
CHAPTER 10.0 IMPACTS AND BENEFITS

10.1 Introduction

This chapter presents a screening-level analysis of impacts and benefits expected from the implementation of the Upper Feather River Integrated Regional Water Management (IRWM) Plan. The purpose of a screening-level analysis is to serve as a general overview of the potential impacts and benefits of implementing the Plan at a regional level. For purposes of this discussion, *benefits* are effects that are expected to represent positive change or improvement over existing conditions while *impacts* are defined as effects that are expected to represent negative or deleterious change from existing conditions.

Effects are separated into Plan-level and project-level impacts and benefits. *Plan-level effects* are those that accrue through implementation of the Plan itself and are not associated with the direct, physical effects of an individual action; they are by nature administrative and process-oriented, and regional in scale. *Project-level effects* stem from individual projects or actions that are typically local in scale although they might have regional implications or have a cumulative regional effect, and are usually associated with direct, physical effects. The goals and objectives of the Plan generally reflect the intended benefits of Plan implementation, and include both Plan-level and project-level benefits (Chapter 5 *Goals and Objectives*).

Because the list of implementation projects may change as the IRWM planning effort proceeds, it is not practical to provide a project-level analysis of impacts and benefits within the IRWM Plan. Therefore, the analysis presented in this chapter is not intended to be comprehensive or exhaustive. Prior to implementation of any individual project approved under this Plan, a project-level analysis will occur in conformance with regulatory processes required by applicable statutes such as the California Environmental Quality Act (CEQA, with conditional exceptions for CEQA review of habitat restoration projects under 5 acres) and the National Environmental Policy Act (NEPA). A detailed description of the timing and process for ensuring adequate environmental analysis at a project level can be found elsewhere (Chapter 9 *Project Development and Review Process*).

The impacts and benefits discussed in this chapter will serve as benchmarks for evaluating Plan performance (Chapter 11 *Plan Implementation, Performance, and Monitoring*). This Impacts and Benefits chapter will be reviewed and updated in light of the Plan's performance data and changes to associated projects.

10.2 Plan-level Impacts and Benefits

10.2.1 Plan-level Benefits

10.2.1.1 Fostering Understanding and Information Sharing Within the Region

One of the five goals of the IRWM Plan is to "Establish and maintain effective communication among water stakeholders." While the Region has a long history of collaborative watershed restoration and management efforts, development of this Plan fostered greater diversity in those collaborations, particularly inclusion of individuals and entities whose interests are affected by project implementation. Examples include restoration projects in upland watersheds that affect downstream availability of water, and insufficient sharing of monitoring information and results. Additionally, the Upper Feather River Regional Water Management Group (RWMG) includes a representative from the Maidu Summit Consortium, a non-profit group representing nine member organizations of Maidu Indians of Lassen and Plumas Counties. The Tribal participation in this planning effort has many benefits including collaboration in the process at both the management and workgroup level of the UFR IRWM Plan; development of

implementation projects, including 'beneficial uses' and Traditional Ecological Knowledge (TEK); and integration of tribal knowledge and values with numerous implementation projects presented in the Plan.

The Plan establishes a framework for governance that includes a memorandum of understanding with existing federal, state, local, non-governmental, and private industry entities in the Plan area. The Plan ensures continued stakeholder participation in Plan and project implementation through workgroups. In addition to stakeholder outreach efforts, the Plan engages in targeted outreach to Disadvantaged Communities (DAC) and Native American tribes. It includes a communication plan for sharing methods, technology, and scientific data (Chapter 11 *Plan Implementation, Performance, Monitoring, and Data Management*).

10.2.1.2 Opportunities to Collaborate on Project Development and Solving Regional Issues

The IRWM Plan provides an integrated approach to identifying and solving water management issues throughout the watershed. Since 1985, the Feather River Coordinated Resource Management (FRCRM) partnership has enhanced communication between federal, state, and local agencies and outreach efforts to private landowners; created successful collaborations in securing grant funds for the watershed; implemented numerous projects; piloted large-scale meadow restoration projects with innovative techniques; and established and maintained a stream monitoring network for flow and temperature.

