Goals/Objectives, Challenge and Opportunities Summary: Bear Creek Watershed Assessment

To assist with the development of goals and objectives for the Westside Integrated Regional Water Management Plan and to supplement challenges and opportunities obtained from stakeholders at the Westside IRWM Plan kick-off meetings, existing plans were reviewed to identify goals/objectives, challenges and opportunities previously articulated for the region. This is a summary of information drawn from the following document:

Title: **Bear Creek Watershed Assessment**
Sponsoring Agency: **Colusa County Resource Conservation District**
Date: **2010**

The full document can be accessed at:
http://www.colusarcd.org/nodes/projects/Bear_Creek_Watershed_Assessment.htm

I. Goals/Objectives

The following were taken from Section 1.2 Goals of the plan.

- Improve water quality
- Restore hydrologic functions
- Conserve topsoil and stabilize erosion-prone areas
- Protect and enhance biological diversity
- Enhance recreation
- Develop energy resources
- Maintain economic livelihoods and create jobs
- Reduce the likelihood and impacts of catastrophic events

II. Challenges

The following challenges are sorted using the same categories employed for the summary of challenges and opportunities collected at the kick-off meetings. Each category includes a reference to the section(s) of the plan where those challenges were discussed.

Climate Change (drawn from Chapter 6 Stakeholder Issues)

- Installation of energy projects could affect species of special concern, would disturb on the ultramafic soils which predominate in the energy lease areas. Large amounts of earth moving

for project development would have the potential to further impair water quality and undermine hydrologic function and may affect scenic values.

Ecosystems (drawn from Chapter 6 Stakeholder Issues)

- Evidence of oak regeneration problems exist in the watershed, especially for valley oak.
- Loss of riparian habitat quality in Bear Creek watershed has resulted from disturbances to riparian areas.

Groundwater Supply Management and Conjunctive Use(drawn from Chapter 6 Stakeholder Issues)

- Ranchers are noticing a decline in forage production related to the lowered water table as streambeds deepen on account of widespread head cuts and channel incision in Bear Valley.

Invasive Species (drawn from Chapter 6 Stakeholder Issues)

- Tamarisk, a non-native invasive plant, has invaded along Bear Creek and lower Sulphur Creek.
- Along Bear Creek, weeds such tamarisk, perennial pepperweed, and tall wheatgrass are now the dominant vegetation in many areas, displacing native riparian plants and preventing native plant establishment

Land Management and Use (drawn from Chapter 6 Stakeholder Issues)

- Currently, no dedicated funds are available to public land managers and private landowners to cover costs of site restoration once sites are cleared of marijuana cultivation activity.
- One major concern for some stakeholders is making fire suppression more cost-effective and less expensive overall.
- Land uses disturb ultramafic soils significantly, increasing erosion and sedimentation, altering habitat value, and affecting species composition.
- Open space on public lands and network of public roads and trails in Bear Creek watershed create challenges for recreation management. Some areas are accumulating refuse from shot-gun shells, excessive soil compaction and erosion from equestrian riding and foot traffic, and inappropriate off-highway vehicle use on Walker Ridge.

Surface Water Quality (drawn from 1.2 Goals, Chapter 6 Stakeholder Issues)

- The principal contaminant of concern is mercury, which originates from abandoned mercury mine sites.
- Bear Creek water has high concentrations of dissolved boron derived naturally from soils and spring waters.
- Illegal marijuana gardens in the watershed use pesticides and fertilizers carelessly and are contaminating the soil and water. Additionally water from streams is being diverted to mix fertilizers.

- Sediment discharges to watercourses are occurring from abandoned mines, poorly designed roads, trails, firelines and culverts, illegal dumping of soil and rock, livestock grazing and loss of vegetation.
- Finding funding to meet regulatory targets and timelines is challenging.

Surface Water Supply Management (drawn from Chapter 6 Stakeholder Issues)

- Many stock ponds are found on the BLM Bear Creek Ranch and on rangeland on the east side of the watershed north of Highway 20. One challenge – especially for public land managers – is how to use these water sources to also benefit wildlife and water conservation. Further development of off-stream watering for livestock may be necessary to sustain livestock operations.

III. Opportunities

The following opportunities are sorted using the same categories employed for the summary of challenges and opportunities collected at the kick-off meetings. Each category includes a reference to the section(s) of the plan where those opportunities were discussed.

Climate Change (drawn from 1.2 Goals)

- Bear Creek watershed has the potential to supply energy from five sources: oil, gas, geothermal, solar and wind. Shifting energy production and use away from fossil fuels) to wind, solar, and geothermal energy can reduce emissions of carbon dioxide and other greenhouse gases into the atmosphere and hopefully moderate climate change.

Ecosystems (drawn from 1.2 Goals)

- Bear Creek is a major corridor for neotropical migratory birds and a wintering area for bald eagles.
- Bear Creek is one of six known hot-spots in California for damsel- and dragonflies.
- One unique feature of the watershed is the high number of rare plant species found on Walker Ridge.
- Ultramafic soils comprise 42 percent of the surface area of the watershed, and ultramafic rock contributes an additional three percent to the ground surface of the watershed. Ultramafic rocks and soils are important for their role in providing unusual habitats for many species of rare plants and several animal species with restricted ranges.

