EXECUTIVE SUMMARY

INTRODUCTION

Overview

The H. T. Harvey & Associates' Team, under contract to the Colusa County Resource Conservation District, has prepared this Watershed Assessment for the Colusa Basin Watershed. We worked with the Colusa County Resource Conservation District to conduct the assessment according to the following steps:

1. Conduct telephone interviews to identify stakeholder concerns
2. Characterize watershed conditions based on existing information
3. Conduct a qualitative assessment of historical changes in key ecosystem features and processes based on existing information
4. Identify data gaps
5. Recommend next steps toward the development of a watershed management plan

The Colusa Basin Watershed is located in northern California and covers approximately 1,045,445 acres (1634 square miles) which encompasses a substantial portion of the west side of the Sacramento Valley. The watershed extends from the Cache Creek Watershed in the south, to lower Stony Creek Watershed in the north and from the Sacramento River westward to the ridge crest of the Coast Range foothills. Overall, the watershed is relatively flat but steeper slopes are present to the west as the watershed climbs into the lower foothills of the Inner Coastal Range. Major landforms within the watershed include the levees along the west side of the Sacramento River; the broad floodplains and basins of the valley floor; and the foothills, ridges, and valleys of the Inner Coast Range. A low trough of relatively flat basin lands runs parallel to the Sacramento River levees. These flat basin lands are referred to herein as the Colusa Basin. Ephemeral streams draining winter rainfall from the Coast Range foothills coupled with overflow from the Sacramento River, have historically contributed to regular seasonal flooding of the Colusa Basin. The natural physical and biological conditions of the Colusa Basin Watershed have been dramatically altered over the past ~160 years through Euro-American settlement, the development of flood control and water supply projects, and the transformation of the Colusa Basin into a highly productive agricultural region.

Assessment Purpose

The Colusa County Resource Conservation District intends to develop a management plan for the Colusa Basin Watershed that will identify and prioritize projects that are "best for the watershed" and locally driven. This Watershed Assessment is the first step in this process and compiles existing information and stakeholder concerns into a user-friendly document to support the future development of a management plan. The assessment describes where we have been (history), where we are now (current conditions), and will help local stakeholders determine where they would like to be (a plan for the future).

FINDINGS

Land Use and Social Characteristics

Historical Conditions. American Indian Tribes such as the Patwin or Wintun, inhabited the Colusa Basin Watershed for at least 10,000 years prior to Euro-American settlement in the mid 1800s. Their subsistence hunter/gatherer economy was based on sustainable management and use of the watershed's once abundant natural resources. For example, they utilized the vast tule marshes of the Colusa Basin for building material harvesting tules to construct their boats, huts, and baskets. The population of American Indians in the watershed plummeted from numbering in the thousands in 1850 to approximately 100 in the modern era due to introduced disease, displacement, and warfare.

Initial Euro-American settlement of the region occurred in the mid 1800s with the Gold Rush ushering in a mass migration to the Sierra foothills. Establishment of the earliest towns (Colusa, Grimes, Princeton) occurred along the Sacramento River corridor where barges of supplies could be loaded and unloaded en route to the Sierra gold mines. Following the initial boom of gold mining, as agricultural production increased in the 1860s and 1870s, the City of Colusa gained prominence as a shipping port delivering the wheat harvest downriver. Towns such as Williams, Maxwell, and Arbuckle later grew up around the Northern Railroad line during the 1870s serving as transportation centers for the grain harvest.

Initially farmers avoided the vast tule marsh of the Colusa Basin lowlands because they did not yet have the technology to drain them or protect them from regular flooding. They established farms and orchards on the well-drained, fertile, levees along the Sacramento River and higher ground at the base of the foothills. However, landmark federal and state water resource management legislation was passed between 1850 and 1870 to provide flood protection, drainage, and irrigation to these floodprone regions [Arkansas Act (1850), State Assembly Bill 54 (1861), Green Act (1868)]. This legislation set in motion numerous projects that, through trial and error, rapidly converted the vast wetland and riparian habitat of the Colusa Basin to lands suitable for agriculture and urbanization. The Green Act, in particular, dramatically stimulated the purchase and reclamation of wetlands. Between 1868 and 1871, nearly a million acres, practically all of the swamplands once owned by the state, passed into private ownership. Reclamation districts were fragmented into numerous small districts that enacted flood control measures independently rather than in a coordinated, valley-wide fashion.

As railroad construction in the region expanded and river navigation improved through dredging the Sacramento River, agricultural production and population growth within the watershed increased. The improved flood control and irrigation water supply provided by legislative ruling also played a major role in the production and population increases. The era around 1913, in particular, saw great increases in the conversion of floodprone swamplands to productive agricultural land.

Great increases in agricultural acreage and shifts toward more valuable crops indicate that agricultural growth in the region has continued to this day. Using Colusa County as an example to illustrate this general historic trend for the whole watershed, in 1939 barley was the largest field crop in Colusa County at 75,000 ac and rice was the second largest at approximately 25,000

ac. while almonds were the largest crop among fruit and nuts at 7,418 ac. Barley remained the largest field crop (on an acreage basis) until the late 1950s when rice acreage (58,770 ac) exceeded barley (46,000 ac) as the largest field crop in Colusa County. By 2006, rice acreage in Colusa County had grown to 142,600 ac and tomatoes were the second largest field crop at 18,400 ac. while almonds remained the largest crop among fruit and nut crops at 28,600 ac.

Existing Conditions. The vast majority of the watershed is rural, dominated by agricultural and rangeland activities. Less than 1% of the watershed is urbanized. The majority of the lands within the watershed's three counties (Yolo, Colusa, and Glenn) are mapped as "Important Farmland" by the U.S. Department of Agriculture and the State of California Department of Conservation. The preservation of important agricultural land is among the highest priorities in the respective county general plans. The counties aim to achieve this goal by encouraging new development to occur within or adjacent to existing cities, communities, and major transportation corridors. The general plans for these three counties are rather old (prepared 15-25 years ago) and are in the process or slated to be updated. Beyond the County General Plans, Williamson Act contracts are the second principal way that agricultural land is protected from conversion to urban land use within the Colusa Basin Watershed. The California Land Conservation Act of 1965 (commonly known as the Williamson Act) allows landowners to voluntarily place restrictions on development and use on their agricultural lands in exchange for tax reductions and other incentives. In the Colusa Basin Watershed, 34% of the prime soils are under Williamson Act Contract (144,711 ac) and 14% are in Farmland Security Zone contract (58,952 ac). Sixty-one percent (61%) of non-prime soils in the Colusa Basin Watershed are under Williamson Act contract (301,508 ac) and less than 1% are under Farmland Security Zone contract.

Physical Processes (Geology, Geomorphology, Soils, Hydrology)

Geology. The Colusa Basin Watershed lies entirely within the Great Valley geologic province, an area that includes the Sacramento Valley bordered by the Coast Range, Klamath, Cascade, and Sierra Nevada mountains and its fringe of foothills underlain by the valley's older sedimentary bedrock. The bedrock formed when a Cretaceous sea filled the Sacramento Valley. Broad warping of the Cretaceous marine sedimentary bedrock layers uplifted and tilted them giving rise to the foothills along the western edge of the Watershed and lowered the rocks along the valley centerline where the aggrading floodplains of the ancestral Sacramento River created the valley flat. Erosional dissection of the uplifted foothills by Tertiary and Quaternary streams poured sediment into the sinking valley, forming a sequence of older semi-consolidated alluvial deposits that flank the foothills. These alluvial deposits in-turn have been uplifted and dissected by still younger streams. Holocene streams continue to dissect the Cretaceous bedrock foothills and the older alluvial deposits transporting sediments onto the valley floor. Holocene streams form contemporary alluvial fans that grade into the wide band of valley flat and basin lands – the Colusa Basin. The Colusa Basin is a complex of loamy floodplain deposits, slough channels, and frequently flooded basins formed by modern fluvial processes on the aggrading Sacramento River floodplain.

Geomorphology. East of the foothill front, the Colusa Basin Watershed landscape is dominated by broad, gradually-sloping alluvial fans grading into the fine-grained deposits of the Sacramento River forming the valley flat and the Colusa Basin. Streams draining from the foothills over the alluvial fan surfaces are variably meandering, sand-and-gravel bedded streams

with naturally erodible banks except where channels are cut in semi-consolidated older alluvial deposits occurring primarily nearer the foothill front. The foothill streams are naturally flood-prone especially along their downstream reaches where the channel slope decreases, the banks and natural levees are increasingly fine-grained, and there may be local stormwater ponding and flood backwater effects from the poorly-drained valley flat and Colusa Basin. The foothill streams have been variably channelized and leveed to conform with transportation infrastructure and general agricultural development, especially the downstream reaches which are more shallowly incised and prone to erosion and flooding. Closer to the foothill front there are still numerous unmodified, isolated stream sections with relatively intact riparian vegetation.

The streams on the valley flat and within the Colusa Basin are sinuous, very gradually-sloping, sand-, silt-, and clay-bedded streams. These streams are commonly referred to as "sloughs." Broad loamy deposits along the borders of slough channels once hosted extensive riparian forests and today provide valuable agricultural soils, including for example Vina and Moonbend soils. Today there are only a few remnants of the slough channels, such as a remnant of Sycamore Slough, south of Colusa. Levee building and drainage works for flood protection and reclamation eliminated routine Sacramento River overflow onto the valley flat, and most of the slough channels have been farmed over.

Soils. The types and patterns of soils on the Colusa Basin Watershed lands follow somewhat directly from its geology and geomorphology:

Upland Soils. Upland soils are generally shallow residual soils that occur in rolling, hilly to mountainous topography, mostly having been formed in place through decomposition and disintegration of the underlying parent bedrock. Low to moderate rainfall can support vegetation for grazing on upland soils. Upland soils cover the western third of the Colusa Basin Watershed area within the Coast Range foothills.

Terrace Land Soils. Terrace land soils are formed in the older and younger valley fill alluvium occurring in the foothill valleys and on the alluvial fans sloping up from the edges of the valley and basin lands, usually at elevations of 5-300 ft above the valley floor. Terrace land soils with dense subsoils exhibit poor drainage and are satisfactory for annual grasses and shallow-rooted crops. Terrace land soils with moderately dense subsoils usually have brownish, neutral surface soils and occupy the lower elevation alluvial fan surfaces where younger alluvium is present, and covered with grass or woodland with a grass understory.

Valley Land Soils. In contrast to the relatively poorly drained terrace land soils, valley land soils are predominately well-drained alluvial soils formed in loamy alluvial fan and floodplain deposits. Valley land soils are generally brown in color and highly valued for irrigated crops. Some of these soils are slightly to moderately saline to alkali. They are located along the Sacramento River, in the streamside areas dissected in the Tehama Formation, and the oldest part of the relict Stony Creek alluvial fan lying northwest of Willows.

Valley Basin Soils. Valley basin soils occur in the lowest elevation parts of the watershed that are nearly flat and poorly drained. These soils are generally dark-colored and clayey, with a high water table. They are subject to frequent stormwater overflow and extended ponding and are

primarily used for rice growing. Valley basin soils occur on the valley flat lying west of the Sacramento River floodplain deposits and east of the gently sloped alluvial fan deposits from the Coast Range foothills, comprising an area often referred to as a "low trough" extending from north of Willows to Knights Landing. The Colusa Basin comprises the southerly and lowest elevation part of the low trough on the valley flat. Valley basin soils also occur upslope from the rim of the Colusa Basin in the interfan basin area in the Maxwell vicinity.

