



YOLO COUNTY

Integrated Regional Water Management Plan

EXECUTIVE SUMMARY

MAY 2007



Introduction

The Water Resources Association of Yolo County (WRA) resolved in 2001 to examine existing local water supplies in terms of quantity, quality, and the environment in order to develop the county's first Integrated Regional Water Management Plan (IRWMP). The Plan is intended not only to describe water supply projects, but also to outline comprehensive programs that will encompass flood management, protect water quality, enhance aquatic and riparian habitat, and improve recreational opportunities.

The development of the IRWMP document is a significant milestone in the advancement of water resources management in Yolo County. Of additional importance, the process of writing the document has led to closer collaborative ties between the State, local water resource agencies, and community organizations. These relationships will allow the task of water resource integration to continue into the future for the benefit of all.

The Water Resources Association of Yolo County

A consortium of public water purveying entities organized in 1993, the nine-member Water Resources Association of Yolo County is a nonprofit, mutual-benefit corporation created to provide a regional forum to coordinate and facilitate solutions to water management issues in Yolo County. Governed by a board of directors with a representative from each of its member organizations, the WRA member organizations are:

- City of Davis
- City of West Sacramento
- City of Winters
- City of Woodland
- Dunnigan Water District
- Reclamation District 2035
- University of California, Davis (UC Davis)
- Yolo County
- Yolo County Flood Control and Water Conservation District



THE WATER RESOURCES ASSOCIATION OF YOLO COUNTY'S IRWMP, COMPLETED IN EARLY 2007, IS THE MOST COMPREHENSIVE, PROACTIVE AND COLLABORATIVE EFFORT EVER UNDERTAKEN TO PLAN FOR YOLO COUNTY'S WATER FUTURE.

IRWMP Background and Purpose

In 2001 the WRA and the California Department of Water Resources (DWR) agreed to “cooperatively plan an integrated resources management program identifying opportunities...to improve water supply reliability in Yolo County.” In the process of developing the program, the WRA has provided a countywide forum to identify and address concerns related to water resources and sought to establish a collaborative effort to resolve these concerns. Serving as an update to the 1992 water management plan, the IRWMP as here presented identifies opportunities for cooperative action and presents a framework for local water management policies and projects. Because regional cooperation is mutually beneficial and even imperative, the WRA’s IRWMP is an important tool for coordinating ongoing efforts of member agencies and opening doors to new funding opportunities.



IRRIGATION CANAL IN YOLO COUNTY

IRWMP Development Steps

The WRA Technical Committee, comprised of staff from each of the member agencies, led the development of the IRWMP in coordination with federal and state agencies and organizations in neighboring regions. Initial efforts focused on completing the Background Data and Information (included as Appendix A). From 2005 to 2007, the WRA Technical Committee developed the Plan itself.

Development of the Plan took more than two years, requiring many phased activities and iterations. The planning process consisted of four sequential steps, which included substantial feedback in response to increasing knowledge and progressive refinements.

- Step 1. Identification of issues in five water resource management categories**
- Step 2. Development of a list of actions to address the issues**
- Step 3. Prioritization of the actions**
- Step 4. Creation of a strategy for implementation**

Public and stakeholder participation were vital in developing the IRWMP. During 2005 and 2006 the WRA hosted three community workshops seeking input regarding concerns over water issues and potential solutions. The WRA used the information gleaned from these workshops, stakeholder interviews and other public outreach efforts to help identify potential actions to meet concerns. Regular meetings of the WRA board of directors, executive committee, and technical committee also included open discussions during each stage of the effort.

Because Yolo County shares several significant water resources with surrounding regions, the WRA worked with other agencies in neighboring counties during the preparation of the IRWMP. In 2006 a regional meeting took place involving representatives of WRA, DWR, Lake County, the Regional Water Authority (representing American River Basin water agencies), the Northern California Water Association (representing Sacramento Valley water agencies), and Solano County Water Agency. At this meeting the participants exchanged information on all their water resource planning goals, processes, and challenges.