Water Dependent Recreation (drawn from 1.2 Goals)

- Recreational opportunities abound in the watershed. Each year thousands of people from around the world visit.

Goals/Objectives, Challenge and Opportunities Summary: Clear Lake Integrated Water Management Plan

To assist with the development of goals and objectives for the Westside Integrated Regional Water Management Plan and to supplement challenges and opportunities obtained from stakeholders at the Westside IRWM Plan kick-off meetings, existing plans were reviewed to identify goals/objectives, challenges and opportunities previously articulated for the region. This is a summary of information drawn from the following document:

Title: **Clear Lake Integrated Water Management Plan**
Sponsoring Agency: **County of Lake & West Lake and East Lake Resource Conservation Districts**
Date: **2010**

The full document can be accessed by following the instructions at:
http://www.co.lake.ca.us/Government/Directory/Water_Resources/watershedplan.htm

I. Goals/Objectives

The following were taken from Section 1.2.2 Objectives of the plan.

- Improve surface and ground water quality.
- Improve water supply management.
- Improve land management practices.
- Improve fish and wildlife habitats.
- Improve tourism and recreation opportunities.
- Prevent the introduction or spread of invasive species.
- Improve lake floodplain management.
- Improve lake and lakeshore management practices.
- Improve education and outreach.
- Improve coordination among agencies, organizations, and Tribes.
- Ensure participation of all communities when developing and implementing programs and projects.

II. Challenges

The following challenges are sorted using the same categories employed for the summary of challenges and opportunities collected at the kick-off meetings. Each category includes a reference to the section(s) of the plan where those challenges were discussed.

Data Management (drawn from Chapter 2 Water Resources)

- In many cases the availability of data collected on Lake County's water resources is not known

outside the agency or organization where it originated.

Ecosystems (drawn from Chapter 4 Wildlife and Wildlife Habitat Resources and Chapter 8 Lake Management)

- Despite apparently significant declines in native fish populations, there have been relatively limited studies of native fish species in Clear Lake
- Important habitat areas (Clear Lake shoreline from Clear Lake State Park west to Lakeport, area around Rodman Slough, Rattlesnake Island, Indian Island and Anderson Island) are not currently protected
- Barriers to fish passage have been identified on the main stems of Kelsey, Scotts, Middle and Clover Creeks
- In Lake County, oak and mixed hardwood-conifer woodlands are a defining element of the landscape; most valley oak woodlands have been converted to agriculture and other uses

Flood Management (drawn from Chapter 7 Lake Floodplain Management)

- The major cause of Clear Lake flooding is the flow limitation imposed by the Grigsby Riffle and the Cache Creek Outlet Channel
- There is increased development pressure for the development of urban and suburban land uses in the floodplains of the watershed
- Many structures constructed in the floodplain are subject to repetitive flooding
- Agricultural lands are subject to flooding for weeks, reducing productivity for the following season
- Levees in the Upper Lake Reclamation Area are substandard and it is not financially feasible to repair or reconstruct these levees to provide 100-year level of protection

Groundwater Quality (drawn from Chapter 2 Water resources)

- Localized areas of hydrothermal influence where groundwater quality is inferior due to higher levels of born, iron and magnesium
- Nitrate concentrations in groundwater has been increasing in some areas
- Arsenic has been detected at 12 of 18 water utility intakes around Clear Lake at levels approaching the MCL
- Data on groundwater quality in Clear Lake Watershed are limited

Groundwater Supply Management and Conjunctive Use (drawn from Chapter 2 Water resources)

- Significant reduction in groundwater storage occurred as a result of channelization and gravel mining during the early and middle parts of the 20th century

Invasive Species (drawn from Chapter 5 Recreation and Aesthetics)

- Quagga and zebra mussels and New Zealand mud snail pose a significant threat to Clear Lake

- Hydrillia is considered the most serious invasive aquatic plant. Hydrilla has the potential to fill the water column, choking boat engines and water intakes and could move downstream to Sacramento-San Joaquin River Delta
- Aquatic invasive species threaten Clear Lake fish and wildlife
- Arundo, perennial pepperweed and tamarisk are terrestrial invasive species found in riparian zones.

Land Management and Use (drawn from Chapter 3 Land Use Management)

- Illegal marijuana growing operations divert water from streams and contaminate streams with fertilizer, pesticides, fuel and other contaminants
- There are an estimated 1,500 miles of unpaved roads, trails and firebreaks in the mountainous portions of the Clear Lake Watershed; these roads can be a major source of erosion and sedimentation

Surface Water Quality (drawn from Chapter 2 Water resources)

- Clear Lake is subject to nuisance algal blooms; a more complete understanding of Clear Lake limnology is necessary to understand causes.
- Clear Lake is contaminated with mercury from past mining efforts; the Sulphur Bank Mercury Mine is estimated to contribute 97% of mercury loads to Clear Lake
- Local Native American tribes have expressed concern with the potential for pesticides to accumulate on aquatic and riparian plants used for traditional activities and in terrestrial animals that feed along Clear Lake
- Illegal waste disposal occurs in and adjacent to stream channels and along isolated roads throughout Lake County

