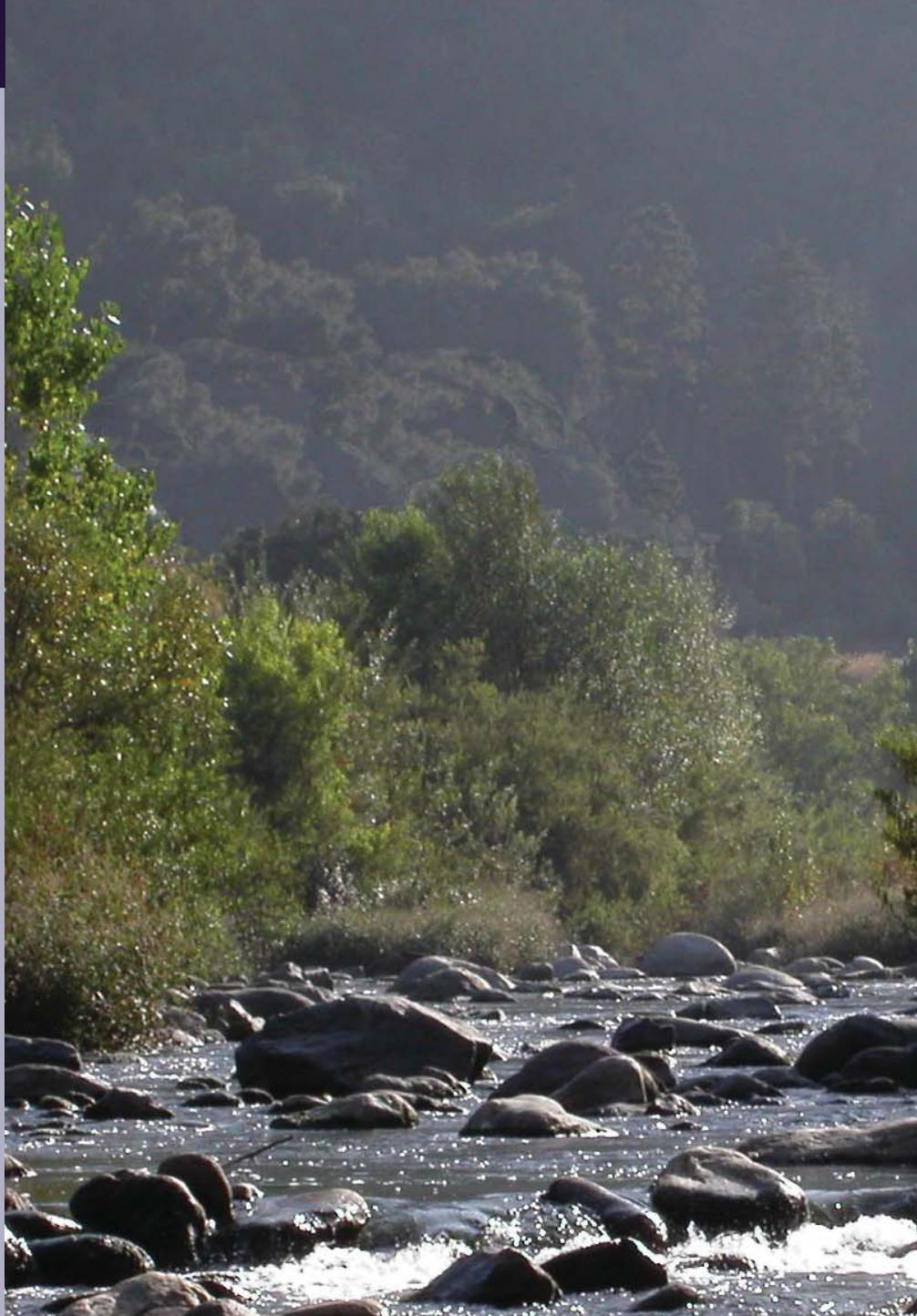


# Integrated Water Management Strategy



## Technical Memorandum

May 31, 2006

Integrated Regional Water Management Plan For the  
Greater Los Angeles County Region



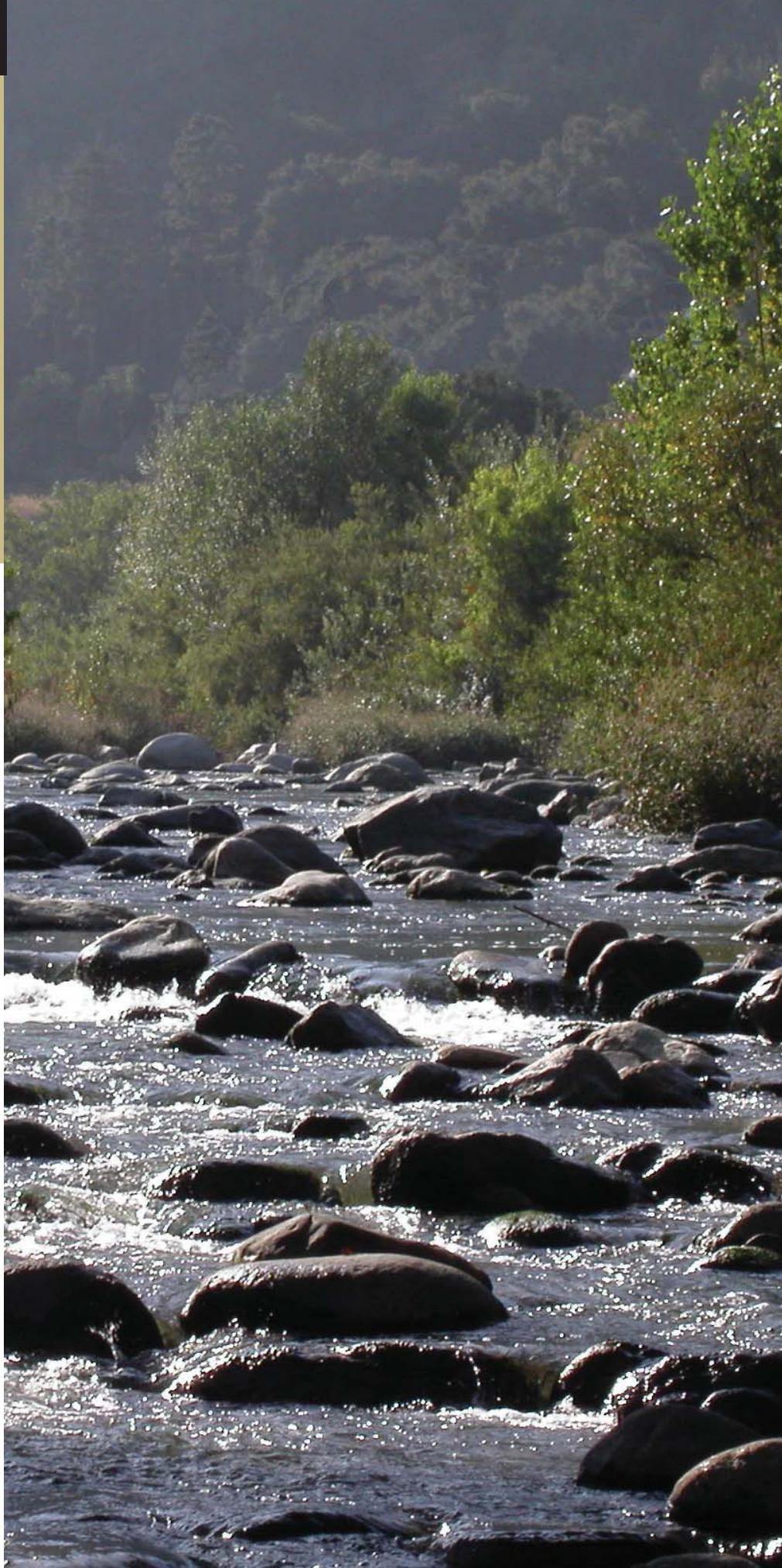


Technical Memorandum for the  
Integrated Regional Water Management  
Plan for the Greater Los Angeles County  
Region prepared in partnership with:

BROWN AND  
CALDWELL



DUVIVIER architects  
*Architecture, Planning and Sustainable Design*



INTEGRATED WATER MANAGEMENT STRATEGY  
TECHNICAL MEMORANDUM

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Prepared for  
Leadership Committee of Greater Los Angeles  
County Integrated Regional Water Management Plan

May 2006



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## LIST OF ACRONYMS

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Acre-feet/year	Acre Feet per Year
BMP	Best Management Practice
cfs	Cubic Feet per Second
DWR	Department of Water Resources
Integrated TM	Integrated Water Management Strategy Technical Memorandum
IRWM	Integrated Regional Water Management
IRWMP	Integrated Regional Water Management Plan
JPA	Joint Powers Authority
LACFCDD	Los Angeles County Flood Control District
MOU	Memorandum of Understanding
MWD	Municipal Water District
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
O&M	operations and maintenance
Region	Greater Los Angeles County Region
RWQCB	Regional Water Quality Control Board
SCAG	Southern California Association of Governments
SCCWRP	Southern California Coastal Water Research Project
TM	Technical Memorandum
TMDL	Total Maximum Daily Load
USC	University of Southern California

LOS ANGELES INTEGRATED  
REGIONAL WATER MANAGEMENT PLAN  
INTEGRATED WATER MANAGEMENT STRATEGY  
TECHNICAL MEMORANDUM

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## 1. INTRODUCTION

Southern California's water resources are a profound local amenity and asset. However, they have also been one of the things to suffer the most from urban growth pressures. Although there have been many important efforts to protect and manage various aspects of these resources in the past, the Greater Los Angeles Region (Region) Integrated Regional Water Management Plan (IRWMP) provides a new opportunity to integrate a variety of planning efforts and concepts into a common vision for water resources management.

Developing a plan to integrate the complex, and sometimes conflicting, water management strategies poses a substantial challenge in a region of more than 2,000 square miles, hundreds of jurisdictions, more than 10 million residents, and significant expected increases to that population over the 20-year life of this planning period. Therefore, the IRWMP must not only integrate water management strategies, but it should also consider other regional planning efforts (such as transportation and land use/redevelopment planning) in order to be a part of a coordinated approach to urban management. The IRWMP will leverage the opportunities for sustainable water resource management and mutually beneficial relationships between the economic stability of the region, the livability of our communities, and the viability of the local natural resources.

### 1.1 Purpose

A series of Technical Memorandums (TMs) supports development of the final IRWMP. This includes TMs on:

1. Water Quality Management Strategies;
2. Water Supply Management Strategies;
3. Open Space Management Strategies;
4. Integrated Water Management Strategies;
5. Integrated Project Sets; and
6. Benefit Assessment.

The first three each focus on the water management strategies, and include a discussion of:

- Existing programs, approaches, projects, plans, and studies;
- Goals;
- Issues, constraints, and opportunities;
- Quantifiable objectives; and
- Strategies.

The first three TMs provide the reader with the basic understanding of how water resources have been managed historically and begin to lay the groundwork for how to better integrate projects in the future. However, the IRWMP must not only coordinate projects within the function of water resource management, it must also ensure that projects are multi-purpose and integrate effectively into the urban fabric of Los Angeles. This Integrated Water Management Strategy TM provides direction for doing this by:

- Summarizing the issues, constraints and opportunities across the Region;
- Providing the overarching strategic framework for integrated water resource planning;
- Outlining an approach for integrating the strategies; and
- Identifying methodologies for integrating water management projects and strategies with other urban management activities.

