

Upper Sacramento, McCloud, and Lower Pit Integrated Regional Water Management Plan



November 25, 2013

Upper Sacramento, McCloud, and Lower Pit
Regional Water Management Group

Chapter 11: Impacts and Benefits



Upper Sacramento, McCloud, and Lower Pit
Integrated Regional Water Management Plan

11. Impacts and Benefits

Impacts and benefits of the Upper Sacramento, McCloud, and Lower Pit Region (USR) Integrated Regional Water Management Plan (IRWMP) may be assessed in two ways: 1) on a regional level according to the effectiveness of implementing Plan objectives while satisfying the two overarching priority goals, and 2) on the basis of individual projects as they are implemented, and their associated impacts and benefits on and to the natural ecosystems and to all stakeholders, including disadvantaged communities (DACs) and local tribes.

The impacts and benefits to the region of the planning process and the Plan itself are more difficult to define than those of individual projects, though likely more important on a lasting level. The advantages of a regional effort over individual efforts have been made clear by the demonstrable increase in collaboration amongst USR stakeholders between the start of the planning process and today. Both planning- and project-level impacts and benefits are described below.

The communities that are affected by this IRWMP will decide the ultimate measure and success of implementation. It is important to note that impacts and benefits are usually interpreted according to a value system; there are several value systems represented in the regional water management group (RWMG) membership under which the impact and benefits and goals and desired future conditions are formulated and developed. On the whole, the state requires that an IRWMP be developed and implemented according to an agency model of water as commodity and implementation, or management, of that commodity as traditional infrastructure. While this model may be changing (see the Defenders of Wildlife white paper *Nature's Benefits: The Importance of Addressing Biodiversity in Ecosystem Service Programs*), it is important to USR stakeholders to acknowledge that diversity in value systems and priorities held by various members of the RWMG and respect these viewpoints as contributing to a larger whole. This topic is discussed further in Chapter 12, Performance Measures.

With respect to the variety of viewpoints represented in the USR stakeholder group, the goals and objectives identified in Chapter 7 are meant to acknowledge — and even embrace — the changing environment in terms of climate change, regulatory structure, and community values and priorities represented by the RWMG. The relative success of this effort will be measured through the evaluation of performance measures as identified in Chapter 12.

11.1 Potential Benefits and Impacts from Implementing the Plan

The creation of a forum for identification of jointly held values, mutually agreed upon goals and objectives, and project development and evaluation has already resulted in the identification of a number of collaborative efforts between agencies, non-profit organizations, and private entities. The advantages of the regional approach include opportunities to share knowledge and expertise; access to a variety of data, studies, plans, and management strategies; avoiding duplicative efforts or overlapping projects; allowing for consolidation of costs, effort and labor; identification of issues which can be better addressed regionally (e.g. climate change, groundwater issues, and cross-watershed collaborations on

fish passage); the ability to work on point and non-point source pollution strategies (pollutants do not respect political boundaries); and an evaluation of projects from a fresh perspective through multiple points of view and experiences. The IRWM process allows for addressing multiple issues through multiple strategies simultaneously in one project and/or enabling cross-jurisdictional, cross-organizational collaborations. All of these things contribute to how the USR interacts with its neighbors, as well. The region is largely made up of disadvantaged communities, Native American groups, and small non-profit entities. Having a common platform from which to speak will help stakeholders to coordinate with neighboring regions as well as communicate better with state and federal agencies.

The requirements of plan preparation have mandated a level of increased regional understanding that did not exist prior to the formation of the USR RWMG. The ongoing dialogues, regular meetings, and creation of work groups have resulted in the ability of organizations to realize an economy of scale through the increased and in-depth knowledge gained in the process. It has also increased the ability of agency and non-profit entities to engage in policy level collaboration, and by so doing has fostered support of and empowerment amongst small grass-roots organizations. For example, though the project development process, a straightforward wastewater treatment upgrade for City of Mt. Shasta was further developed to meet additional objectives and regional needs through their collaboration with other project sponsors in project development workshops. Through this interaction, participants discussed the project during and the city incorporated recommendations for integration of other project aspects, which included:

1. Education and outreach;
2. Consideration of inclusion of in line hydropower generation in the outfall; and
3. The consideration of including a wetland-based tertiary treatment system to save money, energy, and expand riparian habitat.

The planning process (as the implementation process is likely to do) has also helped entities in the region to understand the importance of the region to the rest of the state, and that implemented projects can and do provide benefits that extend beyond the needs of the region. Some of these are described in Table 11.1, below.

Importantly, the design of projects by diverse stakeholders will help to increase public acceptance of water management strategies as they see projects proposed and supported by agencies and organizations that have not traditionally cooperated. This also has fostered an increasing sense of project-based altruism that continues to develop; once regional needs are known and understood it becomes easier to determine the relative importance of individual organizational issues.

Potential impacts on a general scale may include a perception of “giving up” power in terms of jurisdictional responsibility. This was a major concern by some USR stakeholders early on in the planning process and continues to be an issue for some stakeholders with regard to tribal sovereignty (more on this topic is shown in Section 11.5, below). RWMG members respect this viewpoint and have worked hard to address it through the governance model.

Most stakeholders see this as an ongoing conversation as the document is implemented, updated, and revised through the next 20 years.

In addition, the process of identifying, refining, and prioritizing projects can lead to hard feelings when specific projects are prioritized above others. Most agency participants in this IRWM process have represented a feeling of “being here for the long haul,” indicating that funding isn’t the sole focus of their participation. However, there are some serious needs represented by DACs in the USR, and the sooner these are fulfilled, the more these resource planners and managers will be able to participate more actively and fully in the non-project components of IRWM.

11.2 Advantages of Integrated Regional Planning and the Need for IRWM in the Region

Implementation of this IRWMP will have significant benefits to all stakeholders, including disadvantaged communities and local tribes (though there is some disagreement by one local tribe as to the benefits — or even authority — of the IRWM process in ancestral lands. More can be read about this issue in Section 11.5, below). As discussed in the governance chapter (Chapter 16), the USR stakeholder outreach efforts and governance structure allows representatives to actively participate in the development and implementation of the IRWMP. Through this open process, the potential for grant funding, partnership, and matching funds will be available to communities that previously may have been overlooked by regional planning efforts.

The need for IRWM has been represented in many ways throughout this document. One key area where IRWM will be able to fill a gap is in the area of groundwater knowledge. As California pursued groundwater measurement and tracking, it is even more important for stakeholders to understand the issues of connectivity and recharge. In order to build a more sustainable management structure for the future of the region (including enhanced adaptation capacity to climate change effects), it is important to enhance stakeholders’ knowledge of how water works in the region and who uses it.

Another need that IRWM fills is that of a forum for discussion. The many resource planning and management efforts in the region have had varying outcomes in a multitude of stakeholder opinions, but there has thus far been no forum for discussion and integration of those efforts. In addition, some stakeholders have felt left out of these processes that affect their livelihoods, cultural history or, in some cases, basic human right to adequate amounts of clean water. RWMG members have voiced the hope that this process will continue on into the future as a forum for discussion of project design, funding, and implementation, as well as a forum for more general topic issue discussions of water storage, groundwater recharge, population and recreational growth and use, and many other topics of mutual concern.

11.3 Impacts and Benefits for Disadvantaged Communities

As discussed in the Region Description (Chapter 3), the USR includes many communities identified as disadvantaged per the public resources code section 75005(g) (80% or less of median household income).

Potential impacts of plan implementation on DACs could result from short-term physical changes during plan construction such as increased sediment, increased traffic congestion, and disrupted recreational access. The measures to ameliorate both short- and long-term negative project-related impacts should be identified through the required California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) processes. While it is the responsibility of individual agencies to implement the CEQA and NEPA environmental and cultural review processes when appropriate, stakeholders have noted that these processes have notoriously failed to reach out to DACs, minority groups, and indigenous tribes. Accordingly, some of these processes have failed to eliminate, minimize, or mitigate negative impacts on these communities. The USR RWMG will continue to reach out to DACs and involve them in the IRWM planning and implementation process to be sure that these communities are fully involved and empowered in what appears to be the mechanism by which the state will be using in the future to direct infrastructure funds to where they are needed.