Surfacewater Hydrology. There is limited stream flow hydrology gage data available for the foothill streams in the Colusa Basin Watershed. There are only three active gages in the watershed: The California Department of Water Resources [DWR] gages along the Colusa Basin Drain at Highway 20 and at the Knights Landing Outfall Gates, and the discontinued U. S. Geological Survey [USGS] station on South Fork Willow Creek near Fruto that DWR began operating after the 1998 flood. The Colusa Basin Drain gages only measure mean daily flow contained in the drainage canal. Flood flows escaping the canal are not measured, and DWR does not publish estimated annual peak flows at those sites. The USGS currently publishes historical records for three discontinued gages: Walker Creek at Artois (16 years), South Fork Willow Creek near Fruto (16 years), and on Stone Corral Creek near Sites (28 years).

Stone Corral Creek had zero or near-zero flow most of the year during normal and dry years with positive flow typically occurring only as the result of individual rainstorms between November and April. South Fork Willow Creek near Fruto has a similar-sized drainage area as Stone Corral Creek with a similar pattern of mean annual precipitation as its upper watershed is adjacent to and within the same range of elevations, and it is underlain by similarly dissected Cretaceous bedrock. Gage records show that both streams had similarly timed and similarly sized peak flows resulting from individual winter rainstorms, with very few exceptions. Walker Creek at Artois captures a larger drainage area, approximately twice as large as the Stone Corral and Willow Creek gages. Walker Creek sustained a measurable winter baseflow for a larger portion of the November to April rainy season, but at times had zero or near-zero streamflow between storms, especially during dry years but also most normal rainfall years.

The drainage area tributary to the Colusa Basin Drain at the Highway 20 gage is 973 mi^2 (about 623,000 ac), approximately 60% of the Colusa Basin Watershed area. Annual average runoff at the Highway 20 gage for the period of record is 496 thousand acre-ft per year – equivalent to an average runoff depth of 9.6 inches. This is much more than the natural amount of runoff from a watershed area with mean annual precipitation ranging generally from 17-27 inches, primarily reflecting the influence of irrigation water imports on the hydrology of the Colusa Basin Drain. It is generally understood that irrigation development substantially increased peak stormwater runoff tributary to the Colusa Basin Drain but few data are available to quantify these historical effects.

Groundwater Hydrology. Groundwater occurs in the alluvial deposits underlying the alluvial fans, low plains, and basin flats of the Colusa Basin Watershed. The Colusa Groundwater Subbasin comprises the part of the larger Sacramento Valley Groundwater Basin lying approximately under the Colusa Basin Watershed footprint, being "bounded on the east by the Sacramento River, on the west by the Coast Range and foothills, on the south by Cache Creek, and on the north by Stony Creek"(DWR 1990). The base of the Tehama Formation is the base of

groundwater-bearing alluvial deposits in the Colusa Groundwater Subbasin. The groundwater-bearing geologic formations in the subbasin include all of the alluvial deposits overlying the Cretaceous bedrock: the Tehama Formation of Tertiary age and the overlying Quaternary alluvial fan, flood basin, and alluvial deposits.

DWR published the most recent analysis of typical seasonal and long-term groundwater elevation trends in 1990, finding no indication of groundwater overdraft. Sufficient groundwater data exist for monitoring changes in groundwater storage and to provide baseline data for evaluating future groundwater management efforts. DWR monitors groundwater levels in 98 wells approximately semi-annually and maintains up-to-date published databases of the well data.

Flood Management. The eastern third of the Colusa Basin Watershed lies within the frequently flooded Sacramento River floodplain. The early locally-driven flood control efforts constructed levees along the western bank of the Sacramento River. Ever higher generations of these levees failed one after the other. The levees were ultimately uniformly bolstered and incorporated into the federal Sacramento River Flood Control Project. The project was deemed largely successful when it substantially prevented flooding in the watershed during the Sacramento River flood of February-March 1940.

