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## CHAPTER 11.0 PLAN IMPLEMENTATION, PERFORMANCE, MONITORING AND DATA MANAGEMENT

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### 11.1 Introduction

The Department of Water Resources (DWR) Guidelines for Integrated Regional Water Management (IRWM) Plans include the standard that IRWM Plans “shall include performance measures and monitoring to document progress toward meeting Plan objectives.” The intent of the Plan Performance and Monitoring Standard is to ensure:

- ◆ The Regional Water Management Group (RWMG) is efficiently making progress toward meeting the objectives in the IRWM Plan;
- ◆ The RWMG is implementing projects listed in the IRWM Plan; and
- ◆ Each project approved under the Plan is monitored to comply with all applicable rules, laws, and permit requirements.

Performance measures allow the RWMG and regional stakeholders to understand and measure the success of ongoing Plan implementation, following adoption by the RWMG and individual entities and organizations. The two primary categories are 1) *Plan Performance*, evaluated and measured by the RWMG (i.e., progress toward accomplishing goals and objectives); and 2) *Project Performance*, the monitoring and evaluation of individual projects against their respective performance measures and outcomes, conducted by project sponsors and reported to the RWMG. The objectives of the Plan (Chapter 5 *Goals and Objectives*) generally represent the intended benefits of Plan implementation, and include both Plan-level and project-level benefits (Chapter 10 *Impacts and Benefits*). Evaluation of Plan Performance will include an assessment of the extent to which Plan-level benefits have been realized through Plan implementation. Assessment of Project-level benefits will be incorporated into individual project monitoring plans.

The Upper Feather River (UFR) RWMG is committed to an IRWM Program with a planning horizon that goes well beyond the recommended 20 years. The Memorandum of Understanding (MOU) brings together entities that intend to collaboratively address the long-term water resources management needs of the UFR Region. The Plan will undergo periodic updates and revisions to reflect changing conditions in the Upper Feather River Region and any updated IRWM Guidelines. In addition, the RWMG membership and governance processes may evolve in response to changing conditions.

In addition to this IRWM’s extended implementation horizon and the possibility of changing governance processes in the RWMG, the list of implementation projects will require updating as the IRWM planning effort proceeds and projects are both completed and new ones identified. For these reasons, monitoring Plan performance will be closely tied to the implementation of individual projects, and the IRWM Plan focuses on establishing a framework for evaluation that will link project completion to IRWM Plan implementation.

### 11.2 Plan Performance and Monitoring

Plan Performance describes the overall performance of the Plan in meeting its goals and objectives, both through implementation of individual projects and through the governance and operation of the Plan itself. Evaluating Plan Performance will focus on summarizing and integrating project-level assessments

but will also involve the effectiveness of the Plan itself, as not all of the intended benefits of the Plan accrue through the implementation of individual projects.

## **11.2.1 Process for Plan Evaluation**

### **11.2.1.1 Responsibility for IRWM Plan Implementation Evaluation**

The RWMG will appoint a representative who will be responsible for evaluating and reporting on Plan Performance, including Plan implementation, progress toward meeting Plan objectives, Plan-level benefits, and implementation and outcomes of individual projects approved under the Plan. This representative may be a member of a participating agency or an outside party.

### **11.2.1.2 Evaluation Frequency**

Plan Performance will be evaluated annually in a report to the RWMG by the appointed representative. Evaluation of Plan Performance will also accompany each successive IRWM implementation grant solicitation; release of updated IRWM Guidelines by DWR; update to regulations; or emergence of new data, science, or awareness of changed regional conditions that affect the issues and priorities within the Region. In response to any or all of the above, the RWMG will review the Plan's content and, as needed, will update the water management issues, goals, objectives, and strategies in the Plan area. Such updates to the Plan will be through an amendment process (Chapter 2 *Governance, Stakeholder Involvement, Coordination*). Major changes to the Plan, including formal update and re-adoption requiring the approval of the RWMG, will occur only as required by the State of California or as deemed necessary by the RWMG. It is the intent of the RWMG that if adequate funding is available, the Plan will be formally reviewed, revised, and re-adopted no less frequently than every five years.

### **11.2.1.3 Feedback Protocol**

After acceptance by the RWMG, the annual report on Plan Performance will be made available to the public on the RWMG website (<http://www.featherriver.org>), in print at appropriate locations in the Plan area (e.g., offices of participating agencies, libraries, community centers, etc.), or upon request. The annual report will provide the basis for discussion of how findings or "lessons learned" from Plan-level evaluation and project-specific monitoring efforts will be used to improve the RWMG's ability to implement future projects in the IRWM Plan. In addition, data from individual project monitoring and data collected for Plan-level assessment will be publicly available (Section 11.4).

