Aquiclude materials are predominantly fine-grained lake deposits. In the

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[29] ---. *CASGEM Basin Summary – Sacramento Hydrologic Region, Grizzly Valley Groundwater Basin*. Available at: http://www.water.ca.gov/groundwater/casgem/pdfs/basin_prioritization/NRO%2087.pdf

[30] CA Department of Water Resources, May 30, 2014. *CASGEM Basin Summary – Sacramento Hydrologic Region, Clover Valley Groundwater Basin.* Available at: http://www.water.ca.gov/groundwater/casgem/pdfs/basin_prioritization/NRO%2086.pdf

[31] ---. *CASGEM Basin Summary – Sacramento Hydrologic Region, Last Chance Creek Valley Groundwater Basin.* Available at: http://www.water.ca.gov/groundwater/casgem/pdfs/basin_prioritization/NRO%2085.pdf

[32] ---. *CASGEM Basin Summary – Sacramento Hydrologic Region, Yellow Creek Valley Groundwater Basin.* Available at: http://www.water.ca.gov/groundwater/casgem/pdfs/basin_prioritization/NRO%2084.pdf.

central part of the basin, alluvial, lake, and basin deposits compose the upper 30 to 200 feet of aquitard material that overlies a thick sequence of interstratified aquifers and aquicludes.

Most of the upland recharge areas are composed of permeable materials occurring along the upper portions of the alluvial fans that border the valley. Recharge to groundwater is primarily by way of infiltration of surface water from the streams that drain the mountains and flow across the fans. Increases in groundwater development in the mid to late 1970s resulted in the cessation of flow in many artesian wells. Large pumping depressions formed over the areas where heavy pumping occurred. Water levels in a flowing artesian well in the northeast portion of the basin declined to more than 50 feet below ground surface by the early 1990s. While Subsequent reductions in groundwater pumping through the 1990s helped to recover groundwater levels to mid-1970's levels, increased pumping in more recent years has dropped water levels in some monitored wells to the deepest level on record.[33]

The estimated groundwater storage in the Sierra Valley Basin is 7,500,000 AF to a depth of 1,000 feet. In 1963 the DWR noted that the quantity of useable water as being unknown. In 1973, the DWR estimated storage capacity to be between 1 million to 1.8 million AF for the top 200 feet of sediment based on an estimated specific yield ranging from 5 to 8 percent. These estimates include the Chilcoot Sub-basin. A wide range of mineral type waters exist throughout the Sierra Valley Basin. Sodium chloride and sodium bicarbonate type waters occur south of Highway 49 and north and west of Loyalton along fault lines. Two wells contain waters that are sodium sulfate in character. In other parts of the Sierra Valley, the water is bicarbonate with mixed cationic character. Calcium bicarbonate type water is found around the rim of the basin and originates from surface water runoff.

The poorest quality groundwater is found in the central west side of the valley where fault-associated thermal waters and hot springs yield water with high concentrations of boron, fluoride, iron, and sodium. Several wells in this area also have high arsenic and manganese concentrations. Boron concentrations in thermal waters have been measured in excess of 8 mg/L. At the Basin fringes, boron concentrations are usually less than 0.3 mg/L. There is also a sodium hazard associated with thermal waters in the central portion of the basin.

The Sierra Valley Groundwater Management District, an entity created by the Sierra Valley Groundwater Management District legislation, manages the Sierra Valley Basin. This legislation clearly defined the boundaries over which the district has authority to manage the groundwater resources. The Chilcoot Sub-basin (described below) falls within the boundaries of the Sierra Valley Groundwater District.

In 2014, DWR ranked the Sierra Valley Groundwater Basin with an overall basin priority of medium.[34] This is the only groundwater basin in the Plan Area that is elevated above "very low priority." An extensive modeling effort is currently underway in the basin to better equip overlying landowners with assessment tools for managing this large and complex basin through increasingly variable precipitation cycles.

[33] Sierra Valley Groundwater Management District. *2012-2014 SVGMD Technical Report*; page 26. Available at: http://www.sierravalleygmd.org/updates.html

[34] CA Department of Water Resources, May 30, 2014. *CASGEM Basin Summary – Sacramento Hydrologic Region, Sierra Valley Groundwater Sub-basin.* Available at: http://www.water.ca.gov/groundwater/casgem/pdfs/basin_prioritization/NRO%2040.pdf

Chilcoot Sub-Basin

The Chilcoot Sub-basin is an irregularly shaped, 7,550-acre, complexly faulted valley on the eastern side of the Sierra Valley Groundwater Basin in Plumas County. The basin is bounded to the north and east by Mesozoic granitic rocks, and to the south by Tertiary Sierran basalt and pyroclastic rocks and Paleozoic metamorphic rocks. The basin is hydrologically connected to the Sierra Valley Basin to the west in the near surface but may be discontinuous at depth due to a bedrock sill. The primary water-bearing formations in the Chilcoot Sub-basin are Holocene sedimentary deposits and silt and sand deposits, fractured and faulted Paleozoic to Mesozoic metamorphic and granitic rocks, and Tertiary volcanic rocks. As noted, the Sierra Valley Groundwater District manages the Chilcoot Sub-basin. In 2014, DWR ranked the sub-basin with an overall basin priority of very low.[35]

Mohawk Valley Groundwater Basin

The Mohawk Valley Groundwater Basin encompasses 18,990 acres and lies within an elongated valley occupying a portion of the Plumas Trench. The basin is bounded on the southwest side by the Mohawk Valley Fault and on the east side by a group of northwest trending faults that branch from the Mohawk Valley fault near Sattley. The floor of the valley consists of a narrow strip of nearly flat alluvial material overlying lake sediments. Lake sediments also underlie the upland areas of the valley. Depth to bedrock is estimated to range between 1,500 and 3,000 feet. The basin is bounded to the northeast by Pliocene volcanic rocks of Penman Peak, to the east by Miocene volcanic rocks of Beckwourth Peak, and to the west and southwest by Paleozoic metavolcanic rocks and Mesozoic granitic rocks of the Sierra Nevada. Sulphur Creek drains the southern half of the valley and enters the Middle Fork of the Feather River near the midpoint of the valley and flows northwesterly. Storage capacity for the Mohawk Valley basin is estimated to be 90,000 AF based on a specific yield of 5 percent for a depth interval of zero to 200 feet. Calcium-magnesium bicarbonate and sodium bicarbonate are the predominant groundwater types in the basin. There are no known groundwater management plans, groundwater ordinances, or basin adjudications associated with this basin. In 2014, DWR ranked the basin with an overall basin priority of very low.[36]

American Valley Groundwater Basin

The American Valley Groundwater Basin is a 6,800-acre basin bounded to the southwest and northeast by a northwest trending fault system. The basin is bounded to the northeast by Paleozoic metavolcanic rocks and on all other sides by Paleozoic marine sedimentary and meta-sedimentary rocks of the Sierra Nevada. Spanish Creek drains the valley and is a tributary to the North Fork Feather River to the northwest. In 1960, the DWR estimated storage capacity to be 50,000 AF for a saturated depth interval of 10 to 210 feet. There is one groundwater management plan for the Plumas-Eureka Community Services District. No other groundwater management plans, groundwater ordinances, or basin adjudications are associated with this basin. In 2014, DWR ranked the basin with an overall basin priority of very low.[37]