There were also substantial but lesser contributions of flood waters from the relict Stony Creek alluvial fan area north of Willows and the foothill streams bordering the valley on the west. Managing these smaller flood waters was partly neglected in the all-consuming struggle to control the more damaging Sacramento River overflows. Also owing to the practical difficulty of managing these foothill stream flood waters, the watershed has been left with residual flooding in the Willows vicinity and along the western edge of the Colusa Basin Drain. The Colusa Basin Drain was originally constructed to provide adequate drainage for agricultural production, not to provide minimum necessary conveyance for winter flood prevention. As agricultural production and volumes of applied irrigation water have expanded, the Drain has also been shown to be undersized in places for handling summer irrigation return flows. According to DWR, the typical pattern of flooding occurring along the Colusa Basin Drain is primarily the result of runoff from foothill streams during the winter and releases of irrigation water from rice fields during the summer.

Beginning in the 1960's, DWR prepared hydraulic models of the Colusa Basin Drain channel to serve as a basis for evaluating the flood control benefits resulting from a range of management actions: (1) improved drainage facilities from the Knights Landing Ridge Cut through the Yolo Bypass, (2) systems of levees along the Colusa Basin Drain, (3) flood control reservoirs in the western foothills, and (4) watershed management. DWR updated the hydraulic model and cost-benefit evaluation of these alternatives in 1990, and evaluated a fifth alternative of enlarging the Knights Landing Ridge Cut. Flood control reservoirs in the western foothills are currently under the most serious consideration. Most recently, the Colusa Basin Drainage District evaluated the feasibility for proposed reservoirs on two foothill streams in the northern part of the watershed – South Fork Willow Creek and Wilson Creek.

Water Quality

Prior to Euro-American Contact (pre-1850). Prior to Euro-American contact, the Colusa Basin likely served as a substantial nutrient and sediment filter during high flows when the flood waters of the Sacramento River and Coast Range tributaries would flow into the once vast riparian and wetland habitats of the Colusa Basin. It is likely that the Colusa Basin thereby improved downstream water quality and flood attenuation on the Sacramento River by reducing sediment loads, nutrient concentrations, and peak flows.

Rice Pesticides in Surface Water. Some of the major pesticides that have historically been used on rice have included Molinate, Thiobencarb, and Carbofuran. During the late 1970s, the levels of rice pesticides in the Colusa Basin Drain sometimes caused declines to fish, such as carp, due to high concentrations of Molinate. In addition, the concentration of some of these pesticides, particularly Thiobencarb, caused taste and odor problems at the cities of Sacramento and West Sacramento in the late 1970s and early 1980s due to interactions with chemicals at the water treatment plant. As a result, a management program (the Rice Pesticides Program, now part of the Regional Water Quality Control Board's Basin Plan) was enacted to reduce the levels of rice pesticides in surface water. The management program has led to numerous improvements in water and pest management techniques. One of the most effective techniques is the retention of rice-field water on fields for one month following pesticide application. This allows pesticide concentrations in water to be reduced through mechanisms such as volatilization, biological processes, or sunlight-induced degradation.

The management program has effectively reduced the discharge of rice pesticides to receiving waters. The total herbicide load (Molinate and Thiobencarb) carried by the Sacramento River dropped from approximately 40,000 lbs in 1982 to less than 125 lbs in 1992. The concentration of rice herbicides in the Colusa Basin Drain has also declined to less than 10% of pre-1985 levels. According to the latest reports from the CA Rice Commission, use of Carbofuran has been cancelled since 2000 and Molinate will no longer be in use after August 31, 2009.

Non-Rice Pesticides in Surface Water. Trace concentrations of a variety of non-rice pesticides have been detected in the Colusa Basin Drain from the mid 1990s to 2007. These include the insecticides Diazinon, Dimethoate, the herbicide Simazine, and legacy organochlorine insecticides such as Dichlorodiphenyldichloroethylene. This is not unexpected given the intensity and history of production agriculture in the watershed. The concentration of some of these pesticides are in excess of regulatory limits, and a variety of regulatory programs, such as the Irrigated Lands Program and 303(d) listing, are in place to address this issue. In spite of detected water quality impacts from the presence of these pesticides, the surface water quality in the Colusa Basin Watershed is adequate to support existing uses which are predominantly agricultural. The quality of surface water in the Sacramento River appears to be largely unaffected by the presence of pesticides and as a result is of high quality.

