

## TABLE OF CONTENTS

---

CHAPTER 1.0	Introduction.....	1-1
1.1	Background .....	1-1
1.2	History, Purpose, and Status of the California IRWM Program .....	1-1
1.3	Purpose and Vision.....	1-4
1.4	Regional and Statewide Priorities for IRWM Program .....	1-4
1.5	Upper Feather River Planning Process.....	1-7
1.5.1	Plan Organization .....	1-9
1.5.2	Plan Adoption .....	1-10
CHAPTER 2.0	Governance, Stakeholder Involvement, Coordination.....	2-1
2.1	Introduction.....	2-1
2.2	Governance.....	2-1
2.2.1	Memoranda of Understanding and Entities Adopting the UFR IRWM Plan .....	2-1
2.3	Plan Governance Structure.....	2-2
2.3.1	Regional Water Management Group.....	2-2
2.3.2	Workgroups .....	2-4
2.3.3	Decision-making .....	2-5
2.3.4	Plan Adoption .....	2-5
2.4	Stakeholder Participation in the Plan Process .....	2-6
2.5	Stakeholder and Public Involvement.....	2-6
2.5.1	Outreach to Disadvantaged Communities .....	2-6
2.5.2	Outreach to Native American Tribes.....	2-7
2.6	Communication Plan .....	2-7
2.6.1	Methods, Technology and Information Access .....	2-7
2.7	Coordination .....	2-8
2.7.1	Adjacent IRWM Regions .....	2-8
2.7.2	State and Federal Agencies .....	2-8
CHAPTER 3.0	Region Description .....	3-1
3.1	Introduction.....	3-1
3.2	Explanation of Regional IRWM Boundary .....	3-1
3.2.1	Jurisdictional Boundaries .....	3-1
3.2.2	Physical Boundaries .....	3-6
3.2.3	Neighboring/Overlapping IRWM Region Boundaries .....	3-8
3.3	Social and Cultural Characteristics of the Regional Community.....	3-9
3.3.1	Population and Demographics.....	3-9
3.3.2	Disadvantaged Communities.....	3-10
3.3.3	Native American Tribes .....	3-13
3.3.4	Economic Conditions and Trends .....	3-14
3.3.5	Social and Cultural Values.....	3-15

3.4	Environmental Setting.....	3-16
3.4.1	Climate and Precipitation .....	3-16
3.4.2	Topography, Geology and Soils.....	3-16
3.4.3	Terrestrial Ecosystems.....	3-18
3.4.4	Aquatic Ecosystems and Fisheries.....	3-20
3.4.5	Endangered and Special-Status Species .....	3-25
3.4.6.	Invasive Species.....	3-29
3.4.7	Role of Wildfire.....	3-30
3.5	Description of Watersheds and Water Systems.....	3-31
3.5.1	Watersheds and Groundwater Basins.....	3-31
3.5.2	Hydrology and Surface Water Resources .....	3-45
3.5.3	Groundwater Resources.....	3-45
3.5.4	Runoff Generation and Water Balance.....	3-46
3.5.5	Droughts and Floods.....	3-44
3.5.6	Climate Effects on Water Supply .....	3-49
3.5.7	Water Supply and Demand .....	3-49
3.6	Water-Related Infrastructure.....	3-52
3.6.1	Surface Water Infrastructure .....	3-52
3.6.2	Groundwater Infrastructure .....	3-56
3.6.3	Wastewater Infrastructure .....	3-57
3.7	Water Quality.....	3-57
3.7.1	Water Quality Regulations .....	3-57
3.7.2	Current Water Quality Conditions.....	3-59
CHAPTER 4.0 Regional Water Issues..... 4-1		
4.1	Introduction.....	4-1
4.2	Regional Water Issues .....	4-1
4.2.1	Agricultural Lands Stewardship.....	4-1
4.2.2	Floodplains, Meadows, Waterbodies .....	4-4
4.2.3	Municipal Services .....	4-9
4.2.4	Uplands and Forest .....	4-11
4.2.5	Capacity .....	4-18
4.3	Conflicts in the Region.....	4-21
CHAPTER 5.0 Goals and Objectives ..... 5-1		
5.1	Introduction.....	5-1
5.2	Development of Goals and Objectives .....	5-1
5.2.1	Process for developing Goals and Objectives .....	5-1
5.2.2	Prioritization of Goals and Objectives .....	5-2
5.3	Goals, Objectives and Performance Metrics.....	5-2
5.3.1	Goals and Objectives.....	5-2
5.3.2	Performance Metrics .....	5-3

