



Section 5 Resource Management Strategies

Included in the California Water Plan are resource management strategies that represent projects, programs, and policies to meet water related regional and statewide resource management needs. The North Orange County WMA will use these resource management strategies as tools to effectively manage the water resources in the region.

5.1 Strategies Not Applicable to Region

Nearly all types of resource management strategies are applicable and have been considered within the North OC WMA Plan and for proposed projects. Although most of the resource management strategies were identified as applicable to the region, and several were not these include:

Conveyance – Delta and Surface Storage – CALFED are not directly applicable to our region, as most of the NOC WMA region’s conveyance issues are related to local infrastructure. The NOC WMA region does not own or operate conveyance in the Delta region or surface storage facilities in the CALFED region. Precipitation enhancement strategies such as artificial cloud seeding, is not practiced locally so it does not apply to our region.

Forest management is not applicable to the NOC WMA region due to a lack of forest zoned land use. Crop idling for water transfers does not apply due to the limited agricultural land and farming that occurs in the region. Dewvaporation or Atmospheric Pressure Desalination is not a practice used within the Region; however, reverse osmosis desalination is utilized locally and addressed accordingly. Fog collection is not applicable due to the limited rainfall and precipitation within the Region. Irrigated Land Retirement is not a strategy used within our limited agricultural farming practices. Rainfed Agriculture is not applicable due to the low rainfall received. Waterbag Transport/Storage Technology has not been explored in our region, where above ground reservoir, are established water storage facilities.

5.2 Integration of Strategies to Meet Objectives

In many instances, water management strategies address multiple IRWMP planning objectives. Table 5-1 shows the relationship between resource management strategies and the North Orange County region’s objectives (discussed in Chapter 4). As shown, multiple water management strategies can be paired together to meet a given objective.

Complete integration of these strategies and objectives will be seen through the implementation of specific projects, as described in Chapter 6. The project will not only incorporate multiple water management strategies, but also multiple objectives. For example, a project that manages urban runoff could also serve to meet the following objectives: protect and

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enhance water quality, promote flood management, enhance local water supplies, and promote environmental justice. Within these objectives, depending on the project itself, multiple water management strategies would be incorporated.

Table 5-1 Water Management Strategies that Support the Objectives		
IRWMP Objectives	Water Plan Water Management Strategies that Meet Objectives	
Protect and Enhance Water Quality in Region	<ul style="list-style-type: none"> ■ Conveyance ■ Drinking Water Treatment and Distribution ■ Ecosystem Restoration ■ Groundwater Remediation/Aquifer Remediation ■ Matching Water Quality to Water Use ■ Pollution Prevention 	<ul style="list-style-type: none"> ■ Recharge Areas Protection ■ Urban Land Use Management ■ Urban Runoff Management ■ Water-dependent Recreation ■ Surface Storage – regional/local
Enhance Local Water Supplies	<ul style="list-style-type: none"> ■ Agricultural Water Use Efficiency ■ Conjunctive Management and Groundwater Storage ■ Desalination ■ Drinking Water Treatment and Distribution ■ Economic Incentives ■ Floodplain Management ■ Groundwater Remediation/Aquifer Remediation ■ Matching Water Quality to Water Use ■ Pollution Prevention 	<ul style="list-style-type: none"> ■ Recharge Areas Protection ■ Recycled Municipal Water ■ System Reoperation ■ Urban Land Use Management ■ Urban Runoff Management ■ Urban Water Use Efficiency ■ Water Transfers ■ Other resource management strategies ■ Precipitation Enhancement ■ Surface Storage – regional/local
Promote Flood Management	<ul style="list-style-type: none"> ■ Agricultural Land Stewardship ■ Conveyance ■ Ecosystem Restoration 	<ul style="list-style-type: none"> ■ Recharge Areas Protection ■ Urban Land Use Management