Groundwater Quality. The California Department of Pesticide Regulation and the U. S. Geological Survey have conducted extensive investigations of groundwater quality in the Colusa Basin since 1983 and 1997, respectively. Groundwater quality in the Colusa Basin is generally acceptable for agricultural uses. With the exception of boron, no naturally occurring groundwater constituent prevents the use of groundwater for irrigation. In some portions of the

Colusa Basin groundwater has elevated salt concentrations that may adversely affect yields of commonly grown crops. For example, high electrical conductivity, total dissolved solids, and adjusted sodium absorption ratio occur near the City of Colusa and high total dissolved solids and boron occur near Knights Landing.

Biology

Historical Conditions. Prior to Euro-American contact, the historic vegetation in the Colusa Basin Watershed was primarily determined by the patterns of soil texture, soil moisture, and flooding cycles. Grassland was perhaps the most extensive original vegetation cover throughout the watershed. Regularly flooded, yet well-drained, fertile soils (e.g., loams and silt loams) occurred on the broad natural levees adjacent to the Sacramento River. In contrast, the intervening basin soils were poorly drained and seasonally flooded for extended periods. A wide corridor (~900 ft wide) of valley oak riparian forest grew atop the river and slough levees and a vast sea of emergent freshwater marsh (~ 5 miles wide and 40 miles long) grew within the basins. Two additional types of seasonal wetland habitat (vernal pool and alkali sinks) were also present, though less extensive than the emergent freshwater marsh. The ephemeral streams draining the foothills supported less extensive riparian vegetation than the perennial flows of the Sacramento River and adjacent sloughs. Beyond the riparian corridor of these foothill streams, native grasslands, chamise chaparral, and blue oak woodland formed a mosaic of habitats along the western foothills.

Based on accounts from the early 1800s by the earliest Spanish explorers of the Sacramento Valley, thousands of tule elk, antelope (pronghorn), and deer browsed the grasslands and wetlands of the valley floor. Will S. Green wrote of his first trip up the Sacramento River towards Colusa that there were "myriads of ducks and wild fowl…deer…and even grizzly bear," along the banks of the river.

Following Euro-American contact, flood control and drainage projects rapidly and dramatically altered hydrologic cycles and pathways, which in turn eliminated or converted the vast majority of the riparian, wetland, and grassland habitat. Beginning in 1860 major flood control and irrigation development projects altered this historic hydrologic/sedimentation regime. Tree species were felled for firewood and construction, woodlands on levees were cleared for cropland, tule marshes were drained for agricultural use, and grasslands were tilled for crops.

Existing Conditions. Patterns of vegetation within Colusa Basin Watershed generally correspond to the watershed's major topographic features and current land-use activity. The existing habitats of Colusa Basin Watershed can be grouped broadly into the following seven types according to vegetation and landscape position:

Habitat Type	Primary Landscape Position	Surface Area (acres)	Percent of Watershed Surface Area
Cultivated	Colusa Basin	606,737	58%
Blue Oak/Foothill Pine Woodlands	Western Foothills	189,068	18%
Annual Grasslands	Western Foothills	185,143	18%
Emergent Wetland	Colusa Basin	31,392	3%
Shrublands	Western Foothills	23,108	2%
Riparian	Sacramento River and Its Tributaries	4,715	0.5%
Developed/Urban	Colusa Basin	2,974	0.3%

Special-status Wildlife. The Colusa Basin Watershed provides suitable habitat for numerous (~44) special-status wildlife species during certain times of year. The watershed provides suitable breeding habitat for nine federal or state listed threatened or endangered species; bank swallow, California tiger salamander, Conservancy fairy shrimp, giant garter snake, Swainson's hawk, western yellow-billed cuckoo, valley longhorn elderberry beetle, vernal pool fairy shrimp, and vernal pool tadpole shrimp. The watershed also provides suitable breeding habitat for 18 wildlife species considered by the state as species of special concern or protected species. The majority of these species utilize freshwater emergent wetlands, vernal pools, and/or riparian habitat; habitats that have been dramatically reduced compared to their historic distribution.