## 1.2 Background and IRWMP Development Process

In response to the release of the Integrated Regional Water Management (IRWM) Grant Program Guidelines (Department of Water Resources [DWR], 2004), six agencies submitted grant applications (in May 2005) to support development of an IRWMP. These agencies included the Santa Monica Bay Restoration Commission, the City of Los Angeles, the Watershed Conservation Authority, the Upper San Gabriel Municipal Water District (MWD), the Central and West Basin MWDs, and the City of Downey. Based on review of applications, DWR only recommended funding the application from the Watershed Conservation Authority. In response, several southern California entities lobbied to expand the funding pool and provide funds for additional applications. DWR subsequently expanded the pool and proposed award of a single grant of \$1.5 million, on the condition that the original six applicants coordinate to prepare a single consolidated plan for the Region. In November 2005, Brown and Caldwell was selected to consolidate the previous efforts and develop a common Plan.

In order to manage the stakeholder input process and accommodate geographic variation, the Region is divided into five sub-regions: North Santa Monica Bay Watersheds, the Upper Los Angeles River Watershed, the Upper San Gabriel River and Rio Hondo Watersheds, the Lower San Gabriel and Los Angeles Rivers Watersheds, and South (Santa Monica) Bay Watersheds.

The organizational structure for oversight of the IRWMP effort includes a Leadership Committee, chaired by the Los Angeles County Flood Control District (LACFCD); representatives of five sub-regional Steering Committees; and five additional seats representing specific water management focus areas, which include groundwater, sanitation, surface water supply, recreation and habitat, and stormwater (Figure 1-1). Each sub-regional Steering Committee includes agency, city, and stakeholder representatives, and additional representatives for the three water management strategy areas. This structure provides opportunities for coordination and integration of decision-making and stakeholder input. The committees meet monthly during preparation of the IRWMP.

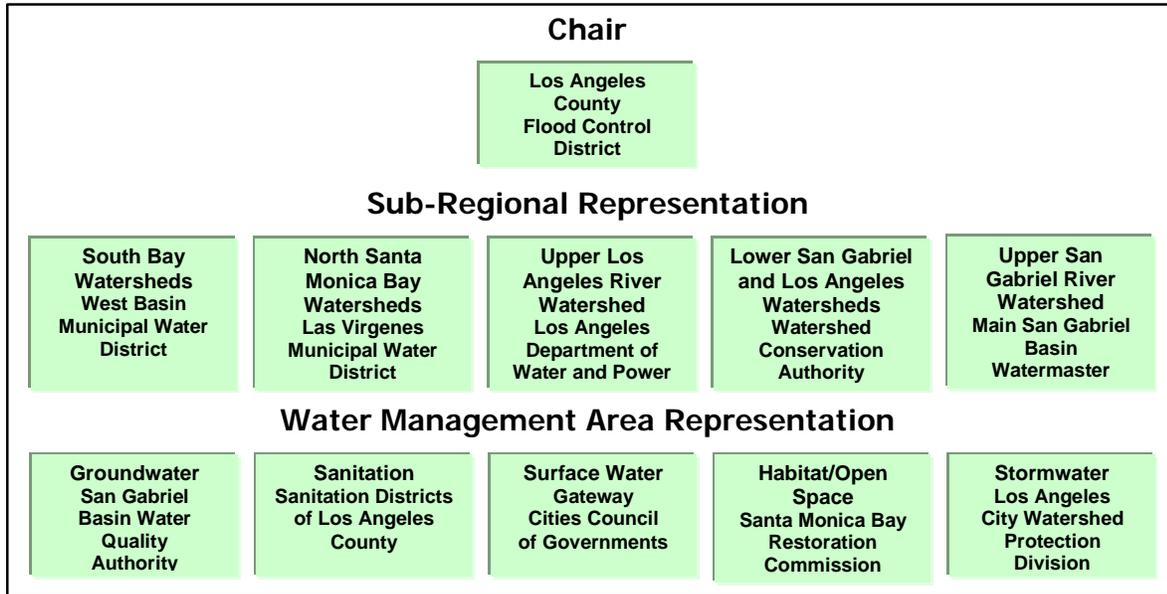


Figure 1-1. IRWMP Leadership Committee Voting Members

## 2. STRATEGIC DECISION-MAKING FRAMEWORK

The IRWMP guides future actions in the Region. In order to do this effectively a decision-making framework has been developed and includes a vision, principles, mission, goals, objectives, strategies, issues, constraints, and opportunities. These elements were developed from input received from the Leadership Committee, Steering Committees, and from stakeholder groups in the public workshops. They represent the cumulative desired outcomes of the IRWMP process. This section consolidates this input here so that it can be viewed and used as a unified basis for collaborative, regional decision making.

### 2.1 Vision and Principles

A vision is clearly defined future that informs the planning and implementation process in the present. It is successful if it guides incremental action towards an ideal outcome, regardless of whether that ideal is ever completely reached. In this case, the vision for the Region is a clearly defined definition for a “place”. There are three main functional areas that are the focus of the analysis in the IRWMP: water supply, surface water quality, and open space. However, the vision for the IRWMP is for the “place”, rather than the “functions” the plan will deal with, because those functions must ultimately be integrated through projects that will be designed and judged based on their relevance to the places in which they are located. A vision will integrate and direct the projects and programs, and guide their relationship to the local urban context. Community members provided input about their vision for the Region in the first five IRWMP sub-regional public workshops. The complete input provided by stakeholders is available in Appendix A. The input related to a vision for the Region has been consolidated into the following draft vision statement:

**The vision for the Region is to be a connected network of thriving river parkway communities that rely only on sustainably managed local water supplies.**

Principles reflect a group of underlying values that provide broad guidance for any future action or outcome, and support consistency among the activities that implement the overall vision. Some of the input that was provided during the visioning exercise was more relevant as a guiding principle for actions than as a vision for a place. That input has been summarized in the principle statements below:

- Respect, celebrate, and design with nature;
- Recognize the true value of local water resources;
- Pursue integrated solutions based on integrative watershed resource management;
- Work together for the greater economic benefit of the area; and
- Enable open public dialog around contentious issues.

In addition to defining a vision and principles relative to water resources, it is critical that water resources within Southern California be managed within an understanding of the issues and constraints within the larger urban context. The Southern California Association of Governments (SCAG) has already completed an extensive community visioning process for the entire southern California area called the Compass Growth Vision Report (SCAG, 2004). All of the stakeholders within Ventura, Riverside, San Bernardino, Los Angeles and Orange counties were involved in this process. Therefore, not only is the SCAG plan consistent across Los Angeles County, but it also presents growth strategies that are consistent with the surrounding Counties as well. To implement their plan and guide future decision-making in Southern California, four main principles were identified through in-depth stakeholder involvement, research and analysis. In order to create

consistency between the IRWMP and the extensive regional visioning effort already completed by SCAG, the four main principles for growth in SCAG's plan should also be included as principles in the IRWMP. This will help ensure that wherever possible, actions and strategies developed through this process to manage water resources will be coordinated with other larger regional efforts and priorities for urban planning. The Compass Growth Vision principles are:

- Improve mobility for all residents;
- Foster livability in all communities;
- Enable prosperity for all people; and
- Promote sustainability for future generations.

The IRWMP will promote integration of water management strategies, as well as acknowledging the larger issues and constraints within the broader urban planning context.

## 2.2 Stakeholder Issues, Constraints, and Opportunities

An issue is a concern or priority of some kind, and can be either long-term or short-term. A constraint has a negative impact on that concern or priority, and an opportunity is an existing possibility for either overcoming a constraint or benefiting an issue. Issues, constraints, and opportunities provide the conditions and circumstances a group works within to achieve their vision. Issues, constraints and opportunities have been identified by members of the Leadership Committee, Steering Committees, stakeholders, from the five sub-regions, and the consultant team. These issues are discussed in greater detail in the first three TMs and serve as guidance for the development of integrated strategies and projects for the Region. Tables 2-1, 2-2, and 2-3 provide a summary for the purpose of beginning to developing integrated water management strategies within and across sub-regions and the region. Section 3 of this TM presents possible approaches for developing these integrated water management strategies.

**Table 2-1. Water Supply Issues, Constraints, and Opportunities**

Issues	Constraints	Opportunities
<ul style="list-style-type: none"> <li>• Dependence on imported water</li> <li>• Reliability during droughts</li> <li>• Protecting supply quality</li> <li>• Maximizing storage capacity</li> <li>• Impervious surfaces</li> <li>• Local firefighting supply</li> <li>• Effluent reuse</li> <li>• Groundwater contamination</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of funding</li> <li>• Contaminated and/or shallow groundwater</li> <li>• Inadequate recycled water distribution system</li> <li>• Limited opportunities for additional reservoirs</li> <li>• Timing of recycled water</li> <li>• Sufficient demand for recycled water</li> <li>• Cisterns for firefighting are difficult to maintain</li> <li>• Limited opportunities for desalination</li> <li>• Resistance to indirect potable reuse</li> <li>• Limited spreading capacity</li> <li>• Institutional hurdles to water transfers</li> <li>• Complex institutional and legal issues</li> <li>• Private property rights issues associate with gravel pits</li> <li>• Contaminant considerations for recycled water</li> <li>• In-stream flow needs for habitat functions</li> <li>• Impermeable soils</li> <li>• Stormwater quality</li> <li>• Unwillingness to conserve</li> <li>• Need for cycling of spreading grounds</li> <li>• Silt removal and maintenance in canyon basin and spreading grounds will require periodic dewatering</li> <li>• Security and health considerations limit public access</li> </ul>	<ul style="list-style-type: none"> <li>• Capture treatment and reuse of stormwater runoff</li> <li>• Grey water use</li> <li>• Increase use of reclaimed water</li> <li>• Conservation</li> <li>• Desalination</li> <li>• Water distribution system improvements</li> <li>• Safe Drinking Water Act compliance projects</li> <li>• System interconnections for increased reliability</li> <li>• Expanded conjunctive use</li> <li>• Groundwater treatment facilities and management programs</li> <li>• Increase replenishment capacity</li> <li>• Water transfer</li> <li>• Add local storage</li> <li>• Infrastructure improvements to improve water reliability</li> </ul>

