

5.0 Potential Actions and Prioritization

5.1 Overview

Potential actions presented in this IRWMP fall into two main categories: foundational actions and actions that directly address resource management issues.

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

Potential actions that directly address resource management issues were initially developed as individual (stand-alone) actions. Subsequently, many individual actions were combined into nine integrated actions, based on shared water resources and common or complementary objectives. For each potential action, **Table 5-1 to Table 5-6** present: identification code¹, title, related water management categories, brief description, and geographic area.

The integrated actions and individual actions were evaluated based on the number of IRWMP objectives and water resource management issues each would address (**Table 5-7**). In addition, the statewide priorities for each action established by DWR and SWRCB were also determined (**Table 5-8**).

Due to the volume of information presented in **Table 5-1** through **Table 5-8**, these tables can be found at the end of Section 5.0.

¹ Each action is identified with a unique identification code consisting of two letters indicating the action's category, followed by a number.

The letter codes are:

- FA = Foundational Action
- AR = Aquatic and Riparian Ecosystem Enhancement
- FM = Flood Management and Storm Drainage
- R = Recreation
- WQ = Water Quality
- WS = Water Supply and Drought Preparedness

Please note that the numbering may not be consecutive; when actions were deleted or moved, the remaining actions were not renumbered.

5.2 Foundational Actions

Ten foundational actions were identified and are presented in **Table 5-1**. One of the foundational actions has two subactions and another has three subactions. Subactions are components of actions that apply to a particular region but have the same objective as the main action.

The foundational actions include continuation and expansion of the existing groundwater monitoring program for the County (FA1), with subactions for Dunnigan (FA1.1), UC Davis (FA1.2) and Woodland (FA1.3). Other foundational monitoring programs include countywide surface water (FA2), subsidence (FA3), and aquatic habitat and fish opportunity assessment programs (FA6). The surface water and subsidence monitoring programs are existing programs that need to be expanded and enhanced. The aquatic habitat and fish opportunity program is a new program that needs to be established. The enhancement of the Water Resources Information Database (WRID) (FA7) is closely related to these monitoring programs because enhancement of this database is necessary to accommodate expanded monitoring programs. In fact, currently available surface water data need to be stored in the WRID. The WRID is a critical tool for integrated water resource management in the County.

Enhancement of the Supervisory Control and Data Acquisition (SCADA) network (FA8) that the YCFCWCD is developing for Lake and Yolo Counties will not only benefit monitoring and control of water transmission and delivery, but can also serve flood management, water quality and environmental monitoring.

Countywide topographic mapping using Light Detection and Ranging (LiDAR) (FA11) and aerial photography of the Lower Cache Creek watershed (FA16) are two foundational data collection projects that will greatly benefit integrated water resource management planning in Yolo County.

One of the foundational actions is to provide funding for the Habitat Conservation Plan/Natural Communities Conservation Plan (HCP/NCCP) currently under development (FA14). This plan will provide comprehensive habitat conservation and streamlined compliance with the Endangered Species Act, as well as other regulations protecting species and habitats. Additional funding is needed to complete this plan within the next 2-4 years. Implementation of this IRWMP should be coordinated with implementation of the HCP/NCCP. Development of the HCP/NCCP includes the collection of data on the distribution of habitats and modeling of conservation areas, and can be helpful in implementing actions.

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.

5.3 Individual Actions

Potential individual actions were identified for each of the five water resource management categories based upon the findings and issues detailed in Section 4.0. During the plan development (Section 3.0) every effort was made to identify and describe all individual actions within the IRWMP region, regardless of their readiness to proceed. There are currently over 150 potential actions presented in this IRWMP. In most cases these individual actions were combined to form integrated actions. Some integrated actions have an individual action as a core (or cornerstone) action. Below is a summary of these potential individual actions, presented by each of the five water resource management categories. Tables 5-2 through 5-6 provide a brief summary of each of the individual actions.

5.3.1 Water Supply and Drought Preparedness

The WRA identified a total of 28 individual potential water supply and drought preparedness actions (**Table 5-2**). One of those actions, the Dunnigan Area Water Storage Program (WS3), has three subactions. Two water supply actions are already in an advanced state of development: the RD2035 Sacramento River Diversion and Conveyance Facilities Project (WS7), and the Davis-Woodland Water Supply Project (WS8). Each of these water supply projects is the focus of an integrated action (see Section 5.4 “Integrated Actions”). The Comprehensive Conjunctive Water Use Program (WS16) for Cache Creek is another water supply project that is essential to an integrated action. In addition, there are water supply actions in the Dunnigan area that, in combination with flood management actions in that area, form the focus of an integrated action in the Dunnigan area.

5.3.2 Water Quality

Seventeen individual, potential water quality projects were identified and are presented in **Table 5-3**. One action, the Yolo County Waste Water Recycling Program (WQ2), had seven subactions, including recycling projects in Winters, Dunnigan, Esparto, Madison, Woodland, Davis and UC Davis. Several water quality actions are already being implemented, but they could be enhanced and/or expanded. These include the Agricultural Lands Conditional Waiver Program (WQ14), a mandatory monitoring program landowners are required to comply with, and for which they need financial assistance; the City of Woodland Wastewater Recycling Project (WQ2.5); the UC Davis Ground Water Remediation Project (WQ3); and the Sacramento River Joint Source Water Protection Program (WQ11).

5.3.3 Flood Management and Storm Drainage

Forty-eight (48) individual, potential flood management and storm drainage actions were identified and are presented in **Table 5-4**. Several flood management and storm drainage actions focus on Cache Creek and form the corner stone of the Cache Creek Flood Management Integrated Project (see Section 5.4 “Integrated Actions”). When implemented, these actions would achieve a reduction of the flood risk in the City of Woodland, and other

P
o
t
e
n
t
i
a
l

A
c
t
i
o
n
s

a
n
d

P
r
i
o
r
i
t
i
z
a
t
i
o
n

I n t e g r a t e d R e g i o n a l W a t e r M a n a g e m e n t P l a n
A p r i l 2 0 0 7

parts of Yolo County near Cache Creek. Together, the Dunnigan Area Storm Drainage/Flood Management Project (FM21) and water supply actions form the core of the Dunnigan Integrated Project. Several potential flood management actions would be taken on the west bank of the Sacramento River and these actions form the core of the Sacramento River (West Bank) Integrated Project. Several conceptual ideas have been prepared for the Yolo Bypass Integrated Project regarding expanded flood management capacity and innovative flood management options. The Yolo Bypass Working Group IRWMP Subcommittee will work with associated stakeholders to expand and advance these conceptual ideas in subsequent iterations of IRWMP actions.

5.3.4 Aquatic and Riparian Ecosystem Enhancement

Fifty-three (53) potential individual aquatic and riparian ecosystem enhancement actions were identified and are presented in **Table 5-5**. Together with potential flood management actions, these potential enhancements play a defining role in the Putah Creek Integrated Project.

It should be noted that many potential ecosystem enhancement actions are identified in two actions: the Yolo Bypass Wildlife Area Ecosystem Restoration Project (AR41), and the Yolo Bypass Conceptual Aquatic Restoration Opportunities (AR 49). Regarding AR46, these ecosystem restoration elements are all part of the same Land Management Plan for the Yolo Bypass Wildlife Area. All these actions are subject to the same environmental review and public involvement process, and were therefore treated as a single action. AR49 reflects a list of restoration concepts that has been prepared by a partnership of federal and state agencies and has been initially discussed with Bypass stakeholders through meetings of the Yolo Bypass Working Group.

5.3.5 Recreation

Thirty-eight (38) potential water-related recreation actions were identified and are presented in **Table 5-6**. Together with ecosystem enhancement actions, recreation actions form the core of the Yolo Bypass Integrated action. The Cache Creek area is the geographic where the most recreation actions have been identified (11 potential actions). Although only one potential action was identified for the Yolo Bypass Wildlife Area that action includes many components that are all part of the Land Management Plan and will require partnerships between diverse stakeholders and DFG.

5.4 Integrated Actions

There are nine (9) integrated actions identified in this IRWMP that would greatly improve water resource management in Yolo County. The following integrated actions are:

1. Davis-Woodland Water Supply Project
2. Reclamation District No. 2035 Sacramento River Diversion and Conveyance Project

P
o
t
e
n
t
i
a
l

A
c
t
i
o
n
s

a
n
d

P
r
i
o
r
i
t
i
z
a
t
i
o
n

Integrated Regional Water Management Plan April 2007

3. Cache Creek Flood Management Integrated Project²
4. Cache Creek Water Management Integrated Project²
5. Dunnigan Integrated Project
6. Putah Creek Integrated Project
7. Yolo Bypass Integrated Project
8. Sacramento River (West Bank) Integrated Project
9. Yolo County Sloughs, Canals, and Creeks Management Program

The attributes below apply to each integrated action:

- **Location** – The geographic area where project components are located.
- **Theme** – The water resource management theme based on the integration of individual actions.
- **Relevance to goals and objectives** – Describes the relevance of the integrated action to the goals and objectives of this IRWMP.
- **Potential component actions** – A list of the individual actions that could potentially be included in the integrated action; with an identification code that cross references to **Table 5-2** to **Table 5-6**.
- **Description** – A description of the integrated action.

Work plans for six of the integrated actions are provided in Section 7.0, including prerequisite tasks, agencies, and other entities that would be involved, a schedule for the first 3–5 years, and approximate costs. Through the refinement of the Sacramento River West Bank and Yolo Bypass Integrated Projects, it was deemed to be premature to include an estimated budget and time line at this time.

5.4.1 Davis-Woodland Water Supply Project

Location

The Sacramento River between Interstate 5 and the City of West Sacramento and the City of Davis, the City of Woodland, and UC Davis.

² For the purpose of implementation the Cache Creek Flood Management and Water Management Integrated Projects were combined into one Cache Creek Integrated Project (see Section 6 “Implementation Strategy”).

Integrated Regional Water Management Plan April 2007

Theme

The combined management of surface and groundwater resources to enhance the quantity, quality, and reliability of the water supply for existing and future residents, and improved quality of the wastewater discharged.

Relevance to Goals and Objectives

Seeks to assure an adequate water supply for the people of Davis, Woodland, and UC Davis in a manner that is efficient, economical, and consistent with IRWMP objectives related to:

- Coordinating and conjunctively managing surface and groundwater supplies.
- Ensuring open and frequent communication with the public.
- Integrating water resource and land use planning.
- Maximizing the extent to which statewide priorities are met.
- Enhancing the aquatic and riparian environment.
- Reducing point source pollution.
- Complying with applicable water discharge requirements.

Potential Component Actions

Individual actions included in this integrated project include the Foundational Actions and the following:

- Davis-Woodland Surface Water Supply Project (WS8)
- City of Woodland Water Meter Retrofit Program (WS12)
- RD 2035 Sacramento River Diversion and Conveyance Facilities Project (WS7)
- UC Davis Water Conservation Program (WS9)
- Comprehensive Conjunctive Water Use Program (WS16)
- Sacramento River Water Testing Program (WQ13)

Integrated Regional Water Management Plan
April 2007

Description

The cornerstone of this integrated action is the application to appropriate water from the Sacramento River under the Watershed of Origin provisions of the California Water Code. This application was filed in 1994 to provide up to 45,000 acre-feet of water annually for municipal uses for the cities of Davis, Winters, and Woodland, and for UC Davis. The City of Winters has subsequently withdrawn from the application.

Davis, UC Davis, and Woodland currently rely solely on groundwater to meet their potable water needs. Concerns regarding groundwater quality, groundwater subsidence, wastewater disposal impacts, and cost impacts on consumers have caused Davis, UC Davis, Woodland, and the YCFCWCD to investigate the feasibility of implementing a project that would divert water from the Sacramento River, treat the water at a new water treatment plant, and convey the treated water to Davis, UC Davis, and Woodland water users.

Implementation of the project would accomplish the following:

1. **Improve Water Quality** – Surface water has a higher water quality than groundwater. Groundwater in the Davis and Woodland areas contains concentrations of dissolved solids, iron, manganese, nitrate, arsenic, and chromium VI that are of concern with regard to drinking water quality and current and anticipated future drinking water regulations. In addition, boron concentrations impact the suitability of the groundwater for landscape irrigation. Surface water from the Sacramento River does not contain problematic concentrations of these constituents.
2. **Improve Wastewater Quality** – Groundwater in the Davis and Woodland areas contains concentrations of total dissolved solids, boron, and selenium in excess of amounts allowed by current and anticipated wastewater discharge regulations. Surface water from the Sacramento River does not contain problematic concentrations of these constituents.
3. **Groundwater Basin Impacts** – Reduced groundwater pumping would beneficially impact groundwater levels and reduce inelastic land subsidence that is documented in the area.

Feasibility studies have been completed by the cities and UC Davis. Recently the cities, UC Davis, and the YCFCWCD initiated preparation of an environmental document that will assess the impacts of the proposed project. A final EIR intended to satisfy the requirements of CEQA is scheduled to be completed in 2007. If a document is required to satisfy the requirements of NEPA, this document will also be prepared during 2007.

The project would involve the conjunctive use of surface water and groundwater. Surface water would supply base demands and would be supplemented by groundwater as required to meet peak-day demands. Three diversion locations are currently under consideration.

I n t e g r a t e d R e g i o n a l W a t e r M a n a g e m e n t P l a n
A p r i l 2 0 0 7

This effort includes an application to the SWRCB for new water rights permits. It is anticipated that the new water rights permits (if successfully obtained by Davis, UC Davis, and Woodland) would authorize these three agencies to divert water from the Sacramento River for a significant portion of the project’s estimated demands. However, it is anticipated that there will be periods in the summer months in many years when these new permits would not authorize any diversions. Davis, UC Davis, and Woodland are currently investigating purchasing water rights or contractual entitlements on a permanent basis that would allow diversion from the Sacramento River in those months (generally from May through October in the driest years) when water would not be available for diversion under the agencies’ own water right permits.

5.4.2 Reclamation District No. 2035 (RD 2035) Sacramento River Diversion and Conveyance Project

Location

The project is located at the Sacramento River near Interstate 5 and the Yolo Bypass.

Theme

Fisheries enhancements with a state-of-the-art fish screen and water supply reliability for agriculture and wetlands management in and adjacent to the Yolo Bypass.

Relevance to Goals and Objectives

Strives to ensure an adequate water supply that is efficient, economical, and environmentally sound, through actions consistent with IRWMP objectives related to:

- Coordinating and conjunctively managing surface and groundwater supplies.
- Maximizing the extent to which statewide priorities are met.
- Enhancing the aquatic and riparian environment.

Potential Component Actions

Individual actions included in this integrated project include the Foundational Actions and the following:

- RD 2035 Sacramento River Diversion and Conveyance Facilities Project (WS7)
- Davis-Woodland Surface Water Project (WS8)

P
o
t
e
n
t
i
a
l

A
c
t
i
o
n
s

a
n
d

P
r
i
o
r
i
t
i
z
a
t
i
o
n

Integrated Regional Water Management Plan
April 2007

Description

For many years, RD 2035 has diverted water from the western side of the Sacramento River just north of the Vietnam Veterans Bridge on Interstate 5. This diversion is one of the largest unscreened diversions remaining on the Sacramento River. The current pumping station has a capacity of 400 cubic feet per second (cfs), and discharges under County Road 16 (River Road), into a channel that ultimately feeds into the Conaway Ranch water supply system. The channel and downstream siphon have a capacity of approximately 300 cfs. Water is diverted through this facility to serve the agricultural users on Conaway Ranch, under appropriate and riparian water rights held by Conaway Ranch, and a settlement agreement between the U.S. Bureau of Reclamation and Conaway Ranch.

A new diversion structure and pumping station have been designed to replace the existing facility, under funding provided through the CALFED Ecosystem Restoration Program. The new diversion facility has also been designed with a capacity of 400 cfs, and meets the latest criteria for fish screen design as defined by the NOAA Fisheries and the California Department of Fish and Game. The purpose of the project is to comply with federal and state fish screening criteria, and to ensure a reliable supply of water to the agricultural users on Conaway Ranch.

There are also plans under consideration that would increase the capacity of the siphon under Highway 16, and convert the open channel that parallels Highway 16 across the Yolo Bypass into a piped transmission system. The reason for converting this open channel into a piped system is to eliminate the potential risk of damage that the channel now faces each year when the Yolo Bypass floods (and the constant need to rebuild the channel after a flood event). These improvements are not part of the project facilities that have been designed under the CALFED funding.

There are some remaining issues regarding project sizing and capacity, which have held the final project approval in abeyance. One of the key issues is the sizing of the new diversion facility and pumping station. The current RD 2035 facility has a capacity of 400 cfs, and it has served district users well for many years. There are times, particularly during rice land flood up in the spring, when instantaneous flow requirements are very important to meeting the user needs in the district. As a result, RD 2035 is reluctant to consider a facility with a lower capacity.

The project's review and approval agencies are concerned that RD 2035 facilities downstream of the new system have a capacity less than 400 cfs, and the water rights under which the diversion would occur have an upper limit of 316 cfs (this is the limit of the combined water rights held by Conaway Ranch for the Sacramento River, and represents the maximum capacity permitted based upon a monthly average). Because of this, they would like to limit project capacity to less than 400 cfs. As stated above, for several years RD 2035 has considered another improvement project that would increase its downstream conveyance capacity to or above 400 cfs, and has instantaneous needs for 400 cfs or more when flooding up for rice crops on Conaway Ranch. In addition, the water rights do not prohibit an instantaneous diversion of

P
o
t
e
n
t
i
a
l

A
c
t
i
o
n
s

a
n
d

P
r
i
o
r
i
t
i
z
a
t
i
o
n

Integrated Regional Water Management Plan
April 2007

up to 400 cfs (unless other water rights holders are adversely impacted – which obviously is not the case), but rather require that the diversion, when averaged over the month, cannot exceed 316 cfs. This issue is yet to be resolved, and represents the single remaining obstacle to moving the project forward.

This diversion and conveyance system has been identified in a number of regional water supply feasibility studies as the logical location for a joint-use facility to not only serve the agricultural users on Conaway Ranch, but to also serve the urban users represented by the cities of Davis and Woodland, and UC Davis. These three entities have joined together to form the Yolo Regional Treated Surface Water Supply Project. Feasibility studies conducted by these agencies demonstrate that with a 400 cfs diversion capacity, the new RD 2035 diversion structure could adequately serve both the agricultural and urban needs in the region. The location of the RD 2035 diversion structure is noted as one of four points of diversion in the water rights application for the regional project.

5.4.3 Cache Creek Flood Management Integrated Project³

Location

The channel, banks, and floodplains of Cache Creek from the town of Rumsey at the head of Capay Valley, to the Cache Creek Settling Basin east of Woodland, which then spills into the Yolo Bypass. A larger focus area (where solution-oriented actions may help achieve flood management objectives) extends from the Cache Creek Settling Basin upstream to include the entire Cache Creek watershed, including Clear Lake Dam and Indian Valley Reservoir.

Theme

Periodic high flows in Cache Creek cause extensive bank erosion, levee degradation, and local flooding, threatening the north and north east sections of the City of Woodland and the town of Yolo. A well-planned series of projects and programs will ultimately provide 200-year level or greater of flood protection and levee integrity by combining the cumulative effects of integrated actions throughout the Cache Creek corridor.

Relevance to Goals and Objectives

Strives to protect people and property from hazards associated with flooding through a suite of actions consistent with IRWMP objectives related to:

³The Cache Creek Flood Management Integrated Project and the Cache Creek Water Management Integrated Project were developed and evaluated separately (see Section 5.5 “Evaluation and Prioritization of Actions”). Subsequently, these two integrated actions were combined for the purposes of developing an integration strategy for Cache Creek (see Section 7).

Integrated Regional Water Management Plan April 2007

- Ensuring open and frequent communication with the public.
- Maximizing the extent to which statewide priorities are met.
- Assisting disadvantaged communities.
- Enhancing the aquatic and riparian environment.
- Providing recreational opportunities without adversely impacting private property owners.
- Providing flood control for the citizens of Yolo County consistent with recommendations of the State Floodplain Management Task Force.