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	<ul style="list-style-type: none"> ■ Floodplain Management 	<ul style="list-style-type: none"> ■ Urban Runoff Management ■ Surface Storage – regional/local
Enhance and Maintain Wetlands/Coastal Areas and Wetland Functions	<ul style="list-style-type: none"> ■ Agricultural Land Stewardship ■ Ecosystem Restoration ■ Floodplain Management ■ Pollution Prevention ■ Recharge Areas Protection 	<ul style="list-style-type: none"> ■ Urban Land Use Management ■ Urban Runoff Management ■ Surface Storage – regional/local
Manage Runoff and Its Related Impacts from Existing and Future Land Uses	<ul style="list-style-type: none"> ■ Agricultural Land Stewardship ■ Conveyance ■ Economic Incentives ■ Ecosystem Restoration ■ Floodplain Management ■ Matching Water Quality to Water Use ■ Pollution Prevention ■ Recharge Areas Protection 	<ul style="list-style-type: none"> ■ Recycled Municipal Water ■ Urban Land Use Management ■ Urban Runoff Management ■ Urban Water Use Efficiency ■ Water-dependent Recreation ■ Surface Storage – regional/local
Maximize Funding from State and Federal Sources	<ul style="list-style-type: none"> ■ Economic Incentives 	
Promote and Support Public Education Programs and Available Information	<ul style="list-style-type: none"> ■ Economic Incentives ■ Urban Water Use Efficiency 	
Reduce Invasive Species and Enhance and Maintain Habitat	<ul style="list-style-type: none"> ■ Agricultural Land Stewardship 	<ul style="list-style-type: none"> ■ Ecosystem Restoration ■ Pollution Prevention
Promote Environmental Justice	<ul style="list-style-type: none"> ■ Urban Land Use Management 	<ul style="list-style-type: none"> ■ Water-dependent Recreation
Enhance Recreational Opportunities in the Watershed	<ul style="list-style-type: none"> ■ Ecosystem Restoration ■ Urban Land Use Management ■ Urban Runoff Management 	<ul style="list-style-type: none"> ■ Water-dependent Recreation ■ Surface Storage – regional/local



5.2.1 Water Quality Strategies

Pollution Prevention

Pollution prevention protects water quality of surface water and groundwater sources for beneficial uses. The State Water Quality Control Board has identified 23 beneficial uses of water, including fish and wildlife, recreation, and drinking water. Pollution prevention aims to control pollution from both point and non-point sources. Managing point source pollution involves source water quality control measures and treatment techniques. Non-point pollution sources, including agricultural and urban runoff, are responsible for most water quality impairments. Non-point source pollution can be managed through implementation of Best Management Practices for urban users and Efficient Water Management Practices for agricultural users. The Regional Water Quality Control Boards are adopting TMDLs to control both point and non-point pollution sources.

Agricultural Land Stewardship

Agricultural land stewardship aims to preserve the region's agriculture while managing the lands for multiple benefits, including water management improvements, and maintaining agricultural land in private ownership. Agriculture provides multiple benefits to the region, including economic revenues, employment, local food supplies, open space preservation, and habitat value. Implementation of agricultural land stewardship practices can protect environmentally sensitive habitat, increase groundwater recharge, provide water for wetlands, and support flood management efforts.

5.2.2 Water Supply Strategies

Conjunctive Management and Groundwater Storage

Conjunctive management is the coordinated use of groundwater and surface water to improve water supplies and reliability. Under conjunctive management, water users would use surface water when available and groundwater at other times. Surface water and groundwater are used in "partnership" to maximize the benefit of both supplies. In wet years, the use of imported supplies increases allowing imported water to be used to replenish the groundwater basin in addition to direct domestic use. In dry years, there is a shift to greater pumping from the groundwater basin to meet demands. Groundwater recharge is essential in conjunctive use projects to increase stored groundwater, and can occur naturally, in-lieu*, or through artificial means, such as recharge ponds or injection wells.

*According to the California Code: "In-lieu recharge" means accomplishing increased storage of groundwater by providing interruptible surface water to a user who relies on groundwater as a primary supply, to accomplish groundwater storage through the direct use of that surface water in lieu of pumping groundwater. Satisfying the demand of a user with additional surface water eliminates the need to pump groundwater, thus increasing the amount of groundwater available for other uses or to remain in storage.



Desalination

Desalination is the process of removing salt from water supplies for beneficial uses. Reverse osmosis is the primary technology used in California to remove salts. Benefits of desalination include diversification of local water supplies and improved reliability during dry years. Primary environmental issues associated with seawater desalination are seawater intake methods, the disposal of brine, and high energy requirements. Seawater desalination plants are also more difficult to permit because of their location within a coastal zone. Brackish water desalination does not have intake issues, but faces similar brine disposal and energy use issues.

Matching Water Quality to Water Use

Agricultural, commercial, landscape and residential water uses have different water quality standards. Matching water quality to water use provides appropriate water quality to each user, recognizing the different needs and different source water quality. Higher quality water is generally required by benefit use type; such as drinking water or industrial needs. Lower quality water can be adequate for some uses, such as stream restoration or irrigation for particular crops. Recycled water can also be substituted for potable water when uses do not require potable water quality. Blending water sources is often an effective means to match water quality to water uses and improve the quality of lesser quality sources.

Drinking Water Treatment and Distribution

Access to safe drinking water is essential to public health and safety. The region treats imported water, groundwater, and local surface supplies for delivery to customers. Standard treatment for surface water involves filtration and disinfection processes to make water suitable for potable uses. Not all groundwater requires treatment. However, many of the producers will disinfect groundwater prior to distribution in their potable systems. There are some wellhead treatment projects involving treatment for reducing nitrate and TDS, and volatile organic compounds. Increasing regulations for drinking water standards could require upgrades to treatment technologies. Improving drinking water distribution systems can further protect water quality after treatment has occurred.

Surface Storage

Surface storage refers to the use of reservoirs for storing water for future use or release. The benefits include water quality management, system operational flexibility, power generation, flood management, ecosystem management, sediment transport management, recreation, water supply augmentation, and emergency water supply.

Water Transfers

Water transfers refer to purchasing water from a willing seller, in response to meeting local water demands. Transfers can be temporary, long-term, between adjacent water districts or across the state.



5.2.3 Water Conservation Strategies

Agricultural Water Use Efficiency can result in substantial demand reductions and water savings. Efficient Water Management Practices (EMWPs) have been developed to improve agricultural water use and management. EMWPs include installing hardware to improve on-farm irrigation systems and regional distribution systems, improving water management through use of new technologies, and reducing crop evapotranspiration.

Urban Water Use Efficiency

Urban water use efficiency can result in substantial demand reductions and water savings. OCWD and multiple cities in the region are signatories to the California Urban Water Conservation Council MOU to implement Best Management Practices to reduce water demands. BMPs include indoor and outdoor water savings methods, pricing and management tools, and public education programs. The Municipal Water District of Orange County administers various water use efficiency indoor and outdoor programs including device rebates, community education and school programs that promote water use efficiency to reduce urban runoff and increase water quality in all of Orange County. BMPs include fourteen (14) indoor and outdoor water savings methods, pricing and management tools, and public education programs.

5.2.4 Groundwater Management Strategies

Groundwater Remediation/Aquifer Remediation

Groundwater remediation involves extraction and treatment of contaminated groundwater from point and nonpoint sources. Treated water can be used for beneficial uses or injected back into the aquifer. Groundwater contaminants can include high nitrate, organic compounds, heavy metals, and high TDS or salinity. Contamination of groundwater can also come from point and non-point source pollution.

Recharge Areas Protection

Recharge areas protection addresses lands that are an important sources for groundwater recharge. Recharge areas include stream beds and off stream areas which allow water to permeate into the ground. Stream beds can be used for natural recharge or managed recharge by increasing flow volume or decreasing velocity. Off stream recharge sites includes ponds, basins, or injection wells to artificially recharge groundwater. Open ponds or basins provide important bird or wildlife habitat. Recharge areas should be protected for water supply, water quality, and environmental purposes and can be protected through land use planning, land conservation or habitat protection programs. Recharge areas protection can also prevent open spaces from being developed for urban infrastructure.



5.2.5 Wastewater Management Strategies

Recycled Municipal Water

Recycled water can augment water supplies by providing water to non-potable demands and making more potable water supply available. Recycled water can be used for landscape irrigation, golf courses, agricultural irrigation, groundwater recharge, and stream flows.

Water and Wastewater Treatment

5.2.6 Aquatic/Riparian Ecosystems & Watershed Management Strategies

Ecosystem Restoration

Ecosystems are threatened as physical changes associated with erosion protection for levees and banks; poor water quality, including temperature, dissolved oxygen levels and pollutants; and non-native invasive species occur. Ecosystem restoration focuses on improving modified ecosystems to provide the original functions and uses before any disturbance occurred. Ecosystem restoration can provide habitat for native plants and animals and improve aesthetic value of the land for current and future generations. Benefits of restored ecosystems also include increased connectivity of habitat, endangered species habitat, increased storm water capture and storage, groundwater recharge, flood control and protection, water quality protection, water supply reliability, and recreation.

Watershed Management

Understanding a watershed's ecological processes is a critical factor to successful watershed management and can allow for adaptive management of the watershed. Actions which can degrade watershed health include altering land uses to affect runoff and flood flows, increasing pollutant loads in water bodies, fragmenting habitat and wildlife corridors, and introducing invasive species. Watershed management planning encompasses a broad perspective on water resource management and seeks to balance the various functions of a watershed, including water resources, ecosystems, open space, and community needs. Watershed management promotes multi-benefit projects and often requires the involvement of multiple stakeholders.

Urban Runoff Management

Urban runoff management aims to protect waterways from increased pollutant loading and other impacts of urbanization. Effective runoff management can help improve ecosystems, improve riparian and fish habitat, prevent flooding, protect groundwater and surface water quality, decrease sedimentation, and improve recreation. Best management practices have been developed to pollutant loads, volume and flows into waterways. The EPA established the NPDES system to regulate urban and storm water runoff to protect water quality.