**Table 2-2. Water Quality Issues, Constraints, and Opportunities**

Issues	Constraints	Opportunities
<ul style="list-style-type: none"> <li>• Impaired water quality</li> </ul>	<ul style="list-style-type: none"> <li>• Poor surface water quality</li> </ul>	<ul style="list-style-type: none"> <li>• Implement TMDL, National Pollutant Discharge Elimination System (NPDES), and AB 885</li> </ul>
<ul style="list-style-type: none"> <li>• Runoff quantity and quality</li> </ul>	<ul style="list-style-type: none"> <li>• Groundwater contamination</li> </ul>	<ul style="list-style-type: none"> <li>• Best management practice (BMPs)</li> </ul>
<ul style="list-style-type: none"> <li>• Trash, contaminants and pollutants</li> </ul>	<ul style="list-style-type: none"> <li>• Conflicting urban and ecological needs</li> </ul>	<ul style="list-style-type: none"> <li>• Develop and implement Regional Water Quality Control Board (RWQCB) Watershed Management Initiative chapters</li> </ul>
<ul style="list-style-type: none"> <li>• Degraded habitat</li> </ul>	<ul style="list-style-type: none"> <li>• Polluted urban runoff</li> </ul>	<ul style="list-style-type: none"> <li>• Urban runoff capture, treatment, and infiltration or reuse</li> </ul>
<ul style="list-style-type: none"> <li>• Degraded aquatic life</li> </ul>	<ul style="list-style-type: none"> <li>• Real or perceived health risks</li> </ul>	<ul style="list-style-type: none"> <li>• Groundwater management</li> </ul>
<ul style="list-style-type: none"> <li>• Numerous discharges</li> </ul>	<ul style="list-style-type: none"> <li>• Limited funding</li> </ul>	<ul style="list-style-type: none"> <li>• Limit seawater intrusion</li> </ul>
<ul style="list-style-type: none"> <li>• Sediment management</li> </ul>	<ul style="list-style-type: none"> <li>• Equestrian impacts are difficult to control</li> </ul>	<ul style="list-style-type: none"> <li>• Wetland treatment</li> </ul>
<ul style="list-style-type: none"> <li>• Wastewater effluent quality</li> </ul>	<ul style="list-style-type: none"> <li>• Cost of water quality solutions</li> </ul>	<ul style="list-style-type: none"> <li>• Conservation</li> </ul>
<ul style="list-style-type: none"> <li>• Impacts of gravel pits</li> </ul>	<ul style="list-style-type: none"> <li>• Nonpoint sources (NPS)</li> </ul>	<ul style="list-style-type: none"> <li>• Naturalize streams and creeks</li> </ul>
<ul style="list-style-type: none"> <li>• Knowledge and data gaps</li> </ul>	<ul style="list-style-type: none"> <li>• Development plans in privately owned open spaces</li> </ul>	<ul style="list-style-type: none"> <li>• Increase permeable surfaces</li> </ul>
<ul style="list-style-type: none"> <li>• Septic systems</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of expertise in maintaining constructed wetlands</li> </ul>	<ul style="list-style-type: none"> <li>• Convert septic systems</li> </ul>
<ul style="list-style-type: none"> <li>• Equestrian impacts</li> </ul>	<ul style="list-style-type: none"> <li>• Funding for watershed management capacity building</li> </ul>	<ul style="list-style-type: none"> <li>• Integrated land use planning</li> </ul>
<ul style="list-style-type: none"> <li>• Stream channelization and modification</li> </ul>	<ul style="list-style-type: none"> <li>• Pervasiveness of impairment</li> </ul>	<ul style="list-style-type: none"> <li>• Create mixed-use areas integrate parks, housing, retail, jobs, and schools</li> </ul>
<ul style="list-style-type: none"> <li>• Effect of trace contaminants (i.e., pharmaceuticals)</li> </ul>	<ul style="list-style-type: none"> <li>• Land availability and cost</li> </ul>	<ul style="list-style-type: none"> <li>• Increase water reuse</li> </ul>
	<ul style="list-style-type: none"> <li>• Public safety</li> </ul>	<ul style="list-style-type: none"> <li>• Develop consistent and integrated water quality objectives for all resources</li> </ul>
	<ul style="list-style-type: none"> <li>• Liability</li> </ul>	<ul style="list-style-type: none"> <li>• Better leverage of public and private resources</li> </ul>
	<ul style="list-style-type: none"> <li>• Impediments to cross-jurisdictional efforts</li> </ul>	<ul style="list-style-type: none"> <li>• Use ecosystem restoration to help revitalize neighborhoods</li> </ul>
		<ul style="list-style-type: none"> <li>• Create continuous greenways</li> </ul>
		<ul style="list-style-type: none"> <li>• Implement recommendations from floodplain management task force</li> </ul>
		<ul style="list-style-type: none"> <li>• Develop and implement coordinated water quality monitoring</li> </ul>
		<ul style="list-style-type: none"> <li>• Green visions plan</li> </ul>
		<ul style="list-style-type: none"> <li>• Public education</li> </ul>
		<ul style="list-style-type: none"> <li>• Collect more data</li> </ul>
		<ul style="list-style-type: none"> <li>• Sediment clean up and removal</li> </ul>
		<ul style="list-style-type: none"> <li>• Improve flood management and protection</li> </ul>
		<ul style="list-style-type: none"> <li>• Multipurpose recreation, habitat and flood control projects</li> </ul>
		<ul style="list-style-type: none"> <li>• U.S. Army Corps of Engineers participation</li> </ul>

Table 2-3. Open Space Issues, Constraints, and Opportunities		
Issues	Constraints	Opportunities
• Equestrian impacts	• Private ownership and development of open space	• Conserve existing natural resources
• Upland habitat preservation	• Reliance on U.S. Army Corps of Engineers for dam removal	• Conserve canyons and hillsides
• Stream modification and channelization	• O&M planning, staff, and funding	• Protect remaining open space and aquatic habitat
• Knowledge and data gaps	• Increase in pathogens and bacteria from wildlife in restored habitat	• Remove dams
• Habitat fragmentation	• Flood control impacts of restoration	• Restore and create wetlands
• Insufficient buffers	• Conflicts between “active” and “passive” recreation	• Restore the aquatic ecosystem
• Greenfield development	• Conflicting habitat needs for wildlife	• Integrate ecosystem restoration into flood control and water supply facilities
• Degraded Steelhead habitat	• Loss of natural function and habitat in channels	• Restore hydrologic and habitat corridors
• Degraded habitat	• Exotic, invasive, and non-native species	• Remove concrete and widen channels
• Loss of riparian function	• Trash and debris	• Ecosystem restoration in existing parks
• Conflicting habitat needs for wildlife	• Safety and liability	• Daylight creeks
• Urbanization	• Single purpose planning and land use policy	• Clean up and develop Brownfields
• Restoration operation and maintenance (O&M) costs	• Urban development and runoff	• Restore along historic tributaries
• Exotics, invasives, and non-natives	• Land availability and cost	• Reconnect landscape hydrology
• Trash and debris	• Lack of funding for land acquisition	• Dual use flood channel (buried) and naturalized stream (on surface)
• Habitat functions are impacted by land use policies	• Stream modification	• Exotic species removal
• Runoff quantity and quality	• Equestrian uses	• Recover native habitat and species diversity
• Sensitive species protection	• Knowledge and data gaps	• Construct treatment wetlands
• Recreation for disadvantaged communities	• Development plans in privately owned open spaces	• Restore steelhead habitat
• Land availability for restoration	• Cost of removal of green waste from upstream restoration	• 100 foot riparian buffers
• Funding for land acquisition	• Upstream urbanization	• Improve access to open space and recreation for all communities
• Funding for monitoring	• Lack of transitions in land use	• Create more trails and regional greenbelts
• Altered hydrology	• Minimal buffer areas	• Create a comprehensive trail and bikeway plan along creeks and rivers and transportation and utility corridors
• Single purpose planning	• Channelization of drainages	• Create more parks and open space
• Property rights	• Habitat fragmentation	• Integrate recreation into restoration and water management projects

Issues	Constraints	Opportunities
<ul style="list-style-type: none"> <li>• Jurisdictions often don't adequately consider downstream and watershed-wide implications</li> </ul>	<ul style="list-style-type: none"> <li>• Protection of sensitive species and wildlife corridors</li> </ul>	<ul style="list-style-type: none"> <li>• Multi-purpose parks</li> </ul>
<ul style="list-style-type: none"> <li>• Safety in open space</li> </ul>	<ul style="list-style-type: none"> <li>• Surrounding land use</li> </ul>	<ul style="list-style-type: none"> <li>• Promote education and compatible access related to riparian habitat and upland wetlands and watersheds</li> </ul>
<ul style="list-style-type: none"> <li>• Conserve existing open space</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of funding for land acquisition</li> </ul>	<ul style="list-style-type: none"> <li>• Provide for maintenance of parks, open space, and trails</li> </ul>
<ul style="list-style-type: none"> <li>• Open spaces not connected</li> </ul>	<ul style="list-style-type: none"> <li>• Staff and funds for monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• Implement multi-objective planning and projects</li> </ul>
<ul style="list-style-type: none"> <li>• Impact of recreation on habitat</li> </ul>	<ul style="list-style-type: none"> <li>• Altered hydrology</li> </ul>	<ul style="list-style-type: none"> <li>• Integrate aquatic considerations into land use policy</li> </ul>
<ul style="list-style-type: none"> <li>• Effect of contaminants</li> </ul>	<ul style="list-style-type: none"> <li>• Respect private property rights</li> </ul>	<ul style="list-style-type: none"> <li>• Integrate riparian habitat and upland wetlands recovery efforts with other public objectives</li> </ul>
<ul style="list-style-type: none"> <li>• Upland habitat loss</li> </ul>	<ul style="list-style-type: none"> <li>• Individual jurisdictions do not consider watershed wide impacts</li> </ul>	<ul style="list-style-type: none"> <li>• Implement watershed based planning</li> </ul>
<ul style="list-style-type: none"> <li>• Homeless</li> </ul>	<ul style="list-style-type: none"> <li>• Fragmentation</li> <li>• Recreation impacts on habitat</li> <li>• Homeless encampments</li> </ul>	

### 2.3 Goals, Objectives, and Strategies

To enhance water supply, improve surface water quality, and improve water supply reliability, the following over-arching goals for the Region have been articulated, based on recent water supply, resource management, and watershed plans. These include the UWMPs, the Metropolitan Water District’s IRP, Common Ground, from the Mountain to the Sea (the watershed and open space plan for the Los Angeles and San Gabriel Rivers), and completed and in progress watershed plans for major tributary streams (Arroyo Seco, Ballona Creek, Compton Creek, Coyote Creek, Dominguez Channel, Rio Hondo, and the Upper San Gabriel River). Goals articulated in these documents were reviewed to generate an initial list, which was reviewed and supplemented by members of the Leadership Committee. An Objectives Subcommittee was subsequently formed to provide input to the Leadership Committee, provide response to comments received on draft objectives, and to maintain a current working set of objectives. Draft objectives were provided to the Steering Committees and presented at one regional stakeholder workshop and five sub-regional stakeholder workshops. Comments received at the workshops were incorporated into the draft objectives. Although at the time of this technical memorandum that list is still evolving, Table 2-4 represents a synthesis of the main concepts identified to date. An updated list will be provided in the Final IRWMP.