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[35] CA Department of Water Resources, May 30, 2014. *CASGEM Basin Summary – Sacramento Hydrologic Region, Chilcoot Sub-basin.* Available at: http://www.water.ca.gov/groundwater/casgem/pdfs/basin_prioritization/NRO%2041.pdf

[36] ---. *CASGEM Basin Summary – Sacramento Hydrologic Region, Mohawk Valley Groundwater Basin.* Available at: http://www.water.ca.gov/groundwater/casgem/pdfs/basin_prioritization/NRO%2039.pdf

[37] CA Department of Water Resources, May 30, 2014. *CASGEM Basin Summary – Sacramento Hydrologic Region, American Valley Groundwater Basin.* Available at: http://www.water.ca.gov/groundwater/casgem/pdfs/basin_prioritization/NRO%2038.pdf

4.5.2. Hydrology and Surface Water Resources

The Upper Feather River drains from its headwaters in the Sierra Nevada, Cascades, and Diamond Mountains into Lake Oroville, which is the largest water storage facility in the State Water Project system. Lake Oroville has a water storage capacity of 4 million AF and generates an average of 3.2 million AF of "firm" annual water supplies to both agricultural and urban State Water Contractors, largely through export pumping from the Sacramento-San Joaquin Delta. The total estimated mean annual discharge into Lake Oroville is 3.8 million AF, based on long-term historical stream flow data. Current inputs to Lake Oroville are likely less than that, given the recent drought. Water output from the Plan Area above the 3.2 million AF "firm" supplies to State Water Contractors, if any, is discharged to the Pacific Ocean through San Francisco Bay.

The North Fork of the Feather River powers PG&E's 734 MW Stairway of Power, a complex of ten interconnected hydroelectric powerhouses; eight dams; and extensive networks of tunnels bored through canyon bedrock that collect tributary streamflows and connect upland storage reservoirs to the main stem of the river in the Feather River Canyon. The Middle Fork of the Feather River originates in the Sierra Valley–the largest valley both in the watershed and in the Sierra Nevada–and descends into the Middle Fork Canyon, 78 miles of which are designated Wild and Scenic River, before flowing into Lake Oroville.

The Upper Feather River watershed has been historically shaped and currently affected by state and federal land and water policies, uses, and conflicts. A large proportion of land is owned by the federal government and the history of large-scale water supply and hydroelectric developments is extensive. The sparse population of the headwaters region has been engaged in ongoing collaborative and conflictive relationships with downstream regions of California, an engagement that belies its physical isolation from the heavily populated regions of Southern California and the Bay Area, and the highly contentious San Francisco Bay Delta. Current hydroelectric operations are regulated by the FERC, and future operations of both PG&E's and DWR's hydroelectric dams and diversions are in various stages of review in six discrete but interrelated relicensing proceedings before the FERC: FERC No. 2100, FERC No. 2107, FERC No. 2105, FERC No. 1962, FERC No. 619, and FERC No. 803.

Two basins in the UFR watershed have water rights decrees, established in the Superior Court of California: the 1940 Sierra Valley Decree (No. 3095), the 1959 Little Last Chance Creek Decree[38], and the 1950 Indian Creek Decree (No. 4185)[39]. The decrees identify specific beneficiaries and water rights, which remain superior in seniority to pre-1914 water rights. DWR provides watermasters for the Sierra Valley and Indian Creek areas to ensure that the water is allocated according to established water rights and to "prevent the waste or unreasonable use of water."[40]

4.5.3. Groundwater Resources

The DWR has estimated storage capacity for only five of the 14 groundwater basins in the Plan Area. The total estimated groundwater storage capacity in those five basins is 7.8 million AF, of which 7.5 million AF is estimated to be in Sierra Valley. If groundwater reserves in the Plan Area are in equilibrium, estimated groundwater reserves are at least two times the annual surface water discharge from the

[38] More information regarding the Sierra Valley Decree is available at: http://www.water.ca.gov/watermaster/ND_Watermasters/ServiceAreas/SierraValley/index.cfm

[39] More information regarding the Indian Creek Decree is available at: http://www.water.ca.gov/watermaster/ND_Watermasters/ServiceAreas/IndianCreek/index.cfm

[40] Regents of the University of California, 2007. *Upper Feather River Watershed irrigation Discharge Management Program: Irrigated Agricultural Practices in UFRW*, March; pg 10.

Plan Area. However, estimated storage capacity in groundwater basins may substantially exceed the amount of groundwater that is realistically available for (1) artificial extraction by pumping or (2) natural processes of surface water recharge. Because many of the groundwater basins in the Plan Area are located in ancient lakes and structural basins that have been largely filled with sediment, aquifers are 1,000 or more feet deep in some basins (see discussions of Sierra Valley and Mohawk Valley Groundwater Basins, above). Deep groundwater may be confined to those basins, and unavailable for either natural or artificial recharge of surface water through springs, seeps, or pumping. Groundwater pumping in Sierra Valley has markedly depleted artesian wells and artificial wells beginning in the 1970s, despite the large estimated storage capacity of the basin.

4.5.4. Runoff Generation and Water Balance

Virtually all of the water in the IRWM Plan Area arrives in the form of precipitation. The two exceptions are a diversion from the Little Truckee River that provides water to parts of Sierra Valley, and water that is delivered to the region in bottled form.[41] Precipitation is highest on the western side of the Sierra Crest and the southern slopes of Mount Lassen, and lowest in the eastern portion of Sierra Valley. Precipitation generally increases with elevation everywhere in the Plan Area. Because of the Mediterranean climate, most of the precipitation in the Plan Area comes during the winter in the form of snow at higher elevations. In this lowest elevation region of the Sierra Nevada Mountain range, snowpack and extensive groundwater storage play an important role in shaping the hydrograph of nearby and more distant streams and rivers. For example, mountain meadows, a widely distributed feature in this region compared to most of the rest of the Sierra Nevada, are places where groundwater surfaces, and then connects with local streamflows. Meadows are places where flood flows are slowed and captured during winter and spring, and gradually released as surface flows downstream during the summer and fall in combinations of surface and groundwater flows that are specific to the soils and geology of each meadow. Restored meadows provide increased forage for wildlife and livestock, increased diversity and vigor of native plants, expanded and improved habitat connectivity for fish and wildlife, increased carbon sequestration (50 tons/acre), reduced summer stream temperatures, increased resiliency of riparian vegetation during periods of drought, and the continuity of culturally important tribal practices and recreational amenities.[42] Meadows, springs, fens, bogs, riparian forests, wetlands and marshes, although a small proportion of the landscape, are biologic “hot spots.”

Streamflow Averages and Extremes

Streamflow averages in the region have undergone a steady decline since the mid-1960s (see Figure XX-3, Chapter XX *Climate Change*). Runoff within the region is affected by cumulative annual reductions in rainfall, snowpack accumulation, and melt. The prolonged dry period of the last ten years has significantly reduced flow from springs and groundwater discharge to streams that provide summer and fall stream flows.