Step 1. Identification of Issues in Five Water Resource Management Categories

Based on the member agencies' goals and objectives, the WRA organized potential water management strategies into five main categories, which served as the framework for the IRWMP:

- **Water supply and drought preparedness**
- **Water quality (both surface water and groundwater)**
- **Flood management and storm drainage**
- **Aquatic and riparian ecosystem enhancement**
- **Recreation**

The WRA made a concerted effort to involve the following stakeholder groups:

- Local aggregate mining companies
- Cache Creek Conservancy
- California Audubon
- California Department of Fish and Game (DFG)
- California Department of Water Resources (DWR)
- California urban water agencies
- Local landowners
- Lower Putah Creek Coordinating Committee
- Natural Resources Conservation Service
- Putah Creek Council
- Reclamation Board of California
- Reclamation District 108
- Tuleyome
- UC Davis Putah Creek Riparian Reserve
- Yolo Basin Foundation
- Yolo Basin Working Group
- Yolo County Agricultural Commissioner's Office
- Yolo Audubon Society
- Yolo County Farm Bureau
- Yolo County HCP/NCCP Joint Powers Authority
- Yolo County Resource Conservation District, and
- Yolo Wildlife Area.

Drawing from nearly 20 years of local and regional water resource plans, technical studies, and public input, the WRA identified key issues related to each of the five water resource management categories. The issues in the respective categories are summarized below.

WATER SUPPLY AND DROUGHT PREPAREDNESS ISSUES

- Availability of adequate water supplies during severe drought conditions
- Subsidence as a result of groundwater extraction
- Ability of deep aquifers to sustain current and future demands
- Cost of providing water and wastewater treatment expected to continue increasing
- Regulatory compliance increasingly complex and expensive



INDIAN VALLEY RESERVOIR

OPPOSITE PAGE
CAPAY DAM
LEVEE REPAIR



TOWN OF MADISON, FLOOD OF 2000

WATER QUALITY ISSUES

- Need to improve existing water quality and pursue higher quality water sources to meet current and future demands
- Increasingly stringent water quality regulations
- High nitrate levels in urban and community drinking water wells potentially posing a risk to human health
- High salinity levels from wastewater treatment plant discharges exceeding permit requirements
- Levels of arsenic and chromium VI, naturally occurring constituents in deep groundwater aquifers, nearing health standard limits, with potential risk to human health
- High levels of boron in shallow groundwater aquifers reducing crop yields or damaging young perennial crops
- Low levels of pesticides, nitrates, or other harmful constituents in surface water that may not be known to exceed human health standards but need additional monitoring
- Surface water sources with high levels of suspended sediment that can negatively affect aquatic life
- High levels of mercury in Cache Creek and the Yolo Bypass with potential risk to humans who consume large quantities of fish and fish-eating wildlife

FLOOD MANAGEMENT AND STORM DRAINAGE ISSUES

- Through-seepage, under-seepage, and erosion threatening Sacramento River levees
- Inadequate funding for geotechnical studies (to determine erosion, stability, and seepage threats to levees) and subsequent repair projects
- Inadequate emergency preparedness plans for river levee failures
- Inadequate public education and outreach (need for flood insurance, understanding of evacuation plans, etc.)
- Need for competent evaluation of risks to development in the floodplain
- Inadequate compensation to Yolo County for providing Sacramento with flood protection; failure of the federal and state governments to properly address the Sacramento River Flood Control Project-induced flood risks within and adjacent to the Yolo Bypass
- Insufficient understanding of the risk of Cache Creek flooding
- Erosion and inadequate flood protection from existing Cache Creek levees
- Inadequate vegetation removal on Cache Creek (impeding flood capacity)
- Inadequate levees to protect Madison and Esparto from Lamb Valley Slough flooding
- Inadequate flood protection at the Yolo County airport
- Need to monitor future land use changes in the Yolo Bypass to ensure that impediments to flow do not occur that would further minimize capacity. All current and future land uses in the bypass must be consistent with flow capacity requirements and are subject to State Reclamation Board enforcement.