If the plan is not implemented there is the potential for the deepening of conflicts for disadvantaged communities if aging and/or inadequate infrastructure is not invested in, public health hazards continue and/or increase, and water and recreational standards decline within the region. USR stakeholders seek to remedy these potential ills before they become acute, through the implementation of this IRWMP.

11.4 Impacts and Benefits for Native American Tribes

Recognizing the special status of Native American populations, the USR has developed and continues to invest in productive and inclusive relationships with regional tribal organizations.

As with DACs, the greatest impacts of the IRWMP will be determined by how the IRWMP functions within the region as the main conduit of state infrastructure funds to local projects and if the RWMG remains open to the views and needs of indigenous communities. The record of other regions and their current relationships with indigenous communities demonstrates that the IRWM process can be variable in its success in reaching out to and incorporating these communities and their priorities.

Their level of involvement and empowerment throughout the IRWM process will determine benefits to indigenous communities. Capacity building will be a key task within these communities; through the RWMG, members will have the opportunity to provide resources and expertise that can enhance the ability of indigenous communities to access funding. Involvement in the planning process will also give these communities a voice in the development, funding, and implementation of policies and projects that benefit the region as a whole.

Potential impacts of plan implementation on tribes could be similar to those felt by DACs, but tribes also have a unique concern with regard to sacred sites. Because of much of the history of land use in the region, many of the locations traditionally sacred to indigenous peoples have been made part of the United States' — and sometimes California's — public land management network. While this can aid in the education of recreationalists regarding

Native American issues and history, it also puts these locations at risk to irresponsible and/or irreverent activities, including defacing places of great ancestral value and interrupting private spiritual ceremonies.

While the implementation of the IRWMP is not expected to worsen this situation, the hope is that one of the benefits of implementing this IRWMP will be that through increased outreach and education efforts, negative effects can be reduced and that the sacred sites can continue to be to today's tribes what they have been to their many generations of ancestors.

In addition, there are a host of federal and state laws that at least nominally protect sites. The IRWM process can help members to educate their respective agencies and the public regarding these laws and their required mandates.

The main benefit of IRWM for indigenous communities must be empowerment of these communities within the funding and policy-making arenas of local, state, and federal agencies.

One of the tribes in the USR, the Shasta Nation, sees the IRWM planning process as a distinct threat to tribal sovereignty, and has made repeated requests to halt the planning process completely by order of the tribe as a sovereign nation, identifying most of the USR area as ancestral tribal lands. This statement excludes other tribes holding ancestral claims to lands within the USR. (Note: The statements and opinions of the leaders of the Shasta Nation in this regard are not shared by the Shasta Indian Nation, which also represents the people of the greater Shasta culture, nor do other tribes in the region concur with those opinions.) The challenge in addressing this statement is complicated by the fact that the treaties for many — if not most — of the tribes in California have never been formally ratified, or even rejected, by the federal government. This leaves tribes' status undetermined and complicates the relationships between tribes, local governments, private landholders, and the federal and state government.

USR stakeholders have been reticent to halt the planning process for several reasons:

1. There has been no explanation of how a planning document without regulatory or implementation enforcement capabilities affects the ongoing sovereignty of the Shasta Nation, especially when this concern doesn't seem to be shared by other participating tribes;
2. DWR has provided no direction as relates to tribal sovereignty and the IRWM program, and thus far has encouraged the continuation of the planning process, with respect to decisions made by the RWMG through the established governance structure; and
3. Discontinuing the planning process would severely hamper — if not explicitly disqualify — USR stakeholders from applying for implementation grant funds when they become available.

The choice made by the USR stakeholders is to acknowledge this as an issue for the region at large and the negative impact of the document on the Shasta Nation, as they perceive it. As

stated previously, stakeholders expect that this discussion will be ongoing throughout the implementation of the IRWMP.