With the concern over climate change, more variable precipitation patterns, more extreme drought and flood events, and increasing reduction in snowpack in the coming decades (see Chapter XX *Climate Change*), the restoration of groundwater and surface hydrology is pertinent. Restoration can be enhanced by reversing erosion in mountain meadows, and in alluvial valleys by reversing the densification of uplands forests. For example, re-watering degraded meadows and floodplains has been identified as an important flood peak attenuation, water storage, and recharge adaptation to a changing precipitation regime. A 2008 study by Jones and Stokes concluded that there was in excess of 500,000

[41] Plumas Co. 2009. p. 30.
[42] Ibid., p. 27.

AF of volume in de-watered meadows in the region, and that additional water storage in excess of 100,000 AF could be restored for enhanced groundwater recharge and for attenuated streamflows in nearby or distant riverine reaches. The USGS has estimated that 25 percent of the annual surface flows into Lake Oroville originates from groundwater. In dry years, the groundwater inputs to surface flows within and downstream of the region are significantly higher, as described in a Forest-Water Balance study developed as part of the Plan.[43]

4.5.5. Droughts and Floods

California's Mediterranean climate is marked by recurring droughts and historic floods, including the extended 1928-1934 drought, as well as the historic peak floods that existed as of the 1940s, 1950s and 1960s. And we continue to see new records broken for both drought and flood events.

Droughts

California's most significant historical statewide droughts were the six-year drought of 1929-34, the two-year drought of 1976-77, and the six-year event of 1987-92. These droughts stand out in the observed record due to their duration or severe hydrology. For example, the 1976-77 drought was short but very severe (1977 is still the driest year in recorded history in the state) and the 1987–94 drought was extreme in its unprecedented duration. More recently, the 2007-2009 drought was the first drought for which a statewide proclamation of emergency was issued – a proclamation that was again issued for the 2012-2015 drought. The water years of 2012-2014 stand as California's driest three consecutive years in terms of statewide precipitation.[44]

The 2012-2015 drought event set other records in addition to that of driest three-year period of statewide precipitation. The drought occurred at a time of record warmth in California, with new climate records set in 2014 for statewide average temperatures. Records for minimum annual precipitation were set in many communities in calendar year 2013. Calendar year 2014 saw record-low water allocations for State Water Project and federal Central Valley Project contractors. Reduced surface water availability triggered increased groundwater pumping, with groundwater levels in many parts of the state dropping 50 to 100 feet below their previous historical lows.[45] Because of the region's degraded but significant groundwater reserves, the IRWM Plan Area suffered severe regulatory surface water irrigation curtailments and wildfire-related damages, but was spared the cataclysmic drought impacts suffered by other regions in the Sierra Nevada.

Floods

Flooding within the region can occur from three sources: (1) rainfall and runoff exceeding the capacity of local watercourses, (2) rainfall and runoff to depressions causing localized areas of shallow flooding, and (3) flooding from failure of a dam. Overall, the most significant flood hazard areas are in the Sierra Valley and the Indian Valley areas of the region. Another significant flood hazard area is located along Spanish Creek and its tributaries north of and around the community of Quincy. As previously described, the region contains an extensive network of rivers and other watercourses that flow out of higher elevations to the valley areas. The Federal Emergency Management Agency (FEMA) has identified several areas of the region as within 100- and 500-year flood zones (Figure 1-10). These areas are primarily located in or

[43] Bohm, Burkhard. 2016. PLACEHOLDER

[44] CA Department of Water Resources. 2014. *California's Most Significant Droughts: Comparing Historical and Recent Conditions,* p. i. Available at: http://www.water.ca.gov/waterconditions/docs/California_Signficant_Droughts_2015_small.pdf.

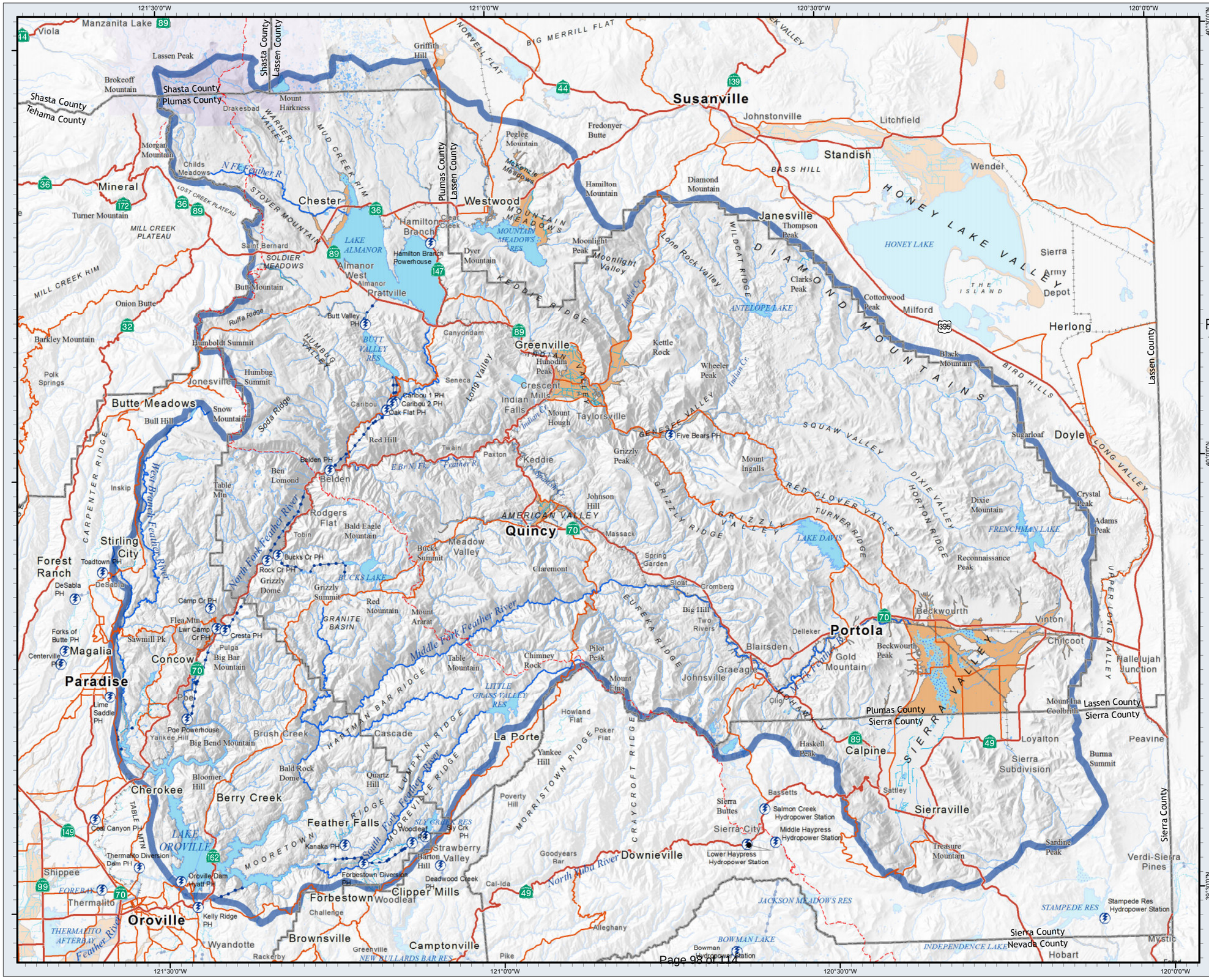
[45] Ibid.