5.2.7 Flood Management Strategies

Flood Risk Management

Floodplain management provides safety and economic benefits by reducing the risk to human life, property, and infrastructure from flood damages. Floodplain management can also protect ecosystems and agricultural lands by reducing development in floodplains and preserving natural habitat and open spaces. Allowing seasonal flooding of some areas could improve habitat values and increase groundwater recharge.

5.2.8 Community Integration Strategies

Water-Dependent Recreation

Water-dependent recreation includes opportunities to access beaches, lakes, river corridors, or wetlands. Interpretive signs and educational facilities can also enhance recreational activities. Improving recreation contributes to watershed stewardship in the region.

Public Education Programs

Promote the implementation of educational programming for professional, worker and student opportunities. Promote informational programs for elected officials and regulatory personnel as appropriate to support the goals of the IRWM Plan. Per-project performance would typically be measured by the number of impressions made.

5.2.9 Climate Change Strategies

System Reoperation

System reoperation allows for better management and movement of existing water supplies and could increase water supplies during dry years. Economic incentives, in the form of loans, grants, or water pricing support, are important for successful implementation of projects to meet the region's objectives. Lack of adequate funds can often prevent a project from moving forward.

Urban Land Use Management

Cities and counties set policies in General Plans, zoning ordinances, or other planning documents that identify current and future land uses within their boundaries. Water related projects can be included in the General Plan elements for conservation, open space, and safety. Projects should be coordinated with these documents for appropriate implementation.

5.3 Benefits of Integration to Meet Objectives

Integration provides multiple benefits to the region which otherwise would not occur if local, independent projects were implemented separately. Benefits of integration include:

- ◆ Sharing knowledge, resources, facilities, and costs,

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- ◆ Reducing duplicative efforts,
- ◆ Achieving broader goals,
- ◆ Improving regional collaboration, and
- ◆ Improving local understanding of water resources.

Regional integration allows agencies, cities, and districts to share resources, such as labor and expenses. This can reduce overlap of efforts and allow cost sharing among involved partners. Integrating also provides the ability to address a broad range of water management goals and optimize efforts to achieve goals. Recognizing where strategies overlap or complement each other can help agencies identify a single project that addresses several water related issues or needs. Lastly, integration promotes regional cooperation and coordination within and between agencies. This collaboration increases the understanding of regional problems and develops relationships that could be used to implement future projects.

5.4 Benefits within the Region and Adjacent Areas

Implementation of the NOC WMA Plan and its projects will lead the NOC WMA region into a future with a reliable water supply, protected and improved water quality, and achievement of the statewide priorities and program preferences for integrated regional planning. The NOC WMA Plan has served as an impetus to bring stakeholders together to discuss common goals, address concerns, and brainstorm solutions. This clearly addresses the NOC WMA Plan purpose of “Total Watershed Efficiency.”

As the NOC WMA Plan is implemented and benefits of water supply and water quality are realized, adjacent areas and regions will benefit from the NOC WMA regional efforts. When dependence on imported water for the region is reduced, water supply to other regions will increase, enhancing their reliability.

Long-term attainment and maintenance of water quality standards within the watersheds throughout the NOC WMA region will result in enhanced local supplies, habitat restoration, pollution control, and increased outdoor recreational opportunities. Pollution reduction in impaired water bodies and sensitive habitat benefits wildlife that creates habitat in North Orange County habitat. Overall watershed health realized in the NOC WMA region provides greater opportunities for communities to enjoy the area in which they live, including beach activities, hiking, biking, bird watching, horseback riding, and other activities that thrive in this region.

Regional solutions are being implemented in the following objectives:

- ◆ Diversify the mix of water supplies
- ◆ Improve water system reliability
- ◆ Reduce vulnerability to drought
- ◆ Ensure appropriate level of investments

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- ◆ Implementation of Best Management Practices water use efficiency measures
- ◆ Protect the quality of surface and groundwater
- ◆ Optimize handling of sanitary and stormwater flows wastes to minimize environmental and socioeconomic impacts
- ◆ Public education programs and opportunities

Collaboration of regional projects and priorities will achieve substantially enhanced regional benefits, increased opportunity for project implementation, collective planning to monitor regional changes and facilitate refinements for implementation, increased participation and cooperation by the public and interregional benefits to adjacent areas. Certain watershed and habitat areas and the improvements made to them know no boundaries. Neighboring regions will experience benefits from the implementation of the NOC WMA Plan.