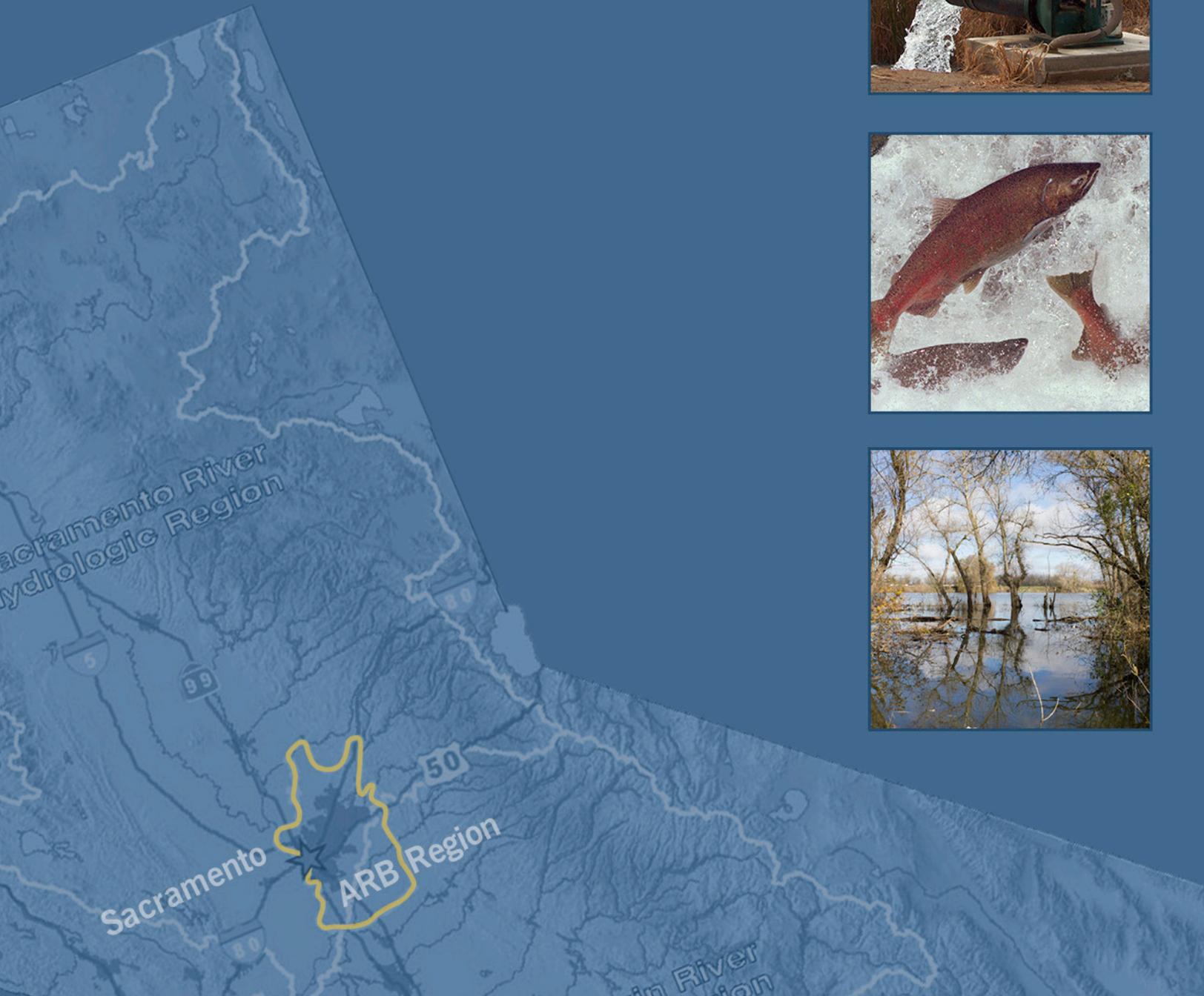


SECTION 5

IRWMP Framework



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5. IRWMP FRAMEWORK

As described in **Section 3**, this 2013 American River Basin (ARB) Integrated Regional Water Management Plan (IRWMP) was developed with extensive stakeholder input. Stakeholders were instrumental in identifying issues that eventually led to what the ARB Region refers to as its ARB IRWMP Framework (Framework). In some cases, input from stakeholders resulted in the ARB Region defining concepts in its IRWMP that go beyond the traditional integrated regional water management (IRWM) planning approach. For example, California Department of Water Resources (DWR) IRWM Guidelines only call for establishing goals and objectives for a region. At the initial stakeholder meeting in November 2009, one of the first comments was that the process of working on goals and objectives could not be started until a *vision* for what the IRWMP should result in was established. During subsequent workshops and meetings, stakeholders voiced recurring themes related to principles that the ARB Region stakeholders should endeavor to employ in their water resource planning and implementation efforts. This section describes in more detail this resultant Framework, the core of the ARB IRWMP.

5.1. Framework Overview

A graphic depiction of the Framework is shown in **Figure 5-1**. Stakeholders were guided in the integrated planning process from higher levels (Principles and Vision), through strategic considerations (Goals and Objectives) to increasingly detailed tactical measures (Strategies and Projects). Several stakeholder meetings were devoted to explaining the integrated planning process, but focus was given to overall content development, not precise alignment within the Framework. Elements within the Framework are further defined and described below.

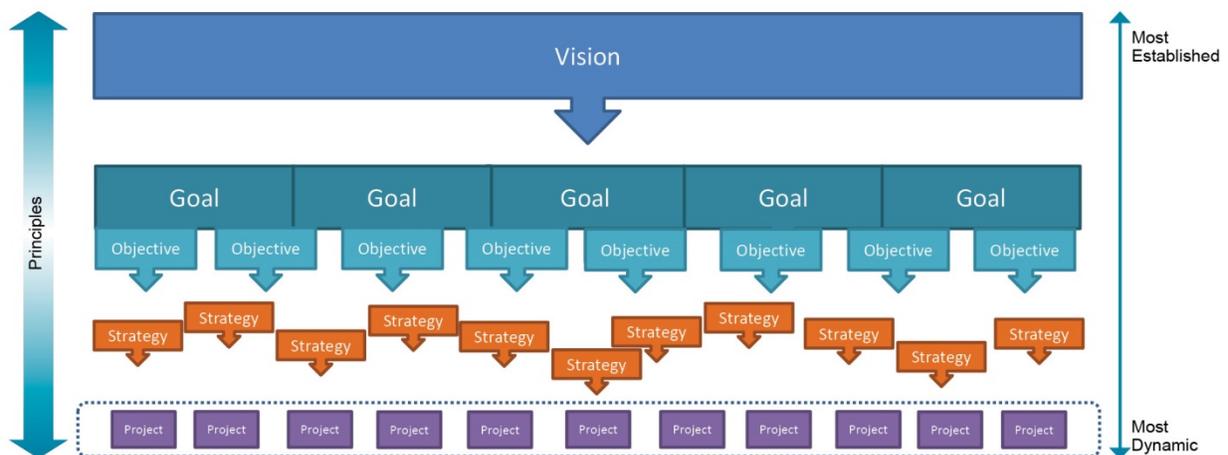


Figure 5-1. ARB IRWMP Framework

The VISION is a compelling description of the future end state (in a time horizon) of the ARB Region that will result from proactive, strategic activities undertaken for the IRWMP. The vision is the most established and agreed upon planning concept. Instead of relying on individual and fragmented attempts to manage water, having a unifying and integrated vision with greater foresight is necessary to coordinate projects, or actions, to successfully and efficiently manage water resources. The vision is shown as a single box to demonstrate its singular and unifying nature.

GOALS represent the desired “end state” of activities and support the overall vision. Goals are meant to span the entire vision. If goals are met, the ARB Region can reach its vision. The vision and goals provide the backbone of the entire planning process and are considered the most agreed-upon and established concepts for the ARB Region.

PRINCIPLES are statements that articulate shared organizational values, support the vision, and serve as a basis for decision making. While not in the direct hierarchy of the Framework as shown above, the principles are foundational and provide guidance on how all stakeholders should consider future planning and implementation of programs and projects. The Framework graphic shows that the principles should permeate throughout the Framework.

OBJECTIVES establish the intent of the ARB Region and the IRWM planning effort, and are geared toward future action. Objectives help the ARB Region determine if it has achieved its goals. Although they strive to be comprehensive, there is recognition that the sum of the objectives may not completely address all aspects of the ARB Region’s water management issues, and thus, gaps are shown in between each objective. However, the objectives represent the ARB Region’s current and best intent to address all of its issues. Although somewhat stable, objectives are more dynamic than the vision or goals, and it is foreseeable that objectives would be reviewed periodically in future planning updates, to continuously strive to meet the goals and vision.

STRATEGIES are general approaches or methods for achieving objectives and resolving specific issues. Strategies speak to the question "How will we go about accomplishing our objectives?" (U.S. Environmental Protection Agency [EPA] 2012). Multiple strategies may be employed to achieve an objective; likewise, a single strategy may help make progress toward multiple objectives. Whenever possible, strategies should be measurable, state a distinct target, have a timeline, and be flexible. Strategies are more dynamic than objectives and are meant to be regularly revisited and revised as necessary.

PROJECTS that help the ARB Region meet its objectives by implementing the strategies. Projects—or actions—are the most dynamic element of the Framework as they can be added or subtracted at any time. However, while there may be a variety and an extensive list of projects at various levels of readiness to proceed, implementing projects may not completely fulfill individual strategies or objectives, much less the goals or vision. It is the intent of the ARB Region to actively support multi-benefit projects that align with the ARB Region’s larger vision.

The Framework also depicts how dynamic the Framework components should be. Those components at the top (vision, goals, and objectives) went through a lengthy process of development, and should not be modified without significant consideration. Strategies and projects are more dynamic compared to the goals, vision, and objectives, and will change much more readily over time. Projects and strategies are inevitably influenced by external factors as well, such as funding availability, regulations, laws, changed regional or statewide priorities, environmental conditions, or economic conditions. In contrast, a unifying vision and comprehensive goals are intended to remain stable regardless of such external factors. The process for making changes to the Framework is described in **Section 6.6**.

The ARB IRWMP principles, vision, goals, objectives, and strategies were iteratively developed through a series of meetings, workshops, research, and individual communications that began in late 2009. This effort involved numerous stakeholders and employed the full Governance Structure (as described in **Section 4**). Meeting summaries can be found on the Regional Water Authority (RWA) Web site at <http://www.rwah2o.org/rwa/programs/irwmp/>. The remainder of this section is a summary of the content developed at these stakeholder and work group meetings.

5.2. Vision

The ARB IRWMP vision is:

The American River Basin Region will responsibly manage water resources to provide for the lasting health of our community, economy, and environment.

The last three components, “community, economy, and environment” specifically refer to the three pillars or the “triple bottom line” of sustainability. The concept of social equity was determined better coined as “community” in the context of the ARB Region. Water inequality is not an identified issue in this Region, but maintaining and improving the health and vitality of communities as well as the community stewardship



of water resources are still important concerns. The vision statement also emphasizes responsible management of water into the indefinite future.

5.3. Goals

The ARB IRWMP goals support the vision, and are presented and described in **Table 5-1**.

Table 5-1. ARB IRWMP Goals

Goal	Description
Provide reliable and sustainable water resources, sufficient to meet the existing and future needs of the Region.	This goal focuses on water quantity, encompassing both the supply and demand aspects of water resources. Concepts such as providing sufficient drinking water, increasing efficiency, exploring unconventional water supplies, and reducing demand are covered by this goal. It is also inclusive of water resources for human and ecosystem needs.
Protect and enhance the quality of surface water and groundwater.	This goal focuses on the water quality aspects of water resources, which includes management of point and nonpoint source pollution and water and wastewater treatment. Although water quantity and quality are closely linked, the two goals attempt to distinguish and highlight both concerns.
Protect and enhance the environmental resources of the watersheds within the Region.	This goal focuses on environmental resources of the watersheds, which includes consideration of vegetation, habitat, and ecosystem functions. This goal directly relates to the environment pillar of sustainability, also included in the vision statement.
Protect the people, property, and environmental resources of the Region from damaging flooding.	This goal recognizes that floods pose significant natural disaster risks in the Region and that the Region needs an integrated effort to mitigate and adapt to these risks. The Region also recognizes that flood management and environmental management can be achieved in ways that complement one another.
Promote community stewardship of our Region's water resources.	This goal recognizes that the need for active participation of the community to achieve the vision. Education and increased awareness at all levels of the community, from public officials to the general public, is an integral part of implementing the ARB IRWMP.

Key:

ARB IRWMP = American River Basin Integrated Regional Water Management Plan

5.4. Principles

The ARB IRWMP principles are:

- Planning for sustainability of our water resources considers all aspects of our watershed. This includes:
 - Strive for balance in environmental, economic, and social impacts and benefits in decision making and actions.
 - Recognize and promote the value of healthy watersheds and ecosystems, and underlying groundwater basins, to provide sustainable water resources.
 - Promote solutions that seek to minimize impacts to the environment.