Upper Feather River Integrated Regional Water Management Planning Area

FEMA 100 Year Flood Zones

Sierra County Data Not Available From FEMA

Figure 4-10 Mapping of FEMA's 100-year floodplains within the Upper Feather River Region



near the communities of Chester, Greenville, Crescent Mills, Taylorsville, Quincy, Vinton, City of Portola, City of Loyalton, and Graeagle.

Flooding in the region typically occurs in the winter and spring and is caused by heavy snowpack that is melted by severe rainfall events. This type of flooding rises slowly and can have lengthy runoff periods. Other flooding types include dam failure or debris flows, most likely from burned areas.

Severe flooding in the UFR IRWM region occurred in 1861-62 ("The Great Flood"), 1937-38, 1942, 1962, 1964-65, 1966-67, 1969-70, 1974, 1982-83, 1986, and 1996-97.[46] The most severe flooding in the region is typically produced by warm rainfall events on heavy snowpack. In 1986, the largest total rainfall for the period was 49.6 inches, recorded at Bucks Lake. Storm totals of 20 to 30 inches were common for many locations. In the upper Feather River basin, flood peaks were the highest on record. State Highway 70, which follows the North Fork Feather River, was closed for several months because of washouts, landslides, and damaged bridges. The peak discharge of record for the Feather River, as measured at Lake Oroville, was 161,000 cfs on January 2, 1997.[47]

Climate records indicate a trend toward heavy rainfall events with little to no snowpack. Additionally, increased climate temperatures increase the risk of catastrophic wildfire, which can result in debris flow floods during heavy rain events.

4.5.6. Climate Effects on Water Supply

See *Chapter XX Climate Change* for discussion on the climate effects on water supply.

4.5.7. Water Supply and Demand

Urban Water Demands

Population in the Plan Area outside of Butte County is expected to continue its current downward trend through 2030. Population in Butte County is projected to increase by approximately 13 percent between 2015 and 2030; however, that increase is not expected in the rural portions of eastern Butte County in the Plan Area (Department of Finance, 2015). Given the expected modest declines in population in most of the Plan Area, urban water demands are not expected to increase in the next 15 years.

In Plumas County, 62 percent of urban water use is for industrial and commercial uses and the remaining 38 percent is for residential uses. In Sierra County, 75 percent of urban water use is for residential uses and 25 percent is for industrial and commercial uses. The current estimate of domestic water use for the Sacramento River Hydrologic Region is 286 gallons per capita per day; however, the rate of domestic water use in the UFR Plan Area is likely much lower than that, as domestic water use in the region is dominated by water use habits in the more urbanized areas of the Sacramento Valley. In general, factors in water consumption such as landscaping, swimming pools, and house size are likely lessened in the Plan Area compared to larger cities and suburbs.

[46] CA DWR. FloodSafe California. 2013. *California's Flood Future: Recommendations for Managing the State's Flood Risk,* p. C-95. Available at: http://www.water.ca.gov/sfmp/resources/PRD_AttachC_History_4-3-13.pdf.
[47] Ibid., p. C-102.

Table 4-9. Population Projections for the Upper Feather River IRWM Plan Area

County	2013 Population in the Plan Area	2030 Projected Change for the County (%)[4]	2030 Projected Population in the Plan Area
Butte[1]	9,323	--[5]	9,323
Lassen[2]	1,774	--[6]	1,762
Plumas	18,606	-0.7	18,476
Shasta	0	n.a.	0
Sierra[3]	1,496	-7.7	1,381
Tehama	0	n.a.	0
Yuba	0	n.a.	0
Total	31,199	--	30,942

[1]Concow and Oroville East CDPs
[2]Westwood and Clear Creek CDPs
[3]Calpine, Sattley, Sierraville, Loyalton, and Sierra Brooks CDPs
[4]**Source**: **California Department of Finance**
[5]Butte County is projected to increase by 12.9 percent; however, that reflects projected growth in the urban areas of the county. Concow CDP declined in population 2010-2013, and Oroville East is downstream of the Plan Area and its water use is inseparable from that of the City of Oroville, which is not analyzed in this plan
[6]Lassen County is projected to increase by 8.6 percent; however, that reflects projected growth in Susanville. The portion of Lassen County in the Plan Area is assumed to be demographically identical to Plumas County for this analysis.

Agricultural Water Demands

The most recent publicly available data on agricultural land use in California are from 2010, and the earliest are from 1998.[48] The DWR Detailed Analysis (DAU) Unit #154 – *Feather River* corresponds closely to the Upper Feather River IRWM Plan Area and data from that DAU were used in this analysis. In 2010, the Plan Area contained 61,678 acres of irrigated cropland, 72 percent of which was irrigated pasture (Table 9). This represented an increase of 10,678 acres (21 percent) of irrigated cropland since 1998. Irrigated cropland totals in the Plan Area fluctuated between 50,800 and 57,000 acres over the decade prior to 2008, and then increased to 61,121 acres between 2008 and 2009 when the acreage of irrigated pasture increased by 8,500 acres.

For comparison, the Plumas County Agriculture Commissioner's 2011 Annual Crop Report for Plumas and Sierra counties reported a total of 60,000 acres of irrigated agricultural land, 77 percent of which was irrigated pasture. This comparison is not exact, but is reasonably close, as the agricultural acreage in the Plan Area is zero or negligible for Shasta, Tehama, Lassen, and Butte counties, and nearly all of the agricultural land in Sierra County is in the Plan Area.

Using water application rates reported by DWR for each crop type, agriculture in the Plan Area used 185,295 AF of water for irrigation in 2010[49] (Table 1-10). Based on the most recent publicly available data, agricultural land in the Plan Area is fairly stable at 60,000 to 62,000 acres, approximately 75

[48] DWR, 2015. Annual Land and Water Use Estimates. Available at: http://www.water.ca.gov/landwateruse/anaglwu.cfm.
[49] Water Year 2010 was 107 percent of average. In Water Year 2010, November was exceptionally dry while October, January, April, and May were well above average.
DWR, 2010. *California's drought update, June 30*. Available at: http://www.water.ca.gov/pubs/drought/california's_drought_update_-_june_30__2010/droughtupdate-063010.pdf

percent of which is irrigated pasture. Future shifts away from irrigated pasture and toward alfalfa and grain cultivation would reduce agricultural water use in the Plan Area, as those latter crop types have a lower irrigation rate. Irrigation rates may decrease in years with higher rainfall, or may increase during droughts, as natural precipitation makes up more or less of the total water demand of the crop.

Table 4-10. Agricultural Water Use in the Upper Feather River IRWM Plan Area

Crop	2010 DWR (ac.)[1]	Irrigation Rate (AF/ac.)[1]	Annual Water Use (AF)	2011 Plumas/Sierra (ac.)[2]
Grain	9,117	2.68	24,434	6,260[3]
Alfalfa	8,143	2.67	21,742	7,290
Irrigated Pasture	44,230	3.10	137,113	46,450
Truck Crops	75	2.30	1,725	--
Apples, apricots, cherries, figs, walnuts, etc.	18	3.14	57	--
Citrus, dates, avocados, olives, etc.	82	2.39	196	--
Vineyard	13	2.12	28	--
Total	61,678	--	185,295	60,000

[1]**Source**: **DWR Agricultural Land and Water Use Estimates**: http://www.water.ca.gov/landwateruse/anaglwu.cfm
[2]**Source**: **Plumas County. Agriculture Commissioner 2011 Annual Crop Report**
[3]Ibid. The report lists grain hay and meadow hay as separate categories, and includes "grain" in miscellaneous crops. For this analysis, grain hay and meadow hay are assumed to be equivalent to "grain" in the DWR reports, as the total acreage is similar.