If the annual report identifies a significant deficiency in Plan Performance, the RWMG may elect to hold public meetings or seek public comment on how implementation of the Plan, or the Plan itself, should be amended to better address regional issues. Amendments may include administrative changes, changes to the resource management strategies (RMS) (Chapter 6 *Resource Management Strategies*), or changes to the goals and objectives of the Plan itself. For example, after a review of the RWMG performance measures, the RWMG may need to amend the RMS or the actual IRWM objectives to account for new scientific data or regional changes in conditions that could alter baseline assumptions or understanding of water management issues discussed in the IRWM Plan. Deficiencies in the performance of an individual project will be addressed by the required remedial and/or adaptive management components of the project-specific monitoring plan; however, the RWMG will take into account "lessons learned" from individual projects when considering future project proposals.

#### **11.2.1.4 Project Updates, Additions, and Funding**

With each IRWM grant solicitation, the RWMG will review the implementation project list and will invite project proponents to participate in the grant opportunity. Project proponents will be responsible for developing individual applications in response to solicitations. Updating the implementation project list within the Plan will be necessary as projects are funded and implemented, regardless of the source of funding. The RWMG's appointee or representative will update the project implementation list for review at the quarterly RWMG meeting.

The RWMG will issue a "call for projects" annually, or as warranted by upcoming grant solicitations, providing opportunity for the consideration of new projects to add to the implementation project list. The RWMG will review projects in accordance with the process presented in Chapter 9 *Project Development*, and the list will be updated annually.

#### **11.2.1.5 Comparison to the 2005 IRWM Plan**

The 2005 Upper Feather River IRWM Plan placed adaptive management at the core of its Technical Analysis and Plan Performance. Adaptive management methods were included in the 2005 Plan as Objective 12, and were divided into passive and active strategies. Passive adaptive management was described as model-based predictions of how ecosystems would respond to certain management actions, and was conducted without experimental design elements such as replication, randomization, or controls.

The 2005 Plan described active adaptive management as a process of applying management strategies as treatments in a controlled, replicated experiment that would allow managers to isolate the effects of management treatments. Furthermore, active adaptive management would allow direct comparison of different management strategies to better inform future management actions.

The 2005 Plan focused on implementation of projects funded by existing sources such as Monterey Settlement Agreement funds and CALFED, and administered through existing programs such as the Feather River Coordinated Resource Management, Plumas Watershed Forum, and the Quincy Library Group. Additionally, the Region successfully obtained \$7 million in Proposition 50 grant funds for implementation projects identified in the 2005 IRWM Plan. However, the 2005 Plan did not include a process for evaluating the performance of the Plan itself, and project performance evaluation was expected to consist of active adaptive management strategies.

### **11.2.2 Plan Performance Measures**

Plan Performance will be evaluated in terms of the Plan-level benefits (Chapter 10 *Impacts and Benefits*), the Plan objectives (Chapter 5 *Goals and Objectives*), and additional measures described in this section. Each project approved under the Plan will address at least one of the Plan objectives. Plan Performance in terms of those objectives will depend largely on the success of individual projects. Table 11-1 presents the 5 Plan-level benefits, 18 Plan objectives, and 5 additional measures by which Plan Performance will be assessed along with suggested metrics to quantify success.

**Table 11-1. Plan Performance Measures and Metrics**

PERFORMANCE MEASURE	METRICS
<b>Plan-level Benefits</b>	
Fostering understanding and information sharing within the Region	Conduct RWMG public meetings Update <a href="http://Featherriver.org">Featherriver.org</a> website Data Management Standard Determine qualitative perceptions of participating stakeholders
Opportunities to collaborate on project development and solving regional issues	Coordinate with stakeholder agencies (including staff) Involve the public in project selection Involve DACs and Tribal representatives
Identification of diverse funding sources	Track the number and diversity of successful grant applications Assemble and disseminate lists of grant opportunities targeted to various stakeholder groups
Capacity building	Coordinate with stakeholder agencies, including staff (organizational capacity-building trainings) Contact UC Davis Extension –Agriculture, NRCS, and other programs to provide funding and assistance to private land owners Improve efficiency and reduce redundancy
Venue to address policy-related and regulatory processes	Conduct RWMG public meetings Update Featherriver.org website Evaluate Plan Performance annually
<b>Plan Objectives<sup>1</sup></b>	
Restore natural hydrologic functions	Implement 3 Plan projects that restore natural hydrologic functions Update the project list and technical and scientific studies at the annual RWMG meeting
Reduce potential for catastrophic wildland fires in the Region	Implement 3 Plan projects that reduce catastrophic wildfire potential Update the project list and technical/scientific studies at the annual RWMG meeting

<sup>1</sup> The Plan objectives were approved on March 27, 2015 at a regular RWMG meeting. The objectives listed in this table are verbatim.