Potential Component Actions

Individual actions potentially included in this integrated project are:

- Huff's Corner Levee Repair Project (FM13)
- Reconciliation of Cache Creek Settling Basin Future Modifications and "Original" South Levee Project (FM14)
- Bear Creek Detention Basin Project (FM16)
- Cache Creek Off-Channel Detention Basin Projects (FM18)
- Woodland Area Flood Management Project (FM19)
- Flood Emergency Preparedness and Hazard Classification Program (FM22)
- Clear Lake Operations Evaluation Program (FM24)
- Create Flood Management Division or separate entity (FM35)
- Thurston Lake Pump Storage Project (WS19)
- Clear Lake Upstream Storage Project (WS20)
- Putah Creek and Cache Creek Exotic and Invasive Species Removal Project (AR7)
- Cache Creek Regional Campground Habitat Enhancement Project (AR18)
- Corell-Rogers Wetlands Project (AR21)

Integrated Regional Water Management Plan April 2007

- Grube-Payne Habitat Restoration Project (AR22)
- Cache Creek Riparian Habitat Enhancement Program (AR24)
- Cache Creek Trail Nodes Program (R3)
- Camp Haswell Renovation Project (R6)
- Camp Haswell/Otis Ranch Improvement Project (R8)
- Cache Creek Regional Park Improvement Project (R15)
- Blue Ridge Campground (R18)
- Nichols Park Improvement Project (R20)
- Develop Recreational Opportunities on Public Lands (R22)
- Levee Public Access Improvements Project (R32)

Description

A primary objective of this integrated project is to resolve public controversy and reach broad consensus for a suite of measures designed to protect north and northeast Woodland, Yolo, and private lands from catastrophic or damaging flooding caused by high flows that exceed the conveyance capacity of Cache Creek.

An integrated flood management project does not rely on a single, major action or exclusively on the federal role and funding by the Corps of Engineers. While no firm decisions have been made, it may be that no single project can provide a Woodland/Cache Creek flood control solution. A feasible solution may, of necessity, require multiple, integrated actions. An effective combination of many actions in the watershed and along the valley floor will be examined that collectively would achieve the level of protection the citizens of Woodland and other parts of the County deserve.

Consideration could be given to temporarily storing floodwater in the upper watersheds in new detention basins (e.g., dry dams, off-channel basins, including deep mine pits), or by re-operation of existing reservoirs. Another fraction of flood flow could be diverted from the creek and redirected into existing canals and bypasses, or new ones could be constructed. The reduced inflow to Cache Creek from these actions will be safely contained within the channel through a combination of site-specific measures.

The integrated project also seeks local cooperation and involvement with DWR and the Corps to determine the most appropriate future modifications to Cache Creek Settling Basin, which is gradually filling to design capacity for capturing sediment before it enters the Yolo Bypass.

I n t e g r a t e d R e g i o n a l W a t e r M a n a g e m e n t P l a n
A p r i l 2 0 0 7

The settling basin levees and spillway height also adversely affect storm drainage from Woodland and surrounding agricultural land by blocking outflow to the bypass, and causing water to back up in Cache Creek. The need to protect the regional flood control function of the Yolo Bypass (by preventing deposition in the bypass) needs to be reconciled with secondary adverse flooding effects to the City of Woodland.

5.4.4 Cache Creek Water Management Integrated Project⁴

Location

Cache Creek between Capay Dam and County Road 94B, including the communities of Esparto and Madison.

Theme

The theme of this integrated project is the conjunctive management of surface and groundwater resources to enhance the water supply and its reliability for existing and future residents, agriculture, aquatic and riparian habitat enhancement, and recreation.

Relevance to Goals and Objectives

Seeks to assure adequate water supply for the communities of Esparto and Madison through actions consistent with IRWMP objectives related to:

- Conjunctive management of surface and groundwater supplies.
- Water management, conservation, and reuse of water for municipal, industrial, and agricultural water users.
- Intra-county transfer of water.
- Integrated water resource and land use planning.
- Maximizing the extent to which statewide priorities are met.
- Assisting disadvantaged communities.
- Enhancing the aquatic and riparian environment.
- Maximizing the use of recycled water.
- Complying with applicable discharge requirements.

⁴ See footnote on page 5-9.

Integrated Regional Water Management Plan April 2007

- Providing recreational opportunities without adversely impacting private property owners.

Potential Component Actions

Individual actions potentially included in this integrated project include the Foundation Actions and the following:

- Comprehensive Conjunctive Water Use Program (WS16)
- County Road 19 Water Storage Project (WS3.1)
- Esparto Water Supply Project (WS4)
- Madison Water Supply Project (WS5)
- Capay Dam Reliability/Restoration Project (WS13)
- Moore Siphon Reliability/Restoration Project (WS14)
- Colusa Basin Drain Water Supply Project (WS22)
- Esparto Wastewater Recycling Project (WQ2.3)
- Madison Wastewater Recycling Project (WQ2.4)
- Cache Creek-Yolo Bypass Anadromous Fish Passage Project (AR8)
- Capay Dam to Moore Siphon Riparian Flow Program (AR35)
- Cache Creek Riparian Habitat Enhancement Program (AR24)
- Cache Creek Anadromous Fish Reintroduction/Introduction Study (AR46)
- Cache Creek Trail Nodes Program (R3)
- Cache Creek Nature Preserve Improvement Project (R19)
- Lower Cache Creek Parkway Access Project (R29)

Description

The cornerstone for this integrated action is the Cache Creek Recharge/Recovery Project (a component of a Comprehensive Conjunctive Water Use Program), and operation of the Capay Diversion Dam (on which the YFCWCWCD retrofitted an inflatable rubber dam in 1994 as the

I n t e g r a t e d R e g i o n a l W a t e r M a n a g e m e n t P l a n
A p r i l 2 0 0 7

first element of the recharge/recovery project). The YCFCWCD has filed an application to appropriate up to 94,000 acre-feet of water in a given year for recharge, primarily in the reach of Cache Creek between County Road 85 and County Road 94B. The estimated average annual water yield is estimated at approximately 20,000 acre-feet per year. This reach of Cache Creek has also been identified as a candidate for significant aquatic and riparian habitat enhancement.

The water supply developed through the conjunctive use program could be treated and delivered to the communities of Esparto, which is indicated to have a population increase from 2,400 to 3,600 by 2025, and Madison, which is projected to increase from 560 to 800 in that same time. The water demands for Esparto are projected to increase from approximately 1,000 to 1,400 acre-feet annually by 2025 and Madison is projected to increase from 240 to 310. Both communities are currently served entirely by groundwater and have encountered problems in both water quantity and quality. A treated water supply would provide both communities with long-term water supply reliability. The groundwater for the recharge/recovery project could be extracted from open gravel pits that are planned as part of the mining reclamation plans to be left open and not backfilled.

The disposal of wastewater from the two communities is currently by evaporation and land disposal. The wastewater facilities for Madison are problematic and currently are not in regulatory compliance. This problem will become more critical with the increasing population. Viewing wastewater as a manageable water resource rather than a waste disposal problem affords the opportunity, with advanced treatment, to provide water that can be recycled and integrated into the overall water supply of the County and used for agriculture and/or environmental enhancement.

An additional increment of water would be developed from storing “winter” water from Cache Creek and/or the Colusa Basin Drain in a County Road 19 water storage facility with a capacity of about 16,000 acre-feet. As examined previously by the YCFCWCD, water could be diverted at Capay Dam and conveyed to the County Road 19 water storage facility via the West Adams Canal, Hungry Hollow Canal, and Clover Canal. Alternately or in combination water could be diverted by pumping from the Colusa Basin Drain to the water storage facility.

The combination of water management activities, including Cache Creek conjunctive water use, wastewater recycling, and storage of “winter” water provides a significant component of “new” water that can be used to increase water supply reliability for residents and aquatic habitat enhancement along Cache Creek.

A critical feature for the management of the water in Cache Creek is the Capay Diversion Dam that was constructed in 1914. The integrity of the facility must be sound to ensure reliability in the delivery of water to agriculture, as well as for the proposed recharge/recovery project .As part of this integrated action, the integrity of the Capay Dam would be investigated and the facility would be upgraded consistent with current water management technology to function

P
o
t
e
n
t
i
a
l

A
c
t
i
o
n
s

a
n
d

P
r
i
o
r
i
t
i
z
a
t
i
o
n

Integrated Regional Water Management Plan April 2007

reliably in the future. Similarly, the Moore Siphon or some modification thereof is required for reliable water management operations in the future to support this integrated action.

5.4.5 Dunnigan Integrated Project

Location

The project is located in the vicinity of the Town of Dunnigan.

Theme

Preliminary information from the Yolo County General Plan Update and from the Dunnigan Steering Committee indicates consideration of development of up to 7,500 new housing units. A comprehensive infrastructure plan is needed that demonstrates the availability of a long-term water supply for existing and future residents, handling wastewater from new development and correcting problems associated with existing development, and managing storm runoff to ensure the safety of existing and future residents and property.

Relevance to Goals and Objectives

The integrated project strives to assure existing and future residents of Dunnigan with a reliable long-term water supply and protection from hazards associated with storm runoff and flooding through actions consistent with IRWMP objectives related to:

- Conjunctive management of surface and groundwater supplies.
- Water management, conservation, and reuse of water for municipal, industrial, and agricultural water users.
- Importing water and/or intra-county transfer of water.
- Integrated water resource and land use planning.
- Maximizing the extent to which statewide priorities are met.
- Assisting disadvantaged communities.
- Enhancing the aquatic and riparian environment.
- Maximizing the use of recycled water.
- Complying with applicable discharge requirements.

Potential Component Actions

Individual actions included in this integrated project include the Foundational Actions and the following:

- Dunnigan Area Water Supply Project (WS2)
- Oat Creek Water Storage Project (WS3.2) or Bird Creek Water Storage Project (WS3.3)
- Colusa Basin Drain Water Supply Project (WS22)
- Dunnigan Area Wastewater Recycling Project (WQ2.2)
- Buckeye Creek Erosion/Flood Management Project (FM4)
- Dunnigan Area Storm Drainage/Flood Management Project (FM21)
- Small Sloughs Revegetation Project (AR25)

Description

Central to this integrated action is the prospect of a substantial increase in population or, in effect, a “new town” in the Dunnigan area. Because the County is planning for such a community, it is essential to develop a Community Plan to determine if a reliable long-term water supply, in the order of 9,000 acre-feet annually, is available to sustain the proposed development. The water demand for the existing community is estimated at 380 acre-feet per year. Based upon work completed by the Dunnigan Water District, it appears that groundwater and a portion of the Dunnigan Water District’s water supply (through its water service contract with the U. S. Bureau of Reclamation) can meet a significant portion of the demand, but not the entire demand. Recycling wastewater produced from the community would assist in meeting the overall water demand.

The area planned for development, as well as the existing development, can be impacted by storm runoff originating in the Dunnigan Hills to the west including Oat Creek, Bird Creek, Buckeye Creek, and several, smaller drainage sheds that discharge through culverts under the Tehama Colusa Canal. A comprehensive storm drainage plan would be required to determine the most effective measures for handling storm runoff originating outside the “new town” area, and for treating and handling runoff originating within the developed area.

With the development being considered, the opportunity exists for revegetating the natural waterways, treating erosion problems, and creating open space corridors along the waterways.

5.4.6 Putah Creek Integrated Project

Location

Putah Creek between Lake Berryessa and the Yolo Bypass

Theme

Improvement of water quality, storm drainage, flood flow conveyance, habitat quality and recreation in the Putah Creek area. In addition, water supply reliability objectives could be realized by the integrated project.

Relevance to Goals and Objectives

Seeks to improve water and habitat quality and flood flow conveyance and recreational opportunities in the Putah Creek area through actions consistent with IRWMP objectives related to:

- Enhancing the aquatic and riparian environment.
- Maximizing the extent to which statewide priorities are met.
- Utilizing recycled water to the maximum extent possible.
- Identifying measures that can be implemented to reduce point-source and non-point source pollution.
- Providing recreational opportunities without adversely impacting private property owners.
- Providing adequate storm drainage and flood control consistent with recommendations of the State’s Floodplain Management Task Force.
- Enhancing water supply reliability.

Potential Component Actions

Individual actions potentially included in this integrated project include the Foundational Actions and the following:

- Putah Creek Bank Stabilization Project (FM1)
- Dry Creek Bank Stabilization Project (FM2)
- City of Winters Storm Drainage Diversion to Putah Creek Project (FM3)

P
o
t
e
n
t
i
a
l

A
c
t
i
o
n
s

a
n
d

P
r
i
o
r
i
t
i
z
a
t
i
o
n

Integrated Regional Water Management Plan April 2007

- Putah Creek Diversion Dam Vegetation Removal Project (FM36)
- Mace Boulevard Bridge Improvement Project (FM37)
- Russell Ranch Riparian and Grassland Habitat Restoration Project (AR2)
- Putah Creek Fisheries Habitat Enhancement Project (AR3)
- UC Davis Confined Animals Relocation Project (AR4)
- Putah Creek Recreational Facilities Restoration and Expansion Project (AR5)
- Putah Creek and Cache Creek Exotic and Invasive Species Removal Project (AR7)
- Putah Creek Spawning Grounds Improvement Project (AR34)
- Replace Earthen Crossing of Putah Creek at Route 106A (AR37)
- Removal of Winters Percolation Dam (AR38)
- Increase Width of Riparian Corridor of Lower Putah Creek (AR39)
- South Fork Preserve Riparian and Grassland Restoration Project (AR45)
- Geomorphic Restoration of Putah Creek (AR48)
- Putah Creek Trails Program (R14)
- Putah Creek Fishing Access Project (R11)
- Levee Public Access Improvements Project (R32)
- Reroute Willow/University Canal (WS26)

Description

Eroding, unstable banks of Putah Creek and its tributaries, and unstable slopes cause deposition of sand and finer sediment in the channel of Putah Creek and Lake Solano. This reduces channel conveyance capacity, causing turbidity and reducing salmonid spawning habitat quality. In addition, the expansion of non-native invasive species (especially giant reed and Himalayan blackberry), reduces channel capacity, deflects flow toward eroding slopes, increases transpiration, and reduces riparian habitat quality.

I n t e g r a t e d R e g i o n a l W a t e r M a n a g e m e n t P l a n
A p r i l 2 0 0 7

The Putah Creek Integrated Project would include a set of compatible actions which could include removal of exotic species; removal of outmoded structures that reduce conveyance (e.g., Winters Percolation Dam); stabilizing banks and slopes by revegetation, and using environmentally sensitive bank and slope stabilization techniques; riparian habitat restoration; and channel maintenance, including the removal of vegetation that chokes the channel. The Putah Creek Integrated Project could also improve storm water drainage along Putah Creek (including diversion of storm flow from the City of Winters), and water supply reliability by rerouting Willow and University Canals away from the creek to avoid washouts of the canal into the creek at high flows. The latter component could be combined with habitat restoration along the banks of Putah Creek. Replacing the Mace Boulevard bridge with a bridge of greater conveyance capacity could also be included.

Replacing the seasonal earthen crossing/dam at Road 106A with a concrete ramp and box culvert would provide better fish passage, more reliable crossing for vehicles at low flows, and reduce silt loading when the earthen crossing is partially removed each fall.

Ongoing and future habitat restoration on the UC Davis properties could also be incorporated into the integrated project, including habitat restoration associated with removal of confined animal facilities from the North Fork, and additional riparian restoration on Russell Ranch and at the UC Davis picnic area.

The Putah Creek Integrated Project could also improve passage for anadromous fish by removing impediments to passage at the Los Rios Check Dam, and also at upstream passage barriers. Spawning habitat for salmonids downstream of the Putah Creek Diversion Dam could be improved by introducing properly sized gravel into the creek.

Recreational opportunities could be improved on public lands, including the development of Winters Putah Creek Park, and improving trails and facilities at Yolo County's fishing access sites in the reach between Lake Solano and Monticello Dam.

Any projects planned and implemented along Putah Creek by the WRA agencies will be closely coordinated with the Lower Putah Creek Coordinating Committee (LPCCC) and LPCCC agencies that are not part of WRA. Agencies that are both members of LPCCC and WRA include Yolo County, the cities of Winters and Davis, and UC Davis.

5.4.7 Yolo Bypass Integrated Project

Location

Yolo Bypass

Theme

The principal function of the Yolo Bypass is flood management and to convey project design flood flows. The theme of the Yolo Bypass Integrated Project is to enhance opportunities for

P
o
t
e
n
t
i
a
l

A
c
t
i
o
n
s

a
n
d

P
r
i
o
r
i
t
i
z
a
t
i
o
n

Integrated Regional Water Management Plan April 2007

agricultural operation, wildlife habitat, native resident and anadromous fish rearing and migration, and public recreation in a manner compatible with the Bypass as a flood management facility. These opportunities will be created by building and enhancing flood management, agricultural, and recreational facilities, restoring appropriate habitat in appropriate locations, conducting biological research and hydraulic/hydrologic modeling to quantify natural resource conditions in the Bypass, and enhancing stakeholder interaction and outreach.

Relevance to Goals and Objectives

Seeks to enhance aquatic and wetland habitat, and recreational opportunities through actions consistent with IRWMP objectives and with flood management responsibilities related to:

- Ensuring open and frequent communication with the public.
 - Integrating water resource planning and land use planning.
 - Maximizing the extent to which statewide priorities are met.
 - Enhancing the aquatic and riparian environment.
 - Maintaining viable agricultural use.
 - Providing educational opportunities.
 - Providing recreational opportunities without adversely impacting private property owners.
- § Providing adequate flood control for the citizens of Yolo County, consistent with recommendations of the State’s Floodplain Management Task Force.

Potential Component Actions

Most current and future actions in the Bypass take place in the context of an extensive set of overlapping planning activities and local jurisdiction policies including the following items:

- Yolo County General Plan
- City of Davis General Plan
- City of Davis Comprehensive Bicycle Plan
- City of West Sacramento General Plan
- City of West Sacramento Access and Bike Plan

Integrated Regional Water Management Plan April 2007

- Delta Protection Commission:
 - a. Delta Recreation Plan
 - b. Delta Mercury Collaborative
 - c. Land Use and Resource Management Plan for the Delta Primary Zone
- North American Waterfowl Management Plan
- Central Valley Habitat Joint Venture
- Yolo County Habitat Conservation Plan / Natural Communities Conservation Plan
- Agricultural / Irrigated Lands Conditional Waiver Program (Ag Waiver)
- Sacramento Area Council of Government's Regional Bicycle, Pedestrian, and Trails Master Plan
- Lower Putah Creek Watershed Management Action Plan
- Sacramento River Flood Control Project
- California State Plan of Flood Control (pending)
- Yolo Bypass Wildlife Area Land Management Plan

The individual actions to be considered in this integrated project represent a range of project readiness. Some potential projects are at a full proposal stage and are waiting for funding. Others are at a preliminary level and require further development. Another group of projects are highly conceptual but represent ideas that Bypass stakeholders feel are reasonable for future development and consideration. Excluding the Foundational Actions (as described in Section 5.2), the following list presents projects for current and future consideration in the Bypass.