The FRCRM was recently reorganized as the Upper Feather River Watershed Roundtable, a collaborative, non-regulatory partnership that involves the active participation of county, state and federal agency representatives, local stakeholder groups, and environmental organizations working together to achieve the enhancement of water quality, water quantity, and aquatic, riparian, and meadow habitat in the Upper Feather River Watershed. The Roundtable is composed of local, state, and federal entities that were signatories to the FRCRM group. Another organization in the Region – the Plumas Watershed Forum (PWF) formed in 2003 as a result of the Monterey Settlement Agreement – has performed similar functions, that is, administering funds dedicated to watershed restoration, and funding high-priority projects that have demonstrated positive results in improving watershed retention and reducing sedimentation.

The IRWM Plan extends that type of watershed-scale integration to infrastructure, municipal services, forest management, and economic needs, as well as complementing the environmental restoration progress already made in the watershed. The IRWM Plan includes similar stakeholder coordination at the Plan- and project-implementation levels through participation in the workgroups and Regional Water Management Group. The Plan also provides benefits through coordination of data and information sharing that will help identify areas of need in the Region and facilitates increased economies of scale through sharing of equipment, expertise, and labor.

10.2.1.3 Identification of Diverse Funding Sources

During its development, the Plan has concentrated on identifying program-level and project-level funding sources to further the achievement of the goals and objectives of the Plan (Chapter 12 *Finance*). The Plan has identified a need for increased capacity to pursue funding by combining grant writing and administrative functions in the Region a need shared with other rural IRWM regions throughout the state. Implementing the IRWM Plan will increase the likelihood of securing funding by demonstrating to funding entities that individual projects are part of an integrated regional program that includes coordinated projects, demonstrates collaboration among stakeholders, and provides for technical data sharing and cost-saving opportunities.

10.2.1.4 Capacity Building

One of the challenges facing the Upper Feather River Region is the issue of capacity to address issues regarding water resources. The small, widely dispersed population of the Plan area makes capacity an especially difficult challenge in the Upper Feather River Region compared to more populous, affluent, and urban regions. Municipal service providers and small districts face a shortage of qualified operators as staff retires, and can have difficulty finding enough people to serve on a board of directors. Private land managers often lack the expertise, knowledge, and time to seek funding and guidance to support projects to manage their lands.

Supporting coordinated planning, project development, funding, monitoring, data management, and administration efforts among the numerous agencies, individuals, entities and local districts in the Region may, through economies of scale or less duplication in individual efforts, make more resources available to all. Building capacity in the Region through integration of water management activities throughout the Plan area is a function of seeking funding for increasing expertise and administration efficiencies and for investing in building the capacities for implementation partnerships by project proponents with other agencies and organizations. This would especially benefit communities that currently have little or no capacity to pursue grants and projects to meet their water management needs. As discussed previously, the adopted IRWM Plan will also increase the likelihood of submitting successful grant applications that reflect the needs of the multiple community and water needs in the region.

10.2.1.5 Venue to Address Policy-related and Regulatory Processes

The workgroups have identified several issues in the UFR Region regarding regulatory requirements that affect local agencies and individuals. These issues include:

- ◆ increasingly stringent requirements on municipal service providers regarding water quality, while many of the groundwater aquifers in the Region carry high levels of arsenic and other metals from both natural sources and historic mining activities;
- ◆ requirements on municipal water districts to ensure that all private wells in their service areas are properly located, in a region where a very large proportion of residents rely on private wells that predate modern regulations;
- ◆ requirement for the Sierra Valley Groundwater Management District to develop a sustainable groundwater management plan in accordance with the new state groundwater management regulations;
- ◆ Forest Service regulations for public grazing lands; requirements for road and stream crossings, and management of springs for domestic water, for wildlife and wildfire fighting needs, and as areas of special importance for tribes;
- ◆ Central Valley Regional Water Quality Control Board conditional waivers of waste discharge requirements for agricultural operations in the Region that are tied to overall watershed water quality that is affected by sources of pollution other than agriculture; and
- ◆ Air Quality regulations for managed fire and disincentives for biomass utilization of woody debris for power generation.

The Plan provides a venue for discussion of these issues and a framework for identifying collaborative, regional solutions. Such collaborative, regional proposals are more likely to succeed than proposals from individual entities.

10.2.2 Plan-level Impacts

Plan-level impacts from implementation of the IRWM Plan will derive from increased responsibility to fund and administer the Plan itself. After the Plan is developed the RWMG is dedicated to meet quarterly, and will be responsible for organizing and documenting meetings, conducting outreach, coordinating project development, and maintaining public information services such as the IRWMP website (<http://featherriver.org/>). Further, implementation of the Plan will require additional volunteers in the community to attend meetings, serve on workgroups, and support public outreach efforts. Local governments and service districts in the Plan area already rely heavily on an informal “town hall” style of personal relationships and volunteerism that would likely be taxed further by implementation of the Plan.

10.3 Benefits and Impacts for DACs and Native American Tribes

As discussed in Chapter 3 *Region Description*, many of the population centers in the Plan area (Cities and Census Designated Places) meet the Department of Water Resources (DWR) definition of a DAC: those having a median household income less than 80 percent of the statewide average. Disadvantaged and Native American communities are often excluded from policy-making processes, which leads to an unequal distribution of environmental issues within those communities. Issues of unequal distribution of environmental benefits and burdens, according to socioeconomic metrics, are collectively referred to as issues of ‘environmental justice.’

Native American tribes are represented through the Maidu Summit Consortium, which represents nine member organizations of Maidu Indians of Lassen and Plumas counties. A tribal members sits on the RWMG and tribal representatives are active in some of the workgroups. Participation by Native American tribes has benefited the overall IRWM Plan substantially: cultural values have been incorporated into Plan language; educational and restoration implementation projects have been developed; and identification of Maidu tribal beneficial water uses and Traditional Ecological Knowledge (TEK) has elevated awareness and tribal consultation has been integrated into numerous implementation projects.

The Region as a whole is considered disadvantaged on a Census Tract level; at the Census Place level, there are numerous DACs throughout the Region. Substantial outreach efforts to DACs were included in the Plan update process, and 79 implementation projects potentially benefiting DAC communities have been identified. Additionally, the Plan update included a Community Vulnerability Study (Appendix 10-1) that assessed the vulnerability of wells to nitrate pollution risks and to municipal and domestic drinking water in high groundwater table areas with septic systems and agricultural livestock production. Further, under the Plan, all projects will be analyzed for their effects on environmental justice and disproportionate impacts to DACs and Native American communities. For example a Tribal Advisory Committee (TAC) project addresses the remediation and redevelopment of a “brownfield¹” site (the “Injun Jim” school property and the James Lee Campground) for cultural and environmental education, with ancillary benefits for the severely DAC subregion of the Feather River Canyon.

10.3.1 Benefits to DACs and Native American Tribes

The goals and objectives of the Plan are central to the project development and review processes, as well as to the Plan monitoring and assessment processes. One of the five goals of the IRWM Plan is to

¹ “Brownfield” is defined by the U.S. Environmental Protection Agency as real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.

"...provide healthy and adequate water and wastewater treatment for all citizens," and one of its 18 objectives is to "Address water resources and wastewater needs of Disadvantaged Communities (DACs) and Native Americans."

Development of the Plan includes outreach to DACs and Native American communities (Chapter 2 *Governance, Stakeholder Involvement, Coordination*). Implementation of the Plan will include involvement of DACs and Native American communities (Appendices 2-2 and 2-3). Project development and review includes targeting projects to DACs and tribal communities (Chapter 9 *Project Development Process*).

Benefits to DACs and Native American communities from implementation of the Plan and associated projects would include improved safety and reliability of drinking water; improved wastewater treatment; improved flood control; and decreased risk of wildfire. Other benefits include ecosystem restoration (e.g., water quality, fisheries and wildlife habitat, meadows, forest health); cleanup of polluted mine sites; improved recreational opportunities; economic opportunities from a re-invigorated forestry industry (i.e., stand thinning, value-added small-diameter wood products, biomass power generation); and increased representation in regional policy-making.