PERFORMANCE MEASURE	METRICS
Balance the needs of forest health, habitat preservation, fuels reduction, forest fire prevention, and economic activity in the Region	Continue to support the integration of biomass electrical generation biofuels development with 1) forest and habitat conservation in US Forest Service (USFS) plan updates, 2) in the carbon sequestration and conservation plan for forests (CA Air Resources Board [ARB]), and 3) by implementing projects UF-12 and TAC-6
Build communication and collaboration among water resources stakeholders in the Region	<p>Continue MOU development with water and land management entities in the Region</p> <p>Develop a process for supporting and endorsing collaborative projects, studies, and actions sponsored by MOU signatories</p> <p>Develop a review process for monitoring information and needs</p> <p>Develop a process for updates on conflicts identified in the Plan during public meetings, on the featherriver.org website, and through Inter-agency coordination/consultation</p>
Work with DWR to develop strategies and actions for the management, operation, and control of State Water Project (SWP) facilities in the watershed in order to increase water supply and recreational and environmental benefits to the Region	<p>Review proposals and management planning for lands, habitat, and cultural/historical resources within and downstream from SWP facilities in the watershed</p> <p>May develop an informational item that updates inter-agency and inter-regional planning efforts at a specific RWMG meeting every year</p>
Encourage municipal service providers to participate in regional water management actions that improve water supply and water quality	<p>Get involved in inter-agency, intra-regional planning efforts</p> <p>Participate in project selection</p> <p>Develop project-specific criteria</p>
Continue to actively engage in Federal Energy Regulatory Commission (FERC) relicensing of hydroelectric facilities in the Region	<p>Obtain an annual progress report from FERC regarding its implementation of hydroelectric license conditions as scheduled for FERC No. 2100, 2107, 699, 2105</p> <p>Obtain a 'letter of intent' from FERC on fish and amphibian passage improvements, wildfire recovery projects, the James Lee and Indian Jim visitors and outdoor recreation and education and events center, the Rock Creek Bench river access project, and the accidental spill response plans. These are implementation priorities for water stakeholders in the North Fork Feather River Canyon</p>

PERFORMANCE MEASURE	METRICS
Address economic challenges of municipal service providers to serve customers	<p>Determine Plan-level efforts of participating entities</p> <p>Obtain outside funding</p> <p>Review efforts by regional and local planning agencies</p>
Protect, restore, and enhance the quality of surface and groundwater resources for all beneficial uses, consistent with the Basin Plan	Implement 2-3 Plan projects that address surface and groundwater resource conservation and quality
Address water resources and wastewater needs of Disadvantaged Communities (DACs) and Native Americans	<p>Implement 4 Tribal benefit and 17 DAC benefit Plan projects</p> <p>Update the DAC water needs inventory every five years, or as needed by the RWMG</p>
Coordinate management of recharge areas and protect groundwater resources	<p>Implement 3 Plan projects that include recharge area and groundwater conservation efforts</p> <p>Assess whether inter-agency, intra-regional planning efforts include implementation of the region-wide LIDAR project (UF-13)</p>
Improve coordination of land use and water resources planning	<p>Incorporate the UFR IRWM Plan into updates of land, water, and natural resource planning for the three national forests in the Region</p> <p>Submit the UFR IRWM Plan as a planning reference for the Plumas, Lassen, and Tahoe National Forest Land and Resource Management Plan updates</p> <p>Support efforts by regional and local entities to participate in ARB’s carbon sequestration and conservation plan for forest and agricultural landscapes</p> <p>Integrate TEK into USFS, ARB, and State Water Resources Control Board (SWRCB) plans</p> <p>Provide resource management strategy recommendations developed by the IRWM Plan workgroups for the next update of the California Water Plan</p>
Maximize agricultural, environmental and municipal water use efficiency	Implement 2-3 Plan projects that address water use efficiencies
Effectively address climate change adaptation and/or mitigation in water resources management	<p>Implement 3-4 Plan projects that address GHG reductions, and climate adaptation and mitigation in water and watershed management</p> <p>Update the project list and technical and scientific studies at the annual RWMG meeting</p>