Current Projects

- Yolo Bypass Mercury Best Management Practices Development Project (WQ16)
- Yolo Bypass 2-D Hydraulic Modeling Project (FM3)
- Yolo Bypass Wildlife Area Ecosystem Restoration Project (AR41)
- Yolo Bypass Working Group Funding (AR47)

Integrated Regional Water Management Plan April 2007

- Yolo Bypass Conceptual Aquatic Restoration Opportunities (AR49)
- Yolo Bypass Wildlife Area Public Access, Outreach, and Interpretation Program (R12)
- Deep Water Ship Channel Trail Project (R13)
- Davis Wetlands Public Access Improvement Project (R31)
- Levee Public Access Improvements Project (R32)
- Public Access Trails Along Existing Storm Water Conveyance Channels Project (R33)
- Colusa Basin Drain Water Supply Project (WS22)
- Yolo Bypass Sediment Removal Project (FM33)

Future Projects

- Project addressing Liberty Island and potential flood impacts (benefits and/or detriments) associated with levee removal (may be coordinated with the Lower Yolo Bypass Collaborative Planning Project).
- Develop non traditional “multi-use” levees that provide flood protection and compatible habitat components.
- Conduct a full Bypass Bio-Inventory expanding beyond current inventory of riparian habitats to include all other Bypass habitats.
- Develop a Wildlife Evaluation and Monitoring Program, providing benefit to landowners by defining species information on their properties, and tools for best business decisions on private and public lands.
- Build a cross-bypass, at-grade bike trail linking Davis and West Sacramento including options to bridge the existing Tule Canal / Toe Drain, and options to address flood damages, user safety concerns, and waste/refuse management. Might be linked to Delta Trails project. Also addressed in Recreation project – R12.
- Develop Yolo Bypass levee and channel improvements to increase flood flow conveyance and reduce flood stages in the Bypass.

Integrated Regional Water Management Plan
April 2007

- Expand outreach and involvement of Bypass subsistence anglers, particularly among diverse ethnic cultures not generally accessed through conventional outreach methods
- Develop a multi-agency Yolo Bypass flood readiness and response plan.

In addition to the list above, there are more than 80 other projects under consideration in this IRWMP process that may have a direct impact on the Yolo Bypass. These projects cover the full range of water management categories and are located directly on, or are on tributaries of Putah Creek, Cache Creek, Willow Slough, the Colusa Basin Drain / Knights Landing Ridge Cut, and the Sacramento River. Each of these waterways flows into the Bypass and can have direct or indirect affect on Bypass conditions.

In support of the Yolo County IRWMP, the Yolo Bypass Working Group (Working Group), with support from DWR and as sponsored by the Yolo Basin Foundation (Foundation), has created an IRWMP Subcommittee (Subcommittee) to review, prioritize, and recommend project ideas on a quarterly basis. The Subcommittee functions under a specific set of operating rules and has a structured consensus-seeking decision process that relies on “consensus with accountability” wherein all participants have committed to seek to reach consensus. In the event a participant must reject a proposal, that participant must provide a counter proposal that legitimately attempts to achieve their interest and the interests of the other participants. The Subcommittee is made up of a representative and equitable cross-section of affected private and public Bypass landowners, and likely public and non-governmental organization project implementers.

The Subcommittee has identified the level of project readiness for each current project (see Section 7.0, “IA7. Yolo Bypass Integrated Project”). Based upon preliminary factors, the Subcommittee has also organized current projects into prioritization categories of *high*, *medium*, and *low* status for the initial iteration of this IRWMP. In subsequent work, the Subcommittee intends to create a more comprehensive rationale for project prioritization reflecting the key interests of the diverse Subcommittee membership. The Subcommittee also expects to further review the current and future projects and also address prioritization taking into account project details, project partnering, and other changes.

Description

Actions identified in this IRWMP must reflect the primary role of the Bypass as floodway. Ideally however, the goal is to create a suite of projects that reflects management of the Yolo Bypass as a multi-function floodway. These actions are based upon stakeholder input and are consistent with the ongoing local management planning process. The integrated action aims to improve existing facilities and establish new ones that enhance flood management, irrigation, habitat values, recreation and education. Planning and implementing this action will be closely coordinated with all stakeholders and local, state and federal agencies that have jurisdiction over flood management and resources in the Yolo Bypass.

I n t e g r a t e d R e g i o n a l W a t e r M a n a g e m e n t P l a n
A p r i l 2 0 0 7

The Yolo Bypass performs multiple functions. It is a key component of the Sacramento River Flood Control Project, provides thousands of acres of productive and diverse publicly and privately managed wetland habitat, an important stop-over on the Pacific Flyway for wintering waterfowl, shorebirds and neotropical songbirds, a productive agricultural area, an important rearing habitat for floodplain dependent fish species, a migration route for anadromous fish and provides important educational and recreational opportunities. Many of these functions reach far beyond Yolo County.

The flood management function of the Yolo Bypass is critical in protecting the cities of Sacramento and West Sacramento and other parts of Sacramento, Solano, and Yolo Counties from flooding. The Yolo Bypass is a critical link in the Sacramento flood control system. Flood conveyance through the Yolo Bypass works to prevent large scale flooding in upstream areas for the entire Sacramento Watershed. The flood management function puts important constraints on other uses of the Yolo Bypass. Hydraulic roughness needs to be maintained below the level where vegetation would increase water surface elevations or flow velocities along structures. Late flooding of the Yolo Bypass in spring may shorten the growing season for crops, and eliminates recreational access to the Bypass.

The Yolo Bypass provides farmers opportunities for a variety of crops including rice, wild rice, tomatoes, beans, melons, and safflower. Farming practices are instrumental in keeping hydraulic roughness of the Yolo Bypass low, because plant species that cause obstructions to flow, such as willows are controlled. The farmland also provides important habitat for waterfowl and other wildlife.

The Yolo Bypass has international significance as a waterfowl and shorebird wintering area, but also provides habitat for a diversity of wildlife through the entire year. The Yolo Bypass Wildlife Area is owned and managed by the California Department of Fish and Game (DFG). It was dedicated and opened for public access in 1997, and covers approximately 16,000 acres. Management of the Yolo Bypass Wildlife Area explicitly addresses the needs of flood management and agriculture in the Yolo Bypass. It is managed for a variety of habitats including seasonal and permanent wetland and riparian and upland areas. An extensive public use program already exists on the Wildlife Area. Habitat restoration and agricultural activities are jointly managed throughout the area. The DFG land management plan for the Wildlife Area is under development. The planning process has included an extensive public involvement process.

Studies by the California Department of Water Resources (DWR) and UC Davis have found that the Yolo Bypass is an important nursery area for salmon and other floodplain dependent species. Juvenile salmon that migrate out through the Yolo Bypass have been shown to grow larger than juveniles that migrate out through the channel of the Sacramento River. Data have also been collected that suggest that survival is higher in the Yolo Bypass. The Yolo Bypass floodplain also provides habitat for other native fish species. The Toe Drain along the eastside of the Yolo Bypass provides habitat for important non-native game fish including striped- and largemouth bass. In 2006, DFG, DWR, National Marine Fisheries Service, and the U.S. Fish

P
o
t
e
n
t
i
a
l

A
c
t
i
o
n
s

a
n
d

P
r
i
o
r
i
t
i
z
a
t
i
o
n

Integrated Regional Water Management Plan April 2007

and Wildlife (the CALFED Ecosystem Restoration Program Implementing Agencies) formed the Yolo Bypass Interagency Working Group (YBIWG) and evaluated the feasibility of implementing a set of aquatic ecosystem restoration opportunities in the Bypass. The primary goals of the YBIWG are to:

1. Improve conditions for native fish species (particularly federal and state Threatened and Endangered fish species and species of special concern) in the Bypass, enhancing populations and recovery efforts.
2. Keep users of the Yolo Bypass whole by maintaining or improving existing conditions.

The YBIWG has identified the following potential sequential aquatic enhancement opportunities for further evaluation and discussion with stakeholders:

- Putah Creek – Lower Putah Creek stream realignment and floodplain restoration for fish passage improvement and multi-species habitat development on existing public lands.
- Lisbon Weir – Improve the structure for fish, wildlife and agriculture; reduce maintenance.
- Additional Multi-species Habitat Development – Provide for controlled localized seasonal inundation on more frequent intervals; identify areas of opportunity only on: the Wildlife Area; other existing public lands; and private lands where cooperative agreements with willing land owners provide mutual benefits.
- Tule Canal Connectivity – Identify passage impediments (example: road crossings and impoundments); work with land owners to develop the best options for improving fish passage and ensuring water diversion capability.
- Multi-species Fish Passage Structure – Investigate the redesign of the existing fish ladder; evaluate the feasibility of constructing a new fish passage structure, operated to ensure: continued maintenance of flood conveyance capacity; no substantial changes in timing, volume, and/or duration of flow; and minimal disturbance to existing land use and agricultural practices.

Project development will include the creation of conceptual restoration opportunities, stakeholder input to guide further actions, and the development of (in concert with stakeholders), an appropriate restoration plan that maintains or improves conditions in the Yolo Bypass for flood control, native fish and Bypass users.

The Yolo Bypass Working Group is an important forum for stakeholder input to the planning and management of the Yolo Bypass. It includes representatives of the local landowners, State, local, and Federal flood and resource management agencies, the conservation community, local

I n t e g r a t e d R e g i o n a l W a t e r M a n a g e m e n t P l a n
A p r i l 2 0 0 7

governments, academia, and a number of other participants. It is sponsored by the Yolo Basin Foundation (with funding that ended in December 2006 from CALFED). The Foundation is a community-based organization originally founded to assist with the establishment of the Yolo Bypass Wildlife Area. It remains an important force in environmental education and community-based planning, working closely with the DFG and other agencies. The Foundation sponsors an extensive educational program associated with the Wildlife Area. Over 4,000 K-12 students from throughout the region visit the Wildlife Area annually. Other public access programs sponsored by the Foundation include public tours, teacher workshops an extensive volunteer program and a public lecture series. In 2001 the Foundation, on behalf of the Working Group published: the *Yolo Bypass Management Strategy*, is a locally-based concept for the future of the Yolo Bypass, resulting from the Working Group’s efforts.

Recreational opportunities in the Yolo Bypass include hunting, fishing, and wildlife viewing. Close proximity to Sacramento, West Sacramento, Davis, and Woodland, and easy access via Interstate 5 and Interstate 80, increases the importance of the area for recreation. The only public recreation access in the Bypass is on the Wildlife Area. DFG manages a large hunting program at the Wildlife Area during the fall and winter months and maintains hiking trails, an auto tour, and fishing dock opportunities. Several trails and cycling advocates have proposed recreational trails concepts in and adjacent to the Bypass. These ideas require further development to appropriately integrate with current Bypass land uses but they are consistent with adjacent local government recreation plans and warrant consideration by the Subcommittee.

5.4.8 Sacramento River (West Bank) Integrated Project

Location

The west bank and levee of the Sacramento River in Yolo County, between Knight’s Landing and Clarksburg, including the urbanized riverfront of West Sacramento and Southport.

Theme

Reduce the risk of flooding by collaborating on levee rehabilitation, levee maintenance, and storm drainage improvements, while enhancing water quality, habitat and water- based recreation.

Relevance to Goals and Objectives

Strives to protect people of Yolo County and property from hazards associated with flooding through actions consistent with IRWMP objectives related to:

- Ensuring open and frequent communication with the public.
- Maximizing the extent to which statewide priorities are met.

P
o
t
e
n
t
i
a
l

A
c
t
i
o
n
s

a
n
d

P
r
i
o
r
i
t
i
z
a
t
i
o
n

Integrated Regional Water Management Plan April 2007

- Enhancing the aquatic and riparian environment.
- Providing recreational opportunities without adversely impacting private property owners.
- Providing flood control for citizens of Yolo County consistent with recommendations of the State's Floodplain Management Task Force.

Potential Component Actions

Individual actions potentially included in this integrated project include Foundational Actions and the following:

- Linden Road Water Intake Plant Replacement (WS27)
- West Sacramento Reclaimed Water Use Standards (WS28)
- Sacramento River Joint Source Water Protection Program (WQ11)
- Sacramento River Storm Water Sources Monitoring Program (WQ17)
- Knights Landing Levee Improvement Project(FM5)
- Clarksburg Levee Improvement Project / Sacramento River Levee Improvement #4 (FM6)
- Sacramento River West Bank Levee Integrity Program (FM7)
- Sacramento River Levee Rehabilitation Project – Merritt Island (FM30)
- Sacramento River Levee Repair (FM40)
- Deep Water Ship Channel Navigation Levee Repair (FM41)
- Sacramento Bypass-Yolo Bypass Levee Repair (FM42)
- West Sacramento South Cross Levee Repair (FM43)
- Ongoing Levee Maintenance and Critical Repair Program (FM44)
- RD 900 and West Sacramento MOU on Storm Water Detention and Raw Water Supply (FM45)
- Elk Slough Reclamation Pumping Plant (FM46)

Integrated Regional Water Management Plan April 2007

- Public Outreach on Flood Risk (FM47)
- Levee Maintenance Fee Structure Assessment (FM48)
- Sacramento River Fish Habitat Enhancement Program (AR26))
- Sacramento Riverbank Enhancement Actions (AR50)
- Bees Lakes Preserve (AR51)
- Merritt Island Habitat Enhancement Project (AR52)
- Knights Landing Boat Launch Improvement Project (R7)
- Main Drain Canal Recreation Corridor (R36)
- Implementation of the Commission's Land Use and Resource Management Plan for the Primary Zone of the (Delta Management Plan) (R37)
- Sacramento River Recreation Trail (R38)

Description

Approximately 50 miles of the County's west bank levees are state-federal levees under the jurisdiction of the State Reclamation Board as part of a valley-wide flood protection system, called the Sacramento River Flood Control Project (SRFCP). The west bank levees protect farmland, utilities and highways, and communities located within historic flood basins including Knight's Landing, West Sacramento and Southport, and Clarksburg. Most of these levees were constructed up to a century ago and are maintained by agricultural levee districts or state maintenance areas with insufficient funding and staff to keep pace with normal deterioration of levees and eroding banks. No levee failures or overtopping has occurred along the river in Yolo County, but miles of west bank levee do not meet current standards and many sites are at risk of damage from bank erosion or high-water seepage conditions.

The Corps has identified several "critical eroding sites" near or against levees along the west bank. Repairs and upgrades at these and other less critical sites requires Congressional and state authorization and funding, and some increment of local cost-share before projects can be designed and constructed.

The Sacramento River Corridor Planning Forum (Forum), a multi-agency and stakeholder group established in 2003 at the direction of the State Reclamation Board, includes the participation of Yolo Co, RD 900, and the City of West Sacramento. The Forum prepared a Floodway Management Plan with comprehensive river corridor guidelines to be adopted in 2006. The guidelines establish prudent measures and policies to ensure public safety and the

Integrated Regional Water Management Plan April 2007

reliability of the floodway and levee system, while integrating future needs of urban waterfront development, public river access and recreation, river habitat conservation, and other land uses.

The Sacramento River (West Bank) Integrated Project would combine and implement many of the Forum's recommended guidelines, protect and upgrade west bank levees and banks, improve shoreline fish habitat and expand riparian vegetation, provide new or improved river access facilities, and secure the water quality of our water supply infrastructure. The Project also enhances the maintenance and monitoring of urbanized portions of the river levee system.

5.4.9 Yolo County Sloughs, Canals, and Creeks Management Program

Location

Countywide but excluding Cache Creek, Putah Creek, and the Sacramento River

Theme

The management of storm water that flows through Yolo County can be enhanced and adverse impacts minimized through a program that integrates treatment of storm water, water quality and habitat improvements on Willow Slough and its tributary sloughs, and water delivery and drainage canals.

Relevance to Goals and Objectives

Strives to protect people and property from hazards associated with storm runoff and flooding.

Potential Component Actions

Individual actions potentially included in this integrated program include the Foundational Actions and the following:

- Regional Irrigation / Tailwater Recovery Systems Program (WS17)
- YCFCWCD Distribution System Canal Extensions Project (WS24)
- Madison Storm Drainage/Flood Management Project (FM9)
- Esparto Storm Drainage/Flood Management Project (FM10)
- Caltrans Highways Hydraulic Impact Assessment Program (FM11)
- County Roads Hydraulic Capacity Assessment Program (FM12)
- Cities-County Storm Drainage Criteria Update Program (FM15)

Integrated Regional Water Management Plan April 2007

- Watershed Management Program (FM20)
- Willow Levee Improvement Project (FM26)
- Creation of Flood Management Division or Entity (FM35)
- Small Sloughs and Creeks Invasive Vegetation Removal Program (FM38)
- Regional Irrigation Tailwater Recovery Systems Program (WS17)
- Agricultural/Urban Storm Runoff Assessment Program (WQ4)
- Ag Waiver Program (WQ14)
- Willow Slough Bypass Environmental Enhancement Project (WQ7)
- Demonstration Farm Project (WS27)
- Environmental Enhancement of Waterways Project (AR6)
- Sloughs and Waterways Environmental Enhancement Program (AR9)
- Agricultural Drains and Sloughs Riparian Habitat Enhancement Program (AR11)
- South Fork Willow Slough Riparian Restoration and Levee Setback Project (AR13)
- Willow Slough Habitat Enhancement Program (AR14)
- Chickahominy Slough Riparian Restoration and Levee Setback Project (AR19)
- Cottonwood Slough Riparian Restoration and Levee Setback Project (AR20)
- Small Sloughs Revegetation Project (AR25)
- Non-native, Invasive Plant Species Removal Program (AR30)
- Canal Bank Habitat and Maintenance Program (AR36)

Description

Central to this integrated program is the management of storm runoff to minimize adverse impacts while enhancing storm water quality and wildlife habitat in a manner that is compatible with agricultural practices. Implementation of this program will result a comprehensive

I n t e g r a t e d R e g i o n a l W a t e r M a n a g e m e n t P l a n
A p r i l 2 0 0 7

approach to treating storm runoff throughout the County, and coordination between agricultural and urban areas.

The waterways that traverse Yolo County convey storm runoff and irrigation water supply and return flow, while providing a habitat corridor for wildlife. A comprehensive assessment of the functional attributes of the various sloughs and waterways is essential for minimizing the adverse impacts of storm runoff and long-term benefits to water quality and wildlife habitat. The sloughs and waterways function as a system and need to be treated accordingly. Sloughs are crossed by federal and state highways, county and private roads, and canals; all of which were designed and constructed at different times with different criteria. Some crossings are clearly impediments to conveying storm runoff and need to be reevaluated.

The regulatory requirements associated with agricultural and urban storm runoff will become increasingly important and the mixing of such waters needs to be dealt with in a deliberate and thoughtful manner. The Yolo County HCP/NCCP in preparation at this time will be helpful in facilitating the permitting and environmental review of measures to enhance the management of storm water while improving water quality and wildlife habitat.

5.5 Evaluation and Prioritization of Actions

5.5.1 Overview

Potential integrated actions and those individual actions not included in integrated actions were evaluated by determining which objectives of the IRWMP and which water resource management issues they addressed. Actions that addressed many objectives and water resource management issues were considered high priority actions.

Potential actions were also compared to the statewide water resource priorities established by DWR and the SWRCB. Those actions that met many of these priorities were considered of importance to statewide water resource management. The latter could be an important factor in attracting funding in the future from various state grant and loan programs.

Early in the development of this IRWMP, a detailed quantitative scoring system was developed for use in prioritization of individual and integrated actions. This method of implementation was not implemented, because insufficient information was available about the potential actions to allow a meaningful detailed quantitative evaluation and scoring. However, a description of this method is included as **Appendix B** to this document, because the method may be useful to IRWMP participants as more detailed information becomes available.

5.5.2 Evaluation Based on Objectives and Issues

Integrated actions addressed 3 to 10 of the 14 IRWMP objectives, and 2 to 21 of the 45 water resource management issues (Table 5-7). Individual actions that were not included in an integrated action addressed zero to seven objectives and zero to six issues (Table 5-7).

Integrated Regional Water Management Plan
April 2007

Three integrated actions addressed more than half of the objectives: the Cache Creek Water Management Integrated Project, the Dunnigan Integrated Project, and the Yolo County Sloughs, Canals, and Creeks Management Program. Three integrated actions addressed six or seven objectives: the Davis–Woodland Water Supply Project, the Cache Creek Flood Management Integrated Project, and the Yolo Bypass Integrated Project. (Table 5-7)

Two integrated actions addressed more than 16 issues: the Cache Creek Flood Management Integrated Project and the Cache Creek Water Management Integrated Project. Two actions addressed more than 11 issues: the Davis–Woodland Water Supply Project and the Dunnigan Integrated Project.