11.5 Project-level Impacts and Benefits

While the impacts and benefits identified in the table below represent a simple “screening level” assessment, project-specific impacts and benefits will be identified in more detail as they’re brought forward for implementation through the USR IRWMP. An assessment of these values will be part of the RWMG’s decision-making process for prioritizing projects and compiling project implementation packages.

Table 11.1, attached at the end of this chapter, portrays potential impacts and benefits based on USR objectives. Multiple issues and interests are addressed through each objective, so using objectives as the organizational principle indicates a variety of impacts and benefits that may or may not be related to each other directly. These impacts and benefits are projected based on possible projects that may be implemented as associated with these objectives.

11.6 Interregional Impacts and Benefits

The USR is an upper-watershed, source-water area. While the region supplies water to much of the state, its infrastructure for water delivery is primarily local and rural in nature, with long extensions of pipe relative to the number of people served. Frequently, projects improving water conveyance and treatment, local habitat, and water quality result in increased benefits to downstream users outside of the USR. The benefits of alternative energy projects alone can help the entire state to meet AB32 greenhouse gas emissions reduction goals. The benefits of project implementation extend far beyond Plan-specific boundaries and serve to enhance and emphasize the region’s status as a source water area.

11.7 Benchmarking – Assessing Progress

Identifying potential impacts and benefits, then following up with a process for assessing those assumptions, will allow the RWMG to better tailor projects and plan-level programs to meet regional needs. Assessing progress must be done on a regional basis, but it’s also possible that interregional collaboration could help in early identification of potential pitfalls. A process for undertaking a regional assessment, as well as an integration of lessons learned and how this work will be reported and recorded, is described below.

11.7.1 Regional Assessment

Assessing the RWMG’s achievement of the benefits described in this chapter while avoiding identified or unanticipated impacts will largely be tracked on a project-specific basis. Each project, prior to implementation, will be required to present a list of impacts and benefits specific to the individual project. This list will be reviewed by the RWMG with any questions answered prior to implementation (and likely prior to funding, as well). Identified impacts will include a description of how the impact may be minimized or avoided completely. Following the completion of a project, the RWMG will request a report from the project sponsor regarding the listed and unanticipated impacts and benefits. A short discussion may ensue regarding specific successes or breakdowns in process or outcome, the

effects of this — long- and short-term — and how they either might be built into future projects or avoided using specific, identified measures.

11.7.2 Interregional Assessment

USR stakeholders and grantees meet periodically with other RWMGs from around the state. Through these meetings, RWMG leadership is able to identify potential challenges, discuss how to structure processes for success, and further investigate opportunities for collaboration between regions. Through the past work of many of these regions, current IRWM benefits have been expounded and impacts have been minimized. This can be seen through some of the outreach strategies used and adapted since the mid-2000s, as well as project structure and approach. The USR will continue to participate in these interregional meetings, and will likely also have region-to-region meetings with surrounding RWMGs, including the Upper Pit, North Coast, and North Sac Valley IRWM groups.

11.7.3 Recording and Reporting Findings

As stated above, most of the impacts and benefits assessment will be made up of a project sponsor report and RWMG discussion. This discussion will be recorded in the meeting notes of the RWMG, but the outcome also must be reported in a formal way. It is expected that a formal performance measures tracking process will be implemented, and that the impacts and benefits will be reported through this, as well. Please see Chapter 12, Performance Measures, for more information regarding this process.

11.7.4 Incorporating Lessons Learned

It is through the RWMG discussion surrounding impact and benefit outcomes that stakeholders will share successes and avoid pitfalls. The RWMG discussions are integral to this process. In addition, however, the formal tracking mechanism described above will make this information available to any interested party at any time. Proposed projects similar to those that have already been implemented and assessed for impacts and benefits will be expected to review and incorporate the findings and successes of those projects.