During the project development stage of the Plan, the Tribal Advisory Committee identified two cultural goals for projects: beneficial uses and traditional ecological knowledge. Extensive coordination efforts have resulted in incorporating these goals into the development of numerous Plan projects.

- ◆ Beneficial uses refers to those uses that support the cultural, spiritual and traditional lifeways of California Indian Tribes, Tribal communities and families. Beneficial uses of water include but are not limited to those that support fish consumption, aquatic and wildlife habitat for plant and animal species, recreation, and the water quality and quantity needed to support such systems and activities.
- ◆ Traditional Ecological Knowledge (TEK) refers to the knowledge, innovations, and practices of indigenous and local communities. Traditional knowledge has developed from experience gained over the centuries and adapted to the local culture and environment. Tribes, Tribal organizations, and cultural traditional ecological practitioners have collaborated to integrate and apply TEK.

The UFR RWMG endorses the opportunity for all of project proponents to enrich their projects through the inclusiveness of the whole community and therefore to reach the Maidu family(s) with traditional stewardship responsibilities and ties to the project locations and to project impacts and benefits.

10.3.2 Impacts to DACs and Native American Tribes

Impacts to DACs and Native American communities from implementation of the Plan would most likely take the form of short-term effects of project construction and monitoring. These effects would likely include dust, noise, traffic disruption, night lighting, temporary interruption of services, temporary loss of access to recreational resources, ground disturbance, erosion and sediment discharge and changes to vegetation. Project development would include implementation of Best Management Practices (BMPs) to avoid or minimize temporary impacts. Permanent impacts from Plan implementation could include changes to U.S. Forest Service road management, which will be vetted through the planning process for *Travel Management Planning, Subpart A*. Implementation of municipal projects might also result in water and wastewater rate increases; however, the IRWM process is specifically intended to facilitate outside funding to alleviate the financial burdens on DACs.

Project-level impacts could fall disproportionately on DACs and Native American communities, as projects may be concentrated in those areas based on existing needs. However, as discussed above, impacts and

mitigations and expected to be designed and implemented in ways that are responsive to any DAC and tribal concerns, are expected to be temporary, and will be far outweighed by long-term benefits.

10.4 Project-level Impacts and Benefits

Because the project selection and development process is ongoing and identified projects are in varying phases of development, a comprehensive list of Plan-associated projects is not available. Therefore, project-level impacts and benefits are discussed in terms of the Plan's goals and objectives. A wide variety of projects will be implemented over time to accomplish the goals and objectives of the Plan. Table 10-1 summarizes the expected potential benefits and impacts from implementing these types of projects.

10.4.1 Project-level Benefits

Project-level benefits are expected to correspond closely with the goals and objectives of the UFR IRWM Plan. While benefits may principally accrue locally, and may extend downstream, there may be cumulative benefits throughout the Plan area. Project-level benefits would include improved water quality and water supply reliability for municipal and agricultural users; alleviation of critical public health and safety problems; greater resilience to climate change; improved environmental health of the entire watershed including uplands health and greater groundwater retention; secure and efficient water and wastewater infrastructure; enhanced economic opportunities and long-term economic viability. Other benefits would include improved communication, involvement, and information sharing among stakeholders; coordination of land use and water resources planning like forest management and recycled water sharing; and reduced threat of catastrophic wildfires. Benefits would also include improved coordination with outside agencies and utilities with facilities in the Region (such as DWR and Pacific Gas & Electric [PG&E]) that increase local resource and economic benefits; and increased capacity for improving water management, including obtaining grant funding, effective project implementation and fiscal administration, and ongoing project and program evaluation and effectiveness.

10.4.2 Project-level Impacts

Project-level impacts are expected to be mostly localized and temporary, like those for DAC and Native American communities. All projects will be subject to CEQA/NEPA review, and will include avoidance and mitigation measures to minimize impacts, as necessary. Some projects, such as feasibility studies, public education and outreach, and BMP implementation, are not expected to result in environmental impacts.