Table 2-4. Greater Los Angeles IRWMP Goals, Objectives, and Strategies		
Goals	Objectives	Strategies
<ul style="list-style-type: none"> <li>• Reduce dependence on imported water</li> <li>• Optimize use of local water resources</li> <li>• Enhance water supply reliability</li> </ul>	<ul style="list-style-type: none"> <li>• Sustain current local water resources production capacity and quality and provide a minimum 850,000 acre-feet/year of additional water supply and/or demand reduction</li> <li>• Reuse or infiltrate a minimum of 700,000 acre-feet/year of additional reclaimed water (or 630 mgd) (over and above the 120,000 acre-feet/year or 105 mgd of recycle currently occurring). This corresponds to a total goal of 80% recycle of the available reclaimed wastewater and would require adding tertiary treatment for about 510 mgd (over and above the 225 mgd currently).</li> <li>• Recycle 50% to 85% of the annual stormwater runoff from developed areas, approximately 300,000 to 500,000 acre-feet/year on average.</li> </ul>	<ul style="list-style-type: none"> <li>• Desalination</li> <li>• Ecosystem Restoration</li> <li>• Environmental and Habitat Protection and Improvement</li> <li>• Flood Management</li> <li>• Groundwater Management &amp; Conjunctive Use</li> <li>• Imported Water</li> <li>• Land Use Planning</li> <li>• Nonpoint Source (NPS) Pollution Control</li> <li>• Recreation and Public Access</li> <li>• Stormwater Capture and Management</li> <li>• Surface Storage</li> <li>• Water and Wastewater Treatment</li> <li>• Water Conservation</li> <li>• Water Quality Protection and Improvement</li> <li>• Water Recycling</li> <li>• Watershed Planning</li> <li>• Water Supply Reliability</li> <li>• Water Transfers</li> <li>• Wetlands Enhancement and Creation</li> </ul>
<ul style="list-style-type: none"> <li>• Improve the quality of urban runoff and stormwater</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce, capture, infiltrate and/or treat the 50<sup>th</sup> to 90<sup>th</sup> percentile dry weather urban runoff flow, approximately 250 to 450 cubic feet per second (cfs), or 180,000 to 320,000 acre-feet/year.</li> <li>• Reduce, capture, infiltrate, and/or treat stormwater runoff from developed areas for the 70<sup>th</sup> to 85<sup>th</sup> percentile storm event, approximately 17,000 to 26,000 acre-feet/storm event. A portion or all of this treated stormwater would be recycled to meet the water supply objective above.</li> </ul>	
<ul style="list-style-type: none"> <li>• Maintain and enhance flood protection</li> </ul>	<ul style="list-style-type: none"> <li>• Note to reviewers – draft flood protection goals are meant to be a placeholder to initiate dialogue. Repair and replace X (tbd) portion of the aging infrastructure each year over the next 20 years. Limit the need to expand flood management capacity to the degree possible by capturing and treating flows in upstream reaches and reducing existing flood flows.</li> </ul>	
<ul style="list-style-type: none"> <li>• Increase watershed-friendly recreation and accessible open space for all communities</li> </ul>	<ul style="list-style-type: none"> <li>• Provide an additional 30,000 acres of watershed-friendly parkland and open space, focused in disadvantaged communities</li> </ul>	
<ul style="list-style-type: none"> <li>• Conserve and restore native habitat</li> </ul>	<ul style="list-style-type: none"> <li>• Restore 20 linear miles of riparian habitat and associated habitat buffer in the Santa Monica Mountains</li> </ul>	
<ul style="list-style-type: none"> <li>• Manage public open spaces to reduce the risk of wildland fires</li> </ul>		
<ul style="list-style-type: none"> <li>• Promote the application of watershed approaches to resource management issues</li> </ul>		

### 3. STRATEGY INTEGRATION

This section reviews the water management strategies that were evaluated in the first three TMs, presents the issue of strategy integration, and provides possible approaches for integration.

#### 3.1 Water Management Strategies

The IRWM Grant Program Guidelines (DWR, 2004) identify 19 water management strategies that may be utilized to enhance water supplies and improve water supply reliability. A detailed description of these strategies and their utilization in the Region is provided in the Draft IRWMP document. All of the water management strategies identified in the Proposition 50 Guidelines are already being utilized in this Region. However, the degree to which they are being implemented varies (Table 3-1). The current application of each strategy has been discussed in the first three TMs. That evaluation is summarized here.

Water Management Strategy	Low	Moderate	High
Desalination	X		
Ecosystem Restoration	X		
Environmental & Habitat Protection & Improvement	X		
Flood Management			X
Groundwater Management/Conjunctive Use		X	
Imported Water			X
Land Use Planning	X		
Nonpoint Source (NPS) Pollution Control		X	
Recreation and Public Access	X		
Storm Water Capture and Management	X		
Surface Storage		X	
Water and Wastewater Treatment			X
Water Conservation		X	
Water Quality Protection and Improvement			X
Water Recycling		X	
Watershed Planning		X	
Water Supply Reliability		X	
Water Transfers	X		
Wetlands Enhancement and Creation	X		

#### 3.2 Water Management Strategy Integration Approach

All of the strategies listed above, with the exception of Land Use and Watershed Planning, represent types of single-purpose projects. Due to the extensive urban constraints in the Region, the opportunities for

implementing these types of projects are constrained by the availability of things like water and open space. Therefore, in order to achieve the vision and goals community members have created, projects must be designed to include as many of these strategies as possible in each project. In this way, ‘strategy integration’ really means multipurpose water project design that provides benefits to as many stakeholders and agencies as possible. The IRWMP will include this integration approach through the presentation and analysis of a variety of concept projects to be developed in the Regional and sub-regional workshops.

Three approaches to integrate water management strategies have been identified:

1. **Geographic Integration:** Similar projects or programs are identified that are geographically connected and will benefit from re-evaluating their objectives to work together to create a whole that is greater than the sum of its parts. (e.g., to form a regional project or program).
2. **Multi-purpose Project and Program Integration:** Agencies, jurisdictions, or organizations will benefit from incorporating multiple strategies into their own specific projects or programs (e.g., multi-purpose projects).
3. **Collaborative Project and Program Integration:** Agencies, jurisdictions or organizations will benefit from working together on collaborative projects or programs (e.g., multi-agency projects).

A discussion of these three methods follows.

### 3.2.1 Geographic Integration

In a Region of more than 2,000 square miles, opportunities for geographic integration are numerous. Two major river systems (the Los Angeles and San Gabriel), with several major tributaries, drain approximately three-quarters of the Region. Several other major creeks drain substantial portions of the remainder of the Region. These watershed (and sub-watershed) boundaries provide an obvious opportunity for geographic integration in the Region, particularly for projects and programs that address surface water quality.

Integration of water supply projects and programs on a geographic basis has been occurring in the Region for some time, due to the geographic boundaries of the major wholesale water supply agencies, including the Upper San Gabriel Valley MWD, the Municipal Water District of Orange County, the Central Basin MWD, and the West Basin MWD, the broad scale of the Metropolitan Water District, and the size of the City of Los Angeles. Opportunities for expanded integration exist between the major wholesalers, groundwater management entities, and sanitation agencies which have available excess recycled water, and a specific discussion of these opportunities is provided in the Water Supply TM.

The adopted (wet- and dry-weather) bacteria TMDLs for Santa Monica Bay beaches and the metals TMDL for the Los Angeles River require the establishment of jurisdictional groups, which are organized on watershed boundaries, or other logical geographic groupings (e.g., smaller watersheds in the South Bay or an individual reach of a river). Pending future TMDLs may include a similar requirement. Thus implementation plans for some TMDLs will result in the geographic integration of projects and programs related to surface water quality. In addition, the Los Angeles RWQCB has suggested that it may consider adoption of watershed-based NPDES permits, which would provide additional impetus for coordination of stormwater and NPS programs on a geographic basis.

### 3.2.2 Multi-Purpose Project and Program Integration

Individual agencies, cities, and counties have the ability to implement projects and programs that address more than one of the identified water management strategies. Although, many resource management agencies typically have single-purpose missions, the implementation of multi-purpose projects provides opportunities to pool limited financial resources and develop “win-win” solutions. Given affinities between

some of the strategies, agencies have opportunities to integrate multiple strategies in their projects and programs.

Table 3-2 identifies which water management strategies are most suited to being implemented together. This suggests the most likely types of multi-purpose projects and programs.

### 3.2.3 Collaborative Project and Program Integration

Partnerships provide opportunities for agencies, cities, communities, and groups to work together for common goals. Cities can, and often do, coordinate planning with adjacent jurisdictions. Agencies can work with cities and other agencies to coordinate studies and implement projects. Interest groups may band together to work on issues of common interest. Neighborhoods and associations can strive to identify consensus on broad goals. These all represent forms of collaboration, which can result in partnerships that increase the strength of individual voices, expand the influence of groups, and extend benefits of project and programs beyond individual cities or jurisdictions.

Given the large number of agencies, cities, and counties with jurisdiction in the Region, and the diversity of neighborhoods and interest groups, the range of interests and issues is very diverse and extends beyond water resource management. Instead of differences, it is possible to focus on common themes on which virtually everyone can concur: improve water supply, improve water quality, and provide more parks and open space. It is possible to work together to plan and develop multi-purpose projects and programs that meet both local needs and agency mandates while also helping to enhance water supplies and improve water supply reliability.

Although informal associations of agencies, cities, counties, and stakeholder groups may be sufficient for the discussion and identification of issues, formulation of plans (such as watershed plans), more formal arrangements are typically required to plan, implement, operate, and maintain projects and programs. Options for the creation of formal arrangements include a Memorandum of Understanding (MOU), typically for single projects or programs, and a Joint Powers Authority (JPA), which typically is used for multiple actions and/or for long-term activities.

### 3.2.4 Opportunities for Integration

Opportunities for integration of each of the water management strategies with each other have been identified in each of the three technical memorandums for water supply, water quality, and open space, and are summarized below.

#### 3.2.4.1 Ecosystem Restoration

- Opportunities for ecosystem restoration in the Region have been identified within local watershed management plans as well as city, state and federal projects and programs such as the California Coastal Conservancy, Mountains Recreation and Conservation Authority, Santa Monica Bay Restoration Project, and the Santa Monica Mountains Conservancy. Examples of some of these opportunities include the DeForest-Dominguez Wetlands Restoration project, Ballona Creek Ecosystem Restoration Project, Los Angeles River Revitalization Master Plan, and the Limekiln Canyon Stream Restoration and Habitat Improvement Project. The common thread within these and other ecosystem restoration projects are their goal of preserving and restoring large areas of habitat to increase and restore the natural functions of both the project and surrounding areas. Ecosystem restoration projects can be designed with objectives of other water management strategies such that they provide additional water supply and water quality benefits including reduction of stormwater runoff, and associated pollutants, increased groundwater recharge, flood reduction, and increased recreation and open space.

**Table 3-2. Potential for Combined Water Management Strategy Implementation**

Water Management Strategies	Desalination	Ecosystem Restoration	Env. & Habitat Protection & Improvement	Flood Management	Groundwater Mgmt / Conjunctive Use	Imported Water	Land Use Planning	NPS Pollution Control	Recreation and Public Access	Storm Water Capture and Management	Surface Storage	Water and Wastewater Treatment	Water Conservation	Water Quality Protection / Improvement	Water Recycling	Watershed Planning	Water Supply Reliability	Water Transfers	Wetlands Enhancement and Creation
Desalination	●											●		●			●		
Ecosystem Restoration		●	●	●	●		●	●	●	●				●		●	●		●
Environmental & Habitat Protection & Improvement		●	●	●	●		●	●	●	●				●		●	●		●
Flood Management		●	●	●	●		●			●	●			●		●	●		●
Groundwater Mgmt/Conjunctive Use		●	●	●	●	●	●	●	●	●	●			●		●	●		●
Imported Water					●	●		●			●	●		●			●	●	
Land Use Planning		●	●	●	●		●	●	●	●			●	●	●	●	●		●
NPS Pollution Control		●	●		●		●	●	●	●				●		●	●		●
Recreation and Public Access		●	●		●	●	●	●	●	●						●	●		●
Storm Water Capture and Management		●	●	●	●		●	●	●	●	●			●		●	●		●
Surface Storage				●	●	●				●	●			●			●		●
Water and Wastewater Treatment	●					●						●		●	●		●		●
Water Conservation							●						●		●		●		●
Water Quality Protection/Improvement	●	●	●	●	●	●	●	●		●	●	●		●	●		●		●
Water Recycling							●					●	●		●	●	●		●
Watershed Planning		●	●	●	●		●	●	●	●				●		●	●		●
Water Supply Reliability	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Water Transfers						●												●	
Wetlands Enhancement and Creation		●	●	●	●		●	●	●	●		●		●	●	●			●

### 3.2.4.2 Environmental and Habitat Protection and Improvement

- Opportunities for aquatic and riparian restoration are limited by extensive development, as well as by geologic and topographic constraints. Restoration in such a heavily urbanized region is hindered by the fact that the physical and hydrological landscape has been irreversibly altered and it is often impossible to re-establish historic conditions. Hydrologic and land use changes in the watersheds also continue to impact stream corridors and downstream aquatic habitats and many created habitats that were designed to mitigate for losses from development seldom perform the same ecological functions as those that were removed.
- Opportunities for restoration, improvement, and protection of the Region's riparian and aquatic habitat and environment have been identified within local watershed management plans. Examples of some of these opportunities include the Rio Hondo Vision Plan (Emerald Necklace Concept), the Wilmington Drain Restoration Multiuse Project, the Sepulveda Basin Habitat Enhancement program, and the Flint Wash Restoration project. Environmental and habitat protection and improvement projects can be designed with objectives of other water management strategies such that they provide additional water supply and water quality benefits including reduction of stormwater runoff, and associated pollutants, increased groundwater recharge, flood reduction, and increased recreation and open space.