PERFORMANCE MEASURE	METRICS
Improve efficiency and reliability of water supply and other water-related infrastructure	Implement 2-3 Plan projects that address water use efficiencies
Enhance public awareness and understanding of water management issues and needs	Implement 4 Plan projects that enhance public awareness and public education about water issues and needs  Update the project list and technical and scientific studies at the annual RWMG meeting  Support MOU signatory proposals for public outreach/education, public workshops and meetings, and water and watershed education in school programs
Address economic challenges of agricultural producers	Encourage agricultural producers to participate in potential funding opportunities through IRWM and other sources  Obtain outside funding
Work with counties/communities/groups to make sure staff capacity exists for actual administration and implementation of grant funding	Implement 2 to 3 Plan projects that include capacity building for project development, implementation, and evaluation  Update the project list and technical/ scientific studies at the annual RWMG meeting
Additional Measures	
How robust the IRWM Plan process has been after Plan development	List the number of RWMG meetings held vs. identified benchmarks  <ul style="list-style-type: none"> <li>◆ Quarterly RWMG meetings</li> <li>◆ RWMG meetings will be cohosted with member organizations when appropriate</li> </ul>
Public outreach and engagement	List the number and variety of attendees compared to what was targeted by the RWMG
Economic benefits	Develop a process for quantifying and assessing the amount of funding and local job creation associated with the implementation of projects identified in the Plan  Retain and grow water management and watershed stewardship job opportunities  Develop volunteer water management positions on regional boards and commissions for community health, education, and improvement activities, including school programs
Reduction of conflicts identified in the Plan	Develop a process for evaluating improved collaboration that includes responding to stakeholder participants and their qualitative perceptions

PERFORMANCE MEASURE	METRICS
Overall effectiveness of the planning process	List the number of funded and implemented Plan projects  List the number of DAC needs and projects that have advanced to implementation readiness  List the number of tribal partnership projects funded and implemented  Develop administrative capacity for the RWMG and for MOU signatories and project partners  List the number of RMS recommendations that are incorporated into the next California Water Plan update
Up-to-date understanding of climate change vulnerability	Review the most current climate change projections, every five years  Review actions to address priority climate change vulnerabilities, annually  Re-prioritize climate change vulnerabilities, every three years

Many Plan performance measures will be assessed using metrics defined for individual projects (project-specific criteria) that cannot be defined at the Plan level; Section 11.3 includes a general framework for project-level monitoring. Other measures can be assessed in terms of the number and variety of projects approved under the Plan (project selection). Finally, some measures can be quantified directly, such as local and regional planning agency efforts, number of public outreach programs, tracking attendance and participation in public meetings, public opinion surveys, cooperation and workload sharing among agencies, and the amount of grant funding obtained. The annual report to the RWMG on Plan Performance will summarize progress made in the preceding year in terms of each of the 28 measures in Table 11-1.

### 11.3 Project Performance and Monitoring

The UFR RWMG or its appointee will be the primary contact for project proponents in the Plan area. Each project approved under the Plan will contribute to the accomplishment of at least one Plan objective, and it is through the implementation of approved projects that the Plan will provide many of its intended benefits. Therefore, evaluation of Project Performance is essential to assessing the overall success of Plan implementation. Project Performance will be quantified and assessed through the implementation of a Project-specific Monitoring Plan (PSMP).

#### 11.3.1 Project-Specific Monitoring Plans

During the development of actual grant applications, PSMPs will be prepared and implemented for most of the projects in this IRWM Plan. This section provides a framework for formulating PSMPs; however, individual PSMPs will vary depending on the nature of the project, the amount of stakeholder involvement, and the type(s) of affected resources. The minimum PSMP requirements set forth in this chapter are intended only to satisfy the monitoring and reporting requirements of this IRWM Plan, and although they may suffice for other monitoring and reporting requirements (e.g., regulatory agencies,



NEPA/CEQA, etc.), other similar monitoring plans may be required concurrently with the PSMP. Each grant solicitation will have its own PSMP content requirements. The minimum content, discussed in the following sections, is consistent with content in the Proposition 84 and Proposition 1 guidelines. Under no circumstances will the PSMP supersede or void a condition required by any other plan as part of project approval.