5.4	Plan Integration of Goals and Objectives .....	5-3
5.4.1	Regional Issues .....	5-3
5.4.2	Resource Management Strategies.....	5-15
5.4.3	Implementation Projects.....	5-16
5.5	Relationship of Plan Objectives to Climate Change.....	5-21
CHAPTER 6.0 Resource Management Strategies .....		6-1
6.1	Introduction.....	6-1
6.2	Selected RMSs and Applicability to Region .....	6-1
6.2.1	Reduce Water Demand .....	6-2
6.2.2	Improve Flood Management .....	6-3
6.2.3	Improve Operations Efficiency and Transfers.....	6-4
6.2.4	Increase Water Supply .....	6-6
6.2.5	Improve Water Quality .....	6-8
6.2.6	Practice Resource Stewardship .....	6-13
6.2.7	People and Water.....	6-17
6.2.8	Other Strategies .....	6-19
6.3	Strategies not Applicable to the Upper Feather River Region.....	6-21
6.4	Strategy Recommendations.....	6-21
6.4.1	Process .....	6-21
6.4.2	Matrix of Recommendations.....	6-22
CHAPTER 7.0 Land Use and Water Planning.....		7-1
7.1	Introduction.....	7-1
7.1.1	Plan Area .....	7-1
7.1.2	Watershed Characteristics.....	7-2
7.1.3	Water Supply .....	7-2
7.1.4	Regional Land Use and Water Planning .....	7-2
7.2	Current Coordination between Land Use and Water Planning Entities .....	7-9
7.2.1	Westwood Community Services District.....	7-10
7.2.2	Sierraville Public Utility District.....	7-10
7.2.3	Plumas-Eureka Community Services District .....	7-10
7.2.4	City of Portola .....	7-10
7.2.5	Land and Water Use Patterns in the Region.....	7-11
7.2.6	Population Growth and Water Demand Trends in the Region .....	7-12
7.2.7	Coordination with State and Federal Planning Efforts.....	7-14
7.2.8	Local Planning Relationship to the IRWMP .....	7-16
7.2.9	Plan Area Evaluated in the Upper Feather IRWMP.....	7-16
7.2.10	IRWMP Participation .....	7-17
7.2.11	Programs, Policies, Standards, and Procedures.....	7-19
7.2.12	Consistency between IRWMP and Local Plan Goals.....	7-27
7.3	Plan in Relation to Neighboring Regional Planning Efforts.....	7-28

7.4	Recommendations to Improve Coordination .....	7-29
CHAPTER 8.0 Climate Change.....8-1		
8.1	Introduction.....	8-1
8.1.1	Regulatory Framework.....	8-1
8.1.2	Chapter Resources .....	8-2
8.2	Climate Change Trends.....	8-2
8.2.1	Introduction .....	8-2
8.2.2	Wildfire.....	8-5
8.2.3	Water Supply .....	8-5
8.2.4	Water Demand.....	8-6
8.2.5	Water Quality .....	8-7
8.2.6	Flooding.....	8-7
8.2.7	Ecosystem Habitat.....	8-7
8.3	Regional Climate Change Vulnerabilities .....	8-8
8.3.1	Water Demand.....	8-8
8.3.2	Water Supply .....	8-11
8.3.3	Water Quality .....	8-16
8.3.4	Flooding.....	8-19
8.3.5	Ecosystem and Habitat Vulnerability .....	8-20
8.3.6	Hydropower .....	8-23
8.3.7	Vulnerability Assessment Summary .....	8-25
8.4	Prioritizing Vulnerabilities.....	8-26
8.5	Further Data Gathering and Analysis of the Prioritized Vulnerabilities .....	8-28
8.6	Greenhouse Gas Emissions and UFR Project Development and Selection .....	8-28
CHAPTER 9.0 Project Development and Review Process.....9-1		
9.1	Introduction.....	9-1
9.2	Project Development .....	9-2
9.2.1	Project Solicitation and Submission .....	9-2
9.2.2	Targeted Communities: Project Development Process .....	9-2
9.2.3	Integration Process .....	9-3
9.3	Project Review Process .....	9-4
9.3.1	Project Review Factors.....	9-4
9.3.2	Project Review Steps .....	9-6
9.3.3	Ranking and Scoring .....	9-6
9.3.4	Documenting the Projects .....	9-6
9.4	Project Selection for Funding Opportunities .....	9-14
9.5	Implementation and Updating Project Lists.....	9-15
CHAPTER 10.0 Impacts and Benefits .....10-1		
10.1	Introduction.....	10-1