Surface Water Supply Management (drawn from Chapter 2 Water resources)

- Clear Lake has potential to provide more than Lake County's total water use in most years, but its stored water is managed by YCFCWCD
- Earlier drying of streams in the spring and summer is considered to be one of the factors leading to a decline in the population of Clear Lake hitch and possible extinction of the Clear Lake splittail

Water/Wastewater Infrastructure (drawn from Chapter 3 Land Use Management)

- Unauthorized wastewater releases due to insufficient capacity and aging infrastructure occur
- Significant areas of the Clear Lake shoreline are served by septic systems, which have the potential to contaminate surface waters through percolation or surfacing during wet weather

Water Dependent Recreation (drawn from Chapter 5 Recreation and Aesthetics and Chapter 8 Lake Management)

- Improving currently owned public access points and acquiring additional public lands for access to Clear lake are important to ensure public enjoyment of the lake
- Currently there is only one boat pumpout station available to the public on Clear Lake
- Currently public access at Blue Lakes is limited to Highway 20 corridor
- All forms of lake recreational use have the potential to introduce invasive species; recreational boating is a major cause of the spread of aquatic invasive species
- Aquatic plants growth has increased, creating congested conditions along the shoreline that restrict recreational activities

III. Opportunities

The following opportunities are sorted using the same categories employed for the summary of challenges and opportunities collected at the kick-off meetings. Each category includes a reference to the section(s) of the plan where those opportunities were discussed.

Ecosystems (drawn from Chapter 8 Lake Management)

- Clear Lake supports a wide variety of seasonal and resident water fowl and is a stop-over for migrating water fowl

Public Education (drawn from Chapter 2 Water resources)

- There have been a variety of volunteer watershed monitoring programs in the county.

Surface Water Quality (drawn from Chapter 2 Water resources)

- Middle Creek Flood Damage Reduction and Ecosystem Restoration Project has been identified as the single largest recommended water quality improvement to Clear Lake.

Water Dependent Recreation (drawn from Chapter 1 Introduction, Chapter 8 Lake Management)

- Clear Lake is a popular sport fishing destination; it is the “bass fishing capitol of the West”
- Swimming, fishing, boating and nature viewing are popular recreational activities on Clear Lake

Goals/Objectives, Challenge and Opportunities Summary: Napa County Integrated Water Resource Management Planning Framework

To assist with the development of goals and objectives for the Westside Integrated Regional Water Management Plan and to supplement challenges and opportunities obtained from stakeholders at the Westside IRWM Plan kick-off meetings, existing plans were reviewed to identify goals/objectives, challenges and opportunities previously articulated for the region. This is a summary of information drawn from the following document:

Title: **Napa County Integrated Water Resource Management Planning Framework (IWRMPF)**
Sponsoring Agency: **County of Napa**
Date: **2011**

The full document can be accessed at: http://www.napawatersheds.org/app_pages/view/5046

I. Goals/Objectives

The following goals and objectives were taken from Section from II Integrated Water and Watershed Resource Management Plan Goals and Objectives of the plan.

Overarching Goals of the IWRMPF

- To ensure healthy watersheds and communities in Napa County.
- To support both economic vitality and ecosystem viability in Napa County.
- To provide an efficient and equitable means to identify, plan, fund and implement projects.
- To facilitate inter- and intra-regional cooperation in the areas of water supply reliability; water recycling; desalination; water conservation; water quality improvements; stormwater capture and management; flood management; recreation and access; wetland enhancement and creation; listed-species recovery; and environmental habitat protection and improvement.
- To foster coordination collaboration, and communication among participating agencies to achieve efficiencies, enhance services, and build support for vital plans and projects.

Issue-Specific Goals of the IWRMPF

- To ensure Napa County has an adequate and reliable supply of water for beneficial uses such as drinking, agriculture, wildlife, and recreation.
- To effectively plan and implement watershed management and habitat restoration and enhancement projects that will preserve the high biodiversity supported by Napa County watersheds.

- To improve flood protection and stormwater management infrastructure and practices so that Napa County agencies can cope with predicted increases in flood and storm activity.
- To protect and enhance the quality of life for residents of Napa County and their property, as well as future generations.
- To actively engage all members of the public (including Disadvantaged Communities), provide public outreach and education, and a forum for data sharing and information exchange among all interested parties.

Objectives

Flood protection and stormwater management

- Maintain and enhance performance of existing flood protection and stormwater facilities.
- Increase community awareness of local flood risks and opportunities to decrease risk through implementation of floodplain enhancement or other flood hazard reduction projects.
- Implement effective floodplain management to minimize risks to health, safety and property by encouraging wise use and management of flood-prone areas.
- Enhance natural conveyance and storage to support flood protection.
- Improve floodplain connectivity.
- Appropriately integrate multi-objective flood protection projects in ways that protect and enhance stream corridor and wetland habitats, are aesthetically pleasing, provide trails and recreational opportunities, and protect cultural resources.