### **11.3.1.1 Projects Requiring a PSMP**

Projects selected for grant solicitations under the IRWM Plan will require a PSMP as part of the application submittal. Proposed implementation projects promote one or more Plan objectives. Such projects include, but are not limited to, infrastructure construction/improvement, restoration, surface or groundwater monitoring, and forest fuels reduction. The RWMG may require PSMPs for projects such as utility rate tiering, metering, land use changes, and system reoperation in order to track the success of such projects at promoting Plan objectives.

Projects such as education and outreach programs that secure outside funding, capacity-building activities, administrative actions by the RWMG and its appointed representatives, data-gathering, RWMG outreach activities, meetings, and inter-agency coordination are not considered projects and will not require a PSMP; these activities will be tracked as part of the annual Plan Performance assessment.

### **11.3.1.2 Party with Primary Responsibility for the PSMP**

The project proponent is responsible for development of a PSMP for each project, according to the procedures described in this chapter. The project proponent is responsible for ensuring that the PSMP meets the minimum requirements specified in this chapter and any additional requirements specified by the RWMG or other agencies.

The project proponent is also responsible for guaranteeing the implementation of the PSMP for the life of the project or the term of the monitoring program, as specified in the PSMP. The exact mechanism for implementation of the PSMP will vary by project; however, the following position regarding monitoring of projects is the adopted policy of the UFR RWMG:

*RWMG Policy (adopted 6/15/2015): Although project monitoring requirements will vary by grant solicitation, it is the position of the Upper Feather River Regional Water Management Group that project monitoring for IRWM-sanctioned projects should be objective, transparent, available to the public, required to be conducted by a third party, and science-based.*

To implement this policy, each PSMP will include a statement that monitoring will be conducted by a third party, subject to approval of the RWMG.

### **11.3.1.3 Review of the PSMP**

The RWMG or its appointed representative will review and accept a PSMP before the project itself is submitted for IRWM funding. Funding agencies and other entities with regulatory authority over the project may also review the PSMP and require revisions to it as a condition of a grant or permit. This Plan does not require public review of PSMPs; however, it is advisable for most projects.

When Plan projects are submitted to other funding sources, they are not subject to the requirements of this Plan. However, project proponents are encouraged to submit their final PSMPs to be included on the Plan website to assist in building a regional data repository.

#### 11.3.1.4 Timing of the PSMP

The project proponent will prepare a complete draft PSMP and submit it to the RWMG, or an appointed representative, for approval. The project proponent will complete a final PSMP and will submit it to the RWMG before the final project is approved for grant consideration. The PSMP will be included in all funding or permit applications (if submitted) to outside agencies, and may be subject to revision in response to requirements of outside agencies with jurisdiction over the proposed project.

#### 11.3.1.5 Minimum Required Contents of the PSMP

Project-specific monitoring must include not only the physical elements of the project (*outputs* such as tank replaced, restored wetland, etc.) but also what the project accomplished in terms of Plan goals and objectives (*outcomes* such as a water supply improved for a DAC for the life of the project, improved watershed retention or sediment control). In other words, monitoring must address not only what the project achieved but also what it contributed toward the achievement of Plan goals and objectives.

Monitoring plans will be prepared according to the specifications required by a funding source. The DWR provides guidance for the contents of a PSMP; this guidance forms the minimum standard for PSMPs in the UFR IRWM Plan. At a minimum, a PSMP must include the following:

- ◆ Describe clearly and concisely (in a table format) what is being monitored for each project. Examples include monitoring for water quality, water depth, flood frequency, and effects the project may have on habitat or particular species (before and after construction). Express monitoring in quantitative metrics to the greatest degree possible.
- ◆ Measures to remedy or react to problems encountered during monitoring. An example would be to coordinate with the Department of Fish and Wildlife if a species or its habitat is adversely impacted during construction or after implementation of a project.
- ◆ Location of monitoring.
- ◆ Monitoring frequency.
- ◆ Monitoring protocols/methods, including who will perform the monitoring.
- ◆ A statement that monitoring will be conducted by a third party, subject to approval of the RWMG.
- ◆ A data management system or procedures to keep track of the results of monitoring. Each PSMP must address how the collected data will be or can be incorporated into statewide databases. Note that standards and guidance relating to the integration of data into statewide databases is included in Section 11-4.
- ◆ Procedures to ensure the monitoring schedule is maintained, and that adequate resources (funding) are available to maintain project monitoring throughout the scheduled monitoring timeframe.
- ◆ Reporting procedures that include a written report provided to the RWMG annually. Any exception to annual reporting must be thoroughly justified in the PSMP.

As stated previously, it is the position of the UFR RWMG that all monitoring should be conducted by a third party, all monitoring should be science-based, and all monitoring results should be available to the public.