- Promote policies and practices that enhance natural watershed functions.
- Develop projects and programs that allow for the fair treatment of people of all races, cultures, and incomes.
- Further integration to achieve multiple benefits is employed throughout our water resources planning. This includes:
 - Value the entirety of the water cycle and consider all forms of water as a potential resource.
 - Prioritize solutions that are integrated, addressing as many objectives, and providing as many benefits as possible.
 - Promote improved integration of land-use planning and management with water resources management.
 - Collaborate to take advantage of the benefits and synergies of water resource planning at the regional level.
 - Collaborate with other IRWM regions.
- Adaptive management techniques and active monitoring are employed in managing our water resources. This includes:
 - As needed, adapt planning processes and use the best available information, data, and tools as feasible, to address changes in a dynamic system and reflect evolving science, changing regulations, and/or program evaluation results.
 - Regularly monitor and evaluate to determine if objectives and targets are met.
 - Incorporate mitigation and adaptation measures in all aspects of planning and implementation in preparation for projected future changing climate conditions.
- A broader community is engaged as stewards of our water resources. This includes:
 - Promote transparency and open communication.
 - Build community awareness and encourage participation in stewardship of water resources.
 - Promote and educate on the value of pollution prevention and source reduction.

5.5. Objectives

In developing the ARB IRWMP objectives, RWA and the Planning Forum considered the objectives of Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan), the water efficiency goals of the *20x2020 Water Conservation Plan*, and the requirements of California Water Code Section 10540(c). During the development process, objectives were categorized by the primary goal each could help achieve. Although it was recognized early on that objectives often could help meet multiple

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goals, the categorization was retained to facilitate stakeholder and work group discussions. The 17 ARB IRWMP objectives are presented and described in **Table 5-2**.

Table 5-2. ARB IRWMP Objectives

Objectives	Description
1. Meet current and future water resources needs.	This objective includes actions to maintain, replace, and construct facilities, and to implement programs and activities as necessary to reliably meet varied water resources needs throughout the Region.
2. Increase water use efficiency.	This objective includes actions to reduce the amount of water necessary for a given purpose and to comply with mandated conservation targets.
3. Improve ability to reliably meet water demands during dry or emergency conditions.	This objective focuses actions such as conjunctive use and improving water system connections for greater operational flexibility.
4. Increase the use of recycled water for appropriate uses.	In a region where recycled water use is not yet considered necessary, this objective aims to encourage its development and to explore its potential benefits.
5. Remediate contaminated groundwater and reuse it to the extent feasible.	This objective currently refers specifically to cleanup initiatives of groundwater contamination plumes.
6. Improve protection of beneficial uses of surface water and groundwater.	This objective addresses water quality issues and covers potential actions such as improving wastewater treatment and infrastructure, meeting discharge standards, and improving stormwater runoff quality.
7. Recharge and reuse stormwater and urban runoff to the extent practicable.	This objective encourages considering runoff as a potential resource and identifying locations for groundwater recharge.
8. Maintain and improve the ecosystem function of area streams and watersheds.	This objective highlights ecosystem function, recognizing that habitat restoration and related efforts may not improve the entire ecosystem function, which is also a vital component of environmental sustainability.
9. Maintain and improve habitat of area watersheds.	This objective includes actions that maintain, improve, and conserve terrestrial, riparian, and aquatic habitats, such as implementing restoration plans and mimicking pre-project hydrologic flow patterns.
10. Conserve natural riparian buffers in undeveloped portions of local watersheds and restore buffers in developed areas when possible.	This objective applies to both the environmental resources and flood goals, with the recognition that preserving remaining riparian habitat also allows for flexible flood management.
11. Increase the capacity of the flood management system to meet applicable standards for designated areas and land uses.	This objective signifies the importance of increasing the capacity of the flood system to handle extreme events, whether through increased conveyance and/or temporary storage.
12. Maintain and improve levees and other flood-related infrastructure to reduce flood risk.	This objective focuses on the need to maintain and improve levees and other flood-related infrastructure throughout the Region, actions that are often postponed even when the structures are not up to standard.
13. Maintain and restore/reconnect floodplains to provide flood storage and other benefits.	This objective recognizes that connecting floodplains would increase total habitat area as well as their connectivity while providing better flood protection.

Table 5-2. ARB IRWMP Objectives (contd.)

Objectives	Description
14. Improve management of residual flood risks.	This objective recognizes that even after all efforts to reduce the flood risk are completed, this risk of flood can never be completely eliminated. Residual risk is the exposure to loss remaining after other known risks have been countered, factored in, or eliminated.
15. Increase awareness of the need for, benefits of, and practices for maintaining sustainable water resources.	This objective covers the need to increase public and public officials' awareness of all water related issues, such as the role of a healthy ecosystem, water efficiency, and flood risk.
16. Improve integration of water resources planning with land-use planning.	This objective recognizes the need to collaborate with land-use planning departments to effectively manage water resources and overall development into the future.
17. Increase sharing of information, studies, and reports to further advance integrated regional water management.	This objective deals with issues of lack of sharing of learned knowledge, which perpetuates the single-purpose oriented approach to water use or management. Increased data availability would also lead to better informed decision making.

Key:

ARB IRWMP = American River Basin Integrated Regional Water Management Plan

As discussed, the objectives will help the Region evaluate if it is making progress towards achieving its goals. **Table 5-3** correlates each of the objectives with the goal—or goals—it helps meet. **Table 5-3** shows the primary goal an objective meets, distinguishing an objective's direct-versus-indirect effects. For example, Objective 2, "increase water use efficiency" directly helps the Region meet the water resources goal. Simultaneously, increasing efficiency and using less water may have water quality benefits, if more flow can be left in the stream. However, this effect is indirect and thus not marked in **Table 5-3**. Similarly, public outreach and education has been shown to increase residential water use efficiency, which may help the Region meet the water resources goal. While important, this effect is also indirect and is excluded from **Table 5-3**. The ARB IRWMP is a unifying document, necessary because of these integrated, interlocking relationships among regional goals, objectives, and strategies (discussed in **Section 5.6**), but are not shown here for clarity.

While the objectives are numbered for reference, the objectives are not prioritized. Objectives were limited to a manageable number for this purpose. The ARB Region believes each objective to be as important and viable as another; regional objectives are not in competition with each other. Objectives are expected to remain fairly static to guide future action. They should not play a role in encouraging a certain type of project or action over another. Objectives also influence one another, and meeting one objective will also affect the Region's progress toward meeting another objective. An appropriate and comprehensive approach to water management should address all or most objectives simultaneously.

Table 5-3. Relationships of ARB IRWMP Objectives and Goals

Objectives	Goals				
	Provide reliable and sustainable water resources, sufficient to meet the existing and future needs of the region.	Protect and enhance the quality of surface water and groundwater.	Protect and enhance the environmental resources of the watersheds within the region.	Protect the people, property, and environmental resources of the region from damaging flooding.	Promote community stewardship of our region's water resources.
1. Meet current and future water resources needs.	●				
2. Increase water use efficiency.	●				
3. Improve ability to reliably meet water demands during dry or emergency conditions.	●				
4. Increase the use of recycled water for appropriate uses.	●				
5. Remediate contaminated groundwater and reuse it to the extent feasible.	●	●			
6. Improve protection of beneficial uses of surface water and groundwater.		●			
7. Recharge and reuse stormwater and urban runoff to the extent practicable.		●			
8. Maintain and improve the ecosystem function of area streams and watersheds.			●		
9. Maintain and improve habitat of area watersheds.			●		
10. Conserve natural riparian buffers in undeveloped portions of local watersheds and restore buffers in developed areas when possible.			●	●	
11. Increase the capacity of the flood management system to meet applicable standards for designated areas and land uses.				●	
12. Maintain and improve levees and other flood related infrastructure to reduce flood risk.				●	
13. Maintain and restore/reconnect floodplains to provide flood storage and other benefits.			●	●	
14. Improve management of residual flood risks.				●	
15. Increase awareness of the need for, benefits of, and practices for maintaining sustainable water resources.					●
16. Improve integration of water resources planning with land-use planning.					●
17. Increase sharing of information, studies, and reports to further advance integrated regional water management.					●

Key:
ARB IRWMP = American River Basin Integrated Regional Water Management Plan

5.6. Strategies

A broad range of strategies were developed by ARB IRWMP stakeholders to support the vision, goals, and objectives of the 2013 ARB IRWMP. This comprehensive range of water management strategies represents the regional outlook and vocabulary to articulate measurable actions to connect objectives to project implementation. The strategies described herein are living and adaptive, and the Region expects to add, revise, and delete strategies fluidly as the regional setting and environment change. The strategies presented in **Table 5-4** represent a current “snapshot” of strategies for the ARB Region. The table includes a brief explanation of each strategy. **Table 5-5** lists strategies that are currently under development but are not yet sufficiently defined nor vetted with all ARB stakeholders.

Strategies are defined as general approaches or methods for achieving objectives and resolving specific issues. Strategies should be measurable whenever possible, state a distinct target and a deadline for when to meet that target, and are flexible. It is recognized that not all strategies are readily quantifiable, but that does not detract from the overall concept or their important role in achieving plan objectives.

Multiple strategies may be employed to achieve an objective; likewise, a single strategy may help make progress toward multiple objectives. An example of these interrelationships among goals-objectives-strategies is presented in **Figure 5-2**. For organizational purposes, the strategies are identified grouped by their primary goal. However, stakeholders recognize that many strategies apply to numerous goals and objectives. **Table 5-6** shows a full matrix of the relationships between ARB Region objectives and current strategies.

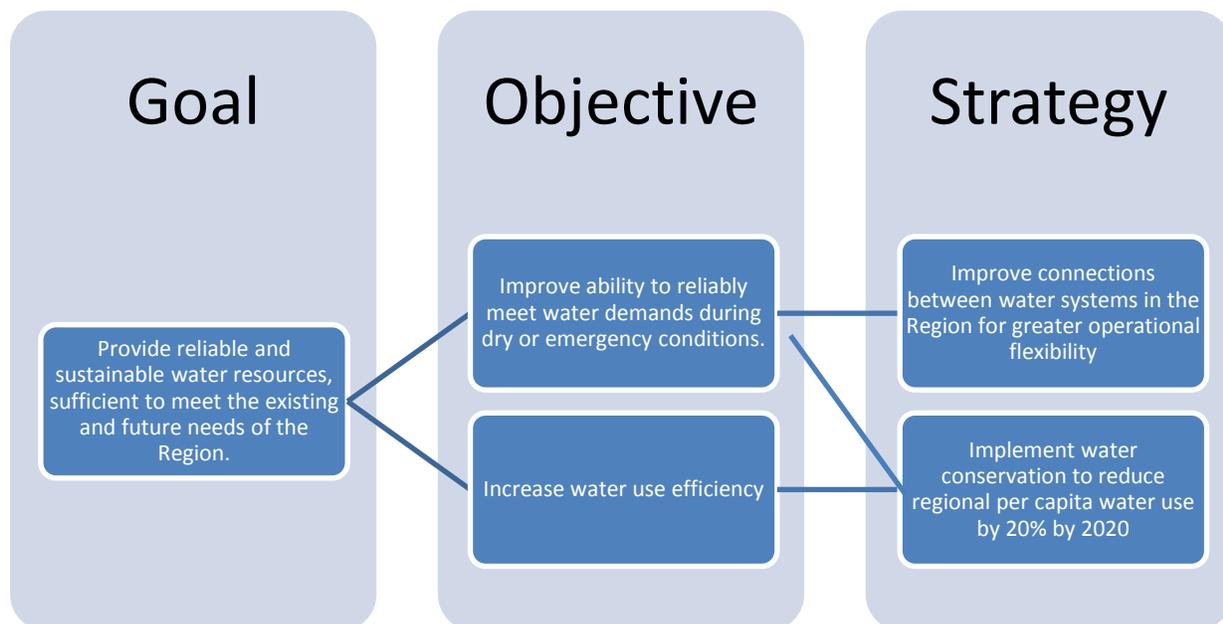


Figure 5-2. Example of Relationships Among a Goal, Objectives, and Strategies

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Strategies are meant to be dynamic. A new strategy may be proposed by a stakeholder at any time. The strategy will then be discussed and vetted to all stakeholders on a quarterly basis before it may be added to the IRWMP. As projects are implemented, RWA will be responsible for tracking progress on these strategies. As the strategies are sufficiently completed or no longer serve a particular purpose, they may be removed from the IRWMP following vetting to all stakeholders.

This flexible and adaptable nature of these strategies allows the IRWMP to adapt and respond to a variety of macro-trends impacting the Region, including:

- The changing demographics of the Region
- Changes in technology
- Climate change
- Changes in state of California (state) and federal policy
- Funding uncertainty
- Aging infrastructure

While an update to goals or objectives will be more time and effort intensive, the Region can adopt a new strategy and implement it on shorter notice.

Table 5-4. ARB IRWMP Strategies

WATER RESOURCE STRATEGIES
<p>WR1. Increase surface water treatment capacity to 800 million gallons per day (MGD) by 2030.</p> <p>The need for increased surface water treatment capacity in the ARB Region stems from two primary drivers: (1) the need to accommodate planned urban growth, and (2) the need to more fully implement regional conjunctive use operations for regional water supply reliability. This strategy envisions a combination of new construction, and repair and maintenance of old infrastructure. The strategy was developed through a survey of public water suppliers in the ARB Region. Current capacity is slightly over 700 MGD, so the target represents an increase of about 100 MGD.</p> <p>Region-wide, urban water demands in 2030 are expected to be 718 thousand acre-feet (TAF) per year (see Section 2.9.1.2), and the increased need for surface water treatment and delivery is a certainty. The ARB Region in aggregate has sufficient surface water rights and contracts to meet future needs; however, overcoming legal and institutional constraints (infrastructure, place of use, perfection of rights, etc.) associated with surface water rights and contracts may preclude surface water delivery to the entire ARB Region. Continued surface water deliveries are expected to be a significant source of regional water supply.</p> <p>In addition to serving the needs of planned growth directly, additional surface water treatment capacity is needed to more fully implement (in combination with other strategies) the regional conjunctive use program, first prescribed by the Water Forum Agreement (WFA) in 2000. Expanded implementation of conjunctive use will be critical to meeting regional water needs, especially considering changes in upstream snowpack and revised reservoir operating rules due to climate change.</p>

Table 5-4. ARB IRWMP Strategies (contd.)