Environmental Water Demands

Environmental waters are waters set aside or managed for environmental purposes that cannot be put to use for other purposes in locations where the water has been reserved or otherwise managed. The California Water Plan Update Bulletin 160-98 defines environmental water as the sum of the following:

1. Dedicated flows in state and federal Wild and Scenic Rivers,
2. Instream flow requirements established by water right permits, CDFW agreements, court actions, or other administrative documents,
3. Bay-Delta outflows as required by SWRCB, and
4. Applied water demands of managed freshwater wildlife areas.

Though it is important to recognize environmental uses as components of total water use, specific data for water rights, Bay-Delta outflow, and applied water demand for managed freshwater wildlife areas are not quantified in this document. Although more than 1,000 irrigation water rights or applications occur in the watershed, their volume, point of diversion, specified use, and timing of use are not quantified in this document. Without this knowledge a comprehensive environmental water demand forecast cannot be calculated. The Bay-Delta outflows will not be examined because the downstream terminus of the Plan Area is Lake Oroville; and although water from Lake Oroville is dedicated to the Bay-Delta, it is part of a forecast for the Lower Feather River Watershed and, thus, is not a part of the Upper Feather River Watershed environmental demand forecast. Finally, none of the five freshwater wetland areas in the Sacramento River Hydrologic Region are in the Plan Area. Environmental water demand presented in this chapter will focus primarily on the dedicated flows in the Middle Fork of the Feather River, which has been designated as a federal Wild and Scenic River, and on the instream flow requirements for the Feather River.

In California, flows in Wild and Scenic Rivers constitute the largest environmental water use. Designated flows for Wild and Scenic Rivers are available to downstream users. Approximately 78 miles of the Middle Fork of the Feather River in the UFR IRWM Plan Area is designated a Wild and Scenic River. Once Middle Fork Feather River water flows into Lake Oroville, it is available for other uses. In 1995, the DWR calculated the water demand for Middle Fork Feather River as 1,192 AF per year in an average year and 497 AF per year in a drought year. The DWR projected that the same flows will be available to the Middle Fork Feather River in 2020.

Instream flow is the water maintained in a stream or river for beneficial uses such as fisheries, wildlife, aesthetics, recreation, and navigation. Instream flow is a major factor that influences the productivity and diversity of California's rivers and streams. It is difficult to forecast future regulatory actions and agreements that could change existing instream flow requirements. Thus, for this environmental demand forecast, only the projected instream flow requirements for the Feather River that were calculated by the DWR are presented. The DWR states that their calculations are "simplifications of reality," as their approach undercounts applied instream flow requirements on streams having multiple requirements, such as the Feather River. The DWR calculated that the instream flow requirements of the Feather River in 1995 were 880 AF per year in an average year and 588 AF per year in a drought year. The DWR projects that the same instream flow will be required in 2020.

4.6. Water-Related Infrastructure

4.6.1. Surface Water Infrastructure

The City of Portola and Crocker Mountain receive surface water from Lake Davis, and the town of Greenville receives surface water from Round Valley Reservoir. Local public agencies are responsible for those systems (City of Portola, Grizzly Lake Resort Improvement District, Graeagle Water Company, and Indian Valley Community Services District, respectively).[50]

The State Water Project depends on a complex system of dams, reservoirs, power plants, pumping plants, canals, and aqueducts to deliver water to users (see Section 1.6.1.3 State Water Project for more detail).

Dams and Reservoirs

Major water-related infrastructure includes SWP storage facilities, along with the SWP's Grizzly Valley Pipeline running from Lake Davis to the City of Portola.[51] Additionally, the USFS operates five dams, and several small dams are owned and operated by private individuals. Altogether, there are 40 dams and diversions in the Plan Area (Table 1-11), not including the small diversion dams and points of diversions throughout the region.

The Department of Water Resources and PG&E have significant facilities in the region with a number of implications for water supply and water quality. Under the Monterey Settlement Agreement, DWR has agreed to deliver SWP water to the Plumas County Flood Control District based on the availability of water in Lake Davis, regardless of the annual statewide allocation percentage for SWP deliveries. DWR also agreed to confer with the Plumas County Flood Control District to develop strategies and actions for the management, operation, and control of SWP facilities in Plumas County in order to increase water supply, recreational, and environmental benefits to Plumas.[52]

[50] Plumas Co. 2009. p. 30.
[51] Ibid., p. 19.
[52] Ibid., p. 30.

Table 4-11. Dams and Diversions in the Upper Feather River IRWM Plan Area

Dam Name	Owner	County	Stream	Capacity (AF)	Height (ft)	Year
Antelope	DWR	Plumas	Indian Ck	22,566	113	1964
Bidwell Lake	Private	Plumas	No Canyon Ck	5,200	35	1865
Bucks Diversion	PG&E	Plumas	Bucks Ck	5,843	99	1928
Bucks Storage	PG&E	Plumas	Bucks Ck	10,300	122	1928
Butt Valley	PG&E	Plumas	Butt Ck	49,800	84	1924
Caribou Afterbay	PG&E	Plumas	North Fork	2,400	164	1959
Chester Diversion	Sac-SJ Rec Board	Plumas	North Fork	75	47	1975
Concow	Thermalito Table Mtn ID	Butte	Concow Ck	6,370	94	1925
Cresta	PG&E	Plumas	North Fork	4,400	103	1949
Eureka	DPR	Plumas	Eureka Ck	220	29	1866
Faggs Debris	USFS	Plumas	Tr. Willow Ck	50	10	1900
Forbestown Diversion	Oroville Wyandotte ID	Butte	South Fork	358	99	1962
Frenchman	DWR	Plumas	Last Chance Ck	55,477	129	1961
Grizzly Creek	Private	Plumas	Big Grizzly Ck	140	39	1915
Grizzly Creek	Private	Butte	Grizzly Ck	76	50	1964
Grizzly Forebay	PG&E	Plumas	Grizzly Ck	1,112	92	1928
Grizzly Valley	DWR	Plumas	Big Grizzly Ck	83,000	115	1966
Indian Ole	PG&E	Lassen	Hamilton Ck	24,800	26	1924
Jamison Lake	USFS	Plumas	Little Jamison Ck	300	15	1902
Lake Almanor	PG&E	Plumas	North Fork	1,308,000	130	1927
Lake Madrone	Lake Madrone Water District	Butte	Berry Ck	200	35	1931
Little Grass Valley	Oroville Wyandotte ID	Plumas	South Fork	93,010	210	1961
Long Lake	Graeagle Water Co	Plumas	Gray Eagle Ck	1,478	12	1938
Lost Creek	Oroville Wyandotte ID	Butte	Lost Ck	5,680	122	1924
Lower Three Lakes	PG&E	Plumas	Milk Ranch Ck	606	32	1928
Lundy Ditch	Plumas Pines Golf Course	Plumas	Jamison Creek			
Oroville	DWR	Butte	Feather River	3,537,577	742	1968
Palen	Private	Sierra	Antelope Ck	146	25	1951
Philbrook	PG&E	Butte	Philbrook Ck	5,180	85	1926
Poe	PG&E	Butte	North Fork	1,150	62	1959
Ponderosa Diversion	Oroville Wyandotte ID	Butte	South Fork	4,750	157	1962
Rock Creek	PG&E	Plumas	North Fork	4,660	120	1950
Round Valley	PG&E	Butte	West Branch	1,147	30	1877