Quality of life

- Minimize water disinfection byproducts, water treatment variability, and costs of water treatment.
- Maintain economic sustainability.
- Support recreational opportunities, including trails and water related recreation.
- Protect cultural resources.
- Promote social equity by working to ensure that all members of society are included in decisions about land use and other policies.

Reliable water supply objectives

- Protect and improve surface and groundwater water quality.
- Meet water supply demands; minimize vulnerability to drought.
- Preserve highest quality water supplies for potable use.
- Protect groundwater supplies from overdraft and preserve groundwater for primarily agricultural uses.
- Improve wastewater-processing facilities where necessary and feasible.

- Expand the use of recycled water (considered a supply source, as well as potable demand reduction) in areas including commercial and municipal landscape irrigation, industrial processes, and potentially agriculture. Specific areas for expansion include the Milliken-Sarco-Tulocay area, the Carneros region, and in and around each of the cities (parks, schools, freeway landscaping, etc.).
- Increase opportunities for water conservation among end-users through incentive programs, education, tiered rate structures, and building codes/zoning regulations; continue to provide public outreach to ensure broad awareness and participation.
- Explore possibilities for off-stream storage to harvest rainwater for later use during dry summer months.
- Consider pursuing dry year supplies through contracts and/or purchases outside of Napa County for larger municipalities.

Stakeholder outreach

- Increase community outreach and education to empower the citizenry to take action to improve watershed health.
- Maximize community involvement and stewardship; conduct outreach to involve all segments of Napa County society in land use planning and water management decisions.
- Conduct education, outreach and service-learning projects to promote greater understanding related to ecology and natural resource management, protection and improvement.

Watershed management and habitat restoration

- Where possible, restore natural river/floodplain interactions for flood protection, groundwater recharge, and to increase and enhance riverine habitat value and complexity.
- Rehabilitate natural processes and ecologic processes that sustain continuous, native riparian cover in river corridors; where feasible incorporate “Living River Principles” as utilized by the Napa River/Napa Creek Flood Protection Project.
- Minimize the need for ongoing channel stabilization and maintenance where practicable; protect property and habitat using natural processes that promote streambank stability.
- When revegetating riparian corridors, replant riparian vegetation that will not serve as hosts for Pierce’s Disease.
- Incorporate exclusionary livestock fencing that allows native mammal migration and access to the creek while keeping domestic grazing animals out of the riparian corridor by providing dispersed, shaded watering sites away from the riparian zone, especially in the upper and middle Carneros Creek Watershed.
- Promote contiguous upland habitat and biodiversity.

- Maintain and improve instream habitat; increase habitat complexity in the lower reaches of tributary streams.
- Establish and maintain uninterrupted riparian corridor where practicable.
- Improve structural complexity in aquatic and tidal habitats, riparian canopies and channel forms
- Remove anthropogenic fish migration obstacles and barriers to all suitable habitats within the basin.
- Reduce fine sediment inputs from chronic sources such as road and bank erosion.
- Acquire, protect, and restore habitat areas, including wetlands, streams, vernal pools, and open spaces.
- Enhance wildlife populations and biodiversity; acquire and protect continuous wildlife corridors and connections between habitat patches.
- Manage pests and invasive species.
- Encourage land stewardship and sustainable land use; coordinate natural resource protection and planning efforts.
- Ensure that new acquisition/conservation activities are part of an existing, coherent design.
- Develop a high-resolution vegetation map, high-resolution aerial photography, and topographic mapping for the County.
- Implement a sustained watershed-health monitoring program that will allow the condition of the watersheds (and the performance of this plan in meeting its objectives) to be evaluated over time.
- Understand the historical ecology of the watersheds, in part to develop a historical reference state model for TMDL analysis and to inform decisions related to restoration implementation strategies.

II. Challenges

The following challenges are sorted using the same categories employed for the summary of challenges and opportunities collected at the kick-off meetings. Each category includes a reference to the section(s) of the plan where those challenges were discussed.

Climate Change (drawn from VII. Key Water Management Issues, Climate Change Planning and Adaption)

- Increased temperatures and precipitation changes may have important effects on agricultural crops. Changes in water availability, temperature averages and minima and maxima, pest and weed ranges, and growing season length will affect crop productivity.

Invasive Species (drawn from VII. Key Water Management Issues, Invasive Species Management)

- Noteworthy terrestrial invasive plants of concern include Eucalyptus (*Eucalyptus* sp.), Himalayan blackberry (*Rubus armeniacus*), perennial pepperweed (*Lepidium latifolium*), yellow star thistle (*Centaurea solstitialis*), artichoke thistle (*Cynara cardunculus*), giant reed (*Arundo donax*), and tamarisk (*Tamarix parviflora*). Eurasian milfoil (*Myriophyllum spicatum*) is an aquatic weed of concern in the County.
- New Zealand Mud snails have been detected in the lower Putah Creek watershed (Yolo County).
- Monitoring and risk assessments show that the Putah Creek watershed is at risk for Quagga and zebra mussel infestation.