RIPARIAN AND AQUATIC ECOSYSTEM ENHANCEMENT ISSUES

- Loss of native plants and increase of invasive plants, leading to increased erosion problems and habitat loss
- Native fish habitat, including spawning grounds, being lost
- Barriers to fish passage preventing anadromous fish from reaching spawning grounds or preventing juvenile fish from reaching floodplains with superior food availability and better protection from predators
- Loss of habitat for terrestrial species, including endangered species, leading to a decline in some populations
- Invasive aquatic species increasing
- Methylmercury accumulation in fish tissue putting fish-eating wildlife at risk of neurological and reproductive disorders

RECREATION ISSUES

- Inadequate educational opportunities (interpretive centers, etc.) related to waterways
- Lack of sufficient hiking, bicycle and equestrian trails along waterways
- Lack of sufficient hunting and fishing access sites along waterways
- Lack of sufficient camping facilities along waterways
- Lack of sufficient boating opportunities (motorized and non-motorized)
- Lack of sufficient wildlife viewing opportunities
- Lack of sufficient day-use activities (picnicking, swimming, etc.)

A VINEYARD IN YOLO COUNTY

INSET
RAFTING ON CACHE CREEK
INVASIVE SPECIES IN CACHE CREEK



Step 2. Development of a List of Actions to Address the Issues

During the course of the IRWMP process, an encyclopedic list of 190 individual actions was developed to address the numerous water resources issues identified in step one. The WRA technical committee, stakeholders, and individual members of the public all contributed ideas to the list of actions.

Below is a summary list of actions by water resource category.

WATER SUPPLY AND DROUGHT PREPAREDNESS ACTIONS

The WRA identified 28 individual water supply and drought preparedness actions. Two are in an advanced state of development: the RD 2035 Sacramento River Diversion and Conveyance Facilities Project and the Davis-Woodland Water Supply Project. Each is the focus of an integrated action (see “Integrated Actions”). The Comprehensive Conjunctive Water Use Program for Cache Creek and water supply actions proposed in the Dunnigan area, in combination with flood management actions in that area, formed the basis of additional integrated actions. (See Table 5-2 in the IRWMP.)

WATER QUALITY ACTIONS

Seventeen water quality projects were identified. Several actions are already being implemented, but could be enhanced or expanded. These include the Agricultural Lands Conditional Waiver Program, a mandatory monitoring program landowners are required to comply with, and for which they need financial assistance; the UC Davis Groundwater Remediation Project; and the Sacramento River Joint Source Water Protection Program. (See Table 5-3 in the IRWMP.)

FLOOD MANAGEMENT AND STORM DRAINAGE ACTIONS

Forty-eight flood management and storm drainage actions were identified. Several focus on Cache Creek and form the cornerstone of the Cache Creek Integrated Project, which is intended to reduce flood risk in Woodland and other parts of Yolo County near Cache Creek. The Dunnigan Area Storm Drainage/Flood Management Project and water supply actions form the core of the Dunnigan Integrated Project. Potential flood management actions identified for the west bank of the Sacramento River formed the core of the Sacramento River (West Bank) Integrated Project. Additionally, conceptual ideas have been prepared for the Yolo Bypass Integrated Project to expand flood management capacity and provide innovative options. (See Table 5-4 in the IRWMP.)

AQUATIC AND RIPARIAN ECOSYSTEM ENHANCEMENT ACTIONS

Fifty-three aquatic and riparian ecosystem enhancement actions were identified, and many are included in the Putah Creek Integrated Project, the Yolo Bypass Wildlife Area Ecosystem Restoration Project and the Yolo Bypass Conceptual Aquatic Restoration Opportunities. (See Table 5-5 in the IRWMP.)

RECREATION ACTIONS

Thirty-eight water-related recreation actions were identified. Together with ecosystem enhancement actions, recreation actions form the core of the Yolo Bypass Integrated Project. The Cache Creek area has the highest number of recreational actions (11). Although only one potential action was identified for the Yolo Bypass Wildlife Area, that action includes many components that are part of the land management plan and will require partnerships between diverse stakeholders and DFG. (See Table 5-6 in the IRWMP.)

The 190 actions were divided into the following three categories:

1. **Foundational actions.** Projects or programs that form a foundation for resource management.
2. **Integrated actions.** Individual actions that naturally cluster together based on shared water resources, geographical considerations, or shared objectives.
3. **Stand-alone individual actions.** Individual actions that are neither foundational nor find a home in one of the integrated actions.

FOUNDATIONAL ACTIONS

Foundational actions are projects or programs that form a foundation for resource management. They include planned or existing ongoing studies, modeling projects, or monitoring programs used to collect, simulate, or predict information relevant to resource management.

Ten foundational actions are presented in detail in Table 5-1 of the IRWMP. They include continuation and expansion of the existing groundwater monitoring program for the county; countywide surface water, subsidence, and aquatic habitat and fish opportunity assessment programs; enhancement of an existing database, improved data acquisition, mapping and aerial photography; and funding the Habitat Conservation Plan/Natural Communities Conservation Plan (HCP/NCCP) currently being developed. The development and implementation of foundational actions are funded in part by the WRA project funds budget and with grant funding or cost-sharing with federal or state agencies where the opportunity exists.

INTEGRATED ACTIONS

The IRWMP identifies eight integrated actions that would greatly improve water resource management in Yolo County. The integrated actions presented in Sections 5.0 and 7.0 are diverse and involve many entities and stakeholders. The breadth of involvement recognizes that Yolo County is made up of very different subregions or subwatersheds from the standpoint of

resources, resource issues and opportunities, and includes numerous jurisdictional or implementing entities and intraregional associations. Recognizing the diversity of authority and responsibility, the IRWMP identifies a lead partner or partners for each integrated action.

The eight integrated actions are listed below (lead partners).

- **Davis-Woodland Water Supply Project** – IA1 (City of Davis, City of Woodland, UC Davis)
- **Reclamation District No. 2035 Sacramento River Diversion and Conveyance Project** – IA2 (Reclamation District 2035)
- **Cache Creek Integrated Project** – IA3, combined Flood and Water Management (Yolo County, City of Woodland, Yolo County Flood Control & Water Conservation District)
- **Dunnigan Integrated Project** – IA4 (Dunnigan Water District)
- **Sacramento River West Bank Integrated Project** – IA5 (Yolo County, City of West Sacramento)
- **Putah Creek Integrated Project** – IA6 (Lower Putah Creek Coordinating Committee)
- **Yolo Bypass Integrated Project** – IA7 (Yolo Basin Foundation)
- **Yolo County Sloughs, Canals, and Creeks Management Program** – IA8 (Yolo County Flood Control & Water Conservation District)