WR2. Increase groundwater production capacity to 550 MGD by 2030.

The need for increased groundwater production capacity in the ARB Region stems from three primary drivers: (1) the need to accommodate planned urban growth; (2) the need to more fully implement regional conjunctive use operations for regional water supply reliability, and (3) the need to replace groundwater supplies (at alternate locations) lost to contamination. This strategy envisions new, expanded, and rehabilitated facilities. The strategy was developed through a survey of public water suppliers in the ARB Region. Current capacity is approximately 400 MGD, so the target represents an increase of about 150 MGD.

Region-wide, urban water demands in 2030 are expected to be 718 TAF per year (see Section 2.9.1.2), and the increased need for groundwater production is a certainty. The ARB Region is generally underlain by robust groundwater supplies that are actively managed and balanced by Western Placer County, Sacramento Groundwater Authority (SGA), Sacramento Central Groundwater Authority (SCGA), and South Area Water Council that preserve, protect, and manage these important resources. Although both Sacramento and Placer counties have policies that require supplemental sources of supply to support “no net groundwater take” for planned growth, groundwater is expected to continue to be a significant source of regional water supply.

Additional groundwater production capacity is needed to more fully implement (in combination with other strategies) the regional conjunctive use program, as described previously. Increased implementation of conjunctive use will be critical to meeting regional water needs during shortage conditions, especially considering changes in surface water availability due to climate change. Replacement groundwater supplies will be needed where existing groundwater production capacity is impacted by contamination from known plume migration or new sources of contamination.

WR3. Increase distribution system water storage capacity to 525 MG by 2030.

The water purveyors in the ARB Region have various operational strategies and practices for using local groundwater and/or surface water supplies to meet water demands. Water delivery system needs depend on topography, water quality, and demand patterns. Many agencies make use of storage reservoirs to balance diurnal flows and variable demands while other agencies rely on groundwater production and direct delivery to meet variable demands. While increased storage is generally desirable from an operational perspective, changes in regional electricity pricing to time-of-use rates may be a significant driver for investing in additional water storage capacity. As peak water and peak power demands roughly coincide, there will likely be increased incentives to avoid peak power rates by treating and storing water at off-peak times. Also, as water suppliers in the ARB Region continue to expand the regional conjunctive use program and interconnect their respective systems, storage reservoirs can be valuable tools to balance line service pressures, water demands, and water quality needs. The strategy was developed through a survey of public water suppliers in the ARB Region. Current capacity is slightly approximately 400 MGD, so the target represents an increase of about 125 MGD.

WR4. Improve connections between water systems in the Region for greater operational flexibility.

Section 2.8 describes individual water suppliers and their known system interconnections with adjoining agencies. In some cases, these connections are for direct delivery (wholesaler to retailer), but in many cases the interconnections are for emergencies. As the ARB Region more fully implements the regional conjunctive use program, agencies will likely want to optimize their water supplies and facilities, especially with adjoining agencies so as to not overbuild capacity or duplicate facilities. Further, policies, water service contracts, or other agreements may contain timing or volumetric constraints that are more efficiently and effectively addressed by multiple agencies to more fully optimize resource use—again making increased system interconnections increasingly important. Operational flexibility also better prepares the Region for shortages and climate change.

Table 5-4. ARB IRWMP Strategies (contd.)

WR5. Increase use of recycled water to 55,000 acre-feet per year by 2030.

Recycled water is currently used to the extent practicable in the ARB Region considering the current availability of Title 22 supplies. As a nearly 100 percent reliable source of supply, recycled water is expected to eventually play an important role in the ARB Region for irrigation and industrial (process) water, and for direct and indirect groundwater augmentation. National Pollutant Discharge Elimination System (NPDES) permit requirements have become more stringent and most regional wastewater plants will produce Title 22 effluent at a minimum, in the very near future. City of Roseville has a robust recycled water system, and Sacramento Regional County Sanitation District (SRCSD) has set a goal to produce and reuse upwards of 55 MGD of recycled water per year by 2020. Because approximately 75 percent of regional water use is outdoors (irrigation), recycled water supplies are expected to offset or replace the need for other surface and/or groundwater sources, either directly or indirectly. Future challenges to fully utilizing recycled water include construction of new infrastructure as well as gaining social acceptance of this alternate water resource.

WR6. Implement water conservation to reduce regional per capita water use by 20% by 2020.

Demand reduction is an integral part of water supply management, and it will become increasingly important as water supplies become less reliable. The Water Conservation Act of 2009 (SB7X-7) established a water conservation target of 20 percent (by urban water supply agency, per capita from a baseline reported to DWR in 2010) by the year 2020 to meet statewide water resource objectives. To track progress toward the 2020 target, water agencies are also required to meet an intermediate milestone of at least a 10 percent savings in per capita water use by 2015. Water agencies that do not meet these targets will not be eligible to receive state water grants or loans.

Water agencies have the option to meet their targets either as an individual agency or through a regional partnership of multiple water agencies. One benefit of regional compliance is the increased regional coordination between agencies and across water sources. This coordination leads to a better understanding of regional water savings potential and the resulting effects on the region's water sources. For this reason and others, regional compliance may be considered in the future. Stakeholders have already identified the need to set a region-specific per capita water use target as the essential next step to this process.

Regardless of the compliance method, there are many strategies, tools, and programs available to assist water agencies with achieving the 20 percent reduction by the 2020 target. The California Urban Water Conservation Council and DWR through their UWMP guidelines offer a list of demand management measures (DMM) or best management practices (BMP) to reduce water demand. Both distribution side (water loss control with leak repair, metering, etc.) and customer side (more efficient irrigation systems and landscape designs, fixture replacement, etc.) DMMs and BMPs should be considered. Some of these DMMs and BMPs appear as ARB Region strategies as well.

The ARB Region and participating agencies have been proactively engaged in water conservation programs well in advance of SB7x7, both collectively through the RWA's Water Efficiency Program (WEP) and individually, to conserve water and manage demands. These efforts have and continue to reduce per-capita water use within the Region. While much progress has been made in recent years, continued meter installation to support volumetric pricing, expanded recycled water programs, and reduced outdoor water use are expected to further help meet this requirement in the coming years.

A more detailed water conservation strategy specific to the ARB Region is still under development. Stakeholders identified the need to determine which BMPs or DMMs would be the most cost effective for the Region to guide such a strategy. This aspect of the strategy is currently listed as a parking lot item, but as interest and conditions warrant this strategy will be revisited.

Table 5-4. ARB IRWMP Strategies (contd.)

WATER QUALITY STRATEGIES
<p>WQ1. Meet all appropriate treatment standards and discharge requirements for wastewater treatment.</p> <p>Wastewater treatment standards and waste discharge requirements help protect beneficial uses of receiving waters. If not properly treated, wastewater can introduce bacteria, viruses, and nutrient loads into receiving waters, among other contaminants. Excessive concentrations of contaminants can lead to negative ecological and habitat impacts, restrictions on water-based recreation, increased drinking water treatment costs, and, in extreme cases, decrease water supply availability. The ARB Region recognizes that federal and state water quality regulations and standards will continue to change, and this strategy intends to allow for adaptation to such changes. In addition to public wastewater treatment plants (WWTP), private industrial plants must also meet discharge regulations, but are not specified in this strategy because they are not within the ARB Region’s purview.</p> <p>The Clean Water Act (CWA) is implemented and enforced by the EPA. The EPA often delegates authority to state agencies (as is the case in California) to assist in implementation. The NPDES permitting is implemented and enforced by the Central Valley Regional Water Quality Control Board for the ARB Region. Within the CWA, the NPDES permit program regulates point source pollution, which is applicable to WWTPs and their effluent. Wastewater treatment standards vary based on receiving waters, but generally secondary treatment (physical and biological treatment) is considered the minimum treatment standard. Tertiary treatment (physical and biological plus filtration) is increasingly common for inland surface water discharges or where effluent is recycled. These standards are expected to become increasingly stringent in the future, potentially including nutrient (nitrogen and phosphorous) removal.</p> <p>Total maximum daily load (TMDL) is another CWA program, applies to both point sources and non-point sources (which is the focus of Strategy WQ2). TMDLs are intended to reduce pollutant loading in 303(d) impaired water bodies for identified, problematic contaminants, for which other efforts or programs have not been sufficient.</p>
<p>WQ2. Meet all nonpoint discharge requirements.</p> <p>Nonpoint sources of water pollution include urban (stormwater) and agricultural runoff. While nonpoint discharges have been found to significantly impact surface water quality, they have been more difficult to regulate because discharge locations are dispersed. Common urban and agricultural nonpoint source contaminants of concern in the ARB Region include pesticides, fertilizer (nutrients), total dissolved solids or salts, and mercury. TMDLs address both point and nonpoint source pollution in water bodies, and this program is described in Strategy WQ1.</p> <p>Urban nonpoint source pollution is regulated through Municipal Separate Storm Sewer System (MS4) programs, which focus on stormwater discharges. MS4 permit renewals have recently moved from qualitative, effort-based BMPs to quantitative, water-quality based standards. The ARB Region is mindful of and intends to learn from recent examples in Southern California (Los Angeles County) where water quality standards and program costs to implement solutions to address the new MS4 permit are increasing dramatically. The ARB Region recognizes that these water quality regulations and standards may change, and this strategy allows for adaptation to such changes.</p> <p>The state’s Irrigated Lands Regulatory Program under the Waste Discharge Requirements (WDR) Program regulates discharges from irrigated agricultural lands. These discharges include irrigation runoff, flows from tile drains, and stormwater runoff. WDRs contain conditions requiring water quality monitoring and corrective actions when impairments are found. Most of the ARB Region is developed and urbanized, except for the northwestern and southern portions of the Region. While actions of agricultural stakeholders are not under the ARB Region’s purview, the Region recognizes the importance of reaching out to these stakeholders and continuing increasing collaboration in the future.</p>

Table 5-4. ARB IRWMP Strategies (contd.)

WQ 3. Reduce source water pollution.

An effective way of managing point and nonpoint source pollution and improving surface water quality is to isolate and/or reduce sources of contamination before these contaminants enter waterways. In contrast to regulations and permits that specifically target agencies, this strategy is dependent upon the general public's behavior and links directly to the need for an increase in awareness. Source pollution reduction is similarly important for agricultural water users as well. Actions that can help reduce source water pollution include, but are not limited to:

- Reducing and controlling the application of pesticides, herbicides, and fertilizer
- Altering the timing of application of pesticides, herbicides, and fertilizer according to irrigation times and amount, or weather
- Managing waste/garbage appropriately so it does not enter waterways
- Maintaining vegetation, buffer strips, water detention areas, and other low impact development (LID) systems between sources of pollution and surface waters to also manage metals, hydrocarbons, and temperature of runoff

Reducing source water pollution is an integral part of overall water pollution management. The success of this strategy, among other water pollution control strategies, can be measured by monitoring improvements in surface water quality.

WQ4. Increase the capture of stormwater runoff for infiltration or reuse where feasible.

Most stormwater and flood management systems are currently designed and operated to capture, channelize, and convey stormwater runoff away from high-value properties and people as rapidly as possible during and after storm events. However, stormwater can also be a resource, if it can be captured and stored. Groundwater basins often provide the most effective means of storing stormwater. Additional benefits of capturing stormwater include the following:

- Increased volume of groundwater in storage regionally for use during shortage periods.
- Attenuation of storm flows. This helps reduce flooding and associated damages to development or habitats in adjacent areas.
- Natural soil treatment processes to remove pollution. This in turn protects and improves receiving water quality and aquatic habitats.

Revising existing stormwater and flood management systems to augment groundwater infiltration will require policy, management, design, and operational modifications. Decentralizing flood management requires collaboration between water and land-use agencies, and potentially making difficult decisions to restrict or redesign development. Decreasing impervious area is one example. Expansion of floodplains and associated habitat creates environmental water needs and requirements. This may necessitate changes in water operations to maintain enough flow for those habitats. Some other examples of efforts to increase infiltration include the following:

- Aquifer Storage and Recovery, where stormwater is artificially pumped into aquifers
- Increasing use of detention ponds or basins.
- Other onsite capture of stormwater using LID techniques

Stakeholders are working to develop a quantifiable target for this strategy for the near future.

Table 5-4. ARB IRWMP Strategies (contd.)