10.2	Plan-level Impacts and Benefits .....	10-1
10.2.1	Plan-level Benefits .....	10-1
10.2.2	Plan-level Impacts .....	10-4
10.3	Benefits and Impacts for DACs and Native American Tribes.....	10-4
10.3.1	Benefits to DACs and Native American Tribes.....	10-4
10.3.2	Impacts to DACs and Native American Tribes .....	10-5
10.4	Project-level Impacts and Benefits.....	10-6
10.4.1	Project-level Benefits.....	10-6
10.4.2	Project-level Impacts.....	10-6
10.5	Impacts from Failure to Implement the Plan .....	10-6
10.6	Interregional Benefits and Impacts .....	10-7
10.6.1	Interregional Benefits.....	10-7
10.6.2	Interregional Impacts .....	10-8
CHAPTER 11.0 Plan Implementation, Performance, Monitoring and Data Management.....11-1		
11.1	Introduction.....	11-1
11.2	Plan Performance and Monitoring.....	11-1
11.2.1	Process for Plan Evaluation.....	11-2
11.2.2	Plan Performance Measures.....	11-3
11.3	Project Performance and Monitoring .....	11-8
11.3.1	Project-Specific Monitoring Plans.....	11-8
11.4	Data Management Standard .....	11-11
11.4.1	Data Needs and Typical Data Collection Techniques.....	11-11
11.4.2	Data Submission to the Website .....	11-13
11.4.3	Stakeholder Access to Data .....	11-13
11.4.4	Data Quality Control.....	11-13
11.4.5	Integrating Data into State Databases .....	11-14
CHAPTER 12.0 Finance .....12-1		
12.1	Introduction.....	12-1
12.1.1	Funding History .....	12-1
12.2	Program-Level Funding Sources .....	12-3
12.3	Project-Level Funding Sources .....	12-4
12.4	Project Operations and Maintenance Funding Sources .....	12-8
CHAPTER 13.0 Technical Analysis .....13-1		
13.1	Introduction.....	13-1
13.2	Review of Mandatory Documents .....	13-2
13.2.1	Federal Resources.....	13-2
13.2.2	State Resources .....	13-3
13.2.3	Local and Regional Plans .....	13-6
13.3	Review of Other Data .....	13-10

13.4	Analysis of Data Gaps.....	13-11
13.4.1	Conjunctive Water Use & Management Resources.....	13-11
13.4.2	Recreation Planning Resources.....	13-11
13.4.3	Water Supply and Management Plans.....	13-12

## **LIST OF FIGURES**

---

Figure 1-1 IRWM Planning Process Overview.....	1-9
Figure 2-1 Upper Feather River IRWM Plan Governance Structure .....	2-3
Figure 3-1 Map of Upper Feather River IRWM Region .....	3-2
Figure 3-2 Map of Counties within the Upper Feather River IRWM Region and Adjacent IRWMS.....	3-4
Figure 3-3 Map of Water and Wastewater Districts in the Upper Feather River IRWM Region .....	3-7
Figure 3-4 Disadvantaged Communities in the UFR Region .....	3-12
Figure 3-5 Map of vegetation communities in the Upper Feather River Region .....	3-19
Figure 3-6 Subwatersheds within the Upper Feather River watershed.....	3-32
Figure 3-7 Groundwater basins within the Upper Feather River watershed.....	3-41
Figure 3-8 Mapping of FEMA's 100-year floodplains within the Upper Feather River Region .....	3-48
Figure 3-9 Map of State Water Project facilities and hydroelectric projects .....	3-55
Figure 8-1 Mean Annual High Temperature (Fahrenheit).....	8-4
Figure 8-2 Annual Average Inches of Precipitation per Decade (A2 and B1).....	8-4
Figure 8-3 North Fork Feather River Water Year (October 1–September 30) Runoff.....	8-12
Figure 8-4 North Fork Feather River April–July Runoff .....	8-13
Figure 8-5 Harkness Flat Snow Course April 1 Snow Water Equivalent and November 1 through March 31 Precipitation at Canyon Dam.....	8-14