Project-level impacts would likely include short-term, localized effects such as dust, noise, traffic disruption, night lighting, temporary interruption of services, temporary loss of access to recreational resources, vegetation removal and ground disturbance, temporary reductions in stream flow or quality. Long-term impacts could result in higher costs for road system management, constraints such as best management practices for some land use activities, water and wastewater rate increases, or regulatory changes.

10.5 Impacts from Failure to Implement the Plan

As part of the Plan development process, workgroups identified 67 issues in the Plan area that affect upland forested watershed lands, meadows and streams, agricultural land stewardship, and municipal services. These issues cover a broad range of challenges to the Upper Feather River Watershed, including:

- ◆ Capacity of institutions and individuals to secure funding, provide necessary services, and manage lands;

- ◆ Safety and supply of drinking water;
- ◆ Aging and inadequate water, wastewater, and flood control infrastructure;
- ◆ Lack of coordination, data sharing, and transparency among agencies and projects;
- ◆ Degraded meadows and drought-stressed forests resulting from reduced groundwater recharge and retention;
- ◆ Economic health of communities and working landscapes;
- ◆ Regulatory mandates;
- ◆ Stakeholder participation;
- ◆ Declining water quality;
- ◆ Loss of wildlife and fisheries habitats;
- ◆ Declining forest health and more catastrophic fire-prone forests; and
- ◆ Climate change precipitation variability, especially prolonged droughts, hotter and drier summers and reduced snowpack.

The Plan intends to address these issues through an inclusive, holistic, and integrated approach to water and resource management (Chapter 4 *Regional Water Issues*).

Failure to implement the Plan would limit the region's ability to meet the growing challenges to the social, economic, and environmental health of the Plan area. This would, in turn, result in continued and perhaps accelerated deterioration of conditions in the Plan area due to climate change, accumulating infrastructure deficiencies, unmet restoration needs, lack of economic development, and chronic capacity challenges. While environmental restoration projects would continue under some programs (e.g., Plumas Watershed Forum, the Resource Advisory Council (RAC) process for federal lands, Mountain Meadows Conservancy, and Upper Feather River Roundtable), the Plan-level benefits of improved efficiencies, integration of management and restoration efforts across all lands, inclusion of disparate stakeholder interests, infrastructure improvements, capacity building, and attention to the needs of DAC and Native American communities may not be realized. In addition, matching funds for many proposed projects carry time limits that would likely expire if the project development process provided by the Plan is not implemented. Finally, failure to implement the Plan would result in the forfeiture of the substantial investment of volunteer time and effort that has already gone into developing the Plan, such as the extensive efforts of the workgroup members and member organizations of the RWMG.

10.6 Interregional Benefits and Impacts

10.6.1 Interregional Benefits

Interregional benefits from implementation of the Plan would derive primarily from improvements to water quality and watershed health and resiliency, which inherently benefit downstream users through the DWR's State Water Project, and secondarily through a more continuous water supply through PG&E's "stairway of power" hydroelectric power development on the North Fork of the Feather River and from interregional benefits associated with the wild and scenic portion of the Middle Fork of the Feather River.

Plan implementation would potentially result in indirect benefits outside the Region as well. Improvements to upland, riparian, and aquatic habitats in the watershed could benefit other regions through effects on the well-being of migratory species. Improvements in forest health and reduction of fuel loads would reduce the likelihood of catastrophic wildfires burning into adjacent regions. Biomass power generation from the products of forest thinning would help the State meet its renewable energy goals.