Table 11.1: Regional and interregional impacts and benefits of IRWMP implementation project types

USR Issue	Potential Regional Impacts	Potential Regional Benefits	Potential Interregional Impacts	Potential Interregional Benefits
<p>Objective 1: Increase knowledge of basin characteristics and raise public awareness and understanding of fractured rock aquifers, watershed dynamics, existing water rights, water resource allocation, and existing management authorities to inform and develop support for IRWM planning and projects.</p>	<ul style="list-style-type: none"> → Investigation into water rights can sometime be cause for temporary conflict → It is difficult to show the benefit of educational efforts, though expected benefits are extensive 	<ul style="list-style-type: none"> → Increased stakeholder participation and coordination → Increased regional investment and understanding → Increased regional cohesiveness → Public support could be galvanized through increased resource understanding → Increased awareness on a State level of source water areas and the resources provided → Increased investment in source water areas → Increased measures to protect groundwater → Increased resources allocated to understanding and preserving ecological function and integrity 	None	<ul style="list-style-type: none"> → Increased awareness on a State level of source water areas and the resources provided → Increased investment in source water areas → Increased interregional coordination efforts for cross-boundary issues and resources
<p>Objective 2: Encourage, improve and maintain an environment that fosters cooperation, facilitates collaboration, and builds relationships of trust and respect among water resource stakeholders and community members with respect to water management efforts within the region.</p>	<ul style="list-style-type: none"> → Political discussions/decisions can be hard on relationships in the short term due to conflicting and competing values and perspectives on water management → Requirement for additional stakeholder time and resources → Can increase the level and cost of regulatory compliance in the short term through increased time spent in coordination and communication 	<ul style="list-style-type: none"> → Will likely decrease regulatory compliance costs in the long term because of coordination efforts → Political discussions/decisions regarding positions will build regional relationships in the long term → Increased regional cohesiveness → Synergies with K-14 curriculum → Increased level of investment of regional residents in regional watersheds 	None	<ul style="list-style-type: none"> → Increased in-region investment → Preserves regional self-determination and responsibility → Interregional coordination on education/ outreach efforts can save money → Education of recreational visitors can help improve stewardship in other regions → Provides information to all stakeholders and regions regarding indigenous communities' history, rights,

Table 11.1: Regional and interregional impacts and benefits of IRWMP implementation project types

USR Issue	Potential Regional Impacts	Potential Regional Benefits	Potential Interregional Impacts	Potential Interregional Benefits
	→ Perceived negative impact on tribal sovereignty (specific to certain tribes)	→ Increased number of people reached in diverse communities		and sovereignty
<p>Objective 3: Maintain and enhance the ecological health of the basin to:</p> <p>6. Support the local economy;</p> <p>7. Ensure public health and safety;</p> <p>8. Respect and support indigenous cultures; and</p> <p>9. Improve recreational infrastructure and opportunities for both tourism and the local economy.</p>	<p>→ Temporary, site-specific construction impacts</p> <p>→ Increased mandatory compliance measures to avoid species and habitat impacts</p> <p>→ Conflicting definitions on watershed health and function could lead to conflict within the region or group</p> <p>→ Imbalance between stakeholder perspective regarding economic and ecological considerations</p> <p>→ Sensitive cultural and ecological areas could be impacted by increased recreational opportunities</p>	<p>→ Increased coordination between water users and environmental groups</p> <p>→ Improved species habitat and population</p> <p>→ Return of previously extirpated species</p> <p>→ Increased species diversity and makeup</p> <p>→ A more robust, healthier ecosystem</p> <p>→ Reduced surface water contamination</p> <p>→ Greater landscape water holding capacity</p> <p>→ Increase substrate available for species/habitat use</p> <p>→ Increased level of investment of regional residents in regional watersheds</p> <p>→ Increased in-region economic opportunity and benefit</p> <p>→ Sites of importance to indigenous cultures are protected</p> <p>→ Increase in the number of small natural-resource-dependent businesses</p> <p>→ Increased Native American representation in water management discussions</p> <p>→ Increased regional awareness of tribes' presence and history</p>	None	<p>→ Improved species habitat and population</p> <p>→ Return of previously extirpated species – more robust statewide populations</p> <p>→ Increased species diversity and makeup</p> <p>→ A more robust, healthier ecosystem</p> <p>→ Increased in-region investment</p> <p>→ Preserves regional self-determination and responsibility</p> <p>→ Sites of importance to indigenous cultures are protected</p> <p>→ Increased interest in regional tribes and collaboration efforts</p>