#### 11.3.1.6 Oversight of the PSMP

The project proponent will be responsible for ensuring that the PSMP is implemented entirely, and that funding is available for adequate implementation for the life of the monitoring program. The RWMG or its appointed representative will conduct oversight of each Plan-approved project to confirm that the PSMP

has been implemented. Oversight will include confirming adherence to all reporting and data submission requirements. Funding for this oversight may be required from the project proponent as part of the proposed project.

## 11.4 Data Management Standard

The intent of the Data Management Standard (DMS) is to ensure efficient use and access to available water resources, land management, and environmental monitoring data for the UFR Region, and to ensure that data generated by IRWM implementation activities can be integrated into existing state databases. During the development of the UFR IRWM Plan update, a website (<http://featherriver.org>) has functioned as the region's DMS and it will continue in perpetuity. The website will be maintained by an entity appointed by the RWMG.

No data utilized in the preparation of a project proposal or collected for any project approved under this Plan will be considered the private property or possession of the project proponent or other private entity except data subject to assertions of Tribal sovereignty. No data collected as part of project implementation may be withheld as proprietary except data that are the possession of a sovereign Tribal entity. Free, open-access to data, along with data collection and submission standards outlined in this section, will promote the IRWM Plan objective of making regional data available to all stakeholders in the Plan area and will support the RWMG's goal of transparency.

### 11.4.1 Data Needs and Typical Data Collection Techniques

Implementation projects included in the Plan range from school watershed educational programs to groundwater monitoring programs, to construction projects, to incorporation of Traditional Ecological Knowledge (TEK) in regional projects. The data developed for each project and produced during the operations phase of each project will be very different. For construction projects, typical data include geotechnical studies and topographic surveys. Groundwater monitoring programs usually generate well boring logs during construction and generate groundwater level and water quality data during the monitoring or operations phases. In its PSMP, each project will be required to identify the data that will be required and generated by the project; the data will be uploaded to the Plan website and state databases.

The Uplands and Forests Workgroup identified a lack of transparent, publicly available, and science-based monitoring data as a general issue in the Region (Chapter 4 *Regional Water Issues*). That data need is contained in the RWMG policy on monitoring (Section 11.3.1.2).

Other regional data needs identified by Workgroups during IRWM Plan development are expressed as resource management strategy recommendations, and include:

- ◆ Sources of real-time data such as:
  - Local meteorological/weather
  - Soil moisture
  - Water application/use monitoring
  - Surface water depth and flow
  - Surface to groundwater depth
  - Groundwater modeling (Table 6-1: RMS 1; Agricultural Lands Stewardship; Strategy 5);

- ◆ Improved data on baseline hydrology and capacity of existing water management components (Table 6-1: RMS 1; Agricultural Lands Stewardship; Strategy 5);
- ◆ Data regarding the environmental and health effects of precipitation enhancement projects (Table 6-1: RMS 10; Floodplains, Meadows, Waterbodies; Strategy 1);
- ◆ Publicly accessible groundwater monitoring data including:
  - Hydrogeologic characterization of the aquifers
  - Changes in groundwater levels
  - Groundwater flow (interbasin + to/from streams)
  - Groundwater quality
  - Land subsidence, if any
  - Surface water flow
  - Surface water quality
  - Interaction of surface and groundwater (Table 6-1: RMS 8; Agricultural Lands Stewardship; Strategy 2);
- ◆ Improved data on sources of pollution including marinas and abandoned mine sites (Table 6-1: RMS 17; Floodplains, Meadows, Waterbodies);
- ◆ Inventory of the organic content of soil (Table 6-1: RMS 20; Agricultural Lands Stewardship; Strategy 5);
- ◆ Additional stream gages, precipitation stations, water quality monitoring stations, and groundwater monitoring wells (Table 6-1: RMS 22; Uplands and Forests; Strategy 3);
- ◆ Groundwater basin management plans for all 14 groundwater basins in the Plan area (Table 6-1: RMS 24; Floodplains, Meadows, Waterbodies; Strategy 2);
- ◆ Improved tracking and reporting method to document changes in the watershed (Table 6-1: RMS 26; Floodplains, Meadows, Waterbodies; Strategy 1 and 2);
- ◆ Improved data and tracking on hydrograph and precipitation in the watershed (Table 6-1: RMS 26; Uplands and Forests; Strategy 1);
- ◆ Improved tracking and reporting methods using Traditional Ecological Knowledge (Table 6-1: RMS 26; Uplands and Forests/Tribal Advisory Committee; Strategy 1), and;
- ◆ Improved understanding of climate change and associated impacts including:
  - Climatic effects on catastrophic wildfire
  - Climatic effects on flooding
  - Increased understanding of snowpack
  - Regional greenhouse gas (GHG) emissions inventory and forecasts
  - Updated, downscaled, and best available climate change projections.