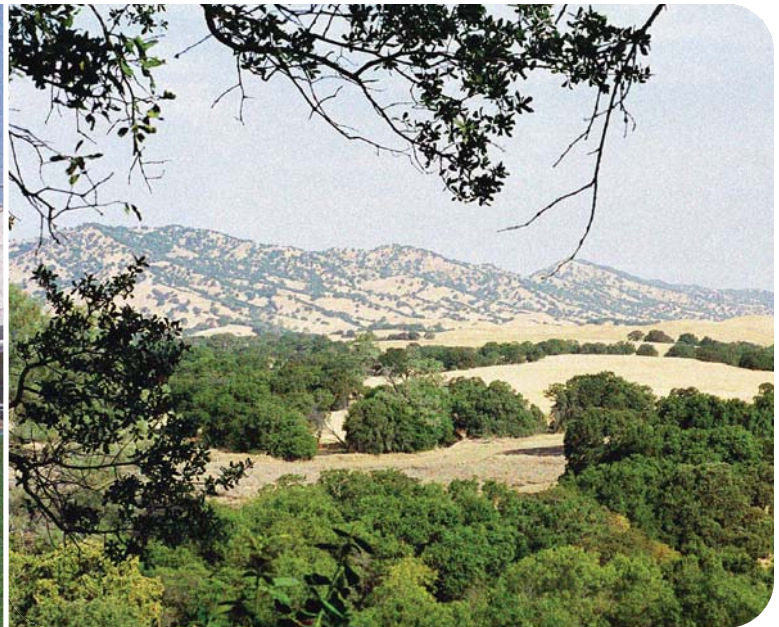
INDIVIDUAL ACTIONS

Only 18 of the 190 actions did not fit into integrated groups of actions. In some cases the action had not yet been thoroughly described or evaluated (such as the Groundwater Nitrate Reduction Program WQ8) and was therefore difficult to integrate. Other actions that were considered very important were more likely statewide or very long-term projects and thus outside of the scope of the Yolo IRWMP (for example, Sites Reservoir Project WS25). Finally, some actions did appear simply as stand-alone individual actions.

Step 3. Prioritization of the Actions



OLD RICE MILL NEAR COUNTY ROAD 100A



BLUE RIDGE HILLS NORTH OF WINTERS

High priority was assigned to the ten Foundational Actions (Section 5.2). These are essential to the successful implementation of the remainder.

Efforts to prioritize individual and integrated actions occurred in two phases. The first round of priority-setting was presented in the initial release of the draft IRWMP in October 2006. Integrated actions and individual actions were evaluated by determining how many IRWMP objectives were addressed, how many water resource management issues were addressed, and how many statewide priorities were addressed. Actions that addressed more objectives, more water resource management issues, and more statewide priorities were considered higher priority actions. These prioritization methods are explained in Section 5.5.2 and depicted graphically in Table 5-7 and 5-8.

Following the release of the first draft IRWMP in October 2006 and in response to public input, the WRA devoted additional attention to integrating and setting priorities for the proposed actions. All lead partners reviewed their respective projects and conducted a second round of integration and priority analysis, if needed. Additional agency consultation and public participation was conducted to gain input on the refined plan. The results of the additional analysis and recommended action priorities are summarized in Table 7-1 and presented in detail for each integrated action (or geographic area) in Section 7.0.

Step 4. Creation of a Strategy for Implementation

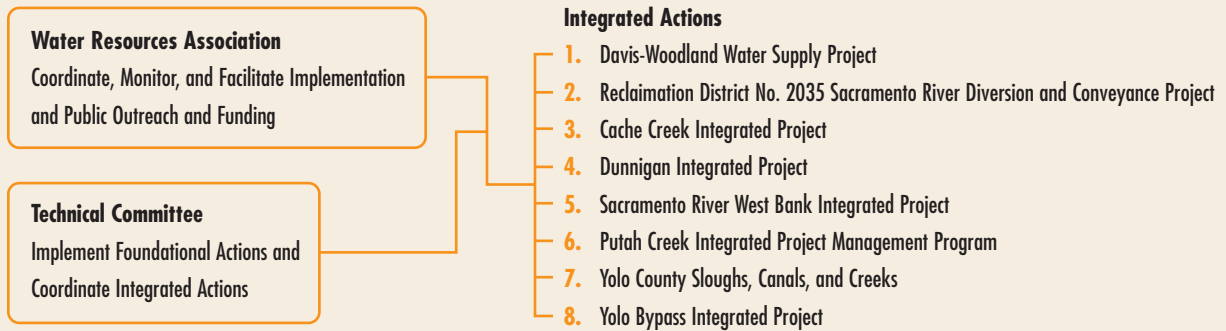
Work plans for the foundational and integrated actions cover the next three to five years. The work plans identify the lead agencies or partners, the specific tasks or activities, and the anticipated budgets and timeframes. These are explained in detail in Section 7.0.