10.6.2 Interregional Impacts

Potential interregional impacts from Plan implementation are likely to be minimal. Projects that increase groundwater retention or reservoir storage capacity are intended to attenuate flows to reduce flooding, maximize groundwater storage, and extend surface flows later in the season. Because water deliveries to users downstream of the Plan area are mediated through Lake Oroville, changes in timing of releases from hydroelectric facilities that may be necessary for stream restoration or recreation uses would not affect the availability of water outside the Plan area. Changes in forest management activities in Plumas, Tahoe and/or Lassen National Forests brought about by implementation of the Plan could affect National Forest lands outside the Plan area; however, any such changes would likely be specific to lands inside the Plan area, and are intended to benefit forest management (i.e., forest thinning). The Plan does not currently include precipitation enhancement projects, but if such projects were pursued in the future, they would presumably have effects outside the Plan area that cannot presently be quantified.

Future projects associated with the Plan would be evaluated for off-site, interregional effects, as part of an environmental review and through consultation with tribal members and DAC representatives.

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Table 10-1. Summary of Potential Regional Impacts and Benefits from Plan Implementation

IRWM Plan Objective	Potential Benefits ¹	Potential Impacts ²
<p>1 - Restore natural hydrologic functions</p>	<ul style="list-style-type: none"> ◆ Reduced seasonal drying of streams ◆ Improved water quality and availability during droughts ◆ Reduced peak flood intensities ◆ Reduced costs for water treatment, groundwater pumping, and flood damage repair ◆ Increased water retention in uplands and more stable stream flows ◆ Decreased sedimentation, bank erosion, and headcutting into meadows and infrastructure ◆ Reduced vulnerability to drought ◆ Increased watershed resiliency to climate change ◆ Increased quality of wetland, riparian, and in-stream habitats ◆ Improved habitat quality for special-status species and other wildlife 	<ul style="list-style-type: none"> ◆ Temporary construction-related impacts³ ◆ Potential conflicts among water rights holders and other beneficial uses of water ◆ Possible short-term changes in surface and groundwater availability or quality
<p>2 - Reduce potential for catastrophic wildland fires in the Region</p>	<ul style="list-style-type: none"> ◆ Decreased risk to life and property ◆ Reduced costs of emergency response ◆ Reduced disruptions caused by emergencies (i.e., evacuations, service interruptions, etc.) ◆ Improved revenue stream for tourism and forest products industries ◆ Economic opportunities from stand-thinning, biomass power, and value-added wood products ◆ Improved health of forested watershed lands ◆ Reduced visual blight and property values from burned landscapes ◆ Decreased emissions and health effects from catastrophic wildfires and prolonged smoke exposure ◆ Reduce potential for GHG emissions by reducing wildfire potential 	<ul style="list-style-type: none"> ◆ Increased forest density reduction activities and associated noise, smoke, dust, traffic, etc. ◆ Potential need for new/expanded and upgraded wood processing facilities ◆ Potential short-term damage to wildlife habitat ◆ Potential deleterious effects on special-status species ◆ Public controversy for some projects

IRWM Plan Objective	Potential Benefits ¹	Potential Impacts ²
	<ul style="list-style-type: none"> ◆ Decreased erosion and sedimentation resulting from catastrophic wildfires 	
<p>3 - Balance the needs of forest health, habitat preservation, fuels reduction, forest fire prevention, and economic activity in the Upper Feather River Region</p>	<ul style="list-style-type: none"> ◆ Increased health of forested watershed lands ◆ Long-term improvement of wildlife habitat ◆ Economic opportunities from stand-thinning, such as biomass power, and value-added wood products 	<ul style="list-style-type: none"> ◆ Increased logging activities and associated noise, dust, traffic, etc. ◆ Potential need for new/expanded wood processing facilities ◆ Potential short-term damage to wildlife habitat ◆ Deleterious effects on special-status species ◆ Public controversy
<p>4 - Build communication and collaboration among water resources stakeholders in the Region</p>	<ul style="list-style-type: none"> ◆ Improved data-sharing, lessons learned, and technical expertise ◆ Decreased conflicts among disparate interests ◆ Increased involvement of private land owners in holistic water management projects ◆ Increased capacity for water management 	<ul style="list-style-type: none"> ◆ Potential increases to staff workload
<p>5 - Work with the Department of Water Resources to develop strategies and actions for the management, operation, and control of State Water Project facilities in the Upper Feather River Watershed in order to increase water supply, recreational and environmental benefits to the Region</p>	<ul style="list-style-type: none"> ◆ Improved inter-agency cooperation ◆ Increased revenues from tourism and recreation ◆ Increased local voice in management practices by out-of-region agencies ◆ Improved environmental health in streams and lakes ◆ Improved local water supplies ◆ Improved fisheries habitat and resources ◆ Increased likelihood of salmon reintroduction to the Middle Fork 	<ul style="list-style-type: none"> ◆ Potentially increased workload for some staff
<p>6 - Encourage municipal service providers to participate in regional water management actions that improve water supply and water quality</p>	<ul style="list-style-type: none"> ◆ Improved efficiencies and economies of scale ◆ Modernized facilities and increased flow capacity ◆ Reduced leakage and contamination ◆ Improved quality of drinking water ◆ Possible rate decreases ◆ Possible additional water storage 	<ul style="list-style-type: none"> ◆ Temporary construction-related impacts ◆ Possible rate increases ◆ Land use changes resulting from construction of new facilities ◆ Changes to the environment resulting from water impoundments

IRWM Plan Objective	Potential Benefits ¹	Potential Impacts ²
7 - Continue to actively engage in Federal Energy Regulatory Commission (FERC) relicensing of hydroelectric facilities in the Region	<ul style="list-style-type: none"> ◆ Faster completion of FERC relicensing with reduced administrative costs ◆ Avoid interruptions in service and/or employment at facilities ◆ Reduce impacts to environmental and recreational values in affected streams ◆ Reduce controversy and avoid litigation 	<ul style="list-style-type: none"> ◆ Potential increase in staff costs for coordination ◆ Potential need for additional technical studies
8 - Address economic challenges of municipal service providers to serve customers	<ul style="list-style-type: none"> ◆ Identification of more diverse funding sources ◆ Improved services without rate increases 	<ul style="list-style-type: none"> ◆ Potentially increased workload for some staff
9 - Protect, restore, and enhance the quality of surface and groundwater resources for all beneficial uses, consistent with the Central Valley Regional Water Quality Control Board Basin Plan	<ul style="list-style-type: none"> ◆ Reduced sedimentation ◆ Reduction of pollution from copper, arsenic, mercury, agricultural inputs, and other chemical contaminants ◆ Removal of Section 303 (d) impairment listing of regional streams, and savings in monitoring and compliance costs ◆ Improved wildlife, fisheries, and salmon habitats 	<ul style="list-style-type: none"> ◆ Temporary construction-related impacts ◆ Land use changes resulting from construction of new facilities ◆ Possible changes to water infrastructure operations, and amount and timing of water availability ◆ Potential changes to water conservation requirements during prolonged or severe droughts ◆ Potential conflicts among water rights holders
10 - Address water resources and wastewater needs of Disadvantaged Communities (DACs) and Native Americans	<ul style="list-style-type: none"> ◆ Improved water quality and reliability for DACs and Native American communities ◆ Conservation and enhancement of beneficial water uses for tribes ◆ Increased involvement of underrepresented communities in water management decision-making and benefits ◆ Fewer environmental justice issues in underrepresented communities 	<ul style="list-style-type: none"> ◆ Temporary construction-related impacts ◆ Potential increase in staffing requirements ◆ Land use changes resulting from construction of new facilities ◆ Changes to the environment resulting from possible increases in water impoundments or other water supply or wastewater treatment infrastructure
11 - Coordinate management of recharge areas and protect groundwater resources	<ul style="list-style-type: none"> ◆ Improved health of forested uplands ◆ Reduced conflicts through increased coordination between upstream management actions and downstream water needs 	<ul style="list-style-type: none"> ◆ Possible costs to of grazing and/or forest operations for watershed protection ◆ Possible short-term changes in surface and groundwater availability