Monitoring data, collected for individual projects, will vary depending on the nature and purpose of the project, and each PSMP will specify the type of data collected. In general, Project Performance is expected to be quantifiable; PSMPs will minimize qualitative or descriptive data collection. Photo-documentation will be the preferred method for qualitative monitoring, and data submissions to the website may include photographs. While the UFR website is configured to allow users to attach photos or other digital files when they submit data, other websites such as Flickr or Google+ provide free, geo-located photo galleries. Monitoring photos submitted to these public sites are likely to reach a broader audience and be easier to access, update, or manage than a custom photo gallery tool built especially for the UFR website. Photos posted to online photo websites may share links to their project photos in relevant pages on the UFR website.

Data submitted to the UFR website will be in a format compatible with import into standard analytical platforms (Excel, .xlsx, or comma-separated value, .csv). Scanned or digitized field data forms will not satisfy the requirements for data submission to most project funders. Wherever applicable, geospatial information should accompany any submitted data. Preferred formats for point locations are latitude/longitude using the WGS 1984 datum. GIS layers should be in the UTM Zone 10 NAD 83 projection, or include a projection file (.prj).

### **11.4.2 Data Submission to the Website**

Monitoring entities and Plan participants may post data directly onto the UFR website. Registration to use the site is free and open to all who request an account. RWMG designees may administer the website to remedy errors, delete fake accounts, or request clarification if questions arise about any submitted data.

Data may be submitted to the website using forms that request basic metadata such as author, title, contact information, date, and keywords. These forms were developed using national standards for spatial metadata developed by the [Federal Geographic Data Committee](#). Contributors should also provide a list of outside databases to which the data have also been submitted, as well as digital copies of any forms or reports generated by statewide databases confirming their receipt of data submissions.

### **11.4.3 Stakeholder Access to Data**

It is the intent of the RWMG to ensure that all public data generated by the projects are available to the stakeholders and project proponents. However, it is not the intent of the RWMG to duplicate efforts and data that are available elsewhere. To accomplish these two goals, the RWMG will ensure that all stakeholders will have access to the data generated by the other projects through the proposed projects page (<http://featherriver.org/proposed-projects>). The proposed-projects page contains links to the project-specific webpages, if applicable, and will contain links to state database webpages.

The UFR website ([www.featherriver.org](http://www.featherriver.org)) is free and accessible to the public. When users share data to the site they may designate it as “sensitive” or “not for public distribution.” Examples of sensitive data may include the location of cultural resources or sensitive species. The UFR website has no special security features; it is recommended that users concerned with unauthorized use of their data *not* submit it to the UFR website. Rather, they should submit an entry that describes their data, and provide contact information so interested parties may follow up.

### **11.4.4 Data Quality Control**

Monitoring entities, participating agencies, and all parties submitting data to the website are expected to take primary responsibility for the integrity of the data they submit and to ensure that those data are consistent with the standards of the project funder. Parties submitting data to the website are exclusively responsible for the accuracy and truthfulness of the data they submit. The RWMG makes no warrantee regarding accuracy or integrity of data on the website.

Funding for a detailed review of data submitted to the website is currently not available. However, should administrative funding become available, the website managing entity will perform an annual audit of data that will include quality control of all data submitted to the website.

The website has a public comment system that allows people to email the website managing entity regarding concerns about the data. The website managing entity will consult with data submitters and stakeholders to address stakeholder concerns regarding data posted to the website/DMS.

### **11.4.5 Integrating Data into State Databases**

Project design will include an evaluation of the data protocols for statewide databases to which project data will be submitted (Section 11.4.2). The legislation supporting a given grant program may specify a state database for data submittal. These protocols will inform the design of the project-specific data collection protocol. If project data will not fit into a particular state database, project designers will use the best principles approach, along with discussions with the project technical advisory committee, to ensure that effective, efficient, and defensible methods are employed.

A brief overview of public databases follows, categorized by data type. This list is not exhaustive but includes all databases described in DWR's IRWM Guidelines (both Proposition 84 and Proposition 1). The last category (Section 11.4.5.5) includes searchable databases that do not accept direct data entry; however, they represent significant data sources that can be useful when designing the data component of a project or assessment.