Dam Name	Owner	County	Stream	Capacity (AF)	Height (ft)	Year
Silver Lake	Soper-Wheeler Co	Plumas	Silver Ck	650	21	1906
Sly Creek	Oroville Wyandotte ID	Butte	Lost Ck	65,050	271	1961
Smith Lake	USFS	Plumas	Wapanusie Ck	400	14	1909
Snag Lake	USFS	Sierra	Tr. Salmon Ck	106	8	1885
South Fork Diversion	Oroville Wyandotte ID	Plumas	South Fork	88	70	1961
Spring Valley Lake	CDFW	Plumas	Rock Ck	75	11	1979
Taylor Lake	Private	Plumas	Tr. Indian Ck	380	14	1929
Walker Mine Tailings	USFS	Plumas	Dolly Ck	1,200	30	unk

[a] ESF, 2005, p. 4-29. Available: http://www.feather-river-crm.org/pdf/MOU/IRWMP_063005.pdf, p. 4-19

Hydroelectric Infrastructure

The other most notable infrastructure is PG&E's Stairway of Power, a series of ten hydroelectric projects on the North Fork of the Feather River stretching from Lake Almanor to Lake Oroville (Figure 1-11).[53] The East Branch of the North Fork of the Feather River serves over 4.36 million electrical customers through its hydroelectric facilities. Lake Almanor is a very popular water-based recreation destination in the West.

The PG&E operations in the Upper Feather River region are governed largely by the terms of licenses issued by the Federal Energy Regulatory Commission. A settlement agreement and the license were completed for Project 1962 (Rock Creek/Cresta) in 2000, and a settlement agreement was completed for Project 2105 (Lake Almanor) in 2004. The license for Lake Almanor is currently under review by the State Water Resources Control Board for purposes of a Clean Water Act Section 401 water quality certification. Licenses for Project 2107 (Poe), Project 2088 (South Feather) and Project 2100 (Oroville) are also pending, and Project 619 (Bucks Lake) began relicensing in 2012.[54]

The settlement agreements for FERC Projects No. 1962, No. 2100, No. 2107, and No. 2105 are included as some of the underlying "mandatory plans" in the 2005 IRWM Plan. The FERC Project No. 1962 license established an Ecological Resources Committee (ERC), whose members serve as an adaptive management committee for license implementation in the central portion of the Feather River Canyon. Participants in the ERC meetings have typically included PG&E, the USFS, Plumas County, the CDFW, federal wildlife and fishery agencies, American Whitewater, local water recreation and trails groups, the California Sportfishing Protection Alliance, and the SWRCB. Many of these parties were also involved in the FERC No. 2100, No. 2105 licensing collaborative discussions and the FERC No. 2107 relicensing. Now they are actively engaged in the relicensing of the Bucks Lake Project (FERC No. 619).[55] Tribal representation was particularly important in the latter proceedings as tribes established their connections and asserted their land and water rights in the project-affected areas.

[53] Plumas Co. 2009. p. 19.
[54] Ibid., p. 30.
[55] Ibid., p. 31.

Related to PG&E operations, the Pacific Forest and Watershed Lands Stewardship Council[56] (Stewardship Council) is in the process of divesting PG&E lands that are not needed for hydroelectric operations by developing land conservation and management plans. The Bucks Lake Planning Unit in the Feather River region was one of four "pilot projects" in which the Stewardship Council sought to refine its process. Six entities--Plumas National Forest, Plumas County, Greenville Rancheria, Enterprise Rancheria, Plumas Corporation, and Feather River Land Trust--submitted statements of qualification and were approved as qualified recipients to potentially receive watershed lands in fee title or to hold a conservation easement over the planning unit. Ultimately, one collaborative land conservation proposal was submitted jointly by Plumas County, Greenville Rancheria, and Enterprise Rancheria. The proposal is currently under review by the Stewardship Council.[57]

The Stewardship Council began work on the Lake Almanor, Mountain Meadows, Butt Valley, and Humbug Valley planning units in 2009. Plumas County is involved with PG&E and the Council in coordinating stakeholder meetings to identify interests and issues among a number of parties, including the Maidu Summit Consortium, the federally recognized Susanville Indian Rancheria and the Greenville Rancheria, individual Maidu leadership, the USFS, the Department of Fish and Wildlife, the Mountain Meadows Conservancy, and the Feather River Land Trust.

4.6.1.1. State Water Project

The Upper Feather River region is the headwaters for the State Water Project, providing 3.2 million AF annually of high-quality water for irrigation, drinking water, recreation, fisheries, and energy.

The SWP depends on a complex system of dams, reservoirs, power plants, pumping plants, canals, and aqueducts to deliver water to users more than 500 miles away from this headwaters region for Lake Oroville (see 1.6.1.1) (Figure 1-11). The SWP infrastructure in the Feather River Watershed begins with Lake Davis, Frenchman Lake, and Antelope Lake, three small lakes on Feather River tributaries. The branches and forks of the Feather River flow into Lake Oroville and then through a complex system of power plants, down the Feather River into the Sacramento River to the Sacramento-San Joaquin Delta. In the north Delta, some water is pumped into the North Bay Aqueduct to supply Napa and Solano counties. Flows also feed the South Bay Aqueduct to serve Alameda and Santa Clara counties. The remaining water flows into the California Aqueduct to serve communities in Southern California.

Lake Oroville, created by the three major forks of the Feather River, is the largest of the SWP's storage facilities, with a storage capacity of 3.5 million AF of water/yr. The East Branch, North Fork of the Feather River, which is contained completely within the region, provides 25 percent of SWP water, which provides 48 percent of the developed municipal and industrial surface water supplies in California.

[56] The Pacific Forest and Watershed Lands Stewardship Council is a private, nonprofit foundation that was established in 2004 as part of a Pacific Gas and Electric Company (PG&E) settlement.
[57] Ibid., p. 31

Upper Feather River Integrated Regional Water Management Planning Area

State Water Project Facilities and Hydroelectric Projects

Figure 4-11 Map of State Water Project facilities and hydroelectric projects within the Upper Feather River Region

- Upper Feather River IRWM Planning Area
- Hydroelectric Plant
- Dam
- Major Stream or River
- Streams
- Canal or Ditch
- Pipeline, Aqueduct, Penstock
- Major Powerlines
- Railroad
- County
- Lake/Pond
- SWP-Operated Reservoir
- Swamp
- National Park
- USFS Wilderness Area
- NPS Wilderness Area

0 2.5 5 10 15 Miles

Cartography by Deer Creek GIS
www.deercreekgis.com

Flood Management Infrastructure

Flood control infrastructure in the region is owned by either PG&E or the DWR and is typically managed as part of operations related to hydroelectric generation and water storage facilities. Facilities include Lake Almanor, the Stairway of Power dams in the Feather River canyon that culminate in Lake Oroville, and Oroville Dam itself in the lowermost portion of the region.