## **LIST OF TABLES**

---

Table 1-1 Voter-approved Bond Measures – Integrated Water Management .....	1-3
Table 1-2 Statewide Priorities, Proposition 1 Guidelines.....	1-5
Table 1-3 Proposition 84 and 1 standards discussed in the 2016 UFR IRWM Plan Update.....	1-10
Table 2-1 Regional Water Management Group (RWMG) Members.....	2-3
Table 2-2 Workgroups of the Upper Feather River IRWM Planning Process.....	2-4
Table 3-1 Counties within the Upper Feather River Watershed .....	3-3
Table 3-2 Agency Services within the Upper Feather River IRWM Plan Area .....	3-5
Table 3-3 Disadvantaged Communities in the Upper Feather River IRWM Plan Area .....	3-11
Table 3-4 Vegetation and Land Cover in the Upper Feather River Watershed IRWM Plan Area .....	3-18
Table 3-5 Common fish species in the Upper Feather River Watershed IRWM Plan Area .....	3-24
Table 3-6 Special-Status Species and Habitats in the Upper Feather River IRWM Plan Area .....	3-26
Table 3-7 Noxious Weeds Managed by the Plumas-Sierra County Department of Agriculture.....	3-29
Table 3-8 Major Divisions of the Upper Feather River Watershed .....	3-31
Table 3-9 Population Projections for the Upper Feather River IRWM Plan Area.....	3-50
Table 3-10 Agricultural Water Use in the Upper Feather River IRWM Plan Area .....	3-51
Table 3-11 Dams and Diversions in the Upper Feather River IRWM Plan Area .....	3-52
Table 3-12 Summary of Applicable Regulations for Water Resources in the UFR IRWM Plan Area .....	3-57

Table 3-13 Impaired Waters in the UFR IRWM Plan Area (Clean Water Act Section 303(d)).....	3-60
Table 4-1 Summary of Regional Water Issues Identified by Workgroups, 2014-2015 .....	4-15
Table 5-1 Agricultural Lands Stewardship Workgroup Issues and Plan Objectives .....	5-4
Table 5-2 Floodplains, Meadows, and Waterbodies Workgroup Issues and Plan Objectives.....	5-8
Table 5-3 Municipal Services Workgroup Issues and Plan Objectives.....	5-11
Table 5-4 Uplands and Forests Workgroup Issues and Plan Objectives.....	5-13
Table 5-5 Plan Objectives and Resource Management Strategies.....	5-15
Table 5-6 Plan Objectives and Implementing Projects .....	5-17
Table 6-1 Summary of Workgroup Recommendations for Resource Management Strategies .....	6-23
Table 7-1 County Acreages in the Upper Feather River IRWM Plan Area .....	7-1
Table 7-2 Primary Land Management Agencies in the Plan Area .....	7-3
Table 7-3 Water Purveyors and Managers in the Plan Area .....	7-3
Table 7-4 Other Water Stakeholders in the Plan Area .....	7-4
Table 7-5 Participation in the Upper Feather IRWMP Process.....	7-17
Table 7-6 Water and Land Use Planning Documents and Programs in the Upper Feather IRWMP Region.....	7-19
Table 8-1 Climate Change Vulnerability Summary .....	8-25
Table 8-2 UFR Climate Change Priorities.....	8-27
Table 9-1 Upper Feather River IRWM Plan implementation project review criterion .....	9-4
Table 9-2 Implementation Projects for the Upper Feather River IRWM Plan .....	9-7
Table 10-1 Summary of Potential Regional Impacts and Benefits from Plan Implementation .....	10-9
Table 11-1 Plan Performance Measures and Metrics .....	11-4
Table 12-1 UFR Proposition 50-Funded Implementation Projects.....	12-2
Table 13-1 CWP Resource Management Strategies.....	13-4
Table 13-2 General Plans in Upper Feather River Planning Area.....	13-8

## **APPENDICES**

---

Appendix 1-1 Resolutions of Plan Adoption
Appendix 1-2 DWR Compliance Review
Appendix 1-3 Public Notices of Intention
Appendix 1-4 Public Comments Received on Draft Plan
Appendix 2-1 Memorandums of Understanding
Appendix 2-2 Stakeholder Involvement Plan
Appendix 2-3 Tribal Engagement Plan
Appendix 3-1 Socio-economic Assessment
Appendix 3-2 Forest and Water Balance Study
Appendix 6-1 RMS Recommendations, Plan Objectives, and Regional Water-Related Issues
Appendix 7-1 General Plan Goals and Policy Review
Appendix 9-1 Project Solicitations
Appendix 9-2 Project Information Form, Climate Change and Greenhouse Gas Worksheets
Appendix 9-3 Agricultural Lands Stewardship Projects (on CD)
Appendix 9-3 Floodplains, Meadows, Waterbodies Projects (on CD)

- Appendix 9-3 Municipal Services Projects (on CD)
- Appendix 9-3 Tribal Advisory Committee Projects (on CD)
- Appendix 9-3 Uplands and Forest Projects (on CD)
- Appendix 10-1 Community Vulnerability Study
- Appendix 13-1 Baseline Source Database