### 3.2.4.3 Existing Imported and Local Surface Water Supplies

- Seek and maintain a diversified water supply portfolio. Diversification should include creating opportunities to bring in new sources in the portfolio. Urban runoff management, conjunctive use, spreading basin and groundwater storage opportunities, etc., should be evaluated based on local availability and constraints.
- Develop community based educational and motivational strategies for conserving water for irrigation.
- Expand conjunctive use capability to capture excess surface water supplies. Also, where possible, consider naturalizing concrete-lined channels to increase percolation and reduce loss of water through evaporation.
- Improve the river water quality in Los Angeles River and San Gabriel River through ecosystem restoration and by controlling contamination from point and non-point sources. These rivers can provide additional reliability to the overall water resources portfolio in the Region.
- Strictly enforce water pollution prevention goals. This will improve water quality and reduce water treatment costs.
- Protect recharge areas, especially in spreading basins, and major watershed areas.
- Identify more recycled water use customers through education, public participation, and incentives. Recycled water is drought-proof, and supply increases with growth. Use of such reliable supply source will reduce dependence on other sources vulnerable to drought and competition among utilities.
- Seek opportunities for system re-operation. This includes probable modification of reservoir, canal and dam operations to better manage storm flows.
- Develop comprehensive urban runoff management programs at local levels to store and use stormwater as a resource.
- Leverage stormwater quantity/quality management for maximum supply yield.

### 3.2.4.4 Flood Management

- Enhance flood management to provide multipurpose benefits. Apply innovative, alternative approaches to enhance flood management facilities to provide multiple benefits. As one example, the Sun Valley Watershed Plan addresses an area of chronic flooding with alternative approaches to construction of a flood conveyance channel, such the use of gravel pits and underground drains below parkland to infiltrate

runoff and thereby enhance groundwater recharge. If successful, the Sun Valley Plan can serve as a model for future localized flood management improvements.

- Develop dual purpose storage and treatment facilities. Evaluate opportunities to site and design constructed wetlands adjacent to existing rivers and streams to provide treatment of urban runoff during normal rainfall conditions and to also function in a manner that could provide off-channel storage, and increase the level of flood protection during infrequent flood events. These facilities could also be designed to provide riparian habitat along these water bodies. The U.S. Army Corps of Engineers may provide significant funding of these facilities. Also, consider other types of stormwater facilities that can serve the dual purpose of capture and treatment during normal rainfall conditions and flood storage during high flow conditions.
- Expand aging infrastructure repair and replacement projects to provide multiple benefits. As the flood control infrastructure continues to age and potentially exceed its design life span, there is an opportunity to evaluate the best use of future financial resources on the repair and replacement of these facilities. Evaluate opportunities to redesign flood control infrastructure to provide multiple benefits including stormwater pollution control, riparian habitat, trails, and recreation.

#### 3.2.4.5 Groundwater, Groundwater Management, and Conjunctive Use

- Provide stormwater quality treatment to reduce contaminant contribution to groundwater.
- Evaluate opportunities to develop multipurpose facilities built by one agency by extending, enlarging or connecting another facility to the original facility. An example of this would include inter-basin transfer of recycled water. Institutional challenges such as the operation of the facility and cost-sharing would need to be addressed. This could be done by contract or forming a JPA. Legislation could be introduced which would make it less burdensome for the agencies to form a JPA.
- Evaluate the use of existing gravel pits for use as water supply reservoirs and stormwater capture facilities.
- Evaluate opportunities to provide recreational, open space, and habitat features to groundwater recharge facilities.

#### 3.2.4.6 Land Use Planning

- Expand Land Use Planning to support water management strategies. Opportunities to expand the use of Land Use Planning in the integrated management of water resources include: the adoption of natural resource protection measures (e.g., a stream protection ordinance), the preparation of Water Resource Elements in city and county General Plans, and the adoption of Sustainability Plans by jurisdictions, agencies, and organizations.

#### 3.2.4.7 Ocean Desalination

- Use desalination supply to actively manage groundwater basin quality through conjunctive use or active injection.
- Supplement surface and groundwater supplies throughout the year or hydrologic cycles as necessary to minimize reliability on imported water.
- Meet environmental and habitat water needs during times of stress on the other water supplies.
- Research technologies to reduce the use and thus the costs of energy for desalinating ocean water.
- Perform further research on membrane technology to improve salt removal and thus reduce the need for energy and drop costs.
- Consider efficiency of plant siting. For example, the close proximity of the LADWP and West Basin desalination plants could argue for consolidating the effort at one facility initially.

### 3.2.4.8 Recreation and Public Access

- To increase open space, the acquisition of land is needed to provide the many neighborhoods in the watershed who have limited open space, with more opportunities for recreating in a variety of forms. Vacant parcels, under-utilized public land, Brownfields, and land along river, creeks or tributaries will need to be acquired to provide new parks, including large traditional parks, pocket parks and community gardens. These sites will provide opportunities for both, active and passive recreation, public education, local farming, habitat creation, as well as provide opportunities for addressing water supply and water quality improvements.
- Utility Rights-of-Way is the most significant open space opportunity along some river corridors which can be enhanced for passive recreational habitat and water quality improvement purposes. There is precedent for utility corridors being used in this manner. In Sun Valley, LADWP easements are being considered for treatment wetlands to assist local cities in meeting water quality regulatory requirements.
- Flood plain restoration is another opportunity to increase open space while also providing water supply and quality benefits. Restoration efforts may include setting back the banks of the rivers and daylighting streams to restore flood plain function, including meandering channels and sandbars. Utility easements and spreading basins offer opportunities to increase flood channel capacity while contributing to floodplain restoration efforts.
- For park poor communities it is necessary to improve access to open space and recreation, with safe, convenient bicycle and public transit facilities. Pedestrian, bicycle and transit access to existing parks needs to be improved, and future parks and open spaces should be planned at locations that can be easily accessed without a vehicle.
- It is vital to long term success as a Region to create a comprehensive network of open spaces or greenbelts by developing continuous pedestrian and bicycle trails along rivers, creeks, tributaries as well as transportation and freight corridors, such as the Alameda and metro rail corridors. It will also be necessary to create gateways and links from the residential areas and commercial districts to the greenways by a network of bridges, gateways and connections which are cohesive design elements of the park system.
- The cumulative benefit of a regional and local-serving greenway network of parks and trails will be improved access for all communities as well as opportunities for improved groundwater protection and recharge for future generations, improved water quality for aquatic habitats and recreation and increased economic development potential.
- There are a significant number of parks, trails and recreational projects happening in the region. There is also an opportunity to weave together these disparate sets of projects into an integrated whole that presents opportunities to complement the goals of improved water supply and quality. Wetlands Enhancement and Creation
- The long-term restoration, improvement and protection of the Region's wetlands would help ameliorate or eliminate the water quality, water supply and biological impacts of environmental degradation. Because many of the issues involved in wetland restoration and enhancement cut across traditional political and organizational boundaries success will only be accomplished through cooperative planning efforts like the IRWMP that include non-governmental organizations, private landowners, industry, and state and federal government. Education and public outreach will be critical helping the public understand their role in protection and achieving buy-in on the necessary improvements.
- Wetlands and habitat projects can provide water quality, groundwater recharge, flood management and recreational opportunities, for example. Integrated projects are more likely to be funded, in that funding agencies treat them more favorably, and there are more funding sources to tap for a given project.
- Numerous opportunities for enhancement and creation of the Region's wetlands have been identified within local watershed management plans as well as city, state and federal projects and programs such as

the California Coastal Conservancy and Southern California Wetland Recovery Project. Examples of some of these opportunities include the Los Cerritos Wetland Restoration, the DeForest-Dominguez Wetlands Restoration Preliminary Plan, Headworks Los Angeles River Wetlands and Water Protection project, and The Long Beach RiverLink project. Each of these projects not only look to restore wetland habitat, but also to integrate additional multi-purpose features such as recreation and open space opportunities, upland and riparian habitat restoration, and water quality and water supply benefits.

- Current and planned projects throughout the Region demonstrate local awareness of the value of integrating habitat creation and preservation with passive and active recreation as well as other water management objectives such as increased infiltration and natural treatment of runoff. Integrating these local efforts into a regional water management plan will result in more effective projects resulting from the sharing of information and resources between the various local proponents, increase available resources by facilitating new partnerships and increase individual project benefits through integration with other projects into regional efforts.

#### 3.2.4.9 Recycled Water

- Integration with other water management strategies – Three potential pathways for integration with other water management strategies are currently envisioned: co-location of seasonal recycled water storage and flood control facilities, use of recycled water facilities not operating during the winter months to treat stormwater, and expansion of recycled water use for environmental restoration such as lake or wetland enhancement or creek restoration.
- During the continued development of the IRWMP, the potential application of these pathways through actual projects will be considered and the list of pathways will be refined and/or expanded. An example illustrating the integration with other water management strategies is a potential lake restoration project in the South Bay region. This project would use advanced treated recycled water from West Basin MWD's Carson Regional Treatment Plant to serve Harbor College for irrigation and Harbor Lake for recreational lake replenishment/enhancement.

#### 3.2.4.10 Surface Water Storage

- Seek opportunities for system re-operation. This includes probable modification of reservoir, canal, and dam operations to better manage storm flows.
- Seek ways to add surface storage to the Region for supply and other water management strategy benefits.
- Integrate gravel pits into storage and stormwater treatment strategies.
- Develop recreational opportunities with surface storage opportunities.
- Develop areas surrounding the lake or reservoir for habitat and to protect the water supply.

#### 3.2.4.11 Water Conservation

- Emphasize landscape irrigation conservation. Landscape irrigation is one of the areas that offer significant opportunities for further conservation within the planning area. The recent efforts of the AB2717 Landscape Task Force provided a list of opportunities for further conservation in landscaping. The recommendations from the Task Force report can be incorporate into regional programs. When designing landscape irrigation projects, efforts should first be made to target areas that are beyond the reach of recycled water projects. Increased coordination between the City and County parks representatives with water agencies will help to establish region-wide conservation programs.
- Develop improved methods to measure conservation. Another opportunity lies in developing better ways to monitor water savings from conservation. This would allow water conservation projects to be more performance-based and would enable Regional targets to be set and progress measured. The ability to

conduct cost-benefit analysis would be improved. It would also help promote water conservation by allowing water agencies, developers, businesses, and institutions to receive credit for their contributions.