Table 11.1: Regional and interregional impacts and benefits of IRWMP implementation project types

USR Issue	Potential Regional Impacts	Potential Regional Benefits	Potential Interregional Impacts	Potential Interregional Benefits
		→ Increased protection of resources important to the Native American way of life		
Objective 4: Support and improve ongoing forest management efforts with regard to local water quality and supply, including fire management, within existing regulatory frameworks.	<ul style="list-style-type: none"> → Temporary, site-specific construction impacts → Competition between user groups and interests → Recreation uses can harm site of traditional and cultural Native American value → Increased emissions from fuels management activities → Conflicting views of healthy forests and effective management 	<ul style="list-style-type: none"> → Increased headwaters water retention → Improved recreation opportunities → Decreased water treatment costs → Increased watershed resiliency → Increased water supply → More stable water temperature and base flow → Improved habitat for native plants and animals → Cost savings due to avoided contamination problems → Decreased emissions from catastrophic fire → Improvement in landscape-level response to climate change → Increased regional adaptation and mitigation to projected climate effects → Increased number of green jobs in region → Healthy, fire-resistant forests 	<ul style="list-style-type: none"> → Recreation uses can harm sites of traditional and cultural Native American value → Increased emissions from fuels management activities 	<ul style="list-style-type: none"> → Improved species habitat and populations → Increased headwaters water retention → Improved recreation opportunities → Increased watershed resiliency → Increased water supply → More stable temperature and base flow → Greater control over invasive species spread → Improvement in landscape-level response to climate change → Increased regional adaptation and mitigation to projected climate effects → Decreased emissions from catastrophic fire → Greater landscape water holding capacity → Lower cost to the state for catastrophic fire fighting → Increased number of green jobs
Objective 5: Ensure support for and foster success of water management efforts for disadvantaged communities including Indigenous Tribes and Nations while respecting the cultural values of existing	<ul style="list-style-type: none"> → Political decisions regarding funding choices can be difficult for a stakeholder group → Requires a formal, long-term structure for funding and 	<ul style="list-style-type: none"> → Increased investment in the region → Increased integration of stakeholders results in a better overall understanding of issues 	<ul style="list-style-type: none"> → Not all grant opportunities are appropriate for all entities/communities; partnering will be an essential component of moving the region forward together 	<ul style="list-style-type: none"> → Increased in-region investment → Preserves regional self-determination and responsibility

Table 11.1: Regional and interregional impacts and benefits of IRWMP implementation project types