5.5.3 Evaluation Based on Statewide Priorities

The Sacramento River (West Bank) Integrated Project addresses eight of the statewide priorities. The Cache Creek Water Management Integrated Project and Yolo Bypass Integrated Project each addressed seven of the statewide priorities (Table 5-8). The Cache Creek Flood Management Integrated Project, Putah Creek Integrated Project, and Yolo County Sloughs, Canals, and Creeks Management Program addressed six priorities (Table 5-8).

A brief discussion of how each of the statewide priorities is addressed is provided below.

Priority 1: Reduce conflicts between water users.

One of the major advantages of integrated water resource planning is the potential to reduce conflicts between water users. By integrating water management actions benefiting different water users into an integrated package, the realization of mutual benefits is possible. Overall integrated actions showed therefore greater potential to reduce conflicts among water users in the County (Table 5-8). This priority is addressed by eight integrated actions (Table 5-8).

Priority 2: Implementation of TMDLs established or under development.

A major water quality issue in Yolo County and the Sacramento-San Joaquin River Delta (Delta) and San Francisco Bay is the level of inorganic and methyl mercury in Cache Creek. Mercury mines along the headwaters of Cache Creek provided a significant source of mercury used in gold mining in the 19th century. The Cache Creek drainage basin only covers 4 % of the Sacramento River watershed, but it provides up to 50% of the total mercury transported downstream in the Sacramento River (Foe and Croyle 1999).

One of the objectives of this IRWMP is to assist in meeting the Total Maximum Daily Load (TMDL) for mercury being developed in the Cache Creek watershed (Objective 8). A staff report was published in 2004 (Cooke *et al.* 2004), and further planning efforts are under way.

The Cache Creek System Mercury Remediation Project (WQ1) addresses this statewide priority and Objective 8.

Integrated Regional Water Management Plan
April 2007

A TMDL for mercury is also being developed for the Sacramento-San Joaquin Delta. Implement Best Management Practices (BMPs) to manage the Yolo Bypass wetland and agricultural fields has the potential to reduce production of methyl mercury, the biologically active form. The Yolo Bypass Integrated Project includes a component to develop BMPs to reduce elemental and methyl mercury (Table 5-8).

Priority 3: Implementation of RWQCB Watershed Management Initiative Chapters plans, and policies.

The Central Valley Chapter of the Watershed Management Initiative (WMI) identifies several priority problems related to beneficial uses of waterways that apply specifically to Yolo County, including problems in the Cache Creek and Delta subwatersheds. Invasive species, degraded riparian habitat, and mercury contamination were identified for the Cache Creek subwatershed. The WMI suggests that support of collaborative stakeholder-driven efforts should be supported to address these issues. This IRWMP considers invasive species, habitat restoration and mercury contamination, and is therefore consistent with the WMI.

Contamination by mercury and pesticides is identified in the WMI as an issue in the Delta. The WMI suggests that further study is needed to address these issues and that management practices need to be developed. The implementation of the mercury TMDL for Cache Creek (see Priority 2), is expected to contribute to addressing the mercury problem in Cache Creek and the Delta. Much of the research is funded through the CALFED Bay-Delta program (see Priority 8). This priority is addressed by seven integrated actions (Table 5-8).

Priority 4: Implementation of the SWRCB's Nonpoint Source Pollution Plan.

This IRWMP identifies actions to reduce nonpoint source pollution (Objective 11). These actions include management measures identified in the *Nonpoint Source Program Strategy and Implementation Plan 1998-2013 (PROSIP)* (State Water Resources Control Board and California Coastal Commission 2000). Specifically, this IRWMP considers the following management measures identified in the Nonpoint Source Pollution Plan: erosion and sediment control, confined animal facilities wastewater and runoff, nutrient management, pesticide management, irrigation water management, and wetlands, riparian areas and vegetated treatment systems. This priority is addressed by four integrated actions (Table 5-8).

Priority 5: Assist in meeting Delta Water Quality Objectives.

Yolo County's major waterways, including Cache Creek, Putah Creek and Willow Slough, drain toward the Yolo Bypass and from there into the Delta. Potential actions identified in this IRWMP that improve water quality in Yolo County streams also improve water quality in the Delta, and thereby assist in meeting Delta water quality objectives. This priority is addressed by five integrated actions (Table 5-8).

P
o
t
e
n
t
i
a
l

A
c
t
i
o
n
s

a
n
d

P
r
i
o
r
i
t
i
z
a
t
i
o
n

Priority 6: Implementation of recommendations of the Floodplain Management Task Force, Desalination Task Force, Recycling Task Force, or State Species Recovery Plan.

Recommendations of the Floodplain Management Task Force, Recycling Task Force and contribution to the recovery of sensitive species are all part of this IRWMP. In particular, the potential integrated actions that address flood management and storm water discharge in this IRWMP are multi-objective projects, as recommended in the California Floodplain Management Task Force’s (2002) *Final Recommendations Report*.

This IRWMP also includes a comprehensive wastewater recycling plan for the county and wastewater recycling development projects for Winters, Dunnigan, Esparto, Madison, Woodland, Davis and UC Davis, as potential actions consistent with the Recycled Water Task Force (2003) Report.

This IRWMP includes potential actions for aquatic and riparian ecosystem enhancement and water quality improvement that, when implemented, will contribute to recovery of sensitive species. This priority is addressed by seven integrated actions (Table 5-8).

Priority 7: Address environmental justice concerns.

This IRWMP includes several potential actions that would improve facilities in disadvantaged communities, according to the Proposition 50 Guidelines. When implemented, these actions would provide funding for improved wastewater treatment, storm water drainage, or flood protection in these communities.

Within Yolo County there are two communities considered disadvantaged based upon the criteria set forth in the Proposition 50 Guidelines. These are the East Yolo County and Knights Landing County Census Designations (CCD). The Knights Landing CCD includes the towns of Dunnigan and Yolo, and the East Yolo CCD includes a strip of land along the Sacramento River from the north County line to Clarksburg, including West Sacramento.

Although they may not meet criteria set forth in the Proposition 50 Guidelines, other communities such as Esparto and Madison, are disadvantaged in that they have failing or deficient infrastructure or drainage and flooding problems that require attention.

The Cache Creek Water Management Integrated Project includes potential projects to upgrade the wastewater treatment systems of Madison and Esparto. This IRWMP also includes a potential action to improve the old wastewater treatment infrastructure of the Town of Yolo. The Dunnigan Integrated Project included potential actions that would upgrade the wastewater infrastructure of Dunnigan, improve storm water drainage and flood management, and improve water supply reliability.

I n t e g r a t e d R e g i o n a l W a t e r M a n a g e m e n t P l a n
A p r i l 2 0 0 7

The Sacramento River (West Side) Integrated Project includes a number of potential actions that would improve flood management and storm drainage in communities along the Sacramento River, including and disadvantaged communities as defined by the Proposition 50 Guidelines.

This priority is addressed by three integrated actions (Table 5-8).

Priority 8: Assist in achieving one or more goals of the CALFED Bay-Delta Program.

Each of the four resource management goals of the CALFED Bay-Delta Program (2000) identified in the Programmatic Record of Decision is addressed by potential actions in this IRWMP. The four goals are:

Water Supply Reliability – Expand water supplies to ensure efficient use of the resource through an array of projects and approaches.

Water Quality – Improve water quality from source to tap for the 22 million Californians whose drinking water supplies come from the Bay-Delta watershed.

Ecosystem Restoration – Improve the health of the Bay-Delta system through restoring and protecting habitats and native species.

Levee System Integrity – Improve Bay-Delta levees to provide flood protection, ecosystem benefits, and protect water supplies needed for the environment, agriculture, and urban uses.

This priority is addressed by all integrated projects (Table 5-8).

5.6 Selection of Actions for Advanced Investigation and Development

The WRA TC selected the Cache Creek Integrated Project (the Cache Creek Flood Management Integrated Project and Cache Creek Water Management Integrated Project combined) for advanced investigation and development. This combined integrated action each addressed more than 32 water management issues.

The Cache Creek flood management issue also emerged during the community workshops as the issue of greatest concern to the community members.

Based upon the qualitative evaluation of potential actions, the WRA agreed to allocate planning grant funds to further develop and refine selected component actions of the Cache Creek Integrated Project.

Table 5-1. Foundational Actions

Table 5-2. Water Supply and Drought Preparedness Actions

Table 5-3. Water Quality Actions

Table 5-4. Flood Management and Storm Drainage Actions

Table 5-5. Aquatic and Riparian Ecosystem Enhancement Actions

Table 5-6. Recreation Actions

Table 5-7. Evaluation of Potential Actions

Table 5-8. Statewide Priorities Addressed by Potential Actions

P
o
t
e
n
t
i
a
l

A
c
t
i
o
n
s

a
n
d

P
r
i
o
r
i
t
i
z
a
t
i
o
n

Integrated Regional Water Management Plan April 2007

Table 5-1 – Foundational Actions

ID	Title	Related Categories*	Description	Geographic Area
FA1	Yolo County Groundwater Monitoring Program	WS, WQ	YCFCWCD, in cooperation with other local, county, state, or federal water resource agencies, developed the framework and guidelines for an ongoing, countywide Groundwater Monitoring Program. While future funding contributions need to be established, this program and its associated database, serve as the basis and clearing house for countywide groundwater monitoring coordination and information dissemination.	Countywide
FA1.1	Dunnigan Area Groundwater Monitoring Enhancement Program	WS, WQ	The Dunnigan Water District, through its Groundwater Management Investigation (October 2005) determined the need for construction of dedicated multiple completion monitoring wells to facilitate obtaining water level and water quality data for specific aquifers. The existing monitoring program is based on production wells that are screened over multiple aquifers. Additionally, the deep aquifer in the Dunnigan area has not been utilized and may offer potential for additional water supply depending upon the quality. Construction of new multiple completion monitoring wells would enable the District to assess the potential of the deep aquifer.	Colusa Basin Drain
FA1.2	UC Davis Groundwater Enhancement Program	WS, WQ	UC Davis is improving its understanding of its use of groundwater, by conducting groundwater investigations such as assessment of long-term yield and sustainability of the deep aquifer, development of a groundwater model to evaluate the impact of pumping at current and higher levels, and considering the joint impact of pumping by the City of Davis. UC Davis is also monitoring groundwater and will be replacing existing groundwater capacity (replacing wells) as the existing wells age.	Davis
FA1.3	City of Woodland Groundwater Enhancement Program	WS, WQ	Demands on the City of Woodland's groundwater supply are increasing while water quality issues are affecting some groundwater wells. Woodland has the potential to divert Sacramento River water under the joint water rights filing and put it to beneficial use. The primary concept behind this action is to divert Sacramento River water, perhaps through an agreement with RD 2035, and convey it to lands adjacent to the city for irrigation use in lieu of groundwater. This would leave additional water in groundwater storage for the City's wells. A secondary part of this action is additional investigation and possible utilization of the deep aquifer in the Woodland area to provide higher quality water and supplement the intermediate aquifer currently tapped by the City's wells.	Woodland

Integrated Regional Water Management Plan April 2007

Table 5-1 – Foundational Actions

ID	Title	Related Categories*	Description	Geographic Area
FA2	Yolo County Surface Water Monitoring Program	WS, WQ, FM, AR	As part of the development of the Groundwater Monitoring Program, the Water Resources Information Database (WRID), includes a module for surface water monitoring data. A comprehensive program should be established to collect, input, quality control and report on all of the various surface water flow and quality parameters that are being collected by the various local, county, state, or federal water resource entities. The County's program of monitoring turbidity and suspended sediment needs to be incorporated into the monitoring program. The program would also identify data needs and promote ongoing regular monitoring by participating agencies.	Countywide
FA3	Yolo County Subsidence Monitoring Program	WS, WQ, FM	The Yolo County GPS Subsidence Monitoring Program recently completed its third triennial countywide survey of land surface elevations. The survey results are indicating that significant subsidence continues to occur in many areas of the county. The subsidence seems to be generally correlated with areas of groundwater pumping. However, there are questions with regards to other causes of subsidence and data interpretation. The 2005 subsidence results report contained a summary of 14 recommendations and their implementation status. Because of the importance of subsidence effects on groundwater use planning, the programs should be continued and implementation of key recommendations should be accelerated.	Countywide
FA4	Yolo County Groundwater Modeling Program	WS, WQ	YCFCWCD is developing a countywide Integrated Ground and Surface Water Model using IGSM. This modeling tool is available for use by qualified agencies and individuals to assist them in validating water management planning scenarios.	Countywide
FA4.1	City of Davis/UC Davis Groundwater Model Enhancement Program	WS, WQ	Davis and UC Davis have participated in joint groundwater management activities for several years and are in the process of developing a groundwater management plan (GWMP) for their service areas. YCFCWCD is also developing a GWMP for areas within its jurisdiction, including Davis and UC Davis. Under mutual agreement between the parties, the Davis-UC Davis GWMP addresses groundwater management needs specific to the Davis-UC Davis service areas. These service areas are not directly included or managed under YCFCWCD's GWMP. YCFCWCD is also developing a	Davis

Integrated Regional Water Management Plan April 2007

Table 5-1 – Foundational Actions

ID	Title	Related Categories*	Description	Geographic Area
			countywide Integrated Ground and Surface Water Model using IGSM. This model includes the Davis area. The purpose of the Davis Area Groundwater Model is to support implementation of the Davis-UC Davis GWMP by providing a much higher modeling resolution than the IGSM model within the Davis-UC Davis service areas. The Davis Area Groundwater Model will be developed to be consistent with the countywide IGSM, but will have a more detailed representation of the Davis and UC Davis production wells and aquifer conditions around the wells.	
FA4.2	City of Woodland Groundwater Model Enhancement Program	WS, WQ	As part of the 1997 Water Master Plan, a Yolo Woodland Aquifer Model (YWAM) was developed. The YWAM was a refinement of the 1996 model developed for YCFCWCD for use in planning the proposed Cache Creek Recharge and Recovery Project. Geotrans later updated the model to provide greater detail and used the updated model to evaluate remote well field alternatives. Woodland now needs to extend the model into deeper zones and use the model to accomplish the following tasks: <ul style="list-style-type: none"> • Predict the effects of new surface water for in-lieu recharge and direct municipal use • Model the effects of planned new wells • Evaluate how to minimize drawdown, energy costs, and subsidence • Model the transport of dissolved minerals, especially nitrate 	Woodland
FA6	Aquatic Habitat and Fish Opportunity Assessment	WS, WQ, FM, AR, R	To provide baseline and ongoing data related to aquatic habitat and fisheries in the region, a comprehensive monitoring program should be established. Similar to the groundwater and subsidence programs, it is envisioned that this would be a multi-agency program. Initial objectives of the program would be to identify and report on what is known and/or currently being monitored, as well as what critical data gaps exist. This information (data) is foundational to all five categories of the IRWMP.	Countywide
FA7	Water Resources Information Database Enhancement Program	WQ, AR	In 2004, YCFCWCD, in cooperation with other local, county, state, and federal water resource agencies, completed the development of a Water Resources Data Management System (WRID). While currently used primarily for groundwater level and quality data, it includes a surface water data module. The WRID needs to be populated, on an on-going basis, with new data, be quality controlled, and distributed to other agencies and the public.	Countywide

Integrated Regional Water Management Plan April 2007

Table 5-1 – Foundational Actions

ID	Title	Related Categories*	Description	Geographic Area
FA8	SCADA Network Enhancement Program	WQ, FM, AR	YCFWCWD is developing a region-wide (Lake and Yolo Counties) broadband based SCADA (Supervisory Control and Data Acquisition) network. While its primary purpose is to monitor and control the District's "transmission and delivery" system, it is flexible enough and has the capacity to serve flood control, water quality and environmental monitoring purposes. This program requires ongoing maintenance and modernization.	Countywide
FA11	Topographic Mapping (LiDAR) Project		Development within Yolo County has substantially altered the land form from what is represented on quadrangle maps prepared by the U.S. Geological Survey. This is the consequence of the construction of infrastructure, leveling of land for agricultural production, the relocation of waterways, and land subsidence. Good topographic information is essential for sound planning thus topographic mapping of the Valley portion of Yolo County is needed. This can be accomplished in a cost effective manner using LiDAR (Light Detection and Ranging) technology to create a Digital Surface Model or topographic map.	Countywide
FA14	Development of HCP/NCCP	AR	The Yolo County Habitat Conservation Plan/Natural Communities Conservation Plan needs additional funding to be completed in the next 2-4 years. The HCP/NCCP will identify priority areas for protection of endangered species habitat.	County Wide
FA16	Lower Cache Creek Aerial Photography Project	AR	Yolo County contracts for aerial photography of the lower Cache Creek watershed every year.	Cache Creek

Note:

* FA = Foundational Action, AR = Aquatic and Riparian Ecosystem Enhancement, FM = Flood Management and Storm Drainage, R = Recreation, WQ = Water Quality, WS = Water Supply and Drought Preparedness

Integrated Regional Water Management Plan April 2007

Table 5-2 – Water Supply and Drought Preparedness Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
WS1	City of Winters Groundwater Supply Project		The City of Winters relies solely on groundwater for its municipal water supply. It is not known at this time whether or not the City can sustain build out of its General Plan relying on groundwater. An evaluation of the capability of the groundwater resources to support build out of the City is needed. This can be accomplished using the IGSM that is currently being prepared by YCFCWCD.	Putah Creek
WS2	Dunnigan Area Water Supply Project		New groundwater wells and/or surface water supply. To serve any new growth in Dunnigan and to address A48nitrate contamination, Dunnigan will need to drill new wells that draw from deeper in the aquifer or request additional surface water supply from the U.S. Bureau of Reclamation via the Tehama-Colusa Canal.	Colusa Basin Drain
WS3	Dunnigan Area Water Storage Program		A variety of alternatives (see below) can be investigated utilizing the topography of the Dunnigan Hills for water supply and flood management benefits. These alternatives have all been considered and studied to varying degrees.	Colusa Basin Drain
WS3.1	County Road 19 Water Storage Project	AR, FM, R	An approximately 16,000 acre-foot off-stream reservoir located on County Road 19, one-mile west of County Road 94B and near the terminus of YCFCWCD's Clover Canal. This reservoir has been studied as part of the Yolo-Zamora/YCFCWCD conjunctive use program. The new water that will be developed can be used to the benefit of agricultural, environmental and municipal interests. This project will be most effective if linked to YCFCWCD's comprehensive conjunctive water use program (WS-16).	Cache Creek
WS3.2	Oat Creek Water Storage Project	FM	A reservoir at Oak Creek in conjunction with extending the Tehama Colusa Canal has been investigated as part of the Yolo-Solano Supplemental Water Supplies Reconnaissance-Level Investigation of Alternatives (May 1992). This reservoir would receive inflow from both local sources and from a Sacramento River diversion. The water could be used for urban, environmental or agricultural benefits. Additionally, landowners in the upper watershed of Oat Creek have discussed with YCFCWCD the potential of constructing a small reservoir that would supplement and enhance their existing groundwater supply.	Colusa Basin Drain
WS3.3	Bird Creek Water Storage Project	FM	A reservoir at Bird Creek in conjunction with extending the Tehama Colusa Canal has been investigated as part of the Yolo-Solano Supplemental Water Supplies	Colusa Basin Drain

Integrated Regional Water Management Plan April 2007

Table 5-2 – Water Supply and Drought Preparedness Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
			Reconnaissance-Level Investigation of Alternatives (May 1992). This reservoir would receive inflow from both local sources and from a Sacramento River diversion. This water could be used for urban, environmental or agricultural benefits.	
WS4	Esparto Water Supply Project	WQ	Explore sources of different or additional water supply (and improved water quality) to accommodate existing and potential growth in Esparto. Level of growth depends on the Yolo County General Plan Update, currently in progress. The existing system is not capable of maintaining adequate system pressures to satisfy normal demands and supplying an adequate fire flow. Furthermore on occasion the system has failed to provide water that met the municipal drinking water bacteriological water quality standards. This project would involve the design and construction of new well(s) and/or storage facilities, booster pumping facilities and distribution mains.	Willow Slough
WS5	Madison Water Supply Project	WQ	Madison water supply and quality improvements should be considered in conjunction with the Esparto water supply (WS4) investigation for potential combined economic, quality and reliability benefits. The existing water system includes two water wells, distribution mains and a hydropneumatic tank. One of the existing wells has elevated nitrate levels, and a replacement well has been drilled. This new well will be equipped with a pump and motor in the near future, and a storage tank will be constructed adjacent to the well. With these planned improvements the remaining deficiency is that the distribution system is primarily constructed of aged asbestos-cement pipe, which must be repaired relatively frequently.	Willow Slough
WS6	North Davis Meadows Water Supply Project	WQ	One of the two wells serving the North Davis Meadows development has failed in May 2006 due to D63high levels of nitrate. Citizens of North Davis Meadows assessed themselves to create a fund that the citizens can use for a new well. The development is not within the City of Davis, and is served by a community water supply system. Potential means of correcting elevated concentrations of nitrate in the well water include drilling new wells that obtain water from deeper formations, or expanding the City of Davis water service area to include this development.	Davis

Integrated Regional Water Management Plan April 2007

Table 5-2 – Water Supply and Drought Preparedness Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
WS7	RD 2035 Sacramento River Diversion and Conveyance Facilities Project	AR	A new diversion structure and pumping station will replace the existing facility on the Sacramento River operated by RD 2035. The new diversion facility meets the latest criteria for fish screen design. The purpose of the project is to position RD 2035 so that its Sacramento River diversion is in compliance with federal and state fish screening criteria, and to ensure a reliable supply of water to the agricultural users on Conaway Ranch. The design and environmental studies have been completed for this project. The remaining effort needed now is to secure project approval from the state and federal regulatory and funding agencies, secure project funding and construct the facilities. There are plans under consideration to increase the capacity of the siphon under Highway 16, and convert the open channel that parallels Highway 16 across the Yolo Bypass into a piped transmission system to eliminate the potential risk of damage the channel now faces each year that the Yolo Bypass floods.	Sacramento River, Yolo Bypass
WS8	Davis - Woodland Water Supply Project	WQ	The cities of Davis and Woodland and UC Davis are members in this regional project to bring surface water from the Sacramento River to supplement the existing groundwater supply now used exclusively by all three agencies. Feasibility studies have been completed on the project, and environmental analysis and documentation is now underway. It is expected that the environmental process will be completed in about two years, and a decision will then be made by all parties on how to proceed with the project. Diversions from the Sacramento River are being considered at several locations, and RD 2035 could be involved eventually in the project if a diversion using their planned new screened pumping facilities is selected as the preferred option. This project also includes securing area of origin water rights and purchase of supplemental surface water to fill the anticipated deficits in many years in the summer months.	Davis, Woodland, Sacramento River
WS9	UC Davis Water Conservation Program		UC Davis is integrating water conservation efforts into its current water use program, which will eventually include remote control of turf irrigation on the campus. Ongoing efforts to expand the campus land uses will also be considering water conservation Best Management Practices (BMPs) in their development including the new neighborhood planned in the west Davis area, and the future research park.	Davis

Integrated Regional Water Management Plan April 2007

Table 5-2 – Water Supply and Drought Preparedness Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
WS12	City of Woodland Water Meter Retrofit Program		In January 1, 2005, the State of California passed AB 2572 that requires certain water purveyors, including the City of Woodland, to install water meters on all unmetered service connections within their service area by 2025. Currently only non-residential units, and all residential units constructed since 1992, are metered. This project will involve retrofitting water meters on residential units constructed prior to 1992.	Woodland
WS13	Capay Dam Reliability/Restoration Project		Capay Diversion Dam (CDD) was built in 1914 and modified in 1994, with a 475-foot-long inflatable dam. The water diverted at the CDD is delivered throughout the canals and sloughs of western Yolo County and sustains a \$300 million agricultural economy as well as providing significant habitat value. In February 2003, seepage was seen beneath the CDD and emergency repair work was performed to stabilize the facility. A thorough structural investigation is required to determine needed repair and stabilization work. In addition, gate modernization, automation, and fish passage investigation work should be conducted.	Cache Creek
WS14	Moore Siphon Reliability/Restoration Project		The Moore Siphon conveys irrigation water from the north side of Cache Creek (Alder Canal) to the south side (Moore Canal). Through the Moore Siphon, YCFCWCD delivers water to approximately 15,000 acres of cropland (12% of its irrigation service area). This water also makes a significant recharge contribution to the City of Woodland's groundwater supply. Due to the age and exposure of the 72" corrugated metal pipe, as well as Cache Creek erosion issues at both ends of the siphon, the siphon will either need to be replaced or removed in the near future.	Cache Creek
WS16	Comprehensive Conjunctive Water Use Program	AR, R, WQ, FM	In 1993, YCFCWCD filed an application to utilize up to 94,000 acre-feet of Cache Creek "winter water." This project could include a variety of methods (recharge/recovery, off-stream storage and canal modification) to effectively store and use this water in the general area between the Capay Dam and the Cache Creek Settling Basin. The new water that will be developed can be used to the benefit of agricultural, environmental and municipal interests. A significant amount of work has already been completed on this	Cache Creek

Integrated Regional Water Management Plan April 2007

Table 5-2 – Water Supply and Drought Preparedness Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
			project including establishment of a groundwater monitoring program, development of a regional groundwater model, and preliminary investigations into associated water rights, engineering, economic, and environmental issues.	
WS17	Regional Irrigation / Tailwater Recovery Systems Program	WQ, AR, R	Small (20 to 200 acre-feet) reservoirs could be incorporated into YCFCWCD’s water delivery (and Slough) system. These "buffer" reservoirs would contribute to improved water delivery management and water quality improvements through sediment trapping. Habitat features would be incorporated into the design. Cache Creek rafting interests would benefit from increased storage release flexibility. Some appropriate locations have been identified and discussions with landowners are taking place. Regional Water Quality Control Board Staff have expressed support for this approach as part of the Ag Waiver program.	Cache Creek, Willow Slough
WS18	Capay Valley Surface Water Supply Project		The Rumsey Band of Wintun Indians have expressed an interest in developing a water delivery turnout near Brooks (inside YCFCWCD’s service area) to provide Cache Creek surface water to lands not currently receiving surface water. This would provide a reliable supply of water to Class A soils in that area in addition to protecting and supplementing existing groundwater resources.	Cache Creek
WS19	Thurston Lake Pump Storage Project	FM	Thurston Lake is a natural lake located near the southwest end of Clear Lake. The topographic configuration of land forming Thurston lake creates the potential for storing up to 300,000 acre-feet of water. The concept that has been examined involved the pumping water from Clear Lake into Thurston Lake in the late fall to spring period for release later in the season. Both Lake and Yolo County interests would realize water supply and flood control benefits. A number of reports describing this concept are available.	Cache Creek
WS20	Clear Lake Upstream Storage Projects	FM	Lake County Flood Control and Water Conservation District has compiled a list of potential water storage projects upstream of Clear Lake that could supply some measure of water supply and flood management benefits to Yolo County interests.	Cache Creek
WS21	Comprehensive Drought Preparedness Program	WQ	The period of record for hydrologic or climate data is relatively short. The results of tree-ring studies indicate that Northern California has experienced dry periods that were	Countywide

Integrated Regional Water Management Plan April 2007

Table 5-2 – Water Supply and Drought Preparedness Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
			more significant in both duration and severity than what is recorded and has been the basis for water supply planning. Similar to the wisdom of flood preparedness, preparedness for drought is prudent as well. Knowing that certain areas of Yolo County are more susceptible to subsidence than others, it would be prudent to formulate a protocol or strategy for management of the available water resources for the overall well being of the community of Yolo County.	
WS22	Colusa Basin Drain Water Supply Project		During many months of the year, water from the Colusa Basin Drain could be diverted for storage and use in Yolo County rather than being discharged to Sacramento River at Knights Landing. In spring months, available water could be stored in a new reservoir for use later in the irrigation season by YCFCWCD. During late spring through early fall months, a portion of the water in the Drain could be sent down the Ridge Cut into Tule Canal for irrigation use and storage by downstream users. This would provide increased water supply reliability to users, enhanced wildlife habitat, and water quality related benefits to many stakeholders. Impacts to downstream water users would need to be evaluated. Impacts to downstream water users would need to be evaluated. Implementation funding could potentially be available through a number of sources.	Colusa Basin Drain
WS23	Tehama-Colusa Canal Extension Project		Extending the Tehama-Colusa canal could provide additional environmental, agricultural, and municipal water supplies to Yolo County.	Colusa Basin Drain
WS24	YCFCWCD Distribution System Canal Extensions Project	AR, R	As part of its comprehensive conjunctive water use program (WS16), YCFCWCD has been investigating a number of areas where it could extend or modify its distribution system (canals) to deliver additional surface water during years of abundance. These modifications would enhance and protect the region's groundwater resource, contribute to the riparian corridor, and provide farmers with a cost- and energy-efficient alternative to pumping groundwater. YCFCWCD has initiated discussions with a group of landowners and growers to determine the engineering, environmental, and economic feasibility of various canal extension configurations. To date, the following canals have been identified for consideration; Brooks Canal, Hungry Hollow Canal, Magnolia Canal, China Slough, Town Ride, Moore Extension, Maple Bypass, and Willow Slough Bypass.	Willow Slough, Colusa Basin Drain

Integrated Regional Water Management Plan April 2007

Table 5-2 – Water Supply and Drought Preparedness Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
WS25	Sites Reservoir Project		The building of Sites Reservoir may enhance the viability of several projects described above, and would provide region-wide benefits. The DWR is leading the effort to develop the Sites Reservoir and a number of WRA member agencies are participating and should continue being involved in this project.	Countywide
WS26	Willow/University Canal Rerouting Project	WQ, AR	Reroute Willow/University Canal 100 feet north of its present course east of Road 95 where it currently runs along the top of the bank to enhance the security of the water supply for irrigation of downstream crops and to maintain the integrity of the north bank of Putah Creek against washouts. The area between Willow Canal and the top of the north bank of Putah Creek in this reach should be set aside under a conservation easement. Areas upstream of Road 95 between Willow Canal and the top of the north bank of Putah Creek have low agricultural value and high wildlife value and should be purchased for conservation easements where sellers are willing. This area within Russell Ranch, the largest single property, has already been set aside for conservation.	Putah Creek, Davis
WS27	Linden Road Water Intake Plant Replacement		Replace existing outdated water intake pumping facility with new intake and discharge pipelines, pump, and electrical panel. New pipeline invert through the levee would be above 200-year water surface. The intake would have fish screens. The old pipeline would be removed and the levee would be restored to meet current USACE requirements.	Sacramento River
WS28	West Sacramento Reclaimed Water Use Standards		Adopt and promulgate the Sacramento County Sanitation District standards for irrigation systems that can use reclaimed or other non-potable water for landscaping or parks.	Sacramento River

Note:

* AR = Aquatic and Riparian Ecosystem Enhancement, FM = Flood Management and Storm Drainage, R = Recreation, WQ = Water Quality, WS = Water Supply and Drought Preparedness

Integrated Regional Water Management Plan April 2007

Table 5-3. Water Quality Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
WQ1	Cache Creek System Mercury Remediation Project	WS	The Central Valley Regional Water Quality Control Board recently adopted the Cache Creek mercury TMDL and is working on the Delta mercury TMDL. Mercury is present in Cache Creek and the Delta as a result of historic mining activities, not local actions. One of the key activities under consideration is to change the groundwater and drainage conditions at upstream abandoned mines, thereby eliminating the source of much of the methylmercury to Cache Creek. Local entities need funding to implement actions to reduce mercury levels in Cache Creek and the Yolo Bypass.	Cache Creek
WQ2	Yolo County Wastewater Recycling Program	WS	All of the individual wastewater recycling programs under the WQ2 listing should be studied for appropriate linkages and joint economies of scale and administration.	Countywide
WQ2.1	City of Winters Wastewater Recycling Project	WS	The City of Winters Wastewater Treatment Facility is located in a primarily agricultural area on County Road 32, northeast of the City of Winters. Wastewater is treated in ponds and applied to 170 acres of grassland. The grass is periodically harvested. Treated wastewater could potentially be used to irrigate other agricultural crops, golf courses and other open space. An upgrade to the treatment facility may be required, depending upon the type of wastewater re-use. Seventy percent of municipal water currently goes to irrigation.	Putah Creek
WQ2.2	Dunnigan Area Wastewater Recycling Project	WS	As a result of problems with nitrate contamination and the need to serve a growing population, the existing residents of Dunnigan will need to move from septic systems to a waste water treatment plant in the next 10 years.	Colusa Basin Drain
WQ2.3	Esparto Wastewater Recycling Project	WS	The Esparto Wastewater Treatment Facility is owned and operated by the Esparto Community Services District. The facility consists of ponds that are near or at capacity. Treated wastewater could potentially be used to irrigate agriculture, golf courses and other open space. An upgrade to the treatment facility may be required, depending upon the type of wastewater re-use.	Willow Slough
WQ2.4	Madison Wastewater Recycling Project	WS	The Madison Wastewater Treatment Facility is owned and operated by the Madison Community Services District. The facility consists of ponds that are near or at capacity. Treated wastewater could potentially be used to irrigate agriculture, golf courses and other open space. An upgrade to the treatment facility may be required, depending upon the type of wastewater re-use.	Willow Slough

Integrated Regional Water Management Plan April 2007

Table 5-3. Water Quality Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
WQ2.5	City of Woodland Wastewater Recycling Project	WS	The City of Woodland Wastewater Treatment Plant (WWTP) is located southeast of Woodland, approximately one-half mile east of the intersection of Gibson Road and County Road 102. Wastewater is currently treated in an activated sludge process that produces secondary effluent; however, tertiary filtration and UV disinfection facilities are currently under construction. Following the completion of these facilities the treated wastewater should be suitable for most potential beneficial uses of wastewater effluent, including water supply for reclamation wetlands, agricultural irrigation, irrigation of golf courses, and other open space.	Woodland
WQ2.6	City of Davis Wastewater Recycling Project	WS	The City of Davis Water Pollution Control Plant (WPCP) is located primarily in an agricultural area on the western side of the Yolo Bypass, approximately three miles northwest of the City of Davis. Wastewater is currently treated by primary sedimentation, oxidation ponds, overland flow, and chlorination/dechlorination. Treated wastewater is discharged to the Willow Slough Bypass just south of the main plant facilities, to the Davis Restoration Wetlands and then to the Yolo Bypass. The Davis Restoration Wetlands were designed and constructed by the USACE to create waterfowl habitat, and have been managed by the City since its completion. The wetlands receive a combination of treated wastewater effluent and storm water to maintain a diverse wildlife habitat. The facility is also the largest constructed wetland in the Sacramento Valley with completely native species. The City of Davis will continue to assess the potential for other beneficial uses of its wastewater effluent. Potential beneficial uses may include water supply for additional reclamation wetlands, agricultural irrigation, and irrigation of golf courses and other open space. An upgrade to the treatment facility may be required, depending upon the type of wastewater re-use.	Davis
WQ2.7	UC Davis Wastewater Recycling Project	WS	UC Davis will continue to assess the potential for reuse of effluent from its wastewater treatment plant. The current discharge is to Putah Creek south of I-80, and withdrawal of all or a portion of this discharge from Putah Creek may be controversial. To proceed in a concrete manner would require UC Davis to find funding sources for a pilot project, and this process would likely begin with a feasibility study. A potential element of this effort could include pumping highly treated effluent from the existing wastewater treatment plant back to the Arboretum waterway to help control water quality.	Davis

Integrated Regional Water Management Plan April 2007

Table 5-3. Water Quality Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
WQ3	UC Davis Groundwater Remediation Project	WS	UC Davis will continue efforts to clean up the contaminated groundwater underlying the landfill and the south campus disposal site. These efforts have defined plans, compliance requirements and ongoing action plans.	Davis
WQ4	Agricultural/Urban Storm Runoff Assessment Program	FM	Storm runoff from agricultural land that enters the storm drainage system for urban areas can be problematic with respect to the sediment and chemicals that may be associated with the runoff. Recognizing that the requirements for managing the quality of runoff from agricultural land and from urbanized areas attention should be given to minimizing the commingling of the storm runoff from the two sources. This is particularly important for the City of Woodland however may relate to other communities and neighboring areas as well. This agricultural-urban interface should be assessed for communities throughout Yolo County.	Countywide
WQ5	City of Woodland Wastewater Ponds Reclamation Project		The wastewater ponds north of the Gibson Channel are no longer required for treating the City of Woodlands municipal wastewater. This area which comprises about 135 acres offers the opportunity for reclamation for beneficial purposes. Accordingly, an evaluation of the alternatives for reclamation should be performed to determine the most effective reclamation plan for the area.	Woodland
WQ6	Outfall Channel Environmental Enhancement Project	FM, AR	The channel between the south levee of the current Cache Creek Settling Basin and the south levee of the Settling Basin that existed until 1992, forms the Outfall Channel which is approximately 2 miles in length and is the drainage channel for the City of Woodland and the agricultural land within the watershed adjacent to the City. The City of Woodland, by implementing its storm drainage master plan will provide storm water quality treatment upstream of the Outfall Channel and before it is commingled with storm runoff from the agricultural area. The land between the new and old levees and outside the existing outfall channel offers opportunity for significant aquatic habitat enhancement in conjunction with water quality treatment of the drainage water.	Woodland, Cache Creek
WQ7	Willow Slough Bypass Environmental Enhancement Project	AR, WS	Some landowners have expressed an interest in partnering with YCFCWCD to develop the "bench" in the Willow Slough Bypass into a series of wetland ponds. A seasonal weir would be installed during the irrigation season near County Road 102. This weir would back up the Slough water (all the slough water is irrigation return flows during the irrigation season) onto the bench and into a series of linear wetland ponds that would run	Willow Slough

Integrated Regional Water Management Plan April 2007

Table 5-3. Water Quality Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
			along the Slough. This would achieve three objectives: sediment removal to assist in compliance with the Ag Waiver Program, managed habitat development, and reduced pumping costs to lift delivery water from the bottom of the Slough. The project would need to be managed and maintained so as not to interfere with the flood management requirements of the Bypass.	
WQ8	Groundwater Nitrate Reduction Program		Study of nitrate contamination that threatens wells serving existing communities. Levels of nitrates exceeding human health standards have been identified in Dunnigan and Davis over the past ten years as a result of fertilizer runoff and septic systems. Levels of nitrates in wells serving Woodland are approaching human health standards. A study of sources of and trends associated with nitrate contamination may help identify ways to slow or stop the spread of contamination before municipalities have to close wells. Modifications to agricultural and municipal wells will be one of the methods evaluated for slowing the downward migration of nitrate.	Countywide
WQ9	Yolo Waste Water Treatment Infrastructure Improvements		Improved wastewater treatment. The community of Yolo's infrastructure is old, and may be need to be replaced.	Colusa Basin Drain
WQ10	Sacramento River Water Facilities Review Program		Countywide, develop comments and opinions related to Environment Impact Reports (EIR) on new surface water treatment facilities and water contracts within the Sacramento River Watershed that affect existing and future Yolo County municipal and agricultural surface water users.	Sacramento River
WQ11	Sacramento River Joint Source Water Protection Program		Project includes funding and participation in the joint source water protection program with the City of Sacramento. This program aims to reduce TOC and pesticides runoff into the Sacramento River. Includes public notification and education programs, coordination with the CRC on rice management and spill notification procedures. Funding enables monitoring for existing and new pesticides during the spring and summer discharge periods.	Sacramento River