IRWM Plan Objective	Potential Benefits ¹	Potential Impacts ²
	<ul style="list-style-type: none"> ◆ Restored meadows and riparian forests and reduced stream incision and head-cutting ◆ Increased groundwater supplies for irrigation and buffering fluctuations in precipitation ◆ Reduced groundwater overdraft, especially in Sierra Valley ◆ Reduced seasonal drying of streams, hillslope springs, and more reliable surface and groundwater water supplies in drought years ◆ Reliability of groundwater resources for private and municipal wells 	<ul style="list-style-type: none"> ◆ Possible increased costs of groundwater monitoring and reporting
<p>12 - Improve coordination of land use and water resources planning</p>	<ul style="list-style-type: none"> ◆ Improved health of watersheds and streams ◆ Increased depth and breadth of stakeholder input into land management throughout the Plan area ◆ More efficient and effective project design 	<ul style="list-style-type: none"> ◆ Possible change in management of some road systems, campgrounds, or other recreational facilities
<p>13 - Maximize agricultural, environmental and municipal water use efficiency</p>	<ul style="list-style-type: none"> ◆ Decreased water demand ◆ Reduced waste ◆ Enhanced water sharing and flexibility among users (i.e., recycled water for irrigation) ◆ Reduced risk of groundwater overdraft 	<ul style="list-style-type: none"> ◆ Temporary construction-related impacts ◆ Potential changes to water availability during prolonged or severe droughts ◆ Land use changes resulting from construction of new facilities
<p>14 - Effectively address climate change adaptation and/or mitigation in water resources management</p>	<ul style="list-style-type: none"> ◆ Reduced vulnerability to climate-related changes in seasonal or overall water availability ◆ Prevent climate-related impacts to special-status species 	<ul style="list-style-type: none"> ◆ Potential conflicts among water rights holders during severe and prolonged droughts
<p>15 - Improve efficiency and reliability of water supply and other water-related infrastructure</p>	<ul style="list-style-type: none"> ◆ Increased supply of municipal and irrigation water ◆ Improved water services to DACs ◆ Reduced potential for contamination of drinking water ◆ Decreased risk of damage from floods, and reduced flood insurance costs ◆ Decreased habitat degradation from bank erosion and water pollution 	<ul style="list-style-type: none"> ◆ Temporary construction-related impacts ◆ Possible increased rates ◆ Land use changes resulting from construction of new facilities ◆ Possible loss of riparian habitat for flood control

IRWM Plan Objective	Potential Benefits ¹	Potential Impacts ²
16 - Enhance public awareness and understanding of water management issues and needs	<ul style="list-style-type: none"> ◆ Improved water conservation and education ◆ Increased public commitment to resource stewardship ◆ Greater public involvement in planning processes and volunteer activities 	<ul style="list-style-type: none"> ◆ Increased costs of staff and materials for outreach and education
17 - Address economic challenges of agricultural producers	<ul style="list-style-type: none"> ◆ Prevent loss of agricultural lands and related enterprises in farming communities ◆ Preserve agricultural revenue and infrastructure ◆ Preserve the rural character of agricultural valleys in the Plan area 	<ul style="list-style-type: none"> ◆ Increased use of pesticides, herbicides, and fertilizers ◆ Impacts to public lands, streams, and meadows from livestock when BMPs become too costly ◆ Changes to the environment resulting from potential water impoundments
18 - Work with counties, communities, and groups to make sure staff capacity exists for actual administration and implementation of grant funding	<ul style="list-style-type: none"> ◆ Identification of more diverse funding sources ◆ Increased likelihood of successful grant applications ◆ Broader range of local administrative capabilities ◆ Increased administrative efficiencies 	<ul style="list-style-type: none"> ◆ Potentially greater demand on a small pool of volunteers ◆ Potentially increased workloads for some staff, which becomes unsustainable

¹Potential benefits are considered at a screening level. This is not necessarily a comprehensive list of all specific local benefits accruing from an individual project.

²Potential impacts are considered at a screening level. This is not intended to be an exhaustive list of all potential impacts from an individual project; all projects will undergo CEQA/NEPA analysis as required.

³Temporary construction-related impacts include dust, noise, traffic disruption, night lighting, temporary interruption of services, temporary loss of access to recreational resources, vegetation removal and ground disturbance, and sediment discharge.

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