Surface Water Quality (drawn from VII. Key Water Management Issues, Water Quality)

- Mercury contamination has been identified as a concern in the upper reaches of Putah Creek

Surface Water Supply Management (drawn from VII. Key Water Management Issues, Regional and Local Challenges)

- The Putah Creek watershed faces many water rights issues. The majority of water rights in the upper Putah Creek watershed are held by the Solano County Water Agency.

Water/Wastewater Infrastructure (drawn from VII. Key Water Management Issues, Regional and Local Challenges)

- The Napa Berryessa Resort Improvement District and the Lake Berryessa Resort Improvement District have received enforcement actions from the Central Valley Regional Water Quality Control Board in the past few years because of periodic wastewater system overflows that discharge into Lake Berryessa. Both Districts have also had difficulties funding necessary upgrades to their water collection and wastewater disposal systems.

III. Opportunities

Opportunities were not identified from review of the plan.

Goals/Objectives, Challenge and Opportunities Summary: Solano Integrated Regional Water Management Plan

To assist with the development of goals and objectives for the Westside Integrated Regional Water Management Plan and to supplement challenges and opportunities obtained from stakeholders at the Westside IRWM Plan kick-off meetings, existing plans were reviewed to identify goals/objectives, challenges and opportunities previously articulated for the region. This is a summary of information drawn from the following document:

Title: **Solano Integrated Regional Water Management Plan**
Sponsoring Agency: **Solano County Water Agency and Solano Agencies**
Date: **2005**

The full document can be accessed at: http://www.scwa2.com/UWMP_IRWMP.aspx

I. Goals/Objectives

The following were taken from Section 4.4 Strategy Statements of the plan.

- Increase understanding of future demands and supplies
- Reduce demand through water conservation and other methods
- Protect existing surface water supplies
- Reduce constraints to contributions from existing sources
- Increase ability to store water between years
- Develop new permanent supplies
- Develop new temporary supplies
- Improve recyclability of wastewater
- Improve ability to use existing [water supply] sources
- Increase understanding and improve management of [groundwater] resource
- Change contributions of existing sources
- Engage in activities that influence Solano Project water quality
- Engage in activities that influence North Bay Aqueduct water quality
- Improve flexibility to send water to different users
- Manage [runoff] source contribution through a watershed approach
- Increase awareness of flood risks
- Provide institutional structures to make flood management more effective
- Implement flood management projects
- Continue operation and maintenance of Ulatis and Green Valley flood control projects

- Engage in activities that promote multi-county flood control
- Take a proactive approach towards protecting and enhancing riparian and fish habitats and watershed
- Actively pursue state and federal funding
- Increase the region's understanding of safety and security for Reclamation facilities
- Implement identified actions to improve safety and security for Reclamation facilities
- Increase understanding of climate change as it affects supply, quantity, and flood control

II. Challenges

The following challenges are sorted using the same categories employed for the summary of challenges and opportunities collected at the kick-off meetings. Each category includes a reference to the section(s) of the plan where those challenges were discussed.

Delta (drawn from 4.2 Strategic Issues, Supply and Demand and Multi-County Flood Control)

- During dry summer, some supplies that are contingent on Delta summer conditions are not available because SWRCB declares Term 91 is in effect.
- Delta levee system failure would affect the water quality in Barker Slough and regional users.
- Sacramento Area Flood Control Agency plans to improve reliability of Yolo Bypass could have a damaging effect on Rio Vista.
- Diminished levels of snowpack in the Sierra Mountains could lead to decrease in SWP supplies.
- Rising ocean levels could inundate facilities and contribute to significant decline in water quality by increasing Delta salinity.
- Rising ocean levels will flood low lying areas and place increased strain on Delta levees.

Ecosystems (drawn from 4.2 Strategic Issues, Environment)

- The Solano agencies are not involved in enhancing the County's small local rivers and creeks. Degraded riparian corridors could increase sedimentation and reduce water quality.

Flood Management (drawn from 4.2 Strategic Issues, Flood Management and Safety and Security)

- Flood control infrastructure in rural areas of the region is not adequate.
- Need exists to improve flood hazard information and residents' awareness therof.
- Ulatis Flood Control Project faces threats of increased runoff from urban development, inadequate operation and maintenance, increased liability associated with multi-purpose use and competition between environmental concerns and flood control objectives.
- Several levees in the county associated with the Ulatis and Green Valley Flood Control Projects and Sacramento River are at risk for potential failure during natural disasters or from intentional damage.

- No adequate countywide characterization of groundwater and surface water quality exists.
- Nitrates from agricultural practices affect runoff quality and eventually affect groundwater quality.

Groundwater Supply Management and Conjunctive Use (drawn from 4.2 Strategic Issues, Groundwater)

- Groundwater conditions outside of the water district boundaries and outside of the Putah Creek/Tehama Formation are largely unknown.
- Extended drought could affect groundwater levels in the Putah Fan/Tehama Formation.
- Shallow groundwater pumpers are subject to drought impacts.

Surface Water Quality (drawn from 4.2 Strategic Issues, Groundwater and Runoff Water Quality)

- Some supplies require a high level of treatment before municipal use.
- Constituents in runoff from the Barker Slough watershed contribute heavily to the degraded quality of NBA water.

Surface Water Supply Management (drawn from 4.2 Strategic Issues, Supply and Demand)

- Some supplies that local agencies depend on are not permanent supplies.
- SCWA's surface water storage is limited to Lake Berryessa, which can only store water from the Solano Project. Without additional storage, SCWA cannot store supplies from wet years until they are needed in dry years.
- Older conveyance facilities cannot convey the design capacity and have increased conveyance losses.

Water/Wastewater Infrastructure (drawn from 4.2 Strategic Issues, Supply and Demand. Quality to Users, and Safety and Security)

- Some areas cannot use all available supplies because of treatment limitations.
- Constituent in recycled water produced in the region limit its applicability for offsetting potable supplies, and render it unsuitable for some uses.
- Treatment facilities' current processes may not be able to meet standards for the end users.
- Pipelines and canals are potentially at risk from earthquakes and could result in a long-term shutdowns or shortages.
- Open canals are a potential target for terrorist threats from chemicals or pathogens.

III. Opportunities

The following opportunities are sorted using the same categories employed for the summary of challenges and opportunities collected at the kick-off meetings. Each category includes a reference to the section(s) of the plan where those opportunities were discussed.

Ecosystems (drawn from 4.2 Strategic Issues, Environment)

- The Solano agencies are currently involved in the Lower Putah Creek Coordinating Committee, which coordinates habitat enhancement projects.

Groundwater Supply Management and Conjunctive Use (drawn from 4.2 Strategic Issues, Groundwater)

- Reports do not include any indication of overdraft in the Solano Subbasin.
- Surface water quality of SCWA's supplies is acceptable for agricultural uses in the region.

Surface Water Supply Management (drawn from 4.2 Strategic Issues, Supply and Demand)

- Estimates show that the Solano agencies can provide adequate (or even surplus) water supplies in some years.

Goals/Objectives, Challenge and Opportunities Summary: Yolo Integrated Regional Water Management Plan

To assist with the development of goals and objectives for the Westside Integrated Regional Water Management Plan and to supplement challenges and opportunities obtained from stakeholders at the Westside IRWM Plan kick-off meetings, existing plans were reviewed to identify goals/objectives, challenges and opportunities previously articulated for the region. This is a summary of information drawn from the following document:

Title: **Yolo Integrated Regional Water Management Plan**
Sponsoring Agency: **Water Resources Association of Yolo County**
Date: **2007**

The full document can be accessed at: http://www.yolowra.org/irwmp.html

I. Goals/Objectives

The following goals and objectives were taken from the sections indicated by each heading.

IRWMP Goals (drawn from 2.1.1 Goals)

- Ensure an adequate water supply – both in quantity and quality – for the residents of Yolo County, present and future, in a manner that is efficient, economical, and environmentally beneficial.
- Ensure high quality surface water and groundwater resources throughout Yolo County on a sustainable basis to serve the needs of all beneficial uses, including urban, agricultural, environmental, and recreational uses.
- Reduce the risk to the people and property of Yolo County from hazards associated with storm runoff and flooding.
- Enhance, improve, and maintain aquatic and riparian ecosystems and aquatic biodiversity throughout the county.
- Provide superior water-related recreational opportunities for Yolo County's growing population.

IRWMP Objectives (drawn from 2.1.2 Objectives)

- Coordinate and conjunctively manage surface water and groundwater supplies to avoid the potential adverse impacts from surface water supply development and use and from groundwater extraction (e.g., water quality degradation, environmental deterioration, and land subsidence).

- Formulate a comprehensive water management, conservation, and reuse program for municipal, industrial, and agricultural waters users.
- 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.
- Ensure open and frequent communication with the public.
- Integrate water resource planning and land use planning.
- Maximize the extent to which priority projects help meet statewide priorities.
- Assist disadvantaged communities with basic infrastructure improvements.
- Help meet Total Maximum Daily Load (TMDL) being developed for mercury in the Cache Creek watershed.
- Enhance the aquatic and riparian environment.
- Use recycled water to the maximum extent possible.
- Identify measures to be implemented to reduce point-source and non-point source pollution.
- Comply with applicable water discharge requirements.
- Provide recreational opportunities that balance public investment interests and consideration of effects upon private property owners
- Provide adequate storm drainage and flood control, consistent with recommendations of the State's Floodplain Management Task Force.

Specific Water Resource Management Objectives (drawn from 2.3 Water Management Strategies and Water Resource Management Categories)

Aquatic and Riparian Ecosystem Enhancement Objectives

- Establish priority aquatic and riparian habitat areas consistent with the emerging Yolo County NCCP/HCP, for enhancement within five years; and establish the necessary management and funding responses to meet NCCP/HCP restoration and protection goals.
- Become a model area for integrating agricultural production and habitat conservation through the use of sustainable agricultural water use practices and habitat enhancement incentives that are compatible with agricultural production.
- Utilize a variety of tools (such as the land development and permitting process, state and federal grants, and university resources) to achieve a sustainable and effective monitoring, management, and reporting process for priority aquatic and riparian habitats in Yolo County within 10 years.

Flood Management and Storm Drainage Objectives

- Meet agreed upon standards to reduce flood risk in all areas of Yolo County within 20 years, taking into consideration resource constraints and environmental impacts.
- Become a model area for flood risk reduction and management approaches that incorporate environmental protection and restoration efforts, and enhance recreational opportunities, while serving flood management needs.

- Develop innovative storm water management requirements, guidelines, and best practices within five years that enable Yolo County to meet state and federal permit requirements, as well as improving storm water runoff quality and reducing impacts to surface water resources.

Recreation Objectives

- Maintain, improve, and expand public access for recreational use of publicly owned water, waterfronts and banks, and open space.
- Create new recreational facilities as part of public investments in water supply and conveyance, water quality, natural resource conservation, flood control, and storm water management infrastructure and operations.
- Integrate complementary recreational access and facility improvements within IRWMP implementation and projects.
- Harness joint funding and development methods to leverage investments across recreational, flood control, water supply, natural resource conservation, water quality and other IRWMP project objectives.
- Establish public recreation benefits as a performance standard for public investment in projects that protect private property or provide for private property development.

Water Quality Objectives

- Meet state and federal standards for water quality protection in all surface and groundwater resources, working closely with water purveyors, landowners and businesses, citizens, and state, federal, and local agencies and non-profits.
- Develop continuous monitoring, management, and protection programs and institutional capacity to ensure that water quality continues to meet standards for surface water and groundwater sources.
- Work in a collaborative manner with state and federal agencies and both public and private water dischargers to ensure a fair and open process of achieving long-term countywide and regional water quality protection standards for point source and non-point source pollutants.

Water Supply and Drought Preparedness Objectives

- Provide reliable and sustainable surface water from a variety of sources sufficient to serve urban, agricultural, environmental, and recreational uses (as planned by Yolo County's water purveyors and consistent with this IRWMP) in normal, above normal, and prolonged drought periods, which is protective of natural resources and surface water flows.
- Manage Yolo County's groundwater resources on a sustainable yield basis that provides water purveyors and individual users with reliable, high quality groundwater to serve urban, agricultural, environmental, and other uses during normal, above normal, and prolonged drought periods.
- Develop conjunctive use and groundwater protection programs within the next 10 years, consistent with this IRWMP and the needs of water purveyors, which maximizes the efficiency, sustainability, and value of Yolo County's surface and groundwater.

- Work with the area's water purveyors within the next five years to develop state-of-the-art urban and agricultural water use efficiency programs that meet statewide guidelines and provide substantial and measurable water use reductions throughout Yolo County.

II. Challenges

The following challenges are sorted using the same categories employed for the summary of challenges and opportunities collected at the kick-off meetings. Each category includes a reference to the section(s) of the plan where those challenges were discussed.

Drinking Water Quality (drawn from 4.2 Water Supply and Drought Preparedness)

- Increasingly stringent water quality regulations.
- Regulatory compliance is increasingly complex and expensive.

Ecosystems (drawn from 4.5 Aquatic and Riparian Ecosystem Enhancement)

- Major waterways and lesser streams in Yolo County that could benefit from various forms of aquatic and riparian aquatic ecosystem enhancement include: Cache Creek; Putah Creek; Colusa Basin Drain; Sacramento River (including Fremont Weir); Salt Creek, Bird Creek, and Oat Creek (north of Cache Creek);Willow Slough, Willow Slough Bypass, and Dry Slough (south of Cache Creek); and Yolo Bypass.
- Loss of native fish habitat, including spawning grounds.
- Barriers to fish passage that prevent anadromous fish from reaching spawning grounds.
- Barriers to fish passage that prevent juvenile fish from reaching floodplains with superior food availability, and better protection from predators than an open waterway.
- Loss of habitat for terrestrial species, including endangered species, leading to a decline in some populations.
- Methylmercury accumulation in fish tissue, which puts fish-eating wildlife at risk of neurological and reproductive disorders.
- **Ecosystems** (drawn from 4.5 Aquatic and Riparian Ecosystem Enhancement)

Flood Management (drawn from 4.4 Flood Management and Storm Drainage)

- Through seepage and under seepage threats to Sacramento River levees.
- Erosion threats to Sacramento River levees.
- Inadequate funding for geotechnical studies to determine erosion, stability, and seepage threats to Sacramento River levees and subsequent repair projects.
- Inadequate public outreach (need for flood insurance, understanding of evacuation plans, etc.).
- Inadequate emergency preparedness plans for levee failures.
- Need to evaluate development in the floodplain (the more development, the greater the risk to public safety).
- Inadequate compensation to Yolo County for providing the City of Sacramento with flood protection. Failure of the federal and state governments to equitably address the Sacramento River Flood Control Project induced flood risks within and adjacent to the Yolo Bypass.
- Inadequate flood protection from existing Cache Creek levees.

- Erosion of existing Cache Creek levees.
- Inadequate vegetation removal on Cache Creek (impedes capacity).
- Insufficient understanding of the risk of Cache Creek flooding.
- The unincorporated area of Yolo County near Cache Creek, as well as parts of the City of Woodland, has only 10-year flood protection according to the Federal Emergency Management Agency (FEMA).
- Inadequate levees to protect Madison and Esparto from Lamb Valley Slough flooding.
- Inadequate flood protection at the airport.
- The Yolo Bypass does not and has not functioned at design flow capacity for many years. This poses a threat to the citizens of Yolo, Solano, and Sacramento Counties if future flood events exceed the capacity of the Bypass.
- Future land use changes in the Yolo Bypass must be closely monitored to ensure that impediments to flow do not occur that would further minimize capacity. All current and future land uses in the Bypass must be consistent with flow capacity requirements and subject to consistent State Reclamation Board enforcement. There should be no redirected hydraulic impacts as a result of the project operations, upstream development, or in-bypass projects.
- During the past 10 years, there has been increasing pressure in the Central Valley to build in floodplain areas. Yolo County has restricted growth in the floodplains in the unincorporated areas, but many residential, industrial, and residential structures continue to be built by cities in the floodplain.

Groundwater Quality (drawn from 4.3 Water Quality)

- High nitrate levels in the drinking water wells of both cities and unincorporated communities that potentially present a risk to human health.
- Potential for high salinity levels in groundwater if agricultural irrigation slowly concentrates salts in shallow groundwater aquifers, but more monitoring necessary to determine if it is an issue.
- Levels of arsenic and chromium VI, naturally occurring constituents in deep groundwater aquifers, approach human health standards and may cause a risk to human health.
- High levels of boron in shallow groundwater aquifers that reduce crop yields or destroy young, perennial crops.
- Trace levels of flame retardant chemicals that do not yet present a risk to human health, but may present a risk in the future.
- Well-head neglect and abandonment, creating possible conduits for pollution to enter groundwater aquifers.

Groundwater Supply Management and Conjunctive Use (drawn from 4.2 Water Supply and Drought Preparedness)

- Future urban population growth will result in an increase in water supply needs and demands from cities, unincorporated communities, and UC Davis.
- Subsidence as a result of groundwater extraction.
- Ability of deep aquifer to sustain current and future demands.

Invasive Species (drawn from 4.5 Aquatic and Riparian Ecosystem Enhancement)

- Loss of native plants, increase of invasive plants leading to increased erosion problems, and loss of habitat.
- Increase of invasive aquatic species.

Surface Water Quality (drawn from 4.3 Water Quality)

- High salinity levels from wastewater treatment plant discharges into waterways that exceed permit requirements.
- Low levels of pesticides, nitrates, or other harmful constituents in surface water that are not known to exceed human health standards, but additional monitoring is required to ensure that the water is safe.
- Some surface water sources have high levels of suspended sediment that can negatively affect aquatic life.
- 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.
- Storm water drainage may result in spikes of pollutants of concern that could exceed human health standards and negatively affect wildlife.

Surface Water Supply Management (drawn from 4.2 Water Supply and Drought Preparedness)

- Need to improve existing water supply quality, and pursue higher quality water sources to meet current and future demands.
- Availability of adequate water supplies during severe drought conditions.

Water Dependent Recreation (drawn from 4.6 Recreation)

- Countywide survey of recreational preferences specific to waterways has not been conducted, although individual government entities have developed detailed plans.
- Insufficient or inadequate educational opportunities (interpretive centers, etc.) related to waterways.
- Insufficient or inadequate hiking, bicycle and equestrian trails along waterways.
- Insufficient or inadequate hunting and fishing access sites along waterways.
- Insufficient or inadequate camping facilities along waterways.
- Insufficient or inadequate boating opportunities (motorized and nonmotorized).
- Insufficient or inadequate wildlife viewing opportunities.
- Insufficient or inadequate day-use activities (picnicking, swimming, etc.)

Water/Wastewater Infrastructure (drawn from 4.2 Water Supply and Drought Preparedness)

- Cost of providing water and wastewater service is increasing and expected to continue.

III. Opportunities

The following opportunities are sorted using the same categories employed for the summary of challenges and opportunities collected at the kick-off meetings. Each category includes a reference to the section(s) of the plan where those opportunities were discussed.

Ecosystems (drawn from 4.5 Aquatic and Riparian Ecosystem Enhancement)

- Recent state government efforts, including the passage of resources bonds, have made funds available for aquatic and riparian ecosystem enhancement efforts.
- Many of Yolo County's waterways are considered to be of statewide importance for aquatic and riparian ecosystem enhancement efforts.

Flood Management (drawn from 4.4 Flood Management and Storm Drainage)

- Three primary geographic regions with flooding issues: Cache Creek basin/Woodland, Sacramento River corridor, and Western Yolo floodplain (Madison, Esparto, Airport Slough, etc.) and Yolo County land west of the unleveed part of the Yolo Bypass south of Putah Creek. Regions have unique circumstances but share common issues.

Water Dependent Recreation (drawn from 4.6 Recreation)

- Many opportunities to enhance existing recreational opportunities along waterways.