Special-status Plants. Twenty four special-status plant species are known to occur, while 33 species have the potential to occur within the Colusa Basin Watershed. Many (28) of these species are associated with vernal pool habitats. Seven of these species are listed as state and/or federally threatened or endangered and six of these threatened or endangered species are associated with vernal pool habitats. The known occurrences of the special-status plant species associated with vernal pools are located in the Colusa Basin between the Colusa Basin Drain and Interstate 5. Numerous occurrences are located within the Sacramento National Wildlife Refuge.

WATERSHED ACTION ITEMS

As noted above, the Colusa County Resource Conservation District intends to develop a management plan for the Colusa Basin Watershed to identify and prioritize projects that are "best for the watershed" and locally driven. We recommend the preparation of an Integrated Watershed Management Plan [IWMP] for the Colusa Basin Watershed. Adopting the watershed as the planning area facilitates the successful management of water-related resources and issues because the management unit (i.e., the watershed) is the natural boundary of water flow as opposed to more arbitrary property and governmental boundaries. An "integrated watershed management" approach facilitates productive dialogue among local stakeholders within the watershed to establish a clear set of management goals and develop collaborative, innovative solutions to achieve those goals. The solutions of an IWMP strive to balance environmental, economic, and social concerns (triple bottom line). An "integrated" approach involves developing interdisciplinary solutions that serve multiple objectives and are based upon a sound, scientifically-based understanding of ecosystem processes. For example, projects that reconnect floodplains to creek channels (at appropriate landscape locations) can reduce flooding, reduce

downstream channel/bank erosion, increase groundwater recharge, and improve riparian habitat quality and quantity.

An Integrated Watershed Management Planning process for the Colusa Basin Watershed should involve the following basic elements:

- Establish a workgroup of key stakeholders to guide the preparation of the management plan. The workgroup should include representatives of local land owners and land users from all three counties and statewide groups such as: County RCDs, CA Rice Commission, University of California Cooperative Extension Advisors, County Planning Departments, Drainage Districts, and Agricultural Commissioners. In addition, it will be essential for the workgroup to also include those government agencies that will have regulatory authority over future projects and/or have resource management responsibilities that overlap with the planning goals. Such agencies include the various water/irrigation districts, DWR, RWQCB, CDFG, USFWS, and USACE.
- Create a Memorandum of Understanding, signed by the workgroup members, to ensure their commitment to participation and collaboration.
- Facilitate the workgroups' establishment of a focused, well-defined, and achievable set of watershed management goals and measurable objectives. The goals should address the workgroups' top land management concerns, while preserving and restoring natural watershed resources and processes.
- As part of the goals development process, the workgroup should determine how the IWMP process will interface with the existing major planning processes in the Colusa Basin Watershed including County and City General Plan Updates, the Colusa Basin Water District's Integrated Resource Management Program for Flood Control, and the Yolo, Colusa, and Glenn County Groundwater Management Planning process. In other words, will this IWMP serve as a vehicle for integrating all, or a subset, of the above planning processes with broader watershed-scale goals that reach beyond strictly flood control, groundwater management and development planning? Or will the IWMP serve to fill "holes" in the above, existing planning processes?
- Fill those data gaps necessary to conceptualize and prioritize projects to achieve the workgroups goals and objectives.
- Formulate a suite of proposed projects (at a broad, conceptual level) that achieve the workgroup's goals and objectives. For each project, identify a project leader from the workgroup, partnering agencies and landowners, environmental review/permitting requirements, estimated duration, and planning-level cost estimates. Group certain projects into programs, if appropriate.
- Prioritize the proposed project/program list. This process will then serve as a basis for the acquisition of funds to implement the management plan. Consider pilot projects where there is considerable uncertainty in the science to predict results and to get actions started on the ground.