A separate facility, the Chester Flood Control Channel, was constructed by the Army Corps of Engineers to address concerns over flood control in Chester. Known locally as the "super ditch," it is located along Highway 36 and diverts excess water around Chester and directly into Lake Almanor. Another flood management infrastructure in the region consists primarily of culverts to address localized roadway flooding.

4.6.2. Groundwater Infrastructure

Municipal water supplies are based primarily on groundwater sources, which are managed by a number of local special districts (CSDs, PUDs), small private water systems, and individual well owners (Table 2).[58]

4.6.3. Wastewater Infrastructure

Most of the population is located in the larger communities that have community wastewater systems. The largest exception is the community of Graeagle which relies upon septic tanks. Septic tanks are also used by dispersed populations living outside the main communities.

Recent developments, such as those served by the Grizzly Ranch Community Services District and the Walker Ranch Community Services District, are designed to recycle wastewater for irrigation purposes.

4.7. Water Quality

4.7.1. Water Quality Regulations

Water resources in the Plan Area are subject to federal and state regulations (Table 1-12).

Table 4-12. Summary of Applicable Regulations for Water Resources in the Upper Feather River IRWM Plan Area

Regulation	Summary
Federal:	
Executive Order 11988	Local governments under this order are required to pass and enforce a floodplain management ordinance that specifies minimum requirements for construction within 100-year flood plains.
Clean Water Act	Establishes basic structure for regulating discharges of pollutants into "waters of the United States." Administered by the U.S. Army Corps of Engineers.
Clean Water Act Section 303 (d) Impaired Waters List	Requires that States establish Total Maximum Daily Load (TMDL) for listed pollutants originating from point and nonpoint sources and requires levels of treatment to achieve compliance with water quality objectives.
Safe Drinking Water Act	Ensures safe drinking water for the public.
State:	
California Department of Water Resources (DWR), Division of Safety of Dams	Places responsibility for the safety of non-federal dams and reservoirs under the jurisdiction of DWR.
Porter-Cologne Water Quality Control Act	Requires that regional water quality control boards establish water quality objectives while acknowledging that objectives may be changed as long as

[58] Plumas Co. 2009. p. 30.

Regulation	Summary
	present and anticipated beneficial uses are not unreasonably impacted and water quality reduced.
State Water Resources Control Board	Established by the State Legislature, has authority over water resources allocation and water quality protection within the state. Note: Some water rights in the region have been established by court decree.
Central Valley Regional Water Quality Control Board	Authorized by the Porter-Cologne Act, the Central Valley RWQCB protects the quality of the waters within its jurisdiction for all beneficial uses. Plumas County is within the Central Valley RWQCB.
NPDES General Permit for Discharges of Stormwater Associated with Construction Activities	Requires a General Construction Permit and implementation of a Stormwater Pollution Prevention Plan (SWPPP) for construction activities of 1 acre or more of land.

Water quality concerns are identified when monitoring data exceeds the standards set to protect beneficial uses. Some stream segments are listed as "impaired" by various contaminants. Impairment means that a standard of water quality for beneficial uses (for example, as a source of drinking water or for recreation or industrial use) is not being met. The federal Clean Water Act requires states to maintain a listing of impaired water bodies for the purpose of establishing Total Maximum Daily Loads (TMDLs). A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that load among the various sources of that pollutant.

Potable Water

Potable water supplies in the Feather River Watershed come from both surface and groundwater, with the majority from surface water. During drought years, additional groundwater is pumped to compensate for reduced surface water supplies. In Sierra County, a majority of supply water is from surface sources (94 percent).

Groundwater sources, both privately owned and publicly operated, occur mostly in the valleys on the east side of the Sierra Crest. Sierra Valley, the largest valley in the watershed, contains a large aquifer (DWR Bulletin 118) as a medium priority groundwater basin subject to compliance with the recent sustainable groundwater management legislation.

State Water Project water sources comprise a large part of supplied water for the Plan Area[59] with the Feather River Watershed supplying 3.2 million AF per year for downstream urban, industrial, and agricultural use. Lake Oroville is the largest of the SWP's storage facilities, with a storage capacity of 3.5 million AF of water per year; it provides 48 percent of the developed municipal and industrial surface water supplies in California.[60] The East Branch North Fork Feather River alone, which is contained completely in Plumas County, provides 25 percent of SWP water.

Wastewater Discharge

Wastewater service in the region is addressed in several ways including on-site septic systems, community septic systems, and community wastewater treatment plants. Public wastewater and sewer system needs have been developed for various districts in the region. All of the region's treatment

[59] ESF. 2005. p. 4-27.
[60] Ibid., p. 4-28.

plants, including those operated by municipalities or wastewater management districts, are regulated under a permit issued by the RWQCB.

The Clean Water Act established the basic structure for regulating discharges of pollutants into "waters of the United States." The act specifies a variety of regulatory and non-regulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. Sections 303 and 304 provide for water quality standards, criteria, and guidelines.

- Section 401 requires every applicant for a federal permit or license for any activity that may result in a discharge to a water body to obtain a water quality certification that the proposed activity would comply with applicable water quality standards. Through the Waste Discharge Requirements (WDR) Program, the SWRCB regulates point discharges that are exempt from the Federal Water Pollution Control Act through issuance of NPDES permits for wastewater treatment system discharges.
- Section 402 regulates point- and nonpoint-source discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program. In California, the State Water Resources Control Board (SWRCB) oversees the NPDES program, which is administered by the RWQCBs. The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits. Anti-backsliding requirements provided for under CWA Sections 402(o) (2) and 303(d) (4) prohibit slackening of discharge requirements and regulations under revised NPDES permits. With isolated/limited exceptions, these regulations require effluent limitations in a reissued permit to be at least as stringent as those contained in the previous permit.
- Section 404 of the CWA establishes a program to regulate the discharge of dredged and fill material into waters of the U.S., including some wetlands. Activities in waters of the U.S. that are regulated under this program include fills for development, water resource projects (e.g., dams and levees), infrastructure development (e.g., highways and airports), and conversion of wetlands to uplands for farming and forestry.

4.7.2. Current Water Quality Conditions

Surface Water

Overall, water quality in the Plan Area is considered good; however, most of the main stem(s) of the Feather River are currently on the Clean Water Act 303 (d) list of impaired waters (listed constituencies include copper, zinc, polychlorinated biphenyls (PCBs), temperature and toxicity; Table 1-13).[61] Impaired waters include the North Fork from Lake Almanor to Lake Oroville, the Middle Fork from Sierra Valley to Lake Oroville, and the South Fork from Little Grass Valley Reservoir to Lake Oroville. Water quality constituents of general concern include temperature, sediment, and bacteria, with most impacts resulting from a variety of common land and water use practices (i.e., mining, ranching, timber harvest, road construction/maintenance and residential development). Erosion is also a legacy factor which can impact surface water quality, on the north, intermountain, and eastern portions of the Plan Area more than the western foothills.[62] Legacy methyl-mercury contamination of fish and wildlife originating from

[61] State Water Resources Control Board, 2010. 2010 California 303(d) List of Water Quality Limited Segments: Category 5. Available at: http://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/category5_report.shtml

[62] Plumas County. 2012. *2035 Plumas County General Plan Update Draft EIR*, pp. 4.6-8. Available at: http://www.countyofplumas.com/index.aspx?NID=2248.

the Gold Rush in hydroelectric and SWP reservoirs is of special concern for tribes, Audubon Society members, and the Water Boards. A Mercury TMDL proceeding is planned for the region during the next five to ten years.