<p>WQ5. Reduce the extent of groundwater contamination, consistent with regulatory cleanup programs.</p> <p>There are several locations in the ARB Region where groundwater resources have been impacted by contamination. Some of these sources of contamination are localized, while others are of regional significance. These contamination locations are currently monitored and controlled, and are being remediated by or at the direction of state/federal government agencies. For example, the Aerojet General Corp., McClellan Air Force Base (AFB), and Mather AFB are accountable under the EPA's Superfund Program (Comprehensive Environmental Response, Compensation, and Liability Act). ARB stakeholders and project proponents need to be aware of these contamination sources and be mindful of ongoing prevention and remediation plans so as not to exacerbate existing contamination plumes. In particular, the water supply agencies should be mindful of groundwater extraction practices that (1) change underlying groundwater elevations (which may remobilize contaminants in the vadose zone of the soil matrix), or (2) change groundwater gradients, which may induce plume migration.</p>
<p>WQ6. Increase use of remediated groundwater for beneficial uses.</p> <p>There are several locations in the ARB Region that have been impacted by groundwater contamination for which there are ongoing and extensive remediation efforts. Remediation efforts entail the extraction of contaminated groundwater, treatment to remove contaminants, and discharge of treated effluent. As contamination impacts the ARB Region's underlying water supplies, it is important to put these remediated waters to beneficial use since some water agencies have had to decommission wells due to groundwater contamination. Depending upon the water quality characteristics of the treated water, remediated water can be used in a variety of ways including landscape irrigation, industrial water, or supplemental supply, in combination with other water supply sources. There are several inter-agency agreements to use remediated water (see Section 2.9.2.1). The ARB Region water agencies should monitor contamination, and they may have to cooperate and expand their remediated water program if further groundwater supplies are impacted. Stakeholders are working to develop a quantifiable target for this strategy for the near future.</p>
<p>WQ7. Coordinate with the CV-SALTS program to identify potential regional issues related to salt and nutrient management.</p> <p>The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) program is a collaborative stakeholder driven and managed program to develop sustainable salinity and nitrate management planning for the Central Valley. Salt, nutrients, (primarily nitrogen and phosphorous), and salinity management are increasingly important water quality and environmental concerns in California. While the ARB Region naturally has lower levels of salts and nutrients compared to other areas of the state, urban and agricultural pollutants are found in the Region's impaired waters. As stated by CV-SALTS, salinity management is needed as part of near and long term sustainable water supply management (CV-SALTS 2013).</p> <p>A related regulation, the State Water Resources Control Board's 2009 Recycled Water Policy aims to address salt and salinity management issues to promote the use of recycled water. All groundwater basins are required to implement Salt and Nutrient Management Plans (SNMP) by 2014. Scientific and regulatory tools developed by CV-SALTS and these SNMPs will be incorporated into the objectives and implementation programs of each California EPA region's Basin Plan.</p> <p>Given the regulatory environment and available resources described above, the ARB Region stakeholders identified a strategy to coordinate with CV-SALTS. This coordination will likely happen through communication and collaboration with SRCSD, a member of the CV-SALTS executive committee and a leader in the CV-SALTS program. Water management agencies that are required to engage in regional salt and nutrient planning efforts per the 2009 Recycled Water Policy will be the most interested in this strategy. This includes groundwater agencies, such as SGA, SCGA and Western Placer County who may want to consider the need for basin assessments of salt and nutrient trends in the future.</p>

Table 5-4. ARB IRWMP Strategies (contd.)

ENVIRONMENTAL RESOURCES STRATEGIES
<p>ER1. Restore functional riparian and wetland habitat.</p> <p>California, and the ARB Region in particular, have lost the vast majority of the wetlands and riparian forests that existed before the Gold Rush. Ecosystem restoration improves the condition of natural landscapes and biological communities to provide for their sustainability and for their use and enjoyment by current and future generations (DWR 2009). Functioning ecosystems are necessary to sustain natural communities.</p> <p>Riparian habitats are in transitional areas between terrestrial and aquatic ecosystems and are distinguished by gradients in bio-physical conditions, ecological processes, and biota. They are areas through which surface and subsurface hydrology connect water bodies with their adjacent uplands. Riparian areas are found throughout the Region adjacent to streams, lakes, and estuarine shorelines. Wetland habitats are areas where water covers the soil, or is present either at or near the surface of the soil. Many wetlands are seasonal and may be wet only periodically. The quantity of water present and the timing of its presence in part determine the functions of a wetland and its role in the environment. Even wetlands that appear dry at times for significant parts of the year—such as vernal pools—often provide critical habitat for wildlife adapted to breeding exclusively in these areas.</p> <p>Restoration of riparian and wetland habitats can provide ecosystem benefits such as water quality improvements, improved in-stream aquatic habitat, recreational opportunities, and increased groundwater recharge. Successful restoration of aquatic, riparian, and floodplain species and communities ordinarily depends upon at least partial restoration of physical processes that are driven by water. These processes include the flooding of floodplains, the natural patterns of erosion and deposition of sediment, the balance between infiltrated water and runoff, and substantial seasonal variation in stream flow.</p> <p>Numerous municipal, watershed management, and environmental organizations are active in restoration efforts throughout the Region, often in collaboration with each other (see Section 2.6.2). These projects and programs are often multi-benefit and include flood management and recreational components. Projects that involve riparian and wetland restoration can be found along Coon Creek, Auburn Ravine, Alder Creek, Laguna Creek (that is a part of the Morrison Stream Group), and the Cosumnes River, among other locations. Stakeholders are working to develop a quantifiable target for this strategy for the near future.</p>
<p>ER2. Conserve functional riparian and wetland habitat.</p> <p>While restoration involves reversing environmental damages, conservation is focused on prevention of damages and the maintenance and protection of existing habitat functions and values. As mentioned in ER1, most original riparian and wetland habitat has been lost. Conserving remaining riparian and wetland habitats in the Region is important for reversing the ongoing trend of environmental decline. Conservation can also prevent the need for more costly restoration in the future. Conservation actions can include acquiring fee title to lands or conservation easements.</p> <p>While Strategies ER1 and ER2 distinguish between restoration and conservation, in practice, projects often include components of both. Agencies identify areas and habitat to conserve from future development, and initiate restoration work as needed on and along those areas. Strategy ER1 and Section 2.6.2 describe some agencies and organizations active in watershed management, habitat restoration, and habitat conservation efforts. Stakeholders are working to develop a quantifiable target for this strategy for the near future.</p>
<p>ER3. Implement local habitat and watershed conservation and restoration plans.</p> <p>ARB Region stakeholders and other entities have established numerous local riparian and wetland habitat and watershed conservation and restoration plans (see Section 2.6.2). Substantial effort, funding, and local expertise has been put into developing these plans, and implementation of these local efforts is one of the most efficient ways to conserve and restore ecosystems in the Region. These plans are collaborative in nature, which is important for maintaining and improving ecosystems on a regional level. Examples of existing local plans include the Auburn Ravine/Coon Creek Ecosystem Restoration Plan, the Placer County Conservation Plan, the South Sacramento County Habitat Conservation Plan, and others.</p>

Table 5-4. ARB IRWMP Strategies (contd.)

ER4. Improve the quality, quantity, and connectivity of habitat communities.

Habitats are the area where an organism lives, including the biotic and abiotic factors that affect it. Ecological communities are composed of populations of different species occupying a particular area, usually interacting with each other and their environment. Riparian and wetland habitats in the Region provide critical ecosystem functions and benefits, but have been reduced in their geographic extent and what remains has been degraded in quality. Large expanses of the ARB Region, and the Central Valley as a whole, lack connectivity between isolated blocks of remaining natural riparian and wetland habitats that support native biodiversity. Habitat connectivity is important for maintaining biological and genetic diversity, allowing seasonal migration or migration in response to habitat losses or climatic shifts, and allowing movement of individual organisms for needed resources. Within the Region, connected riparian corridors are of particular importance.

This strategy can be achieved through restoration or conservation actions, as described in Strategies ER1 and ER2.

ER5. Actively manage the incidence of invasive species.

Nonnative invasive species, which occur in every habitat type throughout the Region, strongly impact sensitive native species. Areas dominated by nonnative weeds prevent native plants from establishing, provide poor habitat quality for wildlife, and discourage recreational uses. Infestations of weed species increase hydraulic roughness during high-flow events, decrease the capacity of floodways, and adversely affect bank erosion and sedimentation processes. Invasive animal species are often able to outcompete native species and impact the food chain.

Active invasive species management can include prevention of invasive species establishment through conservation of existing habitats, regular inspections and monitoring, and eradication programs. Well-designed restoration programs subsequent to eradication are essential to preventing reestablishment of invasive species.

ER6. Increase access, quality, and quantity of anadromous and native fish habitat.

Anadromous fish species are those that migrate from the ocean to spawn in freshwater. In the ARB Region, these species include Chinook and Coho salmon, steelhead, Pacific lamprey, sturgeon, striped bass, shad, and others. Other important native fish species include Sacramento sucker, Sacramento pikeminnow, sculpins (prickly and ruffle), tule perch, and hardhead. Many of these species are state- and/or federally listed as threatened or endangered. They are inhibited by degraded habitat quality (water quality, temperature, and flows), and access to substantial amounts of upstream habitat is impeded by barriers to fish passage. Salmonids provide substantial recreational and cultural value to the Region. Previous efforts to promote spawning in regional streams appear to have been helpful, especially in the American River where spawning gravels have been placed to support in-stream spawning.

This strategy can be accomplished by improving flows, quantity, quality, and temperature of area streams and rivers (Strategy ER1 as well as water quality strategies), and by removal of passage barriers, especially to upstream spawning locations. Save Auburn Ravine Salmon and Steelhead, for example, has been active and successful in forming partnerships with Placer County and Nevada Irrigation District to develop alternative migration paths for salmon around barriers.

Table 5-4. ARB IRWMP Strategies (contd.)

ER7. Improve flows, quality, and temperature of area streams and rivers.

Sufficient in-stream flows, water quality, and temperatures are critical for maintaining aquatic habitats and species in the Region. In-stream flows are needed to protect and preserve resources, such as fish, wildlife, and recreation, in a waterway. Natural flow regimes are important factors in the health of aquatic and riparian ecosystems. Aquatic habitats and species are adapted to specific monthly, seasonal, annual, and inter-annual variabilities in flow. Sufficient flows must be available during the spring and fall months when a variety of anadromous fish are en route to the Sacramento-San Joaquin River Delta (Delta) or upstream spawning and rearing grounds.

In-stream flows also need to meet temperature and water quality standards to support aquatic habitats. Water temperature is a major influence on biological activity and growth, and governs the kinds of organisms that can live in rivers and lakes. Aquatic species have preferred temperature ranges; as temperatures get too far above or below this preferred range, the ability of species to survive or perform life cycle functions (such as spawning) declines. Temperature is also important because of its influence on water quality; dissolved oxygen, an essential water quality parameter for aquatic life, is reduced in elevated water temperatures. Pollutants and sediment concentrations are also important for aquatic life. There are many types of pollutants that can affect aquatic life, including pesticides, toxic chemicals, sediments, and nutrients.

Achieving ER7, by its nature, requires collaborative and integrated resources management, and is dependent on progress in other ARB strategies, such as the following:

Considering environmental flow needs in water operations (such as how dams are operated, see FM4)

Addressing water quality concerns (as described and addressed in water quality strategies)

The ARB IRWMP effort will continue to bring these stakeholders together to address these interdependent concerns.

ER8. Improve groundwater levels to support and improve habitat.

Maintaining sufficiently elevated groundwater levels supports and improves habitat by providing reliable base flows for streams. It also contributes to the supply of water for springs, seeps, and wetlands or for phreatophytes and other vegetation that reduce soil erosion. This strategy can be accomplished through active groundwater management and conjunctive use (see Section 2.6.3), artificial recharge (see Strategy WQ4), and in-lieu recharge projects (requires increases in regional water system efficiency, as discussed for example in Strategy WR4).

Table 5-4. ARB IRWMP Strategies (contd.)

FLOOD MANAGEMENT STRATEGIES
<p>FM1. Provide a 200-year level of flood protection for urban areas by 2025, where feasible.</p> <p>The potential for flooding presents significant risks for many areas in California. Floods can cause substantial economic, social, and environmental damage, as well as the potential for loss of life. Several bills, including Senate Bill 5, were passed by the State Legislature in 2007 adding to and amending state flood management and land-use laws. These laws were intended to improve local land use and other planning decisions by strengthening the link between flood management and land use.</p> <p>As part of the flood management legislation passed in 2007, all cities and counties within the Sacramento-San Joaquin Valley will be required to make findings related to the urban (200-year) level of flood protection before entering into a development agreement for a property, approving a discretionary permit or entitlement for any property development or use, or approving a ministerial permit that would result in construction of a new residence, or approving a tentative map/parcel map for a subdivision (see California Government Code Sections 65865.5, 65962, and 66474.5). This requirement applies to urban and urbanizing areas, as defined by California Government Code Section 65007, Paragraphs (j) and (k).</p> <p>After the Board's adoption of the Central Valley Flood Protection Plan (CVFPP) in 2012, cities and counties within the Sacramento-San Joaquin Valley have up to 24 months to amend local general plans, and 36 months to amend local zoning ordinances to be consistent with the CVFPP. Subsequently, by approximately 2015, cities and counties will be required to make findings regarding an urban level of flood protection when considering decisions about entering into a development agreement for a property, approving a discretionary permit or entitlement for any property development or use, or approving a ministerial permit that would result in construction of a new residence, or approving a tentative map/parcel map for a subdivision. After 2025, for urban and urbanizing areas protected by State Plan of Flood Control (SPFC) levees, cities and counties must find that the new development is protected to at least the urban level of flood protection.</p> <p>The Sacramento-San Joaquin Valley encompasses a larger geographic area than the areas currently protected by facilities of the SPFC (SPFC Planning Area). The ARB Region includes lands within the SPFC Planning Area, outside SPFC Planning Area (but in the Sacramento-San Joaquin Valley), and lands outside the Sacramento-San Joaquin Valley.</p> <p>This strategy recognizes that (1) agencies with flood management and/or land-use responsibilities in the ARB Region will need to work together and with state and federal agencies to meet the requirements of SB 5, (2) there will likely be different ways to achieve an urban level of flood protection and to make a successful finding of such, (3) urban level of flood protection may be determined to be economically infeasible, (4) some agencies may choose to NOT provide an urban level of flood protection, and (5) there are areas in the ARB Region that are outside the Sacramento-San Joaquin Valley.</p>

Table 5-4. ARB IRWMP Strategies (contd.)

FM2. Improve level of flood protection for levee-protected small communities and agricultural lands in the Region, where feasible.

Sizable portions of the ARB Region are devoted to agricultural land uses (see Section 2.5). In 2011, agricultural production in Sacramento, Placer, and El Dorado counties totally nearly \$500 million, contributing to the local and state economies, and providing food and fiber for worldwide consumption (California Department of Food and Agriculture 2013).

The continued viability of small communities is essential to the preservation of cultural and historical continuity and important social, economic, and public services to rural-agricultural populations, agricultural enterprises, and commercial operations. However, physical conditions of the levees and other flood management facilities in the ARB Region are varied.

This strategy recognizes that (1) small communities and rural-agricultural areas will not be required to provide urban level of flood protection (as the name implies), (2) agencies with flood management and/or land-use responsibilities in the ARB Region will need to work together and with state and federal agencies reduce flood risks in small communities and rural-agricultural areas, (3) there will likely be different ways to reduce these flood risks (both structural and nonstructural improvements¹) (4) current federal engineering guidance and design standards may result in cost-prohibitive levee repairs, and (5) flood risk reduction projects that can achieve multiple resource benefits will likely be preferable to single-purpose projects and may provide greater long-term value.

FM3. Promote restoration and conservation of floodplain function.

Floodplain restoration is the process of recovering the natural hydrologic, geomorphic, and biological functions and resources of an area adjacent to a stream or river that experiences occasional or periodic flooding. Floodplain restoration is often accomplished by reconnecting the floodplain to the stream or river through the removal of physical or human-made barriers. Restoring floodplains includes the attenuation of flows and enhancement of floodway capacities, the promotion of diverse habitats for aquatic and terrestrial species, the improvement of water quality, and the increased recharge of groundwater. Floodplains also support agricultural production, recreational opportunities, and scientific study and education. Floodplain restoration also reduces the potential for increased flood risks and damages over time associated with unwise commercial or residential development within floodplains.

In the ARB Region, floodplains provide a broad area to spread out and temporarily store floodwaters. This attenuates flood peaks and reduces velocities and the potential for erosion. One acre of floodplain land flooded 1 foot deep holds 325,851 gallons of water. The natural and beneficial functions of floodplains should be valued and considered in future integrated water management projects and programs. Examples of ongoing floodplain restoration efforts in the ARB Region include those in the Lower Cosumnes River Floodplain, Lower Dry Creek Floodplain, North Laguna Creek Watershed, and Cross Canal Watershed.

Conservation is included here as a means of emphasizing the need to restrict development into existing, functioning floodplains.

Table 5-4. ARB IRWMP Strategies (contd.)

FM4. Support a Folsom Dam Water Control Manual update that balances flood control, water, environmental and recreational needs.

Folsom Dam and Reservoir is a multipurpose project (flood risk management, water supply, hydroelectricity, water quality, fish and wildlife preservation, and recreation) operated by the Reclamation as part of the CVP. The U.S. Army Corps of Engineers (USACE) is responsible for prescribing operations pertaining to use of the storage allocated for flood risk management. The dam provides flood risk management benefits to the City of Sacramento and its surrounding areas by regulating runoff from approximately 1,860 square miles of drainage area.

The Folsom Dam Joint Federal Project, consisting of a new auxiliary spillway currently under construction, will improve the ability of Folsom Dam to manage large flood events. To fully realize the benefits of the new auxiliary spillway, the current Folsom Dam and Reservoir Water Control Manual must be updated.

The purpose of the ongoing update effort is to identify, evaluate, and recommend changes to the flood management operation rules of Folsom Dam and Reservoir that would reduce flood risk to the Sacramento area by using the new auxiliary spillway and by incorporating an improved understanding of the American River watershed upstream from Folsom Dam. The findings of the evaluation will be used to help define the dam's new flood operations plan, with the intention of meeting flood risk management objectives in a manner that conserves as much water as possible and maximizes all authorized Folsom Dam project uses to the extent practicable. A number of flood management operation alternatives are expected to be developed and the effect of those alternatives on Folsom Dam and Reservoir's other authorized purposes will be analyzed in an Environmental Impact Statement/Environmental Impact Report.

This strategy recognizes that (1) proposed alternatives could have significant effects on the other authorized purposes of the project, and (2) a balanced manual update will be critical to achieving the ARB IRWMP goals.

FM5. Coordinate with inter-jurisdictional, regional flood management efforts.

Developing and implementing integrated, multi-benefit projects often involves (1) a large number of local, regional, state, and federal agencies with complex and overlapping jurisdictional roles and responsibilities, inconsistent policies and regulations, and multiple management goals, and (2) a continual investment in stakeholder and public education and engagement. Projects with a flood management component often have effects both upstream and downstream, further expanding the geographic scope of the coordination effort. Flood management functions within a single geographic area may be carried out by a combination of city and county planning and public works departments, drainage districts, water supply districts, joint powers authorities, and others. Coordinating activities within this fragmented jurisdictional landscape can be challenging and costly, particularly for local entities.

Participants in the ARB IRWMP Governance Structure are involved in the ongoing Lower Sacramento & Delta North Regional Flood Management Plan (RFMP) effort, described in Section 2.7. At a minimum, this regional plan should include (1) an informational atlas describing the regional setting and available information, (2) a vision of flood management for the region, (3) a prioritized list of potential local/regional projects consistent with the 2012 CVFPP, and (4) a financial plan that includes local funding strategies and considers financial feasibility. Some of the outcomes of this regional plan will be reflected in the ARB IRWMP projects database as well as in future updates of this plan.

Outside the geographic scope of the Lower Sacramento & North Delta RFMP effort, RWA as the RWMG, participants in the Governance Structure, and project proponents have a long history of coordinating across geographic and jurisdictional boundaries in support of effective flood management and land-use planning.

Table 5-4. ARB IRWMP Strategies (contd.)

FM6. Coordinate flood emergency planning and response efforts.

Flood emergency planning and response is an element of residual risk management. It involves preparing for floods, effectively responding to flood events, and quickly recovering when flooding occurs. Often the first responders, local agencies play a key role in the management of flood emergencies in their jurisdictions. However, coordinated flood planning and operations among local agencies, cities and counties, the California Emergency Management Agency, the State-Federal Flood Operation Center, and USACE are critically important in successfully managing and fighting floods, and saving lives and properties.

California Water Code Section 9621 requires that each county in the Sacramento-San Joaquin Valley collaborate with cities within its jurisdiction to develop a flood emergency plan within 24 months of the adoption of the CVFPP. In addition, to qualify for Federal Emergency Management Agency (FEMA) disaster funds, local agencies are required to prepare a Multi-Hazard Mitigation Plan, called an Emergency Action Plan, which includes planning for all potential emergencies in their jurisdictions, including flood emergencies.

This strategy recognizes that (1) without proper planning, interagency coordination during a flood emergency can be disorganized and inefficient, (2) conflicting policies amongst agencies can lead to delayed response and recovery activities, and (3) in many cases, local agencies do not have sufficient resources to effectively prepare for and respond to major floods (DWR 2012c).

COMMUNITY STEWARDSHIP STRATEGIES

CS1. Increase availability and access to educational material on sustainable water resources.

Widespread awareness of the need to manage water resources sustainably is critical to develop, select, and implement effectively integrated projects and programs. Education of both citizens and natural resources managers across jurisdictional lines and differing fields will help develop a stronger common vision and goals. A common understanding provides support for and promotes sustainable, integrated projects. Availability and access to educational materials is one method that supports continued education of citizens and resource managers alike.

Educational material could be public-friendly Web sites or fliers and brochures that could be distributed. Currently, RWA's WEP, for example, maintains a user-friendly Web site on water use efficiency and also provides educational classes. Watershed management groups and environmental organizations often incorporate outreach and education into their programs and associated efforts. Additionally, educational material such as informational signs could be placed near a project (e.g., a trail or a well site) with an explanation of how that water-related facility is a part of the larger water and sustainability picture and how it influences each citizen. Developing materials suitable for use directly in classrooms may also be important.

Table 5-4. ARB IRWMP Strategies (contd.)

CS2. Identify, summarize, and discuss the potential for partnering of existing regional outreach and education programs by 2015.

Working to leverage existing regional outreach and educational programs in the Region is a strategy focused on encouraging community stewardship of water and natural resources among citizens in the Region. These efforts include those being undertaken by local and regional water entities, as well as other local, state, federal, and non-government organizations that promote outreach to disadvantaged citizens, and public water education. This can include public events, including Earth Day and Creek Week, volunteer clean up initiatives of local waterways, classroom presentations, and regional water efficiency programs.

By cataloguing and tracking existing regional outreach and education programs in the community, the ARB Region can find and leverage relationships between community-based organizations, the local water community, elected officials, and media organizations. For instance, through this IRWMP's Opti Web site's announcements and calendar, regional entities can communicate and collaborate on upcoming events and programs. RWA is also planning to update its strategic plan, which may include an evaluation of its current programs.

Every public participation effort in the Region strengthens the relationship of the community to water resources, and builds upon existing partnerships in the Region. Regional water agencies and other organizations looking to reach out to citizens can maximize their impact and effectiveness by partnering and sharing local knowledge, expertise, and resources. The benefits of an engaged and educated community include better planning in communities, more diverse and meaningful public participation, and building better connections between people and the planet.

CS3. Identify natural recharge areas and relay that information to relevant land-use planning agencies by 2015.

Protecting natural groundwater recharge areas to facilitate and promote groundwater infiltration is important to maintain and protect groundwater levels and groundwater quality. Various infiltration investigations have occurred in the past, and water agencies can continue to study and identify the areas with soil/ground characteristics in their respective service areas that promote infiltration. However, only agencies with land-use planning authority (cities and counties) have the ability to make land decisions. This strategy specifically addresses the need for broader knowledge on the issue of regional groundwater infiltration and sets a deadline for communicating with land-use planning agencies about identified recharge areas. Efforts may continue thereafter to develop a common understanding with land-use planning agencies and to ensure the areas' protection into the future.

CS4. Promote the use of Low Impact Development (LID) methods, where appropriate.

According to the EPA, LID is "an approach to land development (or re-development) that works with nature to manage stormwater as close to its source as possible" (2013). LID could involve preserving landscape features, minimizing impervious areas, and onsite capturing rainwater/stormwater for later reuse or groundwater infiltration. Effective decentralized stormwater management delays and attenuates peaks of high water flows and improves water quality. This in turn protects receiving water quality and ecosystem habitats from degradation.

A review of other regions implementing LID suggests that water managers, stormwater agencies, and land-use agencies need to work together well before attempting to implement a LID program. This strategy, therefore, intends to increase communications and to support manuals, zoning, and other regulations that would support LID. Education and support for these practices could become a part of water efficiency outreach.

Table 5-4. ARB IRWMP Strategies (contd.)

CS5. Provide annual updates to city and county governments and other local agencies on accomplishments and continued challenges of integrated water management.

The various discussions that took place in developing the ARB Region goals, objectives, and strategies attested to the increasingly integrated nature of water and land resources as well as economics and people. The ARB Region recognizes that water management is getting more complex and thus more discussion across traditionally separate disciplines is imperative for understanding and eventual success in integrated water resources management. Dialogue must continue and increase in frequency into the future. This strategy, therefore, delineates that city and county governments will be provided with updates of integrated water management efforts yearly. This communication will lead to greater understanding and better integration of local/regional efforts in water management.

CS6. Increase engagement of community leaders (e.g., using community-based social marketing where applicable).

Increasing the effectiveness of engagement to community leaders is critical to the future of the ARB Region. Elected officials, representatives of disadvantaged communities, and the business community all have a stake in the success and overall health of the ARB Region. By reaching out to these community leaders and inviting them to participate in the planning process and stakeholder forums, leaders and the organizations they represent can help build and sustain regional knowledge and skills, recruit for volunteer efforts, networks, and partnerships that contribute to promote the health and sustainability of natural resources.

Community-based social marketing can be described as a strategy that can help motivate communities, businesses, individuals, and institutions to foster behaviors that support sustainability. This could include reducing lawn watering, promoting safe disposal of household contaminants, or backyard composting. Social marketing retains the focus on customers that is the center of the more commonly known “commercial marketing,” but differs in that the tools and concepts promote social goals (like the triple bottom line). Actions can include but are not limited to; print and radio advertisements, e-mail distributions and online content. Engaging community leaders effectively is imperative to effectively working with the customers and communities that the Region would like to engage in these programs that promote community stewardship.

Note:

¹ Nonstructural improvements—Projects that are intended to reduce or eliminate susceptibility to flooding by preserving or increasing the flood-carrying capacity of floodways, and include such measures as levees, setback levees, floodproofing structures, and zoning, designating or acquiring flood prone areas. (California Water Code Section 79068(a))

Structural improvements—Are projects that are intended to modify flood patterns and rely primarily on constructed components and include such measures as levees, floodwalls, and improved channels. (California Water Code Section 79068(b))

The development of these strategies was an iterative process. The Planning Forum members (ARB stakeholders) thought some of the proposed strategies involved important ideas and concepts, but could not be currently developed. The reasons include lack of authority over the particular area of water management or a lack of information available at this time to form a strategy. Additionally, some stakeholders proposed new strategies following the public review draft release of the ARB IRWMP, and these new strategies need to be vetted with all stakeholders in the Planning Forum. All these strategies that are in development were placed in a “Parking Lot,” as shown in **Table 5-5**. Specific ARB stakeholders are currently exploring and developing these strategies, and the strategies are expected to be added to the IRWMP in the near future. New strategies can be formally added to the IRWMP on a quarterly basis following a vetting process with the ARB stakeholders.