USR Issue	Potential Regional Impacts	Potential Regional Benefits	Potential Interregional Impacts	Potential Interregional Benefits
communities.	<ul style="list-style-type: none"> follow-up (staff and funding requirements) → Resources don't go towards other programs and projects 	<ul style="list-style-type: none"> → Increased level of investment of regional residents in regional watersheds → Increased number of people reached in non-traditional cultural groups 		
Objective 6: Support local participation in development and implementation of water quality standards that reflect local conditions and implementation of projects that maintain and enhance the basin's existing water quality. Identify point source pollution and problem areas.	<ul style="list-style-type: none"> → Political discussions/decisions can be hard of relationships in the short term → Requirement for additional stakeholder time and resources → Can increase the level and cost of regulatory compliance → Could result in lower standards within the region, negatively affecting recreational, cultural, and other important values 	<ul style="list-style-type: none"> → Political discussions/decisions regarding positions will build regional relationships in the long term → Increased regional cohesiveness → Collaborative efforts can increase regulatory compliance rates → Increased regulation and water quality monitoring 	None	<ul style="list-style-type: none"> → Increased in-region investment → Preserves regional self-determination and responsibility → Interregional coordination on education/ outreach efforts can save money → Efforts can increase compliance rates on a statewide level
Objective 7: Ensure adequate water supply and quality while maintaining regulatory compliance, minimizing conflict, and recognizing and respecting existing water rights and other water users.	<ul style="list-style-type: none"> → Efforts to protect water supply could cost participants financially and with staff time and resources → Prioritizing projects/issues may be a difficult task → Temporary, site-specific construction impacts → Additional contamination sites could be discovered → Negative feedback from recreation groups due to increased restrictions → The health and environmental effects of weather modification are not well understood and could be detrimental within the region 	<ul style="list-style-type: none"> → Stakeholders protect and invest in regional resources → Have a greater understanding of regional water supply needs now and into the future → Increase regional understanding of potential hydrologic changes → Increased available water supply → Decreased treatment costs → Decreased number of health advisories → Increased protection of threatened/ endangered species → Adequate supply for fish and wildlife, as well as for 	<ul style="list-style-type: none"> → More water kept in the USR through additional storage/reservoirs could change the hydrologic pattern and timing for water going into Shasta Reservoir, and could result in additional evaporative losses → The health and environmental effects of weather modification are not well understood and could be detrimental within the region and beyond 	<ul style="list-style-type: none"> → Higher base flow could result from water supply conservation → Increased populations of threatened/ endangered species

Table 11.1: Regional and interregional impacts and benefits of IRWMP implementation project types

USR Issue	Potential Regional Impacts	Potential Regional Benefits	Potential Interregional Impacts	Potential Interregional Benefits
		communities in the region		
<p>Objective 8: Facilitate development of sustainable water/wastewater infrastructure to ensure public health, protect ecological integrity, and support economic stability. Research, facilitate and support alternative waste/waste water treatment technology that also protects public health, ecological integrity and economic stability.</p>	<ul style="list-style-type: none"> → Political decisions regarding funding choices → Requires a formal, long-term structure for funding and follow-up (staff and funding requirements) → Resources don't go towards other programs and projects → Water quality degradation during construction → Habitat/species affects during construction → Potential effects on DACs/EJ communities → Temporary or permanent reduced in-stream flow 	<ul style="list-style-type: none"> → Increased investment in the region → Increased integration of stakeholders results in a better overall understanding of issues → Increased level of investment of regional residents in regional watersheds → Increased in-stream flow → Increased supply reliability → Improved in-stream water quality → Increased recreational opportunities → Increased system redundancy → Better preparation for an altered hydrology → Decreased spill violations 	<ul style="list-style-type: none"> → Water quality degradation during construction → Habitat/species affects during construction → Potential effects on DACs/EJ communities → Temporary or permanent reduced in-stream flow 	<ul style="list-style-type: none"> → Increased in-region investment → Preserves regional self-determination and responsibility → Increased in-stream flow → Improved in-stream/downstream water quality → Increased recreational opportunities → Increased supply reliability → Decreased spill violations
<p>Objective 9: Address flooding concerns through infrastructure improvements and support ongoing flood management efforts. Research history of flooding in the region including the different landscape and water conditions that naturally decreased flooding.</p>	<ul style="list-style-type: none"> → Temporary site disturbance → Possible temporary or permanent habitat loss, depending on the infrastructure identified 	<ul style="list-style-type: none"> → Increased regional capacity to adapt to climate change → Increased number of green jobs in region → Decreased in-region costs due to flood damage, including insurance costs → Possible gain in habitat, depending on the infrastructure identified 	<ul style="list-style-type: none"> → Possible temporary or permanent habitat loss, depending on the infrastructure identified 	<ul style="list-style-type: none"> → Increased regional adaptation and mitigation to projected climate effects → Increased number of green jobs in region



Upper Sacramento, McCloud, and Lower Pit
Regional Water Management Group

UpperSacIRWM.org



5937 Dunsmuir Avenue • Dunsmuir, CA 96025
530.235.2012 • RiverExchange.org

FORSGREN
Associates Inc.

3110 Gold Canal Drive, Ste. C • Rancho Cordova, CA 95670
916.638.1119 • Forsgren.com