Table 4-13. Impaired Waters in the Upper Feather River IRWM Plan Area (Clean Water Act Section 303(d))[59]

Water Body	Pollutant (Source)	Total Maximum Daily Load (TMDL) Schedule
Little Grizzly Creek	Copper (Mill Tailings) Zinc (Mill Tailings)	Est. TMDL Completion: 2020
Fall River, Tributary to Feather River, Middle Fork	Unknown Toxicity (Source Unknown)	Est. TMDL Completion: 2021
Feather River, North Fork (below Lake Almanor)	PCBs, Temperature, Unknown Toxicity	Est. TMDL Completion: 2021
Feather River, Middle Fork (Sierra Valley to Lake Oroville)	Unknown Toxicity (Source Unknown)	Est. TMDL Completion: 2021
Feather River, South Fork (Little Grass Valley Reservoir to Lake Oroville)	PCBs and Unknown Toxicity (Sources Unknown)	Est. TMDL Completion: 2021

Groundwater Quality and Water Quality from Storage Facilities

The review of groundwater quality for the vulnerability analysis focuses on nitrate, salinity, and pesticides. Other constituents of concern are reviewed as necessary, based on documented occurrences. In the Sierra Valley, "the poorest quality groundwater is found in the central west side of the valley where fault- associated thermal waters and hot springs yield water with high concentrations of boron, fluoride, iron, and sodium. Several wells in this area also have high arsenic and manganese concentrations" (DWR 2003). In this subwatershed, groundwater quality impacts, when they occur, tend to be linked to natural geologic conditions, and not so much from agricultural impacts, due to low irrigation and fertilizer and pesticide inputs. In addition, population is sparse, and impacts due to septic systems are not expected.[63]

Lowering of water tables and depletion of shallow aquifers are typical consequences of headcutting in streams throughout the Plan Area. This results from increased incision of streams in channels that become hydrologically isolated from their historic floodplains. Poor retention of precipitation is also a consequence when headcutting lowers water tables and vegetation changes to more xeric types. Active rehabilitation work on streams where this occurs will restore water tables and shallow aquifers when headcutting is reversed and as riparian and upland vegetation recovers.

However, some portions of the Plan Area are experiencing dry-year depletions of deep groundwater systems as a result of continued extraction and reduced recharge during those periods. In these areas in particular, the need for a more integrated approach to surface and groundwater and land management practices is being recognized, especially in lower precipitation years. Sierra Valley is an example of a high desert groundwater basin, developed for agriculture in the late 1800s. Collection of groundwater data started in the late 1980s, which indicated the basin experienced periodic drought depletions that only

[63] Northern California Water Association, 2014. *Sacramento Valley Water Quality Coalition Groundwater Quality Assessment Report, June:* Pg 17-4. Available at: http://www.svwqc.org/wp-content/themes/svwqc-2015/docs/groundwater-quality-assessment-report.pdf.

partially recover during wet periods. Prior to the end of the 1970s most groundwater use in the valley was stock water from artesian wells. In the 1980s, many deep, large capacity irrigation wells were developed to grow alfalfa and hay crops. Significant groundwater declines have developed in the most heavily pumped areas during the last decade of intensifying drought. Since its inception in 1980, the Sierra Valley Groundwater Management District has monitored groundwater levels and installed flow meters to monitor pumping on all wells in the valley pumping 100 gpm or more. In order to manage the drought depletions, enhancement of upland and historic flood recharge areas on the valley floor are being investigated.

Nitrates

The Upper Feather River watershed NO_3 analysis is based on a review of the concentration of the most recent sampling at each well from 348 wells located in this watershed and for which records were readily available. Three percent of most recent wells had nitrate values above half the MCL, while 1 percent of wells had nitrate values exceeding the primary MCL of 45 mg/L. The average concentration is 3.5 mg/L, well below half the MCL. It should be noted that these wells are not necessarily restricted to irrigated agricultural areas, but represent the general water quality of groundwater in the entire watershed.[64]

The Upper Feather River watershed has almost no MCL exceedances of nitrate and TDS, and those present are not necessarily linked to irrigated agricultural impacts. There have not been any reported issues of nitrate and TDS in this watershed, other constituents of concern are generally linked to natural subsurface conditions. High vulnerability areas are considered the areas that have high nitrate and/or salinity with increasing trends in concentrations. The well sampling data generally show low nitrate and TDS concentrations. Even though the hydrogeologic susceptibility is high, the agronomic susceptibility is very low. This combined with the good groundwater quality found in the alluvial basins, it can be inferred that the UFR watershed has a low vulnerability designation for all basins.[65]

Wastewater and Recycled Water Quality

All of the region's treatment plants, including those operated by municipalities or wastewater management districts, are regulated under a permit issued by the RWQCB. However, individual septic systems serving individual residences also have the potential to impact water quality. The individual systems are of particular concern in areas where historical development has resulted in a high concentration of older septic systems that may not have been designed and constructed using current standards or that are not regularly maintained or upgraded. Additionally, nitrate contamination of groundwater is a concern, especially in areas of permeable soils and relatively shallow groundwater. The SWRCB adopted a water quality control policy in 2012, which defines criteria for siting, design, operation, and maintenance of onsite wastewater treatment systems.[66]

Recycled water in the region is used primarily to irrigate golf courses. Recycled water is treated to industry standards prior to application.

[64] Ibid.
[65] Ibid. pg 17-6.
[66] SWRCB, 2012. *Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems*, June 19. Available at: http://www.waterboards.ca.gov/water_issues/programs/owts/docs/owts_policy.pdf

ITEM NO. 7

Upper Feather River
Integrated Regional Water Management

RWMG Meeting No. 9
February 26, 2016

To: Upper Feather River Regional Water Management Group

From: Uma Hinman, Uma Hinman Consulting

Subject: Next Meeting Date and Topics

Date: February 20, 2016

INTRODUCTION

Regular Meeting

During the January 22, 2016 meeting, the RWMG scheduled the next meeting for March 18, 2016 at 1:00 p.m.

Topics recommended for the next RWMG meeting – Meeting No. 10:

1. Workgroup updates
2. Plan objectives metrics
3. Draft DAC Assessment
4. Draft Implementation Project lists
5. Draft Impacts and Benefits Chapter

Future topics:

- Draft Water Issues, Integration and Capacity chapter
- Presentation on Community Vulnerability Study
- Presentation on Forest-Water Balance Study
- Remaining Draft Chapters

REQUEST

Discuss and confirm the next meeting date, time and tentative content.

Calendar for year 2016 (United States)

January

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	**18**	19	20	21	22	23
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31						

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February

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March

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April

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May

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June

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July

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August

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September

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25	26	27	28	29	30	

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October

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23	24	25	26	27	28	29
30	31					

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November

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20	21	22	23	**24**	25	26
27	28	29	30			

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December

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18	19	20	21	22	23	24
25	**26**	27	28	29	30	31

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Holidays are listed on the following page.