Table 5-5. ARB IRWMP Strategy “Parking Lot”

Item	Description
1. WR: Conjunctive use	Conjunctive use has a long history in the ARB Region. Conjunctive use was a principal means to implement the WFA and to preserve portions of dry year surface water supplies for environmental needs. However, while many features of the regional conjunctive use program are planned or have been built by agencies or agency partnerships, full regional system integration is forthcoming. In time, and with additional funding full integration will be accomplished.
2. WR: Implementation of cost-effective BMPs in UWMPs	Other strategies identified the need for increased water conservation and to comply with state law to reduce per capita demand. Regional water agencies have discussed the need to identify which BMPs are effective in this Region in meeting this target and to develop a strategy that was more customized to the ARB Region. At the time of the adoption of this IRWMP Update, this strategy is still under development.
3. WR: Non-revenue water reduction	Non-revenue water is defined by the American Water Works Association as the “distributed volume of water that is not reflected in customer billings” (2013). Non-revenue water generally falls into one of these three categories: unbilled authorized consumption (water used for firefighting, hydrant flushing, etc.), apparent losses (meter inaccuracies, data handling errors, etc.) and real losses (system leakage, storage tank overflows, etc.). ARB water suppliers are investigating a strategy to focus on reducing non-revenue water associated with apparent losses and real losses through comprehensive system audits. Practices to reduce this water loss could include targeted leak detection and repair, systemwide metering, replacement of inaccurate meters, and billing systems upgrades.
4. WR: Regional and local water-energy relationships and opportunities to achieve greater resource efficiency	<p>The water-energy nexus is a term used to describe the dynamic relationship between water and energy. It takes water to produce energy and energy to produce water. For an individual water agency, energy use is often the highest operating expense, exceeding labor expenses; therefore, reducing energy use can reduce costs while saving water.</p> <p>ARB water suppliers recognize the importance of better understanding their energy use. This information would help many agencies prioritize infrastructure replacements, adjust revenue requirements, optimize use of different supply sources, and plan for long-term future demand. Coupling energy and water use data can also strengthen funding proposals and lead to cost-sharing partnerships between the water and energy sectors. A concrete strategy to evaluate this water-energy relationship will be developed in the near future.</p>

Table 5-5. ARB IRWMP Strategy “Parking Lot” (contd.)

Item	Description
<p>5. WR: Regional data management system for water supply systems</p>	<p>The ARB water supply agencies recognize that water supply infrastructure and efficiencies can be improved region-wide only with support from adequate and consistent data collection and analyses across various entities. Such a data management system would be integral also to implementing an efficient and effective conjunctive use program. As meters are installed throughout the Region, this system would additionally help determine the effect of new rate structures on the long-term stability of the entire water supply system. This suggested new strategy will be developed in the next quarter of IRWMP implementation.</p>
<p>6. WR: Peak demand reduction</p>	<p>Peak demand is the highest water use experienced by a water supply system, measured on an hourly, daily, monthly, or annual basis (Vickers 2001). Reducing peak demand is one way a water agency can decrease operational cost; reduce energy, chemical, and water use; and increase supply reliability. It also allows agencies to afford more replacement and rehabilitation of aging infrastructure rather than expand or build new infrastructure, which would require future investments in operations and maintenance (O&M). The ARB water agencies may consider and develop this strategy as both O&M costs and the need to refurbish existing infrastructure increases. Conserving water is necessary for utilities to keep water rates reasonable.</p>
<p>7. WQ: State Water Resources Control Board Biological Objectives</p>	<p>The State Water Resources Control Board is currently developing Biological Objectives for freshwater streams in California. These objectives will help improve water quality using biological characteristics as a measure. The ARB Region is aware of Biological Objectives and intends to, monitor and incorporate objectives into the IRWMP as applicable.</p>
<p>8. CS: Outreach strategy related to agricultural water management and efficiency</p>	<p>The southern portions of Sacramento County and western Placer County have strong agricultural interests and associated private water use. However, these areas are not required to develop Agricultural Water Management Plans. The ARB Region recognizes outreach to these interests is necessary moving forward.</p>
<p>9. (N/A): Quantification of certain strategies</p>	<p>The ARB Region recognizes that quantifiable, measurable strategies are important whenever possible, so the Region can objectively measure progress during implementation. Some of the above strategies are qualitative at the time of the adoption of this IRWMP out of necessity (the strategy is not quantifiable) or out of lack of experience. In the latter case, numeric targets will be developed as experience is gained and is anticipated in the next update of strategies.</p>

Key:
 ARB = American River Basin
 BMP = Best Management Practices
 IRWMP = Integrated Regional Water Management Plan
 UWMP = Urban Water Management Plan
 WFA = Water Forum Agreement

Table 5-6. Relationships of ARB IRWMP Strategies and Objectives

Strategies	Objectives																
	Meet current and future water resources needs.	Increase water use efficiency.	Improve ability to reliably meet water demands during dry or emergency conditions.	Increase the use of recycled water for appropriate uses.	Remediate contaminated groundwater and reuse it to the extent feasible.	Improve protection of beneficial uses of surface water and groundwater.	Recharge and reuse stormwater and urban runoff to the extent practicable.	Maintain and improve the ecosystem function of area streams and watersheds.	Maintain and improve habitat of area watersheds.	Conserve natural riparian buffers in undeveloped portions of local watersheds and restore buffers in developed areas when possible.	Increase the capacity of the flood management system to meet applicable standards for designated areas and land-uses.	Maintain and improve levees and other flood related infrastructure to reduce flood risk.	Maintain and restore/reconnect floodplains to provide flood storage and other benefits.	Improve management of residual flood risks.	Increase awareness of the need for, benefits of, and practices for maintaining sustainable water resources.	Improve integration of water resources planning with land-use planning.	Increase sharing of information, studies, and reports to further advance integrated regional water management.
WR1. Increase surface water treatment capacity to 800 MGD by 2030	•																
WR2. Increase groundwater production capacity to 550MGD by 2030.	•		•														
WR3. Increase distribution system water storage capacity to 525 MG by 2030.	•	•	•														
WR4. Improve connections between water systems in the Region for greater operational flexibility.	•	•	•														
WR5. Increase use of recycled water to 55,000 acre-feet per year by 2030.	•	•	•	•													
WR6. Implement water conservation to reduce regional per capita water use by 20% by 2020.	•		•														
WQ1. Meet all appropriate treatment standards and discharge requirements for wastewater treatment.	•					•											
WQ2. Meet all nonpoint discharge requirements.	•					•											
WQ3. Reduce source water pollution.	•					•											
WQ4. Increase the capture of stormwater runoff for infiltration or reuse where feasible.	•						•										
WQ5. Reduce the extent of groundwater contamination, consistent with regulatory clean-up programs.	•					•											
WQ6. Increase use of remediated groundwater for beneficial uses.	•				•												
WQ7. Coordinate with the CV-SALTS program to identify potential regional issues related to salt and nutrient management.	•					•											•
ER1. Restore functional riparian and wetland habitat.	•					•		•	•	•							
ER2. Conserve functional riparian and wetland habitat.	•					•		•	•	•							
ER3. Implement local habitat and watershed conservation and restoration plans.	•					•		•	•	•							

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Table 5-6. Relationships of ARB IRWMP Strategies and Objectives (contd.)

Strategies	Objectives																
	Meet current and future water resources needs.	Increase water use efficiency.	Improve ability to reliably meet water demands during dry or emergency conditions.	Increase the use of recycled water for appropriate uses.	Remediate contaminated groundwater and reuse it to the extent feasible.	Improve protection of beneficial uses of surface water and groundwater.	Recharge and reuse stormwater and urban runoff to the extent practicable.	Maintain and improve the ecosystem function of area streams and watersheds.	Maintain and improve habitat of area watersheds.	Conserve natural riparian buffers in undeveloped portions of local watersheds and restore buffers in developed areas when possible.	Increase the capacity of the flood management system to meet applicable standards for designated areas and land uses.	Maintain and improve levees and other flood related infrastructure to reduce flood risk.	Maintain and restore/reconnect floodplains to provide flood storage and other benefits.	Improve management of residual flood risks.	Increase awareness of the need for, benefits of, and practices for maintaining sustainable water resources.	Improve integration of water resources planning with land-use planning.	Increase sharing of information, studies, and reports to further advance integrated regional water management.
ER4. Improve the quality, quantity, and connectivity of habitat communities.	•							•	•								
ER5. Actively manage the incidence of invasive species.	•							•	•								
ER6. Increase access, quality, and quantity of anadromous and native fish habitat.	•							•	•								
ER7. Improve flows, quality, and temperature of area streams and rivers.	•					•		•	•								
ER8. Improve groundwater levels to support and improve habitat.	•							•	•	•							
FM1. Provide a 200-year level of protection for urban areas by 2025, where feasible.	•									•							
FM2. Improve level of protection for levee-protected small communities and agricultural lands in the Region, where feasible.	•									•							
FM3. Promote restoration of floodplain function.	•									•		•		•			
FM4. Support a Folsom Dam Water Control Manual update that balances flood control, water, environmental and recreational needs.	•	•	•			•		•	•	•							
FM5. Coordinate with inter-jurisdictional, regional flood management efforts.	•									•	•	•	•		•	•	
FM6. Coordinate flood emergency planning and response efforts.	•												•				
CS1. Increase availability and access to educational material on sustainable water resources.	•													•			
CS2. Identify, summarize, and discuss the potential for partnering of existing regional outreach and education programs by 2015.	•													•			
CS3. Identify natural recharge areas and relay that information to relevant land-use planning agencies by 2015.	•					•	•								•		
CS4. Promote the use of Low Impact Development (LID) methods, where appropriate.	•					•	•	•	•					•	•	•	
CS5. Provide annual updates to city and county governments and other local agencies on accomplishments and continued challenges of integrated water management.	•													•	•	•	
CS6. Increase engagement of community leaders (e.g., using community based social marketing where applicable.)	•													•		•	

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5.6.1. Resource Management Strategies and ARB Strategies

To assist IRWM regions meet their water-related resource management needs, the California Water Plan (CWP) outlines a diverse set of resource management strategies (RMS). An RMS is “a project, program, or policy that helps local agencies and governments manage their water and related resources” (DWR 2009). RMSs are treated as tools in a tool kit-the appropriate combination of tools should be used in each region, depending on that region’s needs and circumstances.

The ARB Region stakeholders used CWP 2009 RMSs to inform the collaborative development of ARB Region specific strategies. **Table 5-7** presents RMSs per RMS topic area and its applicability to the ARB Region for the Region’s current set of strategies. There are a few new RMSs expected for the 2013 update of the CWP, and are presented at the end of **Table 5-7**.

Table 5-7. Resource Management Strategies and Applicability to the ARB Region

CWP RMS	Applicability	Description	Applicable ARB Strategies
RMS Topic: Reduce Water Demand			
Agricultural Water Use Efficiency	Pending	Private agriculture can be found throughout the state, especially in undeveloped areas of western Placer County and southern Sacramento County. Outreach to these individuals and entities is important to encourage participation in regional planning.	Parking Lot Item 8
Urban Water Use Efficiency	Applicable	Water conservation is an important component of demand management in the ARB Region. RWA has a Water Efficiency Program targeting the public, and individual water suppliers implement other conservation programs, such as BMPs established by the CUWCC. State law requires decreasing urban per capita water use by 20 percent by year 2020 (see Section 2.9.1).	Strategy WR6, CS1, CS2
RMS Topic: Improve Operational Efficiency and Transfers			
Conveyance – Delta	Not Applicable	The ARB Region is not dependent of water conveyed through the Delta. As described in Section 2.3, The Region does have a point of diversion within the legal Delta, but the Region does not rely on Delta-conveyance for its supply.	N/A
Conveyance – Regional/Local	Applicable	Numerous water agencies share water treatment and distribution infrastructure. Maintenance of old systems, construction of new capacities, and improvements in connections between water systems are important in the ARB Region for efficiency, planned growth, and water reliability in dry years.	Strategy WR1, WR2, WR3, WR4

Table 5-7. Resource Management Strategies and Applicability to the ARB Region (contd.)

CWP RMS	Applicability	Description	Applicable ARB Strategies
System Reoperation	Applicable	System operational efficiency is important for water agencies. New infrastructure will provide additional opportunity for increased operational flexibility. Folsom Dam operations are not under local or regional control, but the ARB Region sees active participation in the dam's water control manual update to be critical in the near future.	Strategies WR4, FM4
Water Transfers	Applicable	Local water transfer agreements have been signed within the Region following the WFA. For example, some agencies with access to groundwater have agreed to share portions of their dry year surface water allocation to those without groundwater supplies.	Strategy WR2
RMS Topic: Increase Water Supply			
Conjunctive Management and Groundwater Storage	Applicable	One of the main efforts following the WFA was a regional conjunctive use program to effectively store water supplies underground for use in dry years. Conjunctive improvements continue to be constructed. The potential to use additional recycled water supplies supporting further conjunctive use will be studied in the near future.	Strategy WR2, WR5, WQ5
Desalination	Not Applicable	The ARB Region currently does not use, nor plan to use, desalinated water.	N/A
Precipitation Enhancement	Not Applicable	Precipitation enhancement is not performed nor is it practical within the ARB Region. However, Sacramento Municipal Utility District has had a cloud-seeding program since 1968 in the upper watersheds of the American River. Pacific Gas and Electric Company has also had similar programs in the Sacramento River watershed. Being downstream from these areas, the ARB Region would be affected by any benefits (increased water supply and power) and impacts from these programs.	N/A
Recycled Municipal Water	Applicable	Several water agencies currently produce and use recycled water for irrigation purposes. The ARB Region expects increased recycled water production due to NPDES permit changes and is engaged in facilitating additional distribution system capacity for increased use regionally.	Strategy WR5, WQ7
Surface Storage – CALFED	Not Applicable	Shasta Lake influences Sacramento River flows as well as operation of other CVP facilities, including Folsom Dam. However, the ARB Region does not expect CALFED projects to materially affect water supply availability or quality in the Region.	N/A

**Table 5-7. Resource Management Strategies and Applicability to the ARB Region
(contd.)**

CWP RMS	Applicability	Description	Applicable ARB Strategies
Surface Storage – Regional/Local	Not Applicable	With the proximity of major storage facilities in the Region, increased surface storage regionally and locally has not been investigated in decades. However increasing efforts in stormwater management may have an indirect benefit to water supplies.	N/A
RMS Topic: Improve Water Quality			
Drinking Water Treatment and Distribution	Applicable	Water treatment and distribution are established practices for protecting public health. Water supply agencies have ongoing projects and programs to ensure safe and adequate drinking water.	Strategies WR1, WR2, WR3
Groundwater Remediation/ Aquifer Remediation	Applicable	Groundwater contamination plumes are a significant threat to groundwater supplies in the Region. Containing, remediating, and finding appropriate uses for remediated groundwater is an ongoing effort.	Strategies WQ5, WQ6
Matching Quality to Use	Applicable	Using recycled water and remediated water for nonpotable uses can offset traditional potable water demands. Both water sources are produced and reused in the ARB Region	Strategies WR5, WQ6
Pollution Prevention	Applicable	The ARB Region recognizes the importance of managing source water pollution, especially as TMDLs and salt and nutrient management become increasingly central issues. One strategy directly addresses source pollution prevention. Stormwater agencies, such as the Sacramento Stormwater Quality Partnership, provide outreach and education to the public to encourage water quality protection.	Strategy WQ3
Salt and Salinity Management	Applicable	Salt and salinity management is important for water management agencies across the ARB Region. SRCSD is an executive committee member of the CV-SALTS program, and one ARB strategy focuses on the need to leverage this opportunity and identify regional salt and nutrient issues. SGA is planning a study of salt and nitrate trends in its groundwater basin. Recycled water producers anticipate developing salt and nutrient management plans in the near future.	Strategies WQ1, WQ2, WQ3, WQ7
Urban Runoff Management	Applicable	Urban runoff management is important to manage local flooding and to protect water quality in receiving waters. Municipalities in the ARB Region manage runoff and develop stormwater management plans. One ARB strategy promotes Low Impact Development, and another encourages runoff infiltration and reuse.	Strategies WQ4, CS4

Table 5-7. Resource Management Strategies and Applicability to the ARB Region (contd.)

CWP RMS	Applicability	Description	Applicable ARB Strategies
RMS Topic: Improve Flood Management			
Flood Risk Management	Applicable	Significant portions of the City of Sacramento and other nearby low-lying areas or stream corridors are within FEMA-designated floodplains. Improving flood management is a priority within the ARB Region. Current projects involve both infrastructure improvements/construction as well as conservation easements/ floodplain property acquisitions. Six ARB strategies address regional flood concerns.	Strategies FM1, FM2, FM3, FM4, FM5, FM6
RMS Topic: Proactive Resources Stewardship			
Agricultural Lands Stewardship	Applicable	Open/agricultural land conservation is important socially and economically in the ARB Region. Land-use agencies carefully consider agricultural land preservation to balance urban development rates. The Placer Legacy is a county-wide open space and habitat protection program. Sacramento County currently has a working draft of the South Sacramento Habitat Conservation Plan. The Cosumnes River Preserve is also active in land stewardship along the Cosumnes River.	Strategies ER2, ER3, ER4
Economic Incentives (Loans, Grants, and Water Pricing)	Applicable	Economic incentives influence water management in the ARB Region. Region-wide agencies, such as RWA and SAFCA, have been effective in securing grants and/or leveraging state or federal programs to plan and implement projects and programs. Water and power agencies, in turn, have established and continue to improve economic incentives for their customers to promote water conservation. For example, RWA's WEP includes a rebate program to encourage consumers to purchase water efficient appliances.	Strategy WR6
Ecosystem Restoration	Applicable	Since the WFA, water management issues in the ARB Region have been intricately linked with environmental interests and needs. Discussion continues for establishing minimum flow requirements on the lower American River, and numerous watershed organizations are active in this Region. Land preservation and stewardship are important in western Placer County and southern Sacramento County as well.	Strategies ER1, ER2, ER3, ER4, ER5, ER6, ER7, FM4

**Table 5-7. Resource Management Strategies and Applicability to the ARB Region
(contd.)**

CWP RMS	Applicability	Description	Applicable ARB Strategies
Forest Management	Not Applicable	While some portions of the ARB Region are forested, most of the upstream forested areas lie within the neighboring CABY IRWM Region.	N/A
Land-Use Planning	Applicable	Land-use planning is inextricably tied to water resources planning. Some water agencies (cities and counties) have land-use authority, and Sacramento and Placer counties have policies and practices that limit urban development relying strictly on groundwater use. Water managers work closely with land-use managers on floodplain issues and evaluating lands for use in meeting ecosystem goals.	Strategies CS3, CS4, CS5, CS6
Recharge Area Protection	Applicable	The surface of the ARB Region is overlaid by various improved (paved) and unimproved surfaces including rural lands, and open space. Numerous projects have studied the effectiveness of protecting known groundwater recharge areas. The Region developed a strategy to identify natural recharge areas and to notify land-use agencies of recharge protection.	Strategy CS3
Water-Dependent Recreation	Applicable	The ARB Region enjoys vast opportunities for water-dependent recreation and has purposefully designating certain lands to recreation For example: the American River Parkway and recreation along Folsom Lake. Integrating recreation and public access into project and ecosystem management allows the public to enjoy open space. It can also provide education to the public about the Region's water supply and ecosystem. Multiple projects and programs for the ARB Region explicitly include recreation and public access elements.	Strategies ER7, CS1
Watershed Management	Applicable	The IRWM planning process promotes integrated watershed management that crosses jurisdictional and political boundaries. The ARB Region also encompasses numerous smaller watersheds, some of which have established watershed management groups. Collaborative watershed management will continue to gain importance in the ARB Region, in line with water quality, flood, and ecosystem priorities.	Strategies WQ2, WQ3, ER3, ER7, FM4, FM5, CS4

Table 5-7. Resource Management Strategies and Applicability to the ARB Region (contd.)

CWP RMS	Applicability	Description	Applicable ARB Strategies
RMS Topic: Other RMSs			
Crop Idling for Water Transfers	Not Applicable	The Region does not currently recognize the need for crop idling for water transfers.	N/A
Dew-vaporation or Atmospheric Pressure Desalination	Not Applicable	The Region does not currently recognize a need for any form of desalination for water supply.	N/A
Fog Collection	Not Applicable	The Region does not currently recognize a need for fog collection for water supply.	N/A
Irrigated Land Retirement	Not Applicable	Irrigated land retirement occurs through market based, economic forces and through land-use planning actions. The Region does not currently recognize a need for forced retirement of irrigated land for water supply.	N/A
Rain-fed Agriculture	Not Applicable	Crops that receive their full water supply from rainfall are generally economically impractical in the ARB Region due to hot summers and the lack of significant rainfall in the summer and fall months.	N/A
Waterbag Transport/Storage Technology	Not Applicable	This strategy is considered impractical in the ARB Region, and would require coastal infrastructure to divert, onload, transport, and offload the waterbags.	N/A
RMS Topic: Anticipated New RMSs for CWP 2013			
Sediment Management	Applicable	Sediment management is a particular concern for stormwater and flood management and for water quality concerns in smaller streams. Stormwater management plans as well as ecosystem or watershed plans throughout the Region include actions on sediment management.	Strategies WQ3, ER7, FM4, CS4
Water and Culture	Applicable	Infrastructure history, such as the building of Folsom Dam as a part of the CVP has cultural significance in the ARB Region. Sacramento originally developed as a regional hub in part because of proximity to water transportation; this history is preserved in Old Town Sacramento. The relative abundance of water regionally was also important to native American tribes that relied on local water supplies.	Strategies CS1, CS5, CS6

**Table 5-7. Resource Management Strategies and Applicability to the ARB Region
(contd.)**

CWP RMS	Applicability	Description	Applicable ARB Strategies
Outreach and Education	Applicable	Community Stewardship is one of five identified goals in the ARB Region. This goal includes both outreach and education of the public as well as better communication and integration among the various water resources managers.	Strategies CS1, CS2, CS4, CS5, CS6

Key:

ARB = American River Basin CABY = Cosumnes, American, Bear, and Yuba CALFED = California Federal Bay-Delta Program CUWCC = California Urban Water Conservation Council CVP = Central Valley Project CV-SALTS = Central Valley Salinity Alternatives for Long-Term Sustainability FEMA = Federal Emergency Management Agency IRWMP = Integrated Regional Water Management Plan	NPDES = National Pollutant Discharge Elimination System OCAP = Operations Criteria Plan RMS = Resources Management Strategies RWA = Regional Water Authority SGA = Sacramento Groundwater Authority SRCSO = Sacramento Regional County Sanitation District SAFCA = Sacramento Area Flood Control Agency WEP = Water Use Efficiency Program WFA = Water Forum Agreement
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5.7. Project Submission, Review, and Communication Process

The ARB Region vision, goals, objectives, and strategies are implemented by projects or programs that are led by project proponents in the Region. The Region, therefore, has an interest in knowing the variety of potential projects and ideas in the Region and identifying projects that would be in the regional interest to help implement, should such an opportunity arise. The ARB project review process was developed with input from stakeholders, so that the process would be fair, understandable, and aligned with the Framework elements. This process has been also approved by the Advisory Committee. This process is presented with descriptions of the project submission process, project review process, and communication process.

5.7.1. Project Submission Process

Successful IRWM planning and implementation requires the identification of, and collaboration on, projects of regional significance. This is intended to be a "living process" that continues after formal adoption of the IRWMP and project implementation. To support the process over the long term and to provide an easy-to-use tool for stakeholders to enter their projects and collaborate with other stakeholders, the ARB IRWMP developed a Web site to serve as an on-line planning tool and information center (also known as "Opti"), which is available at <http://irwm.rmcwater.com/rwa/login.php>. Screen shot are shown in **Figures 3-1** and **3-2**. The Opti user guide is available by clicking on the help icon on the site. Opti was developed with a committee of stakeholders to ensure the functions were user friendly and that a project could be entered by stakeholders without extensive computer or engineering backgrounds while

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maintaining data integrity. One part of the Opti submission form is shown in **Figure 5-3**. A paper copy of the project input form is also available to stakeholders that are unable to use the Web site.

The screenshot shows a web browser window titled "Add Project". The form has a navigation bar with tabs: "Project Info", "Contact", "Description", "Benefits", "Objectives", "Feasibility", "Cost/Funding", and "Other Considerations". The "Project Info" tab is selected. Below the tabs, the form is divided into sections. The "Project Info" section contains: "Project Name: *" with a text input field; "Organization: *" with a text input field; and a checkbox labeled "I don't want my project ranked at this time" with a question mark icon. The "Project Location" section contains: "Project Coordinates: Enter decimal latitude and longitude below or [Find My Location on the Map](#)." followed by "Latitude: *" and "Longitude: *" with text input fields; and "Project Area: [Draw or Add a Project Boundary](#)." Below this is a table with two columns: "File Name" and "Type". At the bottom of the form, there are "Save" and "Submit" buttons. To the right of the buttons is a legend: "* Minimum Required Information for Project Submission" and "** Information Used in Project Ranking".

Figure 5-3. Opti Project Submission Form

Stakeholders are able to enter projects at any time during development and future implementation of the ARB IRWMP. By creating a user account at the site and requesting to become a member of the "community," stakeholders are able to add and edit their projects. While a stakeholder is entering their project information, they can share it with other community members of their choice that are also able to add information to the project. The project information can be saved, so that stakeholders are able to add their project information over multiple sessions. However, the entered project does not become visible to either the site administrator (RWA and its consultant) or the remainder of the ARB IRWMP community until the stakeholder selects the "submit" button.

Because the ARB IRWMP will pursue a diverse set of funding mechanisms well into the future, RWA encourages stakeholders to enter their projects into the system regardless of their current state of readiness. This will allow for greater collaboration and flexibility in shaping future projects. The ARB

IRWMP allows for projects at various levels of completion, so only a subset of project information is required to enter a project into the Web site initially. There are two levels of required information as noted on the Web site. If a stakeholder only wishes to enter a project concept so that the community is aware of it, but does not want to have an initial project score assigned, very minimal information is required. However, until a project score is assigned (discussed in **Section 5.7.2**) and the project is vetted with stakeholders (**Section 5.7.3**), it cannot be considered as part of the ARB IRWMP. If a project score is requested by the stakeholder, additional information used to prioritize the project is collected on the Web site.

5.7.2. Project Review Process

RWA, as the RWMG, carefully considered the DWR November 2012 Guidelines in developing a process to review projects for inclusion into the ARB IRWMP. RWA was able to incorporate all of the review considerations (described below), with the exception of “whether the project proponent has adopted or will adopt the IRWM Plan.” This is a funding criteria specific to the DWR IRWM Grant Program, and will only be applied if a specific grant proposal is developed in the future with this standard as a criteria. While RWA encourages others to consider adopting the ARB IRWMP, RWA will not require it of each individual stakeholder unless a specific funding mechanism requires it and that particular stakeholder is interested in pursuing the funding opportunity.

RWA interpreted that the DWR project review factors could be grouped into one of two categories: (1) factors related to the level of integration of a project, and (2) factors related to the implementability (or feasibility) of a project. The ARB project review process distinguishes these two project characteristics. In consultation with the ARB IRWMP Advisory Committee and following input from stakeholders, RWA devised an alpha-numeric ranking system that places projects into one of 16 categories based on the project’s level of alignment with regional priorities and implementability. This is shown graphically in **Figure 5-4**. Projects are assigned a regional priorities score of 1 through 4, where those with the highest level of alignment score a 1 and the lowest score a 4. Projects are also assigned a letter from A to D for an implementability score, with being the most implementable or the most ready-to-proceed and D being the least implementable, or the least ready-to-proceed, at the time of scoring. A project with a score of 1A is considered to be of both the highest level of priority based on its level of alignment with regional priorities and the most ready-to-proceed based on its implementability score. A project score of 4D would be the least aligned and the least ready to proceed.

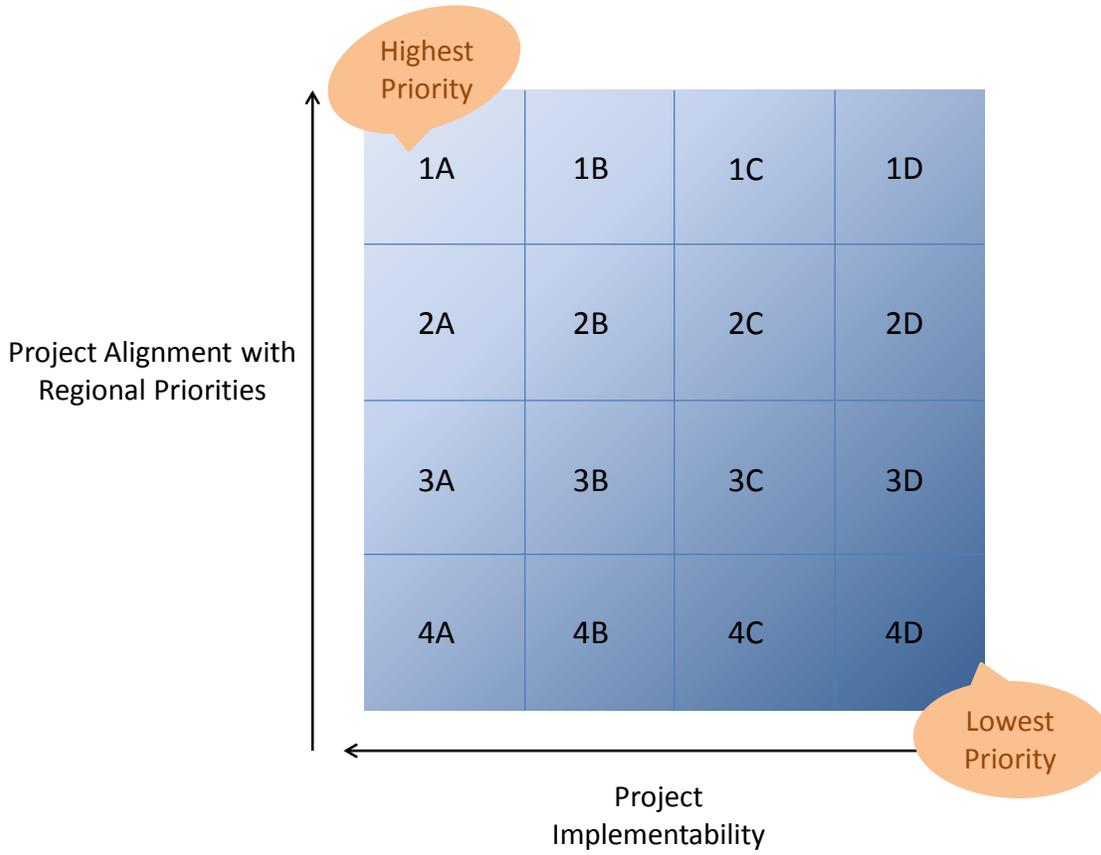


Figure 5-4. ARB Project Review Score Tiers

This method allows RWA to assign projects to tiers, rather than having to assign an absolute or relative ranking (e.g., Projects 1 through 150). This allows projects with different primary benefits (e.g., water supply, water quality, habitat, flood) to be on more level footing in being identified as a priority for the Region, which will help in promoting a diverse set of priority projects within the Region. This method also gives project proponents feedback on where the Region sees their projects in terms of priority and implementability. Project proponents can then work on modifying their projects to increase alignment with regional priorities (e.g., bring in additional partners, find additional benefits) and update information on implementability to increase the readiness to proceed score in the future. The two categories of review factors and relative scoring are described below.

5.7.2.1. Project Alignment with Regional Priorities Score

This part of the scoring considers how a project provides benefits to the Region, according in part, to the goals and objectives identified by stakeholders. It also considers how integrated the project is with other regional stakeholders/agencies and their efforts as well as to DWR Guidelines. **Figure 5-5** shows an example project report card that assigns a score to a project that is a part of the ARB IRWMP.

Project Name:
Project Proponent:
Project Rank:

Regional Priorities Score	Possible Point Value	Points Awarded	Comments
Objectives (max 8 points)			
Meets 1	2		
Meets 2	4		
Meets 3	6		
Meets 4+	8		
Goals (max 1 point)			
Addresses more than one IRWMP goal	1		
Resources Management Strategies (max 1 point)			
Addresses more than one DWR Resource Management Strategy	1		
Strategic Considerations (max 4 points)			
1 Includes multiple partners	1		
2 Single purpose, but part of broader plan implementation	1		
3 Provides benefit beyond project proponent	1		
4 Purposefully restructured for added benefit	1		
5 Part of Water Forum Agreement or other regional or collaborative plan	1		
6 Data to be collected and shared from project	1		
Assists in climate change adaptation or reduces GHG emissions (max 1 point)	1		
Benefits to local disadvantaged community or tribal community (max 1 point)	1		
Total			
Regional Priorities Score Tiers			
Tier 1 = 10 points or more		Tier 3 = 6 to 7 points	
Tier 2 = 8 to 9 points		Tier 4 = 5 points or less	
Implementability Score	Possible Point Value	Points Awarded	Comments
Ready to start construction or implementation within 2 years, if funding available	1		
Project Status section of Feasibility tab is complete	1		
Project Funding and Project Cost Breakdown sections of Cost/Funding tab are complete	1		
Benefits section of Benefits tab is complete with explanations	1		
Total			
Implementability Score Tiers			
Tier A = 4 points		Tier C = 2 points	
Tier B = 3 points		Tier D = 1 point	

Comments

Figure 5-5. ARB Project Review Report Card Template

A total of 16 possible points can be awarded to a project based on the following criteria:

- **Number of ARB IRWMP Objectives Addressed.** The ARB IRWMP includes 17 adopted objectives. Because objectives represent the heart of the ARB IRWMP effort, the points account for a majority of the score. A project must address at least one objective to be included in the IRWMP. The objective scores are allocated as follows:

The project meets...	Points given:
1 objective	2
2 objectives	4
3 objectives	6
4 or more objectives	8

- **Number of ARB IRWMP Goals Addressed.** Projects that address more than one of the five adopted goals would receive a score of one point. This scoring criterion was added at the request of the Advisory Committee, because they felt that it was relatively easy to address more than one objective with a project but more challenging to address more than one goal; those multi-purpose, integrated projects should receive a preference point in the scoring method.
- **DWR RMS.** Projects that implements more than one of the DWR RMSs will receive a score of one point. RMSs are listed on the Opti Web site and a link to DWR's explanation of each RMS is provided.
- **Strategic Considerations.** This criterion examines the level of integration a project achieves. Strategic Considerations represent an opportunity to address both DWR and local considerations. Because there were several ways in which a project proponent could receive a point with relative ease, this criterion is capped with a maximum of four points regardless of the number of considerations addressed. Points are eligible for addressing the following:
 - Project includes multiple partners
 - Project is single purpose, but is part of broader plan implementation¹
 - Project provides benefits that extend beyond the project proponent and its immediate constituents
 - Project was purposefully restructured to provide additional benefit
 - Project can be demonstrated to be important part of implementation of the WFA or another regional or collaborative planning effort
 - Project includes data collection that will be shared with ARB IRWMP stakeholders
- **Climate Change/Greenhouse Gas Emissions.** A project is awarded a point if it can demonstrate that it contributes to adapting to the effects of climate change or that it will result in the reduction of greenhouse gas emissions. Detailed project GHG emissions will be calculated later as the project develops, as part of a California Environmental Quality Act requirement.
- **Disadvantaged Community/Native American Tribal Community/Environmental Justice Considerations.** A project is awarded a point if it can demonstrate that it addresses critical water supply needs of these communities.

¹ This factor acknowledges that there are projects that would appear to have little direct integration (e.g., groundwater public supply well), but are necessary as part of a broader regional strategy that will achieve integrated benefits (e.g., a groundwater public supply well that will help implement a conjunctive use program that dedicates water to environmental purposes in dry periods).

The allocation of points is a result of a calibration exercise that reviewed more than three dozen projects in the project database. The raw number of points awarded for the regional priorities score results in a distribution of projects into one of four tiers, which represent the project's level of alignment with regional priorities. The tiers and raw point scores are related as shown in the table below. The regional priorities score is also dynamic, as project proponents can continue to develop and adjust their projects to provide more regional benefits and integration.

Raw Regional Priorities Score	Tier
10 or more points	1
8 or 9 points	2
6 or 7 points	3
5 of less points	4

Note that the scale of the projects, or the quantified level of benefits of the projects (e.g., acres of habitat restored) were not considered. This ensures that smaller projects would not be disadvantaged by larger projects. Additionally, many projects (e.g., environmental and water quality) have benefits that can be difficult to quantify and compare against other projects. Considerations such as the relative contribution of a project's benefits would only be applied to specific criteria associated with distinct funding opportunities. Detailed project benefit and impact analysis will occur as each project develops and such an analysis becomes required by funding opportunities and/or environmental permitting.

5.7.2.2. Project Implementability Score

This part of the project review process takes into account the readiness of the project to proceed or its overall feasibility. Under this category, up to four points can be awarded based on meeting the criteria listed below. These criteria are also shown in the Report Card in **Figure 5-5**, above.

- **Readiness.** One point is awarded if the project proponent indicates that the project could commence construction (for construction projects) or implementation (for non-construction projects) within 2 years if project funding is available.
- **Feasibility.** One point is awarded if the project proponent is able to complete the project status section of the feasibility tab on the Opti site. Information in this section includes the status and estimated timeline for project tasks and identification of required environmental and other project permits.
- **Project Budget.** One point is awarded if the project proponent completes the project function and project cost breakdown sections of the cost/funding tab on the Opti site. This includes identifying current funding and funding needs as well as a basic project budget broken down by task.
- **Project Benefits.** One point is awarded for projects that complete the benefits section with explanations on the benefits tab of the Opti site. Benefits are organized around the five primary

ARB IRWMP goals. This information will be helpful in looking at the benefits to costs of a project, once such an analysis becomes necessary in the future.

Projects are reviewed using the above criteria and assigned to one of four tiers for implementability. The tiers and raw point scores are related as shown in the table below. As with the regional priorities score, this implementability score should be considered dynamic, and it is expected that projects will increase their score as the project develops. It is also expected that some projects will ultimately be removed if they do not continue to develop through time.

Raw Implementability Score	Tier
4 points	A
3 points	B
2 points	C
1 point	D

5.7.3. Project Review Communication and Vetting Process

Projects are scored by RWA, unless project proponents request otherwise. Project proponents have the opportunity to view and receive feedback on how their projects scored and the reasons why. Staff and project proponents communicate to make any scoring adjustments as necessary. This allows project proponents to be aware of their project scores before the scores become available to all stakeholders.

After projects are scored, all scored and non-scored projects are vetted by stakeholders. Project information is communicated to stakeholders through both the Opti Web site and direct e-mails to a distribution list of more than 150 stakeholders that have expressed an interest in the ARB IRWMP. Stakeholders may provide input and comment on any listed project or its score during a 1-month comment period. As described above, a project is not required to receive a score to be included in Opti. However, scoring is necessary for project inclusion in a regional funding application. The final vetted list of projects, identified as “IRWMP Approved” in Opti, is the list of projects selected for inclusion in the IRWMP.

Projects will continue to be accepted on Opti on an ongoing basis, following adoption of the IRWMP. Before being approved for inclusion into the IRWMP, projects will be vetted to stakeholders on a quarterly basis. A summary of projects submitted over the previous quarter will be released at the close of the quarter (i.e., March 31, June 30, September 30, and December 31). Stakeholders would have one month to comment on the projects. For projects that were previously included in the IRWMP but not ranked, project proponents could request rankings and these projected will be vetted on the same quarterly schedule. In cases where a project proponent cannot wait to vet their project until the end of the upcoming

quarter (e.g., a funding opportunity with a short schedule arises), RWA will release the project to stakeholders on an as-needed basis. All submitted and vetted projects can be viewed on Opti at <http://irwm.rmcwater.com/rwa/login.php>.

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