The principal elements of the institutional structure envisioned for implementing the IRWMP are presented in Figure ES-1.

The responsibility for managing Yolo County’s water resources is currently distributed among a large and diverse group of public agencies. Moreover, several non-profit organizations have important roles in protecting and enhancing aquatic ecosystems. The WRA has succeeded in engaging these various entities in the shared development of this integrated plan. All of the participants in the process have gained a comprehensive view of the issues and the opportunities that will affect outcomes in the coming years. But the success of this IRWMP will be measured by the extent to which the Integrated Actions are implemented.

FIGURE ES-1

YOLO COUNTY IRWMP IMPLEMENTATION STRUCTURE



Foundational Actions	West								
	Winters	Davis	Woodland	UCD	County	Sacramento	YCFWCWD	DWD	RD 2035
Groundwater Monitoring Program	▲	▲	▲	▲	▲	▲	⊗	▲	▲
Surface Water Monitoring Program		▲	▲	▲	▲	▲	⊗		▲
Subsidence Monitoring Program	▲	⊗	▲	▲	▲		▲		▲
Groundwater Model Enhancement Program	▲	▲	▲	▲	▲		⊗	▲	▲
Water Resources Infrastructure Database Enhancement Program	▲	▲	▲	▲	▲	▲	⊗	▲	▲
HCP/NCCP Development	▲	▲	▲	▲	⊗		▲	▲	▲
Aquatic Habitat and Fish Opportunities Assessment	▲	▲	▲	▲	▲		⊗	▲	▲
Topographic Mapping (LiDAR Project)	▲	▲	▲	▲	⊗		▲	▲	▲

⊗ INDICATES LEAD ENTITY FOR THE RESPECTIVE FOUNDATIONAL ACTION ▲ INDICATES POTENTIAL BENEFITS FROM FOUNDATIONAL ACTION
THIS FIGURE IS FIGURE 6.1 IN THE IRWMP

To this end it is critical to have an institutional structure that will facilitate and support execution of the plan. Important elements of this IRWMP are not the direct responsibility of any WRA member. These include the Foundational Actions, HCP/NCCP Development, and two Integrated Actions: the Putah Creek Integrated Project Management Program and the Yolo Bypass Integrated Project. While the IRWMP provides the framework for future collaboration, the composition of the WRA needs to be expanded to include all lead partners and implementing agencies. These lead partners will report to the WRA Board annually on their progress in implementing the integrated actions.

The development of the IRWMP has stretched over several years and involved innumerable meetings of the Technical Committee, consultants, and state and local representatives, in the pursuit of the ambitious goal of integrating water management planning in Yolo County. The Plan itself is the crowning achievement of this effort. But perhaps of even greater importance and overarching benefit are the collaborative relationships that have formed over the course of the years-long process. From these relationships, the agencies, stakeholders and people of Yolo County can expect to reap a substantial harvest.



FIELD SPRINKLERS

After adoption of the IRWMP by the member agencies, implementation of the recommended actions will depend on the level of member commitment to the Plan. An important responsibility of the WRA will be to seek out funding opportunities and to support the lead partners' efforts to secure financial aid through state bond funds (e.g., those made available through Propositions 50, 84 and 1E) in the form of grants and loans, state revolving funds, local financing under FEMA, and through NCRS and community development block grant programs. Actions proposed in the IRWMP will need to comply with all applicable federal, state and local laws and regulations, including environmental laws, regulations and ordinances. The future of the IRWMP will also depend on developments that may affect environmental compliance strategy.



A CATTLE RANCH IN YOLO COUNTY



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