- Consider stakeholder suggested actions. Other ideas for water conservation brought up during stakeholder workshops included assessing fines for runoff and providing public recognition for water conservation. Another opportunity lies in changing the Covenants, Conditions and Restrictions (CCR) restrictions in many homeowner agencies that restrict the ability to utilize native or water friendly landscaping. A goal for water conservation could be tied directly to the Region's share of imported water. Grey water use was also discussed. A final opportunity identified was to develop programs to make information about landscape conservation more accessible.
- Develop conservation master plans. The development of conservation master plans is the first step in integrating conservation efforts regionally.
- Implement pilot programs. A pilot program could be developed to demonstrate the efficiency of large landscape irrigation devices and to draw interest from potential partners. Training and installation can be consolidated on a sub-regional basis. Since there are micro zones that exist throughout the Region, a comprehensive installation and potential sharing of data would allow creation of a locally improved system. Since the weather-based irrigation controllers will also reduce dry weather urban runoff, the large landscape irrigation programs can be combined with and be counted as part of urban runoff reduction efforts.

#### 3.2.4.12 Water Transfers

- Water transfers provide a high degree of flexibility and are a valuable tool necessary to implement many of the integrated water strategies developed in this IRWMP. One of the primary restrictions to increasing transfers within the Region is the limitations on using Metropolitan facilities because of water quality impacts to downstream users. Once these water quality impacts are mitigated, opportunities for transfers and thus more water supply reliability can be attained.
- A water supply transfer that is being completed through direct replenishment has opportunities for integration with other water management strategies where the areas around the recharge basins are developed for habitat or other beneficial uses.

#### 3.2.4.13 Water Supply Reliability

- Increase education efforts to inform the public of reliability supply issues and potential consequences of low reliability supplies.
- Further develop drought response supplies such as desalination and proactive groundwater banking.
- Funding from the State to help defray some of the costs of developing supplies.
- Streamlining and removing roadblocks from the permitting process for new projects.
- Stakeholder groups working together to overcome institutional complexities and water quality challenges.
- Further research to develop new technologies to overcome barriers to projects.

Integrating these strategies and concepts with the various supply and demand management strategies will enhance the viability of all the integration efforts.

#### 3.2.4.14 Water Quality Protection and Improvement, Stormwater Capture and Management, and NPS Pollution Control

- Develop local and regional facilities to capture and treat stormwater as part of a TMDL compliance strategy. This could include package treatment plants to remove contaminants, filtration systems, or natural treatment systems such as constructed wetlands. In either case, it will be necessary to identify existing publicly-owned open spaces, or acquire/develop new open spaces downstream of urban runoff to

retain the design storm proposed in this Plan. Water cleansed by such facilities could either be recharged to groundwater or stored for delivery to local uses, such as landscape irrigation.

- Develop multipurpose TMDL solutions. Coordinate with regulatory agencies to establish and implement science-based TMDLs and reasonable schedules for implementation, which will encourage multipurpose solutions.
- Evaluate opportunities to share funding resources. The funding for the installation and maintenance of single-purpose facilities (i.e., CDS units, catch basin inserts, low flow diversion systems, and end-of-pipe treatment plants) is typically supported by single-purpose agencies. Evaluate opportunities to develop multipurpose solutions which allow for the sharing of funding resources among several partner agencies.
- Retrofit existing publicly owned lands for stormwater capture. Identify public lands, such as parks, schools, or power line or utility easements that can be retrofitted to provide a secondary function of stormwater capture either above or below ground.
- Develop joint use stormwater capture facilities. Identify and acquire available land in heavily urbanized areas to be used for collection and treatment of polluted stormwater runoff for the short rainy season, and then as parks and recreational facilities for the remainder of the year. Potential partners may include parks departments and stormwater management agencies.
- Expand river corridors to include more area for riparian habitat and stormwater storage. Develop a policy to acquire lands over the next few decades adjacent to existing rivers and creeks to allow for restoration of riparian habitat, reconfiguration of concrete channels to restore ecosystem functions, provision of stormwater storage, creation of parks along these improved facilities, conversion of existing urban land use to more densely developed urban land use adjacent to these facilities, and improvement of adjacent property values. Partners may include stormwater management agencies, Redevelopment Agencies, private developers, and the Department of Housing.
- Develop joint use groundwater recharge facilities. Consider packaging groundwater recharge facilities, which can require significant land acquisition, to provide treatment of influent urban runoff pollution for recharge, as well as wildlife habitat and recreational features. Also, consider locating facilities in areas to provide recharge of wastewater effluent in the non-storm season. Partners may include water supply, stormwater management, wastewater management, parks, habitat, and open space agencies.
- Expand water quality protection and improvement programs and projects, such as Safe Drinking Water Act (SDWA) projects, to address broader water quality issues. Also, coordinate with implementation of programs and projects to remediate groundwater contamination.

#### 3.2.4.15 Water and Wastewater Treatment

- Look for multiple benefits with future upgrades at wastewater reclamation plants. Opportunities to expand and/or enhance water and wastewater treatment include projects designed to meet SDWA requirements and recent and pending TMDLs. As enhancements for facilities throughout the Region's planning area are considered, evaluate other multipurpose opportunities to help treat dry weather and/or stormwater runoff or to polish reclaimed water for recycle.
- Develop joint use facilities for treatment of wastewater and stormwater. Identify and acquire available land in heavily urbanized areas to be used for treatment/polishing of wastewater treatment plant effluent to meet expected future TMDLs for nutrients and metals. Evaluate the ability of these facilities to be designed to also provide treatment of polluted stormwater runoff for the short rainy season and wastewater for the remainder of the year. Partners may include wastewater management and stormwater management agencies.
- Coordinate efforts to expand river corridors for multiple uses (see water quality strategy section above). Coordinate with stormwater management and development agencies to allow for development of treatment wetlands for wastewater treatment plant effluent along expanded river corridors and integration

of these facilities with restoration of riparian habitat and reconfiguration of concrete channels to restore ecosystem functions.

#### 3.2.4.16 Watershed Planning

Incorporate water management strategies in new watershed plans. Opportunities for the preparation of new watershed plans include: the headwaters of the Los Angeles River, Burbank (east and west) Wash, Verdugo Wash, the mainstem of both the Los Angeles and San Gabriel Rivers (although the respective river Master Plans cover the river corridors and some adjacent lands), Los Cerritos Channel, and numerous smaller watersheds that drain directly to Santa Monica Bay and San Pedro Bay.

## 4. WATER MANAGEMENT STRATEGIES AND THE URBAN CONTEXT

As identified in Section 2, many stakeholders are defining a vision for integrated water resource management that improves the quality of life in the Region overall. This section describes the mechanisms that exist for coordinating water resource planning with other urban planning issues to mutually benefit both and create collaborative opportunities that wouldn't exist otherwise.

The elements of life in an urban place are things like education, recreation, home, economy, employment, health, transportation, safety, water, nature, civic functions, worship, shopping, cultural centers, etc. The vitality of these elements is based on the efforts of the individuals and institutions that support and manage them. The coherency between them is more complicated because society tends to manage specific functions, not the interrelationships between them. This section will focus on some of the mechanisms that exist to form the connective tissue between our aquatic environment and other elements of the community.

### 4.1 Internal Policy Opportunities

This section presents some of the internal opportunities that exist within local agencies and jurisdictions for supporting the community's vision of sustainable water resources.

#### 4.1.1 Municipal General Plans

Counties and cities operate based on their General Plan. Each element in the General Plan provides a basis for everything that municipality does or authorizes. Everything that a municipal government does affects how land and natural resources are impacted. Therefore, each element of the General Plan provides a valuable opportunity for integrating water resource considerations into the process of how a local government and stakeholders operates. The first seven elements listed below are required by the State of California (Table 4-1). The subsequent elements are listed by the State as optional elements. However local governments are free to create any additional General Plan elements they choose.

Not only should water resource considerations be integrated into all of a General Plan's elements, but General Plans should be coordinated across jurisdictional boundaries in regards to a common approach for shared water resources. While this kind of consistency would be ideal, General Plans are only updated about once every ten years or more because this process can be demanding on a city. Therefore, this kind of integration is more of a long-term opportunity than a short-term one. As cities undertake their General Plan update processes, regional water resource managers can provide assistance and guidance on how to maximize mutually beneficial water management strategies and opportunities. In fact, the IRWMP is a process intended to promote solutions that make progress towards both water resource goals and tangible community benefits.

Supporting local ordinances that serve the function of implementing a General Plan's guidance will also need to be updated. This includes other planning laws, zoning ordinances, subdivision ordinances, building ordinances, and financial policies that affect both land use and water resources. If there are no conflicts with the existing General Plan, these changes can be made at any time. If it does, the community will have to update the General Plan.

Table 4-1. General Plan Elements

Element	Sample Opportunities
<b><u>Required Elements by the State of California</u></b>	
Land Use	Use natural hydrologic features as a guide for zoning density.
Circulation	Integrate multipurpose water projects into road design.
Housing	Incentivize investment in housing through improved local amenities.
Conservation	Incorporate watershed analysis into conservation planning.
Open Space	Integrate multiple hydrologic functions into open space design.
Noise	Use tree and vegetation cover to help buffer noise.
Safety	Improve the feeling of safety with more calming landscaped streetscapes.
<b><u>Optional Elements</u></b>	
Air Quality	Help improve air quality by planning more trees.
Capital Improvements	Attract more funding sources with integrated resource project design.
Community Design	Improve urban aesthetics by using water resources as a design element.
Economic Development	Retain and incentivize investment by improving local amenities, and attracting additional funding partners for multipurpose projects that incorporate environmental features into project design and avoid regulatory delays.
Energy	Reduce energy demand by increasing shade cover.
Flood Management	Increase flood capacity with greater on-site retention and infiltration.
Parks and Recreation	Increase park space and reduce maintenance with native vegetation.
Water	Integrate water resource planning and management.

### 4.1.2 Cost-Sharing Agreements

Agencies operate based on legislative authorization. They are only given the authority to do what they are instructed to do by law. Therefore it is difficult for them to implement projects or manage resources in a way that serves multiple purposes when they do not have the authority to spend public money to do so. Projects that serve the objectives of multiple agencies will have to be funded through cost-sharing agreements so that each agency pays proportionally for the value that they will receive. This may include the collaborative development of a master plan for a comprehensive set of projects. Each agency would undertake the projects that they have the authority to implement.

### 4.1.3 Agency Coordination

There are a variety of local, state and federal regulations for water resources and the surrounding land uses. Each regulating agency is responsible for some specific public concern. While each of the underlying concerns are important, a great deal of the difficulty in managing water resources in an integrated way is that all of the regulations that mandate how the resources must be managed are not integrated themselves. However, if regulators and land managers can coordinate their programs, there is an opportunity to begin to take a proactive approach by balancing the various needs and then tailoring regulation to implement an integrated plan, rather than having to plan around an effort to comply with unrelated regulation. There are already efforts going on in the region that can be used as benchmarks and built upon, such as the U.S. Army Corps of Engineers Special Area Management Plans or the State’s Natural Communities Conservation Plans and Habitat Conservation Plans.

## 4.2 Collaborative Mechanisms

In many cases internal changes that wouldn't be possible if an organization approached them alone, become possible when these same organizations collaborate with other stakeholders. The purpose of this section is to outline some of the mechanisms for collaboration that would be relevant to water resource management. These mechanisms will enable the most diverse urban elements to find common ground and develop mutually beneficial strategies.

### 4.2.1 Land Use Planning

A watershed is recognized by a body of water, but it is defined geographically and ecologically by all of the land that drains into that body of water. The relationship between land and water is so close that they cannot be managed separately. Regional decision-makers have an opportunity to integrate important ecological features into their vision for growth.

The IRWMP will be useful in this process in two important ways. First, it provides some of the landscape level analysis needed to identify the important ecological features and their connections. Second, it is also a mechanism for attracting the project funding and coordinated implementation that local governments will need in order to make integrating water resources into their land use planning feasible.

As an example of an opportunity to integrate water management strategies with land use planning, SCAG has undertaken in their Compass Growth Vision Report an extensive planning process to identify how the region should grow in a way that will make the most effectively utilize financial resources, and balance the pressures that growth can put on urban infrastructure and quality of life considerations. One of the main solutions identified through a stakeholder process was to cluster increased densification into 2 percent of the total land area of Southern California, to be located along critical economic and transportation corridors. This is known as the 2 percent Strategy. Figure 4-1 shows the Los Angeles County areas that have been identified for densification.

A similar approach may be appropriate for inclusion in the IRWMP.. Densification of redevelopment along rivers, creeks and flood control channels could ultimately provide the necessary open space along these water bodies to collect, store and treat stormwater runoff. These facilities could be designed to provide additional benefits such as parks, habitat and open space that could link communities using greenbelts, increasing the ease of mobility between them, as well as providing habitat connectivity across all ranges of densities throughout the region. Projects could be designed within water management strategies that could ease the feeling of congestion by integrating open spaces to provide views and calming natural amenities. Integrated, well designed, and well articulated plans for densification may be presented in a way that provides community members something to be excited about and support.

Economically disadvantaged communities are positioned to receive even greater benefits from this plan because they can leverage restored ecological features and new open space to plan entire community revitalization efforts around. Improving the environment can also be used strategically to improve social conditions and economic activity.

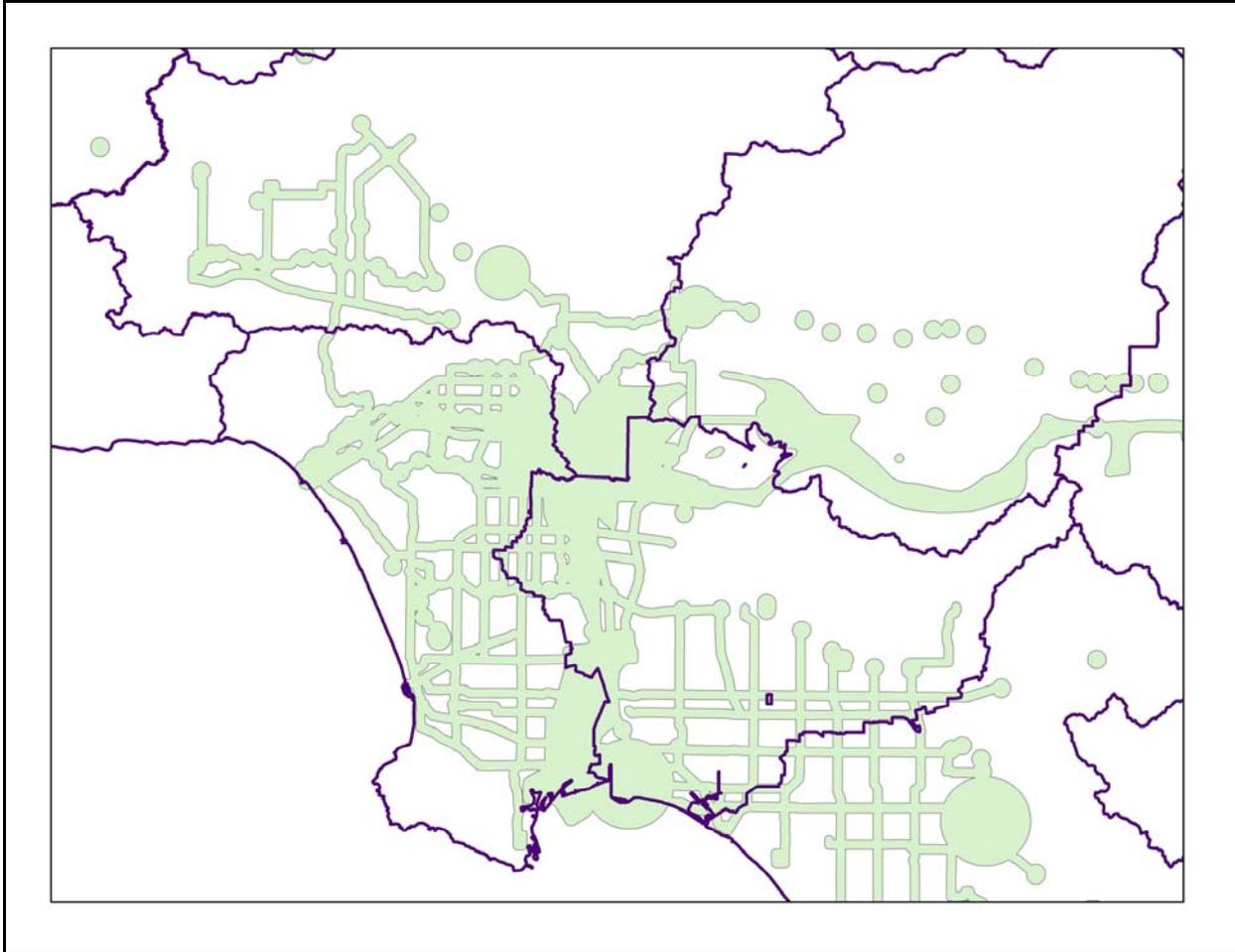


Figure 4-1. Two Percent Land Area Identified for Increased Densification (SCAG, 2004)

#### 4.2.2 Governance and Organizational Structure

Public, private, and non-profit stakeholders all perform unique functions, and there are opportunities to coordinate as a group to leverage each other's strengths and achieve common goals as efficiently as possible. In order to achieve effective management of the watershed areas of the Region, stakeholders who have an impact on land and water resources need to be included into a common organizational structure that identifies and coordinates their activities in relationship to each other for the purposes of sustainably managing watershed resources. This means that their roles need to be understood, and their relationships, both existing and potential, need to be identified. This kind of management relationship mapping will illustrate both existing management gaps, as well as opportunities for relationship building and watershed management capacity development.

In regards to the integrated management of water resources projects, many efforts have already taken place in the Region to create more coordinated management relationships. The Leadership Committee and five sub-regional Steering Committees that have been created to oversee this IRWMP represent a very broad range of public sector interests. They provide a forum for collaborative planning and decision making over the long term that can deal with issues specific to this sector.

### 4.2.3 Monitoring and Adaptive Management

Broader than the potential for development of integrated projects, opportunities also exist to integrate activities, such as monitoring, that synthesize efforts to provide improved efficiency and decision-making capability. There are many agencies collecting environmental data, but these efforts are not usually coordinated, and the data that they collect is also not usually compared. Data collected for the purposes of monitoring must be integrated across stakeholders to take full advantage of its utility to the full range of decision-makers.

The Southern California Coastal Wetlands Recovery Project (SCCWRP) is a leader in the region for integrating monitoring programs. Many of the various agencies and special interest groups within Greater Los Angeles County area are already engaged with this organization in the programs that they are currently developing. As the Leadership Committee progresses into the implementation stage for the projects that will be integrated in this plan, they could coordinate with SCCWRP to develop an effective monitoring program that effectively leverages already existing resources and identifies approaches for how to develop the other necessary information.

### 4.2.4 Data Management

In order to integrate water management and planning with other urban issues, opportunities exist to streamline data. This will take collaboration, analysis and coordination. Collaborative organizations, like the Southern California Coastal Wetlands Recovery Project, are already undertaking efforts like this in relation to TMDL regulations. The U.S. Army Corps of Engineers and the California Department of Fish and Game are doing this in the San Diego Creek watershed of Orange County for the purposes of developing a coordinated regulatory program.

One of the largest incentives for this kind of coordination is the fact that data collection is very expensive. Not only will coordinated data collection enable collaboration, but it will also reduce the costs that each organization has to absorb itself for the information it needs. If the community can coordinate the kind of information that is generated for these efforts in order to be most useful for multiple purposes, then the time and resources that are expended can be utilized much more broadly. During implementation of the IRWMP, coordinated data management can provide efficiency and support the evaluation of local and the broader regional benefits resulting from project and program implementation.

## 5. LIMITATIONS

### Report Limitations

This document was prepared solely for the Leadership Committee of Greater Los Angeles County Integrated Regional Water Management Plan in accordance with professional standards at the time the services were performed and in accordance with the contract between the Leadership Committee of Greater Los Angeles County Integrated Regional Water Management Plan and Brown and Caldwell dated May 15, 2006. This document is governed by the specific scope of work authorized by the Leadership Committee of Greater Los Angeles County Integrated Regional Water Management Plan; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by the Leadership Committee of Greater Los Angeles County Integrated Regional Water Management Plan and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

## REFERENCES

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California Department of Water Resources and the State Water Resources Control Board. 2004. Integrated Regional Water Management Grant Program Guidelines. November.

SCAG. 2004. Southern California Compass Growth Vision Report. June.

Thayer, GW, TA McTigue, RJ Bellmer, FM Burrows, DH Merkey, AD Nickens, SJ Lozano, PF Gayaldo, PJ Polmateer, PT Pinit. 2003. Science-Based Restoration Monitoring of Coastal Habitats. Volume 1: A Framework for Monitoring Plans Under the Estuaries and Clean Waters Act of 2000 (Public Law 160-457). NOAA, National Ocean Services, National Centers for Coastal Ocean Science.