Integrated Regional Water Management Plan April 2007

Table 5-3. Water Quality Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
WQ13	Sacramento River Water Testing Program		Fund and implement raw water testing for Cryptosporidium and Giardia to comply with the recent federal Stage 2 Disinfection Byproduct Rule.	Sacramento River
WQ14	Ag Waiver Program		The Central Valley Regional Water Quality Control Board has adopted an "Ag Waiver" to monitor agricultural and storm water runoff and to implement BMPs to improve the quality of the agricultural and storm water runoff. Local sub-watershed groups have been formed to allow growers and landowners an alternative to obtaining individual discharge permits from the Regional Board. The Yolo County subwatershed is being lead by the Yolo County Farm Bureau with assistance and input from the Ag Commissioner, YCFCWCD, YCRCD and from the larger Sacramento Valley watershed group. The IRWMP should at a minimum endorse the goals, objectives, and methodology of the current ag waiver program. Requirements of the newly imposed Agricultural/irrigated Lands Conditional Waiver Program require monitoring of certain water quality parameters. Funding is needed to assist landowners in complying with these water quality monitoring efforts.	Countywide
WQ15	Demonstration Farm Project		Establish a demonstration farm to demonstrate agricultural practices that reduce runoff and reduce water use (e.g., drip and certain land treatments). Experienced farmers could give advice about these practices to other farmers. Demonstrate how the Watershed Management Program (FM20) would be implemented.	Countywide
WQ16	Develop Best Management Practices for the Yolo Bypass Regarding Production and Transport of Elemental and Methyl mercury		Several studies looking at methylmercury are underway in the Yolo Bypass. State Dept of Fish and Game is conducting a monitoring study, UC Davis is looking at bioaccumulation and the USGS is doing a one-year study entitled. "Methylmercury cycling and export from agricultural and natural wetlands in the Yolo Bypass." A proposal for an additional study looking at Methylmercury is underway. In the next five years there will the need for: (1) additional funding will be needed in the future for studies, to further develop cost-effective BMPs to minimize the production and transport methyl mercury from rice fields and wetlands; and (2) funds to pay for monitoring required by the Delta TMDL once it is adopted.	Yolo Bypass

Integrated Regional Water Management Plan April 2007

Table 5-3. Water Quality Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
WQ17	Sacramento River Storm Water Sources Monitoring Program	WQ	Project includes funding for implementation of a storm water monitoring program to identify and reduce runoff contaminants from entering the Sacramento River water supply. Project consists of developing a long-term storm water monitoring program for Yolo County along the Sacramento River.	Sacramento River

Note:

* AR = Aquatic and Riparian Ecosystem Enhancement, FM = Flood Management and Storm Drainage, R = Recreation, WQ = Water Quality, WS = Water Supply and Drought Preparedness

Integrated Regional Water Management Plan April 2007

Table 5-4. Flood Management and Storm Drainage Actions

ID	Title	Related Categories*	Description	Geographic Area
FM1	Putah Creek Bank Stabilization Project	AR, WQ	Unstable banks of Putah Creek generate large volumes of sediment in Putah Creek. Thompson Canyon, Proctor Draw and Dry Creek are three of the main tributary channels draining from the Yolo side and all have deposited large quantities of sediment into Putah Creek over the past 50 years. Lake Solano shows encroachment of sediment across 80 percent of its width, mostly contributed by Proctor Draw and rapid encroachment of vegetation on what was previously lake surface over a recent three year interval. Farmers along Proctor Draw have lost rows of trees to this tributary. Grade control with rock weirs and removal of eucalyptus from the floor of this channel are urgent needs. Some of this sediment originates from Pleasants Creek (Solano County), but the Delta is centered on Proctor Draw. Bank stabilization can be achieved with rock vane flow deflectors, and grade control structures (rock weirs).	Putah Creek
FM2	Dry Creek Bank Stabilization Project	AR, WQ	Bank erosion along Dry Creek produces large volumes of sediment that are deposited in Putah Creek. With the large flows on Putah Creek regulated the sediment contributed from Dry Creek is prone to deposition and not being transported through the system. Alternative means of bank stabilization along various reaches of Dry Creek need to be evaluated to minimize the deposition of sediment in Putah Creek and loss of urban and agricultural land.	Putah Creek
FM3	City of Winters Storm Drainage Diversion to Putah Creek Project	AR, WQ	Management of storm runoff for the City of Winters includes the diversion of up to 1,000 cfs to Putah Creek during a 100-year storm event. The diversion of this amount of water was evaluated by the USACE several years ago and should be reevaluated. This diversion is an integral part of the City of Winters storm drainage master plan to facilitate build-out of its General Plan.	Putah Creek
FM4	Buckeye Creek Erosion/Flood Management Project	AR, WQ	Erosion of the banks along Buckeye Creek west of Interstate 5 is causing sediment deposition and flooding on property North of the Town of Dunnigan. An assessment of the causes of erosion and determination of measures to effectively mitigate or minimize the erosion is needed to arrest the problem and preserve the watershed.	Colusa Basin Drain
FM5	Knights Landing Levee Improvement Project		Levee improvements to address through seepage and underseepage problems are needed, as well as repair of a critical erosion site. Through seepage can be addressed through construction of the Mid-Valley Project, a multiple-phase USACE project. Yolo County, RD 827, RD 108, and RD 785 benefit from the Mid-Valley Project. Underseepage can	Sacramento River

Integrated Regional Water Management Plan April 2007

Table 5-4. Flood Management and Storm Drainage Actions

ID	Title	Related Categories*	Description	Geographic Area
			only be addressed once levee integrity studies are completed that will identify needed improvements. In addition, a critical erosion site at River Mile 85.6 needs to be repaired. Failure of this levee will affect Knights Landing.	
FM6	Clarksburg Levee Improvement Project		RD 307 estimates that they need to repair erosion sites on 6,500 linear feet within 6.6 miles of levees that help protect Clarksburg and the Sacramento Regional Sanitation District's Northwest Interceptor project.	Sacramento River
FM7	Sacramento River West Bank Levee Integrity Program		Underseepage studies of 75-80 miles of Sacramento River levees, as well as needed improvements identified by studies. The potential for underseepage at Yolo County's Sacramento River levees has never been studied, despite identified seepage problems. Levee failure may negatively impact West Sacramento, Knights Landing, Clarksburg, agricultural land and rural property owners, as well as the Sacramento Bypass, an integral part of the Sacramento River Flood Control Project.	Sacramento River
FM8	Knights Landing Storm Drainage/Flood Management Project		New pumping infrastructure to pump storm water and flood waters from the Knights Landing Ridge Cut Canal, benefiting existing and proposed residential areas in Knights Landing.	Colusa Basin Drain
FM9	Madison Storm Drainage/Flood Management Project		The Town of Madison has a chronic problem of flooding from storm runoff entering the town from Cottonwood Slough, the South Fork Willow Slough, and general overland flow from west and north of the town. During these events homes are flooded and the sewer system is overtaxed as well. The updated County General Plan may indicate the potential for some growth of the community. The flood hazard needs to be mitigated not only for the existing community but before additional growth is allowed to occur. An opportunity to mitigate this flood hazard may in part be provided by the Caltrans Highway 16 Safety Project, however the residual flooding that may persist needs to be addressed.	Willow Slough
FM10	Esparto Storm Drainage/Flood Management Project		Land within Esparto and adjacent lands that are planned for growth are subject to flooding under significant storm events. This is due to some extent to the capacity limitations of Lamb Valley Slough and the South Fork Willow Slough. A storm drainage/flood control master plan is needed to mitigate existing flood hazards and to provide the basis for planned growth without adversely impacting existing or new development.	Willow Slough

Integrated Regional Water Management Plan April 2007

Table 5-4. Flood Management and Storm Drainage Actions

ID	Title	Related Categories*	Description	Geographic Area
FM11	Caltrans Highways Hydraulic Impact Assessment Program		The hydraulic capacity of water conveyance structures constructed for the Federal and State Highways in Yolo County (Interstate 5 and 505 and State Highway 16) have created adverse impacts to storm runoff in several areas of the County. Incremental increases in the impacts occur over time by virtue of constructing pavement overlays. A comprehensive assessment of the hydraulic capacity of the structures at principal waterways is needed to address storm water management throughout the County.	Countywide
FM12	County Roads Hydraulic Capacity Assessment Program		The hydraulic capacity of water conveyance structures constructed for County Roads may not be adequate for particular waterways. A comprehensive assessment of the capacity of hydraulic structures associated with County Roads is needed to provide the framework for future structure maintenance and replacement.	Countywide
FM13	Huff's Corner Levee Repair Project		Erosion control at a critical site within a 2,500-foot levee section on the south bank of Cache Creek. The section stretches from Interstate 5 upstream to high ground at a location known as Huff's Corner. Failure of this levee could result in 1-4 feet of flooding in Woodland and the surrounding unincorporated area, affecting 15,000 residents. Control of erosion at this site is a short-term solution. Yolo County continues to work with the City of Woodland and other entities on a long-term solution to improve flood protection in this area.	Cache Creek
FM14	Reconciliation of Cache Creek Settling Basin Future Modifications and "Original" South Levee Project		The Cache Creek Settling Basin is a feature of the Sacramento River Flood Control Project. The Settling Basin was modified substantially in 1992 to increase its efficiency and capacity for trapping sediment transported by Cache Creek to preserve the flood carrying capacity of the Yolo Bypass. The Settling Basin has created adverse drainage conditions for the City of Woodland as well as drainage and seepage issues to adjacent land. A new south levee was constructed approximately 200 feet north of the south levee that functions as part of the facility prior to the 1992 modification. As a consequence the "old" south levee has effectively been abandoned by the USACE and the State Reclamation Board as part of the Sacramento River Flood Control Project. Resolution is needed regarding the responsibility for ownership and maintenance of the "old" south levee which remains part of the Yolo Bypass, the impacts of the Settling Basin modifications on the City of Woodlands storm drainage, and the handling of sediment from Cache Creek when the trap efficiency of the Settling Basin is no longer acceptable.	Cache Creek

Integrated Regional Water Management Plan April 2007

Table 5-4. Flood Management and Storm Drainage Actions

ID	Title	Related Categories*	Description	Geographic Area
FM15	Cities-County Storm Drainage Criteria Update Program		Consistency in the hydrologic and hydraulic design criteria and the interfacing between the urbanized and non-urbanized areas or rural areas would result in more effective and compatible management of storm runoff as new facilities are constructed or existing structures are replaced. This interfacing occurs informally to some extent however the community of Yolo County would be better served in the future with a formally established process and consistent criteria. Criteria for urban areas, whether in a city or unincorporated area, should include provisions for Low Impact Development.	Countywide
FM16	Tributaries Detention Basins Project		Storm water detention basins on Cache Creek tributaries have been identified as a potential method of reducing peak flows in the creek during storm events. An investigation into the economic, engineering, environmental and legal feasibility of dry dams at various locations throughout the watershed should be conducted.	Cache Creek
FM18	Cache Creek Off-Channel Detention Basin Projects	WS	Appropriate sites should be identified for temporary, peak-runoff diversion and detention. One of the critical criteria for site selection would include having the proper topography that would allow for gravity diversion and return flows to Cache Creek immediately after a storm event. Assuming these detention basins would be on private property, flood easements would need to be negotiated.	Cache Creek
FM19	Woodland Area Flood Management Project		Public outreach/technical analysis necessary to identify a long-term solution to Cache Creek flooding and provide a minimum of 200-year flood protection to the City of Woodland and surrounding areas. Implementation of publicly-supported solution.	Woodland
FM20	Watershed Management Program		Grazing and other land management practices have a substantial impact on storm runoff rates. An educational program should be initiated to assist private landowners in understanding the impacts of their land management practices. This could be coupled with an incentive program to provide financial assistance to help landowners adopt certain BMPs.	Countywide
FM21	Dunnigan Area Storm Drainage/Flood Management Project		The updated Yolo County General Plan may indicate potential growth and development in the vicinity of the Town of Dunnigan. The growth would impact and be impacted by storm runoff from the Dunnigan Hills including Oat Creek, Bird Creek, and several smaller drainage courses that cross the Tehama Colusa Canal west of the potential growth area. A master storm drainage/flood control plan would need to be formulated as	Colusa Basin Drain

Integrated Regional Water Management Plan April 2007

Table 5-4. Flood Management and Storm Drainage Actions

ID	Title	Related Categories*	Description	Geographic Area
			part of a Dunnigan Community Plan. Planning for management of storm drainage should include the application of Low Impact Development design considerations.	
FM22	Flood Emergency Preparedness and Hazard Classification Program		The 2005 New Year's Eve storm event highlighted the need to improve the method of notifying at-risk residents of the need to take emergency action (evacuation). The appropriate emergency response authorities should refine the process by which the at-risk public is notified.	Countywide
FM24	Clear Lake Operations Evaluation Program	WS	During the winter months Cache Creek Dam releases are dictated by the Gopcevic decree. YCFCWCD and LCFCWCD have discussed the possibility of modifying these operational rules under certain conditions to benefit both Yolo and Lake County interests. These changes could be coupled with some physical modifications at the Grigsby Riffle. These actions could potentially reduce peak flood flows in Cache Creek by about 4,000 cfs on the levees near Woodland, while also providing flood relief to Clear Lake residents. Additionally, reoperations of the Cache Creek Dam could provide a significant amount of water supply in certain hydrologic year types.	Cache Creek
FM25	Sacramento River Levee Rehabilitation Project (West Sacramento)		Funding for implementation of improvements identified during 2006 analyses of seepage problems. Funding for emergency repairs at two critical erosion sites at River Mile 56.0 and 56.7. Funding for non-emergency repairs at River Mile 57, RM 55.8, and RM 53.5. These levees protect 40,000 residents in West Sacramento. (RD 900)	Sacramento River
FM26	Willow Slough Levee Improvement Project	AR	Willow Slough levee improvements necessary to protect the town of Madison and Highway 16 from flooding, including associated habitat restoration.	Willow Slough
FM27	Funding for the Flood Management Division of DWR		Increased funding for the maintenance work of DWR's Flood Management Division. The Division maintains 56 miles of Yolo County levees.	Countywide
FM28	Sacramento River Levee Rehabilitation Project (RM 69.9 RD827)		RD 827 needs funds to fix a critical erosion site at RM 69.9. No levee break analysis has been completed to determine what would flood if this levee fails.	Sacramento River
FM30	Sacramento River Levee Rehabilitation Project (Merritt Island)		Erosion control and levee improvements on the Sacramento River levee as identified by RD 150.	Sacramento River

Integrated Regional Water Management Plan April 2007

Table 5-4. Flood Management and Storm Drainage Actions

ID	Title	Related Categories*	Description	Geographic Area
FM31	Sutter Slough Erosion Control and Pumping Infrastructure Improvement Project		Minor erosion control on Sutter Slough. These levees protect Clarksburg , but RD 999 indicates they can work through the Delta Levee Subventions Fund to fix the problems. RD 999 also needs new pumping infrastructure, as existing pumps are 80 years old.	Sacramento River
FM32	Sutter Bypass Vegetation Removal Project		Vegetation removal in the Sutter Bypass consistent with habitat restoration activities. Sutter Bypass is losing capacity because of vegetation, water that is not captured in the Sutter Bypass can put additional pressure on the Yolo Bypass and downstream levees.	Sacramento River
FM33	Yolo and Tisdale Bypasses Sediment Removal Program		RD 108 and the DWR need additional funding to periodically remove sediment that is restricting the capacity of the Yolo Bypass and the Tisdale Bypass.	Yolo Bypass, Sacramento River
FM34	West Sacramento Levee Monitoring and Maintenance Program		Funding for ongoing monitoring and maintenance/repair operations for the West Sacramento levee system.	Sacramento River
FM35	Creation of Flood Management Division or Separate Entity		YCFCWCD, Yolo County, and the City of Woodland are interested in establishing a two-year trial position within YCFCWCD to lead flood management efforts associated with the Woodland/Cache Creek and the Yolo Floodplain flood problems (Note: Sacramento River flood issues would not be part of this program except as they might relate to the defined areas). An individual would be hired to coordinate efforts in the legal, long-term funding, solution/project development and implementation, and ongoing maintenance areas as they might contribute to flood management solutions in these two areas. Based on the success (or lack thereof) of this program, this position will be considered for long-term funding either within YCFCWCD or within a separate entity.	Countywide
FM36	Putah Creek Diversion Dam Vegetation Removal Project		Channel capacity is substantially below design capacity of Putah Diversion Dam. This may cause the potential for overtopping of the dam, dam failure and disruption of water supply. Control of invasive weeds (especially arundo and Himalayan blackberry from Putah Diversion Dam to Winters would restore much of the design capacity.	Putah Creek
FM37	Mace Boulevard Bridge Improvement Project		The capacity under the Mace Boulevard Bridge over Putah Creek east of Davis is the lowest of any bridge on Putah Creek. The 500-foot long bridge has multiple supports that can catch debris. Hydrologic studies would be required to determine the appropriate capacity.	Putah Creek

Integrated Regional Water Management Plan April 2007

Table 5-4. Flood Management and Storm Drainage Actions

ID	Title	Related Categories*	Description	Geographic Area
FM38	Small Sloughs and Creeks Invasive Vegetation Removal Program		Conveyance capacity of small creeks and sloughs is reduced and could become more reduced by invasive plants including giant reed (arundo) and tamarisk. A removal program should be initiated to maintain flood conveyance capacity.	Countywide
FM39	Yolo Bypass 2-D Hydraulic Modeling Project		The USACE, with funding from CBDA, is in the process of finalizing a two-dimensional hydraulic model (RMA2) of the Bypass for the purpose of assessing the impacts of proposed land use changes, such as ecosystem restoration within the Yolo Wildlife Area. The final model is scheduled to be completed in October 2006 and will be available for use by anyone proposing a land use change throughout the entire Bypass. It is the model by which the State Reclamation Board will judge impacts to flood carry capacity when an application is made for a permit. Funding is required to support the following activities: (1) determine which agency will be responsible for maintaining and updating the model as projects are completed; (2) conduct long-term management of the model, which is a key tool needed to implement projects in the Yolo Bypass; and (3) enable project proponents to pay for input of project data to run the model for specific projects. Lack of upkeep on this model will make it obsolete and will preclude making informed decisions in the future about Bypass flow, Bypass land, and feature design, associated impacts and adjustments, and associated enforcement if warranted.	Yolo Bypass
FM40	Sacramento River Levee Repair		Correct deficiencies, protect against underseepage, and maintain the Sacramento River levees to current standards for FEMA 100-year and 200-year levels of flood protection. Physical improvements may include, but not be limited to, restoration and armoring of waterside levee slopes, increased levee height through crown raising or crown top walls, slurry cutoff walls in the levee prism, seepage blankets on the levee landside, levee setbacks, etc.	Sacramento River

Integrated Regional Water Management Plan April 2007

Table 5-4. Flood Management and Storm Drainage Actions

ID	Title	Related Categories*	Description	Geographic Area
FM41	Deep Water Ship Channel Navigation Levee Repair		Correct deficiencies, protect against underseepage, and maintain the Deep Water Ship Channel levees to current standards for FEMA 100-year and urban levee 200-year levels of flood protection. Physical improvements may include, but not be limited to, restoration and armoring of waterside levee slopes, increased levee height through crown raising or crown top walls, slurry cutoff walls in the levee prism, seepage blankets on the levee landside, levee setbacks, etc.	Deep Water Ship Channel and Levees
FM42	Sacramento Bypass-Yolo Bypass Levee Repair		Correct deficiencies, protect against underseepage, and maintain the Sacramento Bypass and Yolo Bypass levees to current standards for FEMA 100-year and urban levee 200-year levels of flood protection. Physical improvements may include, but not be limited to, restoration and armoring of waterside levee slopes, increased levee height through crown raising or crown top walls, slurry cutoff walls in the levee prism, seepage blankets on the levee landside, levee setbacks, etc.	Sacramento Bypass and Yolo Bypass
FM43	West Sacramento South Cross Levee Repair		Correct deficiencies, protect against underseepage, and maintain the West Sacramento South Cross Canal levees to current standards for FEMA 100-year and urban levee 200-year levels of flood protection. Physical improvements may include, but not be limited to, restoration and armoring of waterside levee slopes, increased levee height through crown raising or crown top walls, slurry cutoff walls in the levee prism, seepage blankets on the levee landside, levee setbacks, etc.	Deep Water Ship Channel and Levees, Cross Levees
FM44	Ongoing Levee Maintenance and Critical Repair Program		Annual program of levee maintenance and repair at critical erosion sites, implementing Public Law 8499.	Sacramento River, Yolo Bypass, Deep Water Ship Channel and Levees
FM45	RD 900 and West Sacramento MOU on Storm Water Detention and Raw Water Supply		The City of West Sacramento and RD 900 are developing an agreement for cooperative management, use, and maintenance of storm water detention facilities, irrigation and drainage canals, pumps, and other facilities associated with purveying and use of untreated water.	Sacramento River

Integrated Regional Water Management Plan April 2007

Table 5-4. Flood Management and Storm Drainage Actions

ID	Title	Related Categories*	Description	Geographic Area
FM46	Elk Slough Reclamation Pumping Plant		Existing pumping plant is 80 years old. Replace three old pumps with four new pumps and drives. This project will increase pumping efficiency, reduce cost, increase reliability, and maintain the existing pumping capacity.	Sacramento River
FM47	Public Outreach on Flood Risk		Continue to improve public outreach efforts to encourage citizens living in the floodplain to purchase flood insurance. Residents and property owners in the floodplain may be at risk if flooding occurs on the Sacramento River. Floodplain managers have recently become aware of potential levee weaknesses along the Sacramento River. Property owners need to understand the flood risk and should also be encouraged to purchase flood insurance or ensure that their policy will not expire.	Sacramento River
FM48	Levee Maintenance Fee Structure Assessment		Assess levee maintenance district fee structure and funding opportunities in relation to maintenance demands. Work with DWR to evaluate and recommend solutions. Use the Local Agency Formation Commission municipal service of levee maintenance districts to initiate changes, as appropriate (occurs every five years, the last one was completed in March 2005).	Sacramento River

Note:

* AR = Aquatic and Riparian Ecosystem Enhancement, FM = Flood Management and Storm Drainage, R = Recreation, WQ = Water Quality, WS = Water Supply and Drought Preparedness

Integrated Regional Water Management Plan April 2007

Table 5-5 – Aquatic and Riparian Ecosystem Enhancement Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
AR2	Russell Ranch Riparian and Grassland Habitat Restoration Project		A funded habitat restoration project is under way to restore riparian and grassland habitat at Russell Ranch. This project could be expanded, by restoring additional areas.	Putah Creek
AR3	Putah Creek Fisheries Habitat Enhancement Project		UC Davis is a member of the Lower Putah Creek Coordinating Committee, and has received in kind contributions from the LPCCC for vegetation management. These contributions can be leveraged as matching funds to obtain additional habitat restoration funding.	Putah Creek
AR4	UC Davis Confined Animals Relocation Project	WQ	Confined animals would be removed from the North Fork of Putah Creek on UC Davis land and the creek's riparian and aquatic habitat can be restored in this area. This action was identified in the 2003 UC Davis Long Range Development Plan.	Putah Creek
AR5	Putah Creek Recreational Facilities Restoration and Expansion Project	R	UC Davis intends to restore and expand the campfire area along Putah Creek, south of the UC Davis Airport. Riparian habitat restoration in this area will be included. Public use will be focused in this area, such that remaining riparian habitat owned by UC Davis can be used for research.	Putah Creek
AR7	Putah Creek and Cache Creek Exotic and Invasive Species Removal Project	WS, FM	Exotic and invasive plant species, in particular arundo, Himalayan blackberry and tamarisk, cause habitat degradation, bank erosion, and excessive transpiration (consumptive use) losses of water on Cache Creek and Putah Creek. Removal of these species and restoration of the removal sites with native riparian vegetation will greatly benefit native wildlife, aquatic habitat, and bank stability, and will save water. The Cache Creek Conservancy, Yolo County, the Lower Putah Creek Coordinating Committee, and other organizations have been working successfully to remove non-native plant species from the banks of Yolo County's waterways. Much more work is needed, and organizations should work together to secure funding for these efforts. Experts agree that removal of non-native plant species in the entire watershed is essential to prevent new growth of these invasive weeds in the lower watershed. Removal should also start in the most upstream areas and proceed in a downstream direction, to reduce the likelihood of re-infestation.	Putah Creek, Cache Creek
AR8	Cache Creek-Yolo Bypass Anadromous Fish Passage Project		Conduct habitat and engineering feasibility studies. If they indicate feasibility, then remove fish passage barriers. Barriers at the Settling Basin and the Capay Dam could be removed to allow salmon to reach potential spawning habitat in Cache Creek.	Cache Creek, Yolo Bypass

Integrated Regional Water Management Plan April 2007

Table 5-5 – Aquatic and Riparian Ecosystem Enhancement Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
AR11	Agricultural Drains and Sloughs Riparian Habitat Enhancement Program	WQ	Bank vegetation on small sloughs and agricultural drainage canals could be enhanced and managed to provide habitat to birds and other wildlife and to shade the waterways without reducing their irrigation and flood management functions. Where feasible and appropriate, grasses and shrubs could be established and maintained along drain and slough banks in order to reduce the use of herbicides for weed control and to reduce erosion and the associated silt load in the waterways. Landowners could be provided financial incentives to offset the cost of establishing the additional vegetation.	Willow Slough
AR13	South Fork Willow Slough Riparian Restoration and Levee Setback Project		Revegetation of 4 acres of Willow Slough to provide wildlife habitat and increase conveyance capacity. Builds on existing work to revegetate Willow Slough at the Stephens property off Highway 16.	Willow Slough
AR14	Willow Slough Habitat Enhancement Program		Prioritize additional habitat enhancement projects along Willow Slough and implement them. Much of the riparian habitat that existed in the Willow Slough watershed (eastside county foothills) in the pre-settlement era has been lost to agricultural reclamation and urban development. All that remains are small patches or narrow strips – often only one tree canopy wide – of riparian vegetation along some slough reaches and seasonal creeks. Nevertheless, riparian-dependent wildlife is abundant in these remaining areas. Ample opportunity exists to work with private landowners to enhance and expand existing riparian groves and fill in linear gaps.	Willow Slough
AR16	Sacramento River Habitat-Friendly Levee Improvement Program	FM	Enhancement of Sacramento River riparian habitat consistent with levee improvements. As a result of increased attention by the Governor and the Legislature on improving California's levee system, projects will be undertaken on Yolo County's 215 miles of Sacramento River Flood Control Project levees to strengthen them. If funding is available, Yolo County can encourage local levee maintenance districts to undertake habitat enhancement projects in addition to their required mitigation activities. Riparian vegetation could be added to levee slopes according to the bank vegetation guidelines of the Sacramento River Corridor Planning Forum's (2005) draft Floodway Management Plan. The guidelines are designed to increase habitat value, while maintaining maximum flood protection and providing additional structure for fish habitat, as appropriate.	Sacramento River

Integrated Regional Water Management Plan April 2007

Table 5-5 – Aquatic and Riparian Ecosystem Enhancement Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
AR17	Clarksburg Boat Ramp Habitat Enhancement Project	R	Enhancement habitat at the Clarksburg Board ramp and removal of invasive weeds.	Sacramento River
AR18	Cache Creek Canyon Regional Park Habitat Enhancement Project		Enhance habitat and remove invasive weeds consistent with the Cache Creek Canyon Regional Park Habitat Enhancement Plan.	Cache Creek
AR19	Chickahominy Slough Riparian Restoration and Levee Setback Project		Revegetation of a 3-mile reach of Chickahominy Slough near County Road 96. Project includes excavation and grading to move the levee back and planting of native trees, shrubs, and grasses.	Willow Slough
AR20	Cottonwood Slough Riparian Restoration and Levee Setback Project		Excavation and revegetation of 10 acres along Cottonwood Slough near County Road 23 and Madison in Yolo County. Current channel is incised, eroding, and nearly devoid of vegetation. Excavation will create a floodplain terrace on the north side of the slough to create over three acres of wildlife habitat.	Willow Slough
AR21	Corell-Rogers Wetlands Project	R	Restore two formerly mined gravel pits to seasonal wetlands at a 56-acre site along Cache Creek. Enhance riparian habitat and remove invasive weeds. Drill a well to provide irrigation and improve access to site, including the native plant demonstration garden.	Cache Creek
AR22	Grube-Payne Habitat Restoration Project		Restoration of riparian habitat, including native fish habitat, on the Grube property upstream of the I-505 bridge.	Cache Creek
AR23	Capay Open Space Park Habitat Enhancement Project		Restoration of riparian habitat, including native fish habitat, at Yolo County's Capay Open Space Park.	Cache Creek
AR24	Cache Creek Riparian Habitat Enhancement Program		Riparian areas of Cache Creek have been significantly degraded as a result of flood control efforts, agriculture, and mining. Opportunities exist to improve riparian habitat, including fish habitat. This program would identify high-priority sites for habitat enhancement along Cache Creek within Yolo County. Yolo County would work in partnership with private landowners, YCFCWCD, and other interested parties.	Cache Creek
AR25	Small Sloughs Revegetation Project		Revegetation of Chickahominy Slough and other small tributaries to provide wildlife habitat and increase conveyance capacity.	Willow Slough

Integrated Regional Water Management Plan April 2007

Table 5-5 – Aquatic and Riparian Ecosystem Enhancement Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
AR26	Sacramento River Fish Habitat Enhancement Program		Out-migrating juvenile salmon and steelhead in the Sacramento River benefit greatly from instream woody material and other inundated structures because they provide cover. Cover protects juveniles from predators, and provides substrate for food organisms. Little structure occurs in the channel, because the sources of instream woody material are very limited in the lower, levee-confined reaches of the Sacramento River, or have been removed for levee and channel maintenance or by rock bank protection projects. In partnership with flood control agencies and as a part of other habitat enhancement efforts, Yolo County will pursue fish habitat enhancement projects.	Sacramento River
AR27	Fremont Weir Fish Passage Public Outreach Process		Public outreach is needed to explore potential solutions and constraints associated with improving fish passage at the Fremont Weir. The Fremont Weir (in conjunction with other obstacles to Sacramento River access) blocks the upstream migration of thousands of adult salmon each year. While most of these fish are not endangered species, each year the Fremont Weir and associated obstacles block the migration of an average of a hundred federally listed, endangered winter-run and spring-run adult salmon. There are additional impacts to federally-listed steelhead trout, as well as green sturgeon, which are proposed for listing. The Fremont Weir also causes stranding of between 5,000 and 40,000 juvenile salmon every time it spills, as well as juveniles of sturgeon and steelhead trout.	Yolo Bypass
AR28	Yolo Bypass Fish Habitat Enhancement Program		Identify priority areas for fish habitat enhancement and implement projects. The Yolo Bypass provides valuable aquatic habitat to at least 42 resident and seasonal fish species, 15 of which are native. It supports state and federally listed species (Delta smelt, steelhead trout, spring-run and winter-run Chinook salmon) as well as game fish (white sturgeon and striped bass). The Yolo Bypass provides significantly better habitat for juvenile salmon than the Sacramento River. Mean salmon size increased significantly faster in the seasonally inundated Yolo Bypass floodplain than in the Sacramento River.	Yolo Bypass

Integrated Regional Water Management Plan April 2007

Table 5-5 – Aquatic and Riparian Ecosystem Enhancement Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
AR30	Non-native, Invasive Plant Species Removal Program	FM, WQ	Non-native, invasive plant species cause multiple problems in Yolo County waterways, such as Putah Creek and Cache Creek, including reduction of channel capacity, bank erosion, habitat deterioration, and direct competition with native plant species. Removal efforts must include development of a plan with other agencies and other counties to coordinate efforts.	Countywide
AR34	Putah Creek Spawning Grounds Improvement Project		Inadequate spawning gravel continues to limit salmon spawning in Putah Creek, especially in the upper reach below Putah Diversion Dam. Monticello Dam and Putah Diversion Dam block gravel and coarse sediment that the creek used to deposit in this reach. Invasive weeds – especially Himalayan blackberry, arundo and tamarisk – stabilize gravel bars impeding natural replenishment of sediment. Currently the main sources of gravel are deposits in the previously mined reach, in-channel bars and terraces, and Dry Creek. A survey during 2002 found that gravels are a common substrate along lower Putah Creek, but in most places the gravels only occur as a relatively thin veneer over a clay-silt substrate. Also, most of these gravels are too small to support viable salmon egg nests. Rock vanes retain gravel that is added upstream.	Putah Creek
AR35	Capay Dam to Moore Siphon Riparian Flow Program		As part of its comprehensive conjunctive water use program (WS16), YCFCWCD is analyzing the feasibility and impacts of releasing irrigation water over the Capay Dam for diversion and reuse nine miles later in the vicinity of the Moore Siphon. Details that need to be studied in more detail include; water transmission losses, water quality impacts, fishery and habitat impacts.	Cache Creek
AR36	Canal Bank Habitat and Maintenance Program	WQ, R	YCFCWCD is establishing an environmental program to integrate environmental and habitat values into its ongoing canal maintenance program. Currently, the District relies on traditional methods for weed and erosion control along its 160 miles of canal bank. Where feasible and appropriate, it plans to establish and maintain native grasses and shrubs along its canal banks in order to reduce the use of herbicides for weed control and to reduce erosion and the associated silt load in the waterways. This program will provide water quality, habitat and recreational benefits.	Willow Slough, Colusa Basin Drain
AR37	Replace Earthen Crossing of Putah Creek at Route 106A	WQ	Replacing the crossing at Road 106A with a concrete ramp and open box culvert with steel grate would enhance fish passage, maintain impoundment of water for farmers, provide a more reliable crossing, and improve water quality in the lower end of Putah	Putah Creek

Integrated Regional Water Management Plan April 2007

Table 5-5 – Aquatic and Riparian Ecosystem Enhancement Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
			Creek. Currently an earthen crossing is pushed into the channel every year and only the center third of the crossing is removed each fall. Two of the past five years the crossing was installed as scheduled on April 1 and was washed out by late rains.	
AR38	Removal of Winters Percolation Dam	R	Removal of the derelict Winters Percolation Dam foundation is a key to restoring floodplains on both banks downstream of the dam. Currently there are no floodplains on either bank for 200 feet downstream. Without floodplains, the channel has very little shade and the water has long residence time that has a warming effect detrimental to native fish. The dam also impedes development of a creek edge trail that is essential to recreational access.	Putah Creek
AR39	Increase Width of Riparian Corridor of Lower Putah Creek		There are possibilities for increasing width of the riparian zone between Willow Canal where it runs along the top of the bank from Yolo Housing (1 mile east of HW 505) to where it spills into Putah Creek about 300 yards west of Pedrick Road. The existing farmlands between Willow Canal and the top of the bank of Putah Creek drain into Putah Creek and are cut off from surrounding lands by the canal. The straight course of the canal and meandering channel of Putah Creek create irregular linear fields that are not very profitable to farm. Occasional breaches of Willow Canal have washed out gullies into Putah Creek that required expensive repairs by YFCWCWD including two events at one location in the past 3 years.	Putah Creek
AR41	Yolo Bypass Wildlife Area Ecosystem Restoration Project		Implement the Ecosystem Restoration Elements documented in the Yolo Bypass Wildlife Area Land Management Plan. Actions include: (1) restoration of permanent and seasonal wetlands, uplands and riparian areas (activities will consist of ground surveys, hydraulic analysis, construction of interior levees, installation of necessary water control structures and earthmoving services necessary to create the microtopography of diverse and manageable wetland ecosystem); (2) control of selected invasive species; and (3) encourage agriculture tenants to practice wildlife friendly farming. Aquatic ecosystem restoration projects on the Wildlife Area are described in AR49.	Yolo Bypass
AR43	Nichols Park Habitat Enhancement Project		Enhance habitat and remove invasive weeds consistent with the Nichols Park Habitat Enhancement Plan.	Cache Creek

Integrated Regional Water Management Plan April 2007

Table 5-5 – Aquatic and Riparian Ecosystem Enhancement Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
AR44	Camp Haswell/Otis Ranch Habitat Enhancement Project		Enhance habitat and remove invasive weeds at the 7.7-acre Camp Haswell site and as appropriate on the 587-acre Otis Ranch.	Cache Creek
AR45	South Fork Preserve Riparian and Grassland Restoration Project		Enhance the existing habitat restoration project on lower Putah Creek with expansion of restoration areas.	Putah Creek
AR46	Cache Creek Anadromous Fish Reintroduction/Introduction Study	AR	Study the potential to reintroduce salmon to Cache Creek. Historically, anadromous fish – fall-run Chinook salmon, steelhead, Pacific lamprey, and river lamprey – were found in Cache Creek although only on an intermittent basis. Barriers to fish passage at the Capay Dam and between the Tule Canal and the Cache Creek Settling Basin, as well as potentially inadequate habitat conditions and flows in the lower creek, prevent successful migration and spawning of anadromous fish today. As recently as 2000, however, three fall-run Chinook salmon were spotted in Cache Creek. There is no evidence that these fish successfully spawned. Fall-run Chinook salmon are not endangered, and it is unlikely (although possible) that any endangered fish species would enter Cache Creek if fish passage barriers are removed.	Cache Creek
AR47	Yolo Bypass Working Group		Provide funding for the Yolo Bypass Working Group to continue periodic stakeholder meetings. The Yolo Bypass Working Group has serves as the primary means of outreach regarding the activities in the Bypass. It is a popular forum for landowners, hunters, researchers, special districts, agencies, advocacy groups, and others who have an economic stake in how the Yolo Bypass is managed.	Yolo Bypass
AR48	Putah Creek Geomorphic Restoration Project		Putah Creek was widened and straightened for flood conveyance before Monticello Dam was built. The relative lack of bedload limits the capacity of the channel to restore functional stream dimensions on its own. Shallow margins of the channel could be filled to restore floodplains where they were eliminated, widen the riparian corridor toward the center of the channel, and scale the channel width to post dam flows for a scaled down morphology that restores ecological function in balance with current post-dam flows.	Putah Creek

Integrated Regional Water Management Plan April 2007

Table 5-5 – Aquatic and Riparian Ecosystem Enhancement Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
AR49	Yolo Bypass Conceptual Aquatic Restoration Opportunities		<p>The purpose of the project is to:</p> <ol style="list-style-type: none"> 1. Improve conditions for native fish species in the Yolo Bypass, and 2. Keep users of the Yolo Bypass whole by maintaining or improving existing conditions. <p>The YBIWG has identified the following potential sequential aquatic enhancement opportunities for further evaluation and discussion with stakeholders:</p> <p>§ <u>Putah Creek</u> – Lower Putah Creek stream realignment and floodplain restoration for fish passage improvement and multi-species habitat development on existing public lands.</p> <p>§ <u>Lisbon Weir</u> – Improve the structure for fish, wildlife and agriculture; reduce maintenance.</p> <p>§ <u>Additional Multi-species Habitat Development</u> – Provide for controlled localized seasonal inundation on more frequent intervals; identify areas of opportunity only on: the Wildlife Area; other existing public lands; and private lands where cooperative agreements with willing land owners provide mutual benefits.</p> <p>§ <u>Tule Canal Connectivity</u> – Identify passage impediments (example: road crossings and impoundments); work with land owners to develop the best options for improving fish passage and ensuring water diversion capability and potential hydraulic connectivity to Cache Creek.</p> <p>§ <u>Multi-species fish passage structure</u>– Investigate the redesign of the existing fish ladder; evaluate the feasibility of constructing a new fish passage structure, operated to ensure: continued maintenance of flood conveyance capacity; no substantial changes in timing, volume, and/or duration of flow; and minimal disturbance to existing land use and agricultural practices.</p> <p>Project development will include three steps:</p> <p>Step 1. Present conceptual restoration opportunities</p> <p>Step 2. Seek stakeholder input to guide further actions</p> <p>Step 3. In concert with stakeholders, develop an appropriate restoration plan that maintains or improves conditions in the Yolo Bypass for native fish and bypass users.</p>	Yolo Bypass from the Fremont Weir to Little Holland Tract

Integrated Regional Water Management Plan April 2007

Table 5-5 – Aquatic and Riparian Ecosystem Enhancement Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
AR50	Sacramento Riverbank Enhancement Actions		<p>This action includes a variety of enhancements of Sacramento River riparian and aquatic habitat consistent with levee improvements. As a result of increased attention by the Governor and the Legislature on improving California's levee system, projects will be undertaken on Yolo County's 215 miles of Sacramento River Flood Control Project levees to strengthen them. If funding is available, local levee maintenance districts and other flood control agencies should undertake wildlife, plant, and fish habitat enhancement projects in addition to their required mitigation activities. Riparian vegetation could be added to levee slopes according to the bank vegetation guidelines of the Sacramento River Corridor Planning Forum's (2005) draft Floodway Management Plan. The guidelines are designed to increase habitat value, while maintaining maximum flood protection and providing additional structure for fish habitat, as appropriate.</p> <p>Out-migrating juvenile salmon and steelhead in the Sacramento River benefit greatly from instream woody material and other inundated structures because they provide cover. Cover protects juveniles from predators, and provides substrate for food organisms. Little structure occurs in the channel, because the sources of instream woody material are very limited in the lower, levee-confined reaches of the Sacramento River, or have been removed for levee and channel maintenance or by rock bank protection projects.</p>	Sacramento River
AR51	Bees Lakes Preserve		Conserve and develop limited, low-impact pedestrian-only access to a 23-acre open space area containing sensitive aquatic, riparian, emergent and upland habitats which are associated with the Sacramento River.	Sacramento River
AR52	Merritt Island Habitat Enhancement Project		Study the structure and habitat of the Elk Sough Levee on Merritt Island (in RD 150). The purpose of the study will be to find a means to improve its structural integrity while maintaining the well-established natural habitat.	Sacramento River

Integrated Regional Water Management Plan April 2007

Table 5-5 – Aquatic and Riparian Ecosystem Enhancement Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
AR53	Cache Creek Infrastructure Protection and habitat Enhancement Project		This project involves the planning and implementation of habitat enhancement and erosion control measures along creek banks that transition in and out of bridge sites along Cache Creek. These areas experience restricted flow and increased bank erosion due to the narrow channel width at bridge sites that act as channel constraints. Due to their importance in providing vital transportation links, as well as the tremendous public investment that they represent, the protection of public infrastructure such as bridges is a priority. Preventive erosion control measures that include bioengineering techniques and planting native vegetation for both bank stabilization and habitat enhancement should be implemented at bridge sites whenever feasible.	Cache Creek

Note:

* AR = Aquatic and Riparian Ecosystem Enhancement, FM = Flood Management and Storm Drainage, R = Recreation, WQ = Water Quality, WS = Water Supply and Drought Preparedness

Integrated Regional Water Management Plan April 2007

Table 5-6 – Recreation Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
R1	American River Parkway - Cache Creek Connection Project		The American River Parkway could be connected by foot- or bicycle bridge across the Sacramento River to trails leading to Cache Creek.	Cache Creek, Sacramento River
R3	Cache Creek Trail Nodes Program		Create trail nodes at locations along Cache Creek, consistent with the CCRMP. The trails would not run along long stretches of the creek, but would be concentrated in specific areas planned for recreation.	Cache Creek
R4	Off-Highway Vehicles Access Program and Development of a Public OHV Facility		Develop an off-highway vehicle (OHV) recreation area in Yolo County, to provide a legal alternative to existing OHV use presently occurring along the Cache Creek corridor. The optimum site location for such a facility would be an existing disturbed area, such as a quarry site or borrow area in that vicinity.	Cache Creek
R6	Camp Haswell Renovation Project		Restore old stone cabin as a nature interpretive center, as well as a source of information on recreational opportunities and public trail systems along Cache Creek and its tributaries in the Capay Valley	Cache Creek
R7	Knights Landing Boat Launch Improvement Project		Renovate an existing river access/fishing facility on a 4-acre site, located along the Sacramento Slough (with access to the Sacramento River). The site is owned by the State Wildlife Conservation Board (WCB), and managed by Yolo County under an operating agreement with the WCB. Renovation and construction would include removing navigation obstacles, installing updated boarding floats, repaving the parking lot, installing a vault restroom, providing a potable water system, providing an automated fish cleaning station, updating the site electrical, installing an automated pay station, installing fishing platforms, and upgrading the park host facilities.	Sacramento River
R8	Camp Haswell/Otis Ranch Improvement Project		Improve the Camp Haswell/Otis Ranch Open Space Area. Camp Haswell a 7.7 acre site located adjacent to Cache Creek along Highway 16. Camp Haswell provides access to the 587-acre Otis Ranch. Improvements to Camp Haswell include development of a parking lot, educational trails, picnic areas, permanent restrooms, and an interpretive center. Improvements to Otis Ranch include additional parking areas, educational trails, and the construction of overlooks and vista points along the trails.	Cache Creek

Integrated Regional Water Management Plan April 2007

Table 5-6 – Recreation Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
R10	Elkhorn Regional Park Improvement Project		Renovate the southern portion of an existing 49-acre park site located eight miles north of West Sacramento along the Sacramento River. Recreational improvements would include installing an elevated universally-accessible educational trail through the rich riparian gallery forest; constructing river overlooks; restoring the wildlife habitat; installing an interpretative kiosk and educational signage; and acquiring a 900-foot easement to connect the park to CDFG’s wildlife area.	Sacramento River
R11	Putah Creek Fishing Access and Campground Project		Improve fishing platforms and trails at five fishing access sites along Putah Creek. Provide sanitary facilities, information kiosks linking the sites to the Putah Creek Discovery Corridor, and develop camping facilities at one site.	Putah Creek
R12	Yolo Bypass Wildlife Area Public Access, Outreach, and Interpretation Program		Implement the Public Use Element of the Yolo Bypass Wildlife Area Land Management Plan by constructing and operating/maintaining the following: (1) Pacific Flyway Center; (2) handicapped accessible facilities for hunting and fishing in the Yolo Wildlife Area; (3) wildlife viewing facilities at the Yolo Wildlife Area; (4) bicycle Crossing Project; (5) Interpretive Sign and Auto Route Extension Project; (6) Tule Ranch Unit Facilities Development Project; and (7) Yolo Bypass Wildlife Area Book Project.	Yolo Bypass
R13	Deep Water Ship Channel Recreational Trail		Construct a 5.3-mile biking/walking trail along the east levee of the Deep Water Ship Channel and the north levee of the south city cross drain. Improvements would consist of paved and unpaved trail surfaces (similar to Caltrans’ Class 1 Bicycle Path), vehicular staging areas and access controls, location-based amenities (e.g., picnic tables, trash/recycling receptacles, information kiosks, drinking fountains, shade structures, landscaping, wildlife or port viewing areas, bank fishing access, etc.). The project could potentially be a part of the proposed Delta Trails effort being lead by the Delta Protection Commission.	Sacramento River
R14	Putah Creek Trails Program		Increase hiking opportunities along Putah Creek, including Cold Canyon, Lake Solano, below Putah Diversion Dam, Old Davis Park, and other areas. Implement the Winters Putah Creek Park Master Plan.	Putah Creek
R15	Cache Creek Canyon Regional Park Improvement Project		Improve Cache Creek Canyon Regional Park, a 700-acre park owned by Yolo County that provides a wide array of recreational opportunities to County residents and significant riparian habitat. General improvements to facilities and infrastructure will be made, as well as construction of a light-duty, all season pedestrian bridge to provide	Cache Creek

Integrated Regional Water Management Plan April 2007

Table 5-6 – Recreation Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
			access to the west side of the bridge. Educational and hiking trails will link the developed areas of the park with the larger regional trail system on federal and State lands adjacent to the site.	
R16	Sacramento River-Barge Canal Park Project		As recommended in the City of West Sacramento's Parks Master Plan, this park would provide a continuous 13.1 mile, 192-acre recreation corridor along the entire length of the Sacramento River within city limits.	Sacramento River
R17	Sacramento River Recreation, Fishing and Boating Access Studies		Conduct user surveys to understand demand and specific needs of fishing and boating, and other recreation activities along the Sacramento River. Use the survey to assess potential opportunities and improvements. Integrate new information with local recreation plans; previous regional studies by the State Lands Commission, Delta Protection Commission, and the Riverfront Master Plan; and information from the upcoming Delta Trail and Delta Vision processes. Although several jurisdictions have developed recreation-related plans, there is no coordinated water-related recreation plan available for Yolo County. The current and future water-related recreational needs are insufficiently known. This lack of information hampers the development of water-related recreational opportunities and access required to meet current and future demand in the City of West Sacramento and Yolo County.	Sacramento River
R18	Blue Ridge Campground Project		Construct a new camp site at the Blue Ridge trailhead, as described in the Yolo County Parks Master Plan.	Cache Creek
R19	Cache Creek Nature Preserve Improvement Project		Improve the Cache Creek Nature Preserve, operated by the Cache Creek Conservancy. Complete the parking lot at the site, develop handicap-accessible trails, construct a permanent educational/interpretative center, and construct additional interpretative demonstration displays.	Cache Creek

Integrated Regional Water Management Plan April 2007

Table 5-6 – Recreation Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
R20	Nichols Park Improvement Project		Improve Vernon A. Nichols Park, a 21-acre park located along Highway 16 in the Capay Valley on Cache Creek. General improvements to facilities and infrastructure will be made, as well as educational trails and informational displays. The existing water service will be upgraded and the camp host pad will be relocated to a more appropriate location.	Cache Creek
R21	Sacramento River Fishing and Boating Access Improvement Program		Design and construct additional boating or bank fishing access points and related improvements along the Sacramento River. Design and construct additional parking spaces for bank fishing in the Sacramento River. Design and construct a fishing pier on the Sacramento River in West Sacramento.	Sacramento River
R22	Develop Recreational Opportunities on Public Lands		Provide more recreational opportunities on public lands, which will reduce pressures of trespass, vandalism and other negative impact to private lands.	Countywide
R29	Lower Cache Creek Parkway Access Project		Install two access points along Cache Creek to complete a string of seven recreation nodes identified in the Yolo County Open Space Element (2000). The access points will provide safe, legal access to Cache Creek at County Road 87 and County Road 89 by providing small parking areas, interpretative overlooks and educational signage, and other amenities.	Cache Creek
R30	Clarksburg Sacramento River Access Facility Improvements		Renovate the 4-acre site located along the Sacramento River. Renovation and construction would include removing navigation obstacles, widening the boat launch ramp to comply with current state standards, installing updated boarding floats, repaving the parking lot, installing a vault restroom, providing potable water, providing an automated fish cleaning station, updating the site electrical, installing an automated pay station, installing fishing platforms, and constructing new park host facilities. Include the site in the State Delta Clean Boating Network Program, which includes the installation of an oil recycling center, public information station, and the distribution of clean boating "kits" to educate the public on the value of keeping the river and the Delta clean.	Sacramento River

Integrated Regional Water Management Plan April 2007

Table 5-6 – Recreation Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
R31	Davis Wetlands Public Access Improvement Project		Construct bike/pedestrian bridge at mouth of Willow Slough Bypass to connect existing 400 acre Davis Wetlands project to public access network.	Yolo Bypass
R32	Levee Public Access Improvements Project		Plan and implement levee top trail network system connecting Woodland, Yolo Wildlife Area, Davis, and UCD	Cache Creek, Yolo Bypass, Putah Creek
R33	Public Access Trails Along Existing Storm Water Conveyance Channels Project		Construct public access trails along existing storm water canals connecting existing Davis greenbelts to the Yolo Bypass Wildlife Area and Willow Slough/Davis Wetlands.	Davis
R34	Davis Storm Water Channel Crossing Project		Construct bike/pedestrian bridge over the storm water channel to connect neighborhoods with existing greenbelt network.	Davis
R35	Central Park Facilities		Construct a broad range of recreational amenities to provide visual and physical access to the Sacramento River and Barge Canal at locations between the Palamidessi and Jefferson Boulevard bridges, the River Bluffs, and the Barge Canal dredge spoils site. Water-related facilities may include an aquatic/boating center, marina, viewing platforms, and shore access pathways. Adjacent active and passive recreation facilities may include civic gathering and festival areas, neighborhood play parks, sport field complexes, meeting and convention facilities, theater or other performing art venues, museum, or other cultural interpretation facilities	Sacramento River
R36	Main Drain Canal Recreation Corridor		Construct over six miles of bicycle and pedestrian access, travel, and other use amenities along the Main Drainage Canal between the Barge Canal and the Deep Water Ship Channel. Improvements would consist of paved and unpaved trail surfaces, vehicular staging areas and access controls, and location-based amenities (e.g., picnic tables, trash/recycling receptacles, information kiosks, drinking fountains, shade structures, landscaping, viewing areas, bank fishing access, etc.). Improvements would be phased according to available funding and other opportunities	Sacramento River

Integrated Regional Water Management Plan April 2007

Table 5-6 – Recreation Actions

ID	Title	Related Categories*	Description/Location	Geographic Area
R37	Implementation of the Commission's Land Use and Resource Management Plan for the Primary Zone of the Delta (Management Plan)		The Management Plan contains findings, policies, and recommendations in the areas of environment, utilities, and infrastructure; land use; agriculture; water, recreation, and access; levees; and marine patrol/boater education/safety programs. The policies of the Management Plan are incorporated in the General Plans of local entities with jurisdiction in the Primary Zone. All projects should be consistent with the Management Plan as well as County General Plan policies pertaining to the Delta. In addition, all projects should be compatible with the Great Delta Trail, which is being planned by the Delta Protection Commission pursuant to SB 1556 (Torlakson).	Sacramento River
R38	Sacramento River Recreation Trail		Construct a continuous 13.1-mile, 192-acre recreation corridor along the entire length of the Sacramento River within the City limits. Improvements would consist of paved and unpaved trail surfaces, vehicular staging areas and access controls, and location-based amenities ranging from major community parks (e.g., River Walk Park, Riverfront Promenade) to occasional experiences (e.g., picnic tables, trash/recycling receptacles, information kiosks, drinking fountains, shade structures, landscaping, viewing areas, bank fishing access, etc.). Improvements would be phased according to available funding and other opportunities.	Sacramento River

Note:

* AR = Aquatic and Riparian Ecosystem Enhancement, FM = Flood Management and Storm Drainage, R = Recreation, WQ = Water Quality, WS = Water Supply and Drought Preparedness

⁽¹⁾ IRWMP Objectives

1. Coordinate and conjunctively manage surface water and groundwater supplies available to Yolo County to avoid the potential adverse impacts from surface water supply development and use and groundwater extraction.
2. Formulate a comprehensive water management, conservation, and reuse program for municipal, industrial, and agricultural water users.
3. Provide a mechanism or process that facilitates the rational treatment of proposals for importing water, for the intra-county transfer of water, and for the export of water.
4. Ensure open and frequent communication with the public.

5. Integrate water resource planning and land use planning.

6. Maximize the extent to which priority projects assist in meeting statewide priorities.

7. Assist disadvantaged communities on basic infrastructure improvements.

8. Assist in meeting TMDL's being developed for mercury in the Cache Creek watershed.

9. Enhance the aquatic and riparian environment.

10. Utilize recycled water to the maximum extent possible.

11. Identify measures that can be implemented to reduce point-source and non-point source pollution.

12. Comply with applicable water discharge requirements.

13. Provide recreational opportunities without adversely impacting private property owners.

14. Provide adequate storm drainage and flood control for the citizens of Yolo County consistent with recommendations of the State's Floodplain Management Task Force.

⁽²⁾ Water Resource Management Issues

Water Supply and Drought Preparedness Issues

- 1 Increasingly stringent water quality regulations (see Water Quality section).
- 2 Need to improve existing water supply quality, and pursue higher quality water sources to meet current and future demands.
- 3 Availability of adequate water supplies during severe drought conditions.
- 4 Subsidence as a result of groundwater extraction.
- 5 Cost of providing water and wastewater service is increasing and expected to continue.
- 6 Regulatory compliance is increasingly complex and expensive.
- 7 Ability of deep aquifer to sustain current and future demands.

Water Quality Issues

- 1 High nitrate levels in the drinking water wells of both cities and unincorporated communities that potentially present a risk to human health.
- 2 High salinity levels from wastewater treatment plant discharges into waterways that exceed permit requirements.
- 3 Potential for high salinity levels in groundwater if agricultural irrigation slowly concentrates salts in shallow groundwater aquifers.
- 4 Levels of arsenic and chromium VI, naturally occurring constituents in deep groundwater aquifers may cause a risk to human health.
- 5 High levels of boron in shallow groundwater aquifers that reduce crop yields or destroy young, perennial crops.
- 6 Trace levels of flame retardant chemicals that do not yet present a risk to human health, but may present a risk in the future.
- 7 Well head neglect and abandonment, creating possible conduits for pollution to enter groundwater aquifers.
- 8 Low levels of pesticides, nitrates, or other harmful constituents in surface water that need to be monitored to ensure that the water is safe.
- 9 Some surface water sources have high levels of suspended sediment that can negatively affect aquatic life.
- 10 High levels of mercury in Cache Creek and the Yolo Bypass may present a risk to humans who consume large quantities of fish and fish-eating wildlife.
- 11 Storm water drainage may result in spikes of pollutants of concern that could exceed human health standards and negatively affect wildlife.

Flood Management and Storm Drainage Issues

- 1 Through-seepage and underseepage threats to Sacramento River levees.
- 2 Erosion threats to Sacramento River levees.
- 3 Inadequate funding for geotechnical studies to determine erosion and seepage threats to Sacramento River levees and projects to fix them.
- 4 Inadequate public outreach (need for flood insurance, understanding of evacuation plans).
- 5 Inadequate emergency preparedness plans for levee failures.
- 6 Need to evaluate development in the floodplain (the more development, the more risk to public safety).
- 7 Inadequate compensation to Yolo County for providing the City of Sacramento with flood protection.
- 8 Inadequate flood protection from existing Cache Creek levees.
- 9 Erosion of existing Cache Creek levees.
- 10 Inadequate vegetation removal on Cache Creek (impedes capacity).
- 11 Insufficient understanding of the risk of Cache Creek flooding.
- 12 Inadequate levees to protect Madison and Esparto from Lamb Valley Slough flooding.
- 13 Inadequate flood protection at the airport.

Riparian and Aquatic Ecosystem Enhancement Issues

- 1 Loss of native plants, increase of invasive plants leading to increased erosion problems, and loss of habitat.
- 2 Loss of native fish habitat, including spawning grounds.
- 3 Barriers to fish passage that prevent anadromous fish from reaching spawning grounds.
- 4 Barriers to fish passage that prevent juvenile fish from reaching floodplains with superior food availability and better protection from predators than open water.
- 5 Loss of habitat for terrestrial species, including endangered species, leading to a decline in some populations.
- 6 Increase of invasive aquatic species.
- 7 Methylmercury accumulation in fish tissue, which puts fish-eating wildlife at risk of neurological and reproductive disorders.

Recreation Issues

- 1 Insufficient or inadequate educational opportunities (interpretive centers, etc.) related to waterways.
- 2 Insufficient or inadequate hiking, bicycle and equestrian trails along waterways.
- 3 Insufficient or inadequate hunting and fishing access sites along waterways.
- 4 Insufficient or inadequate camping facilities along waterways.
- 5 Insufficient or inadequate boating opportunities (motorized and non-motorized).
- 6 Insufficient or inadequate wildlife viewing opportunities.
- 7 Insufficient or inadequate day-use activities (picnicking, swimming, etc.).