#### **11.4.5.1 General Databases**

*Sacramento River Watershed Information Module* – SWIM is a data tool developed by the Sacramento River Watershed Program to catalog technical information about the Sacramento River watershed. This site is a clearinghouse and is not intended to provide a protocol for data collection. The Upper Pit IRWM Region used SWIM as its data management system. The UFR website includes imported data from SWIM relating to the UFR Region. Information on SWIM is available at [www.sacriver.org](http://www.sacriver.org).

*California Environmental Data Exchange Network* – CEDEN is a system designed to facilitate integration and sharing of data collected by many different participants and is organized into regional data centers. The UFR IRWM Plan area is covered by the Central Valley Regional Data Center. CEDEN data templates, prepared by the regional data centers, are available on the CEDEN website, <http://www.ceden.org>.

#### **11.4.5.2 Water Quality Databases**

*Surface Water Ambient Monitoring Program* – Any group collecting or monitoring surface water quality data using funds from Propositions 13, 40, 50, and 84 must provide such data to SWAMP. The SWRCB has developed required standards for all data submissions. The SWAMP data checker produces a summary report for each data submission. Information on SWAMP is available at [http://www.swrcb.ca.gov/water\\_issues/programs/swamp/index.shtml](http://www.swrcb.ca.gov/water_issues/programs/swamp/index.shtml).

#### **11.4.5.3 Groundwater Databases**

*Groundwater Ambient Monitoring and Assessment program* – GAMA provides a comprehensive assessment of water quality in water wells throughout California. Projects that include a groundwater component should contact the GAMA program manager before designing a field or lab data output format. GAMA requires electronic submittal of information and prefers GeoTracker ([http://www.waterboards.ca.gov/ust/electronic\\_submittal/](http://www.waterboards.ca.gov/ust/electronic_submittal/)); Excel files can be problematic. Additional information on the GAMA program is available at <http://www.waterboards.ca.gov/gama/>.

*California Statewide Groundwater Elevation Monitoring Program* – The intent of the CASGEM program is to establish a permanent, locally managed program of regular and systematic monitoring in all of California's alluvial groundwater basins. CASGEM anticipates that the monitoring of groundwater elevations required by the enacted legislation will be done by local entities. The purpose of the CASGEM database is to maintain the collected elevation data in a readily and widely available public database. Local entities such as counties or agencies implementing an IRWM Plan that do not agree to conduct groundwater monitoring are ineligible to receive water grants and loans from the state. Information on the CASGEM Program is available at <http://www.water.ca.gov/groundwater/casgem/>

#### **11.4.5.4 Climate Change Database**

*Cal-Adapt* – The California Energy Commission (CEC), the California Natural Resources Agency (CNRA), and the Public Interest Energy Research Program (PIER) maintain Cal-Adapt, an online database that synthesizes and shares the most up-to-date understanding of how climate change might impact the State of California. Projected impacts of precipitation changes, temperature increases, and wildfire in the UFR IRWM Plan are available through the year 2100. Cal-Adapt is available at <http://cal-adapt.org/>

#### **11.4.5.5 Reference-only Databases**

*Water Data Library* – DWR maintains the state's WDL which stores data from various monitoring stations, including groundwater monitoring wells, water quality stations, surface water stage and flow sites, rainfall/climate observers, and well logs. Information regarding the WDL is available at <http://wdl.water.ca.gov/>.

*Integrated Water Resources Information System* – DWR maintains IWRIS, a data management tool for water resources data that is not a database. IWRIS is a web-based GIS application that allows entities to access, integrate, query, and visualize multiple sets of data simultaneously. Information on IWRIS is available at <http://www.water.ca.gov/iwris/>.

*California Irrigation Management Information System* – CIMIS is a program in the Office of Water Use Efficiency Branch (DWR) that manages a network of automated weather stations in California. The purpose of CIMIS is to make real-time weather data publicly available for irrigation scheduling. CIMIS information is available at <http://www.cimis.water.ca.gov/cimis/>.

*California Natural Diversity Database* – CNDDDB is maintained by the Biogeographic Data Branch of the California Department of Fish and Wildlife. The purpose of CNDDDB is to inventory the status and location of rare plants and animals in California. CNDDDB staff work with partners to maintain current lists of rare species and to maintain a database of GIS-mapped locations for these species. Plan projects involving surveys for wildlife, such as habitat restoration projects, should report records of sensitive species to CNDDDB. Information on accessing and submitting data to CNDDDB is available at <http://www.dfg.ca.gov/biogeodata/cnddb/>.

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