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APPENDIX A

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Stakeholder Vision Statements

## STAKEHOLDER VISION STATEMENTS

### Verbatim Stakeholder Vision Statements

1. Flood control that also promotes ground permeability, recreational opportunities, potential for job and revenue creation (San Antonio river walk provides the “scene” around which businesses want to locate).
2. A massive network of restored riverine habitat/parks. Continuous from the Mountains to the Sea.
3. Connect people to their stormwater. Include awareness of, and education about, watersheds in everything designed to treat water. Incorporate economic development in projects, giving education and capacity building benefits to local firms who can then go on to develop sustainable projects in the future.
4. Any brownfield designated parcel would immediately be planted for bio-remediation. Failure of property owner to do so would result in forfeiture of property. Maintenance would be taken over by a conservation Corps type work program. Developers would be held to a strict code of respecting all children of all species for all time.
5. Integrate wastewater, stormwater, and drinking water resources to reduce dependence on outside water. Eliminate polluting of local water bodies. Increase conservation efforts. Ensure that local ordinances within municipalities and regional jurisdictions are consistent and integrated. Namely, building & safety codes, planning, environmental, public works, parks, and redevelopment agencies are in line with each other and are not conflicting.
6. Open space area within ¼ mile of every residence. Have eight acres of park space/1,000 residents in each sub-region. Multi-use wetland sites for storm water detention, cleaning, ground water, recharge and reclamation, and recreation/habitat, open space upstream of every storm drain entering a river, creek, or channel. Put vegetated swales as medians in all highways for ground water recharge and runoff cleansing.
7. Restore river floodplains and riparian areas, including estuaries and wetlands. Ecologically based planning and design that has no net negative impact on water quality or surface runoff/groundwater recharge. More open space and natural vegetation.
8. How are the public works, U.S. Army Corps of Engineers and other jurisdictions flood control existing strategies for quick removal of storm water being integrated into this process?
9. Implement the Olmstead Plan. Create retention ponds/water recharge areas. Create green belts along water courses. Stop channeling every canyon, stream bed, river, water course. Mandate no riparian habitat be removed or replaced. This also means reducing size of approved developments. Get flood control agencies to paradigm shift their thinking to a more sustainable approach.
10. Thriving communities living lightly in the watershed. Total water Independence. Total integrative watershed & water resource management. Permeable urban fabric. Ribbons of river parkways. Celebration of our creeks & rivers. Ecosystem functions integrated into all economic development. Design with nature.
11. At the turn of the century, on a clear day you could see the brilliant splash of poppies blooming on the slopes of Alta Dena from Catalina Island. I'd like to stand on the slopes of Alta Dena and see rivers of green space meandering towards Santa Catalina.
12. Go back to the original Olmstead Plan for Los Angeles where development of river parks, amenities and open spaces follow the natural systems, and commercial city/residential development works around those natural systems.
13. I am still trying to figure out what “NPDES” and “TMDL” stands for? Let a long what a “watershed” is. Distribute a glossary.
14. Having rivers that run naturally, with water clean enough to drink, where there are permeable open spaces in every community, allowing groundwater to be replenished and flooding to be reduced, where people

- are aware of their connections to all aspects of the watershed and act accordingly to protect it, and where minimal amounts of water are imported from watersheds outside the region, allowing the Colorado River Delta, Sacramento River Delta and Owens Lake to be restored to their natural state.
15. Remove all buildings and roads within a certain width around all rivers. Remove concrete lining and build upon space and a way for water to move in and out of wetland areas. Build bridges over the entire width of river corridors so that space is continuous. Improve public transportation, try to find a way to not use internal combustion engine.
  16. Regional detention and replenishment wetlands at strategic locations.
  17. Flood water to stormwater to drinking water supply - the integration of this to the watershed. Why clean it up, capture it, and then send it to the ocean?
  18. Self sufficiency for potable water. No significant amounts of bacteria, other than wildlife, with systems for mitigation that. No trash in drainage system or water courses. Natural, permeable surfaces for flood control channels (gabions, woven oak splits, etc.) No toxic/hazardous chemicals or harmful levels of others.
  19. No water resources, be it stormwater, groundwater, imported water, or recycled water, etc., shall be used for less than two beneficial uses. The public will recognize the true value of water and will be willing to commit the resources necessary to protect that value.
  20. Something that can't be publicly discussed without running the risk of spending the next ten years being sued, or having the likes of the RMC buy up the site (with the help of the Trust for Public Land) in order to "save" it from some inaccurately assumed fate. (i.e. see "Duck Farm")
  21. Mission Statement: Including "quality of life" as part of the mission may help the general public relate to and support the plan's objectives, particularly as the plan may be used to obtain voter approval for a future measure.
  22. Channel information to people that are interested and that will become involved and active in these topics of this goal/plan.
  23. Respect, enjoy, and live sustainably with water available to us locally. Vision is the realization of a county-wide greenway (i.e. Olmsted, Bartholomew 1930 Plan) laid off of urban rivers and tributaries and creeks. This multi-benefit greenway would allow: access to recreation, open space for all communities, storm water capture and management, separation of potable reclaimed water sources and uses as appropriate, decreased load of water to flood channel, water conservation, water quality protection and improvement, environmental restoration, and habitat protection.
  24. Return the watershed to its native state in as many places as possible. Wastewater should be treated in natural ways and the resulting recycled water should be used for irrigation. Overall, the amount of permeable surface in the region should be increased to reduced stormwater runoff. Storm water should be treated through bioswales and other means. Finally, all permeable surface and natural treatment places should be open to the public as parks for recreation. These spaces should include native habitat space for exercise and cultural and natural history education. Most importantly, community and academic resources should be tapped. These projects should serve the communities needs, so the community should be involved in the planning process.
  25. The integrated approach to solving these questions is primary. I gained a great deal of knowledge/information at this meeting. The mission statement is very comprehensive and integrated. I look forward to continuing to stay informed with this plan.
  26. Focus on capturing more stormwater runoff for groundwater recharge. Dam Big Dalton Canyon?
  27. All water sources are used to fullest extent possible, including recycling, desalination, stormwater, imported water. Use flood control storage for replenishment (operational plan). All agencies work together for the greater economical benefit of the area.

28. Conservation, reform retail rate structure and make conservation part of educational curriculum.
29. Local and sustainable water supply- fully capable of meeting current and future demands. 1) Improve water use efficiency by 20%, 2) Increase beneficial water recycling by 10 times, 3) Increase water banking/conjunctive use of groundwater basin by 2 times (more stormwater capture/storage, more storage of surplus SWP supplies).
30. 1) Regional watershed protection/preservation: TOP PRIORITY to protect water/water supply/water quality, 2) coordinated local to regional project planning connections, 3) sustainable design emphasis in projects, and 4) maintenance mandate on project funding.

## Stakeholder Comments Organized into Vision, Principle, and Strategy Statements

### Vision Statements:

#### River Parkways

- A massive network of restored riverine habitat/parks. Continuous from the Mountains to the Sea.
- Ribbons of river parkways.
- I'd like to stand on the slopes of Alta Dena and see rivers of green space meandering towards Santa Catalina.
- River parks, amenities and open spaces follow the natural systems, and commercial city/residential development works around those natural systems.
- Rivers that run naturally, with water clean enough to drink.
- County-wide greenway (i.e., Olmsted, Bartholomew 1930 Plan) along urban rivers, tributaries and creeks that provide access to recreation and open space for all communities, stormwater capture and management, separation of potable reclaimed water sources and uses as appropriate, decreased load of water to flood channel, water conservation, water quality protection and improvement, environmental restoration, and habitat protection.

#### Community Character

- Thriving communities living lightly in the watershed.
- Quality of life.

#### Water Use

- Total water Independence.
- Minimal amounts of water are imported from watersheds outside the region, allowing the Colorado River Delta, Sacramento River Delta and Owens Lake to be restored to their natural state.
- Self sufficiency for potable water.
- Local and sustainable water supply that is fully capable of meeting current and future demands.

### Principle Statements:

- Respect all children of all species for all time.
- Design with nature.
- Implement a sustainable approach to flood control.
- Planning based on integrative watershed & water resource management.

- Celebrate our creeks & rivers.
- Awareness of the connections to all aspects of the watershed.
- Protect all aspects of the watershed.
- Recognize the true value of water and commit the resources necessary to protect that value.
- Respect, enjoy, and live sustainably with local water supplies.
- Work together for the greater economic benefit of the area.
- Enable open public dialog around contentious issues.
- Pursue integrated solutions.

## Strategy Statements:

### Flood control

- Connect people to their stormwater.
- Permeable open spaces in every community, allowing groundwater to be replenished and flooding to be reduced.
- Flood control that also promotes ground permeability, recreational opportunities, potential for job & revenue creation.
- Permeable urban fabric.
- Integrate public works departments, the U.S. Army Corps of Engineers and other flood control jurisdictions into this process.
- Natural, permeable surfaces for flood control channels (gabions, woven oak splits, etc.).
- Overall, the amount of permeable surfaces in the region should be increased to reduce stormwater runoff.
- Remove concrete lining.

### Pollution and Treatment

- Include awareness of, and education about, watersheds in everything designed to treat water.
- Eliminate polluting of local water bodies.
- No trash in drainage system or water courses.
- No toxic/hazardous chemicals or harmful levels of others.
- No significant amounts of bacteria, other than wildlife, with systems for mitigation that.
- Storm water should be treated through bioswales and other means.
- Wastewater should be treated in natural ways and the resulting recycled water should be used for irrigation.

### Conservation, Restoration & Open Space

- Any brownfield designated parcel would immediately be planted for bio-remediation. Maintenance would be taken over by a conservation Corps type work program.
- Open space area within ¼ mile of every residence.
- Have eight acres of park space/1,000 residents in each sub-region.
- Restore river floodplains and riparian areas, including estuaries and wetlands.
- More open space and natural vegetation.

- Create retention ponds/water recharge areas.
- Create green belts along water courses.
- Go back to the original Olmstead Plan for Los Angeles.
- Implement the Olmstead Plan.
- Increase conservation efforts.
- Multi-use wetland sites for storm water detention, cleaning, ground water, recharge and reclamation, and recreation/habitat, open space upstream of every storm drain entering a river, creek, or channel.
- Put vegetated swales as medians in all highways for ground water recharge and runoff cleansing.
- Remove all buildings and roads within a certain width around all rivers.
- Return the watershed to its native state in as many places as possible.
- Finally, all permeable surface and natural treatment places should be open to the public as parks for recreation. These spaces should include native habitat space for exercise and cultural and natural history education.
- Make conservation part of educational curriculum.
- Regional detention and replenishment wetlands at strategic locations.
- Create a way for water to move in and out of wetland areas.
- Build bridges over the entire width of river corridors so that space is continuous.
- protect water/water supply/water quality.
- Maintenance requirement for project funding.

### Development

- Incorporate economic development in projects, giving education and capacity building benefits to local firms who can then go on to develop sustainable projects in the future.
- Ensure that local ordinances within municipalities and regional jurisdictions are consistent and integrated. Namely, building & safety codes, planning, environmental, public works, parks, and redevelopment agencies are in line with each other and are not conflicting.
- Ecologically based planning and design that has no net negative impact on water quality or surface runoff/groundwater recharge.
- Stop channeling every canyon, stream bed, river, water course. Mandate no riparian habitat be removed or replaced.
- Ecosystem functions integrated into all economic development.
- Improve public transportation.
- Sustainable design emphasis in projects.

### Water Supply

- Integrate wastewater, stormwater, and drinking water resources to reduce dependence on outside water.
- Capture stormwater, clean it and use it as a supply.
- No water resources, be it stormwater, groundwater, imported water, or recycled water, etc., shall be used for less than two beneficial uses.
- Focus on capturing more stormwater runoff for groundwater recharge. Dam Big Dalton Canyon?
- Conservation.

- Reform retail rate structure.
- Improve water use efficiency by 20%.
- Increase beneficial water recycling by 10 times.
- All water sources are used to fullest extent possible, including recycled water, desalination, stormwater, and imported water. Use flood control storage for replenishment (operational plan).
- Increase water banking/conjunctive use of groundwater basin by 2 times (more stormwater capture/storage, more storage of surplus SWP supplies).

#### Partnership and Public Involvement

- Provide information to people that are interested and that will become involved and active in these topics of this goal/plan.
- Community and academic resources should be tapped.
- Make the dialog accessible to the public by decoding the acronyms and industry terminology for people.
- These projects should serve the communities needs, so the community should be involved in the planning process.
- Coordinated local and regional project planning connections.