Water Supply and Instream Habitat Improvements in Suisun Creek

Laurel Marcus, Ca. Land Stewardship Institute, laurelm@fishfriendlyfarming.org

The California Land Stewardship Institute (CLSI) has been involved in watershed restoration in Suisun Creek watershed since 2001. In 2004 a watershed plan, funded by the Coastal Conservancy, was completed and included extensive monitoring of water temperatures in Suisun Creek and its tributaries Wooden Valley and White Creeks. The plan recommended evaluation of Lake Curry releases to enhance cold water habitat in Suisun Creek for steelhead trout as well as a number of other actions. CalFed provided funding for implementation of the Suisun Creek Watershed Plan. Several studies were completed for Lake Curry. An engineering evaluation included a bathymetric survey and monitoring of stream flow in Suisun Creek below the dam. A computer model was set up to look at the temperatures of water in Lake Curry under various rainfall conditions (normal, dry and very dry) and the length of time that water releases to Suisun Creek would last under various release rates. In addition water temperatures were monitored using dataloggers at 15 stations on Suisun Creek while release rates from Lake Curry were varied from 2 cfs, 4 cfs, and 6 cfs. The study of Lake Curry concluded that during a normal or wet year, the reservoir is full on April 1 and can release 5.5 cfs from April 1 to November 1 of 68^{o} F water. The experiment found that a maximum release of 6 cfs of cold water creates cold water conditions at Stations SC 10 to SC 8 in the first 3 miles of Suisun Creek below the reservoir. The analysis of the 2006 experiment found that the stream temperatures warmed downstream of SC 8 largely due to the large volume of water in the creek channel heated by solar inputs and the lack of riparian canopy. Next steps will be illustrated.

Keywords: water supply, steelhead trout, Suisun Creek, reservoir reoperation

Poster Topic: Watershed Management

Upper Napa River Water Quality Improvement and Habitat Enhancement Program

Laurel Marcus, Ca. Land Stewardship Institute, laurelm@fishfriendlyfarming.org
Rune Storesund, Storesund Consulting, rune@storesundconsulting.com
Jonathan Koehler, Napa County Resource Conservation District, jonathan@naparcd.org
Karen Peitz-Eberle, Ca. Land Stewardship Institute, karenp@fishfriendlyfarming.org
Lili Prahl, Ca. Land Stewardship Institute, lilip@fishfriendlyfarming.org
Jeff Schlueter, Ca. Land Stewardship Institute, jeffs@fishfriendlyfarming.org

The Upper Napa River Restoration Project stretches 5.3 miles from Calistoga to Big Tree Lane. The project started with the Fish Friendly Farming Program and landowners along the river wanting to reduce bank erosion and improve the river environment. The California Land Stewardship Institute (CLSI) led an interdisciplinary team evaluating the physical and ecological features of the river. Ground-based LIDAR was coupled with aerial LIDAR and surveyed cross sections of the channel to create detailed topographic maps of the channel. Geomorphic features were delineated, riparian condition and regeneration potential was assessed as were instream salmonid habitats. The plan documented widespread channel incision. Incision is believed to occur during very wet years when banks slump into the channel creating new floodplains and damming long glides in the channel. This pattern of change differs significantly from reaches downstream where eroded banks are largely swept out of the river channel during floods. This drop in base level from incision migrates up every tributary and drainage ditch until hard rock or another type of grade control is reached. This process is increasing fine sediment pollution and damage to properties and habitat. This project focuses on widening the main river channel to reduce water velocities and thus stop any further drop in the river's base level and the subsequent long-term sediment generation it causes. The physical form of the channel translates to healthy aquatic and riparian habitats. The riparian ecosystem needs complex channel habitats to regenerate new trees to replace older trees that erode into the water, to provide for a diversity of tree species and to produce the physical heterogeneity of plant growth forms (trees, shrubs, vines, and herbs) needed to support fish and wildlife. This project addresses the cause of poor habitat: a narrow and deep channel with high velocity flood flows

Keywords: channel, incision, riparian regeneration, LIDAR, Napa River, agriculture, restoration

Poster Topic: Watershed Management

Central Valley Flood System Conservation Strategy - Planning Tools, Key Datasets, and Measurable Objectives

Ron Melcer Jr., CA Department of Water Resources, Ron.Melcer@water.ca.gov

The Central Valley Flood System Conservation Strategy is an integral component of the 2017 Central Valley Flood Protection Plan (CVFPP). It provides a framework for achieving ecological improvements within flood risk reduction projects through the development of restoration targets, planning tools and key datasets, and geographically specific measurable objectives. These efforts are focused on the Sacramento and San Joaquin Rivers within the Systemwide Planning Area of the CVFPP. Restoration targets include fundamental riverine processes and habitats, focused species conservation, and proposed reductions in stressors such as fish passage barriers. Planning tools and key datasets describe the existing conditions and potential for ecosystem uplift. Measurable objectives have been developed through analyses of the conservation and recovery needs of sensitive terrestrial and aquatic wildlife and plant species which depend upon riparian systems within the Central Valley. The CDWR is working closely with federal, state, and regional flood management and resource agencies, local stakeholders, and non-governmental organizations to develop multi-benefit flood risk reduction projects which address both flood risk management and ecosystem goals and objectives. There are ongoing and future opportunities for collaboration with large-scale restoration programs such as the San Joaquin River Restoration Program to achieve ecological uplift by meeting conservation strategy objectives. Through these efforts, the flood management community and others will contribute to the resilience and sustainability of riparian systems within the Central Valley.

Keywords: Flood Management, Multi-benefit Projects, Endangered Species Recovery, Watershed Management

Poster Topic: Watershed Management

RipZET: A GIS-Based Decision Support Tool for Estimating Riparian Zones at the Watershed and/or Project Scale

Scott Dusterhoff, San Francisco Estuary Institute, scottd@sfei.org
Josh Collins, San Francisco Estuary Institute, josh@sfei.org
Kristen Cayce, San Francisco Estuary Institute, kristen@sfei.org
Marshall Kunze, San Francisco Estuary Institute, marshallK@sfei.org
Jamie Kass, San Francisco Estuary Institute, jamie@sfei.org
Pete Kauhanen, San Francisco Estuary Institute, petek@sfei.org

The loss of riparian areas throughout the Bay-Delta region has affected water quality and habitat conditions and presented a number of challenges for resource managers related to water management and land use planning. Current approaches for restoring and protecting riparian areas are starting to focus on appropriate riparian functions or ecological services, including stream shading, bank stabilization, organic and inorganic material input, runoff filtration, floodwater storage, and groundwater recharge. Land-use planners therefore need tools to help delineate and map the extent of "functional riparian width" as a means of ensuring appropriate riparian width in developed stream reaches targeted for restoration and relatively undisturbed stream reaches targeted for development.

The Riparian Zone Estimation Tool (RipZET) is a recently released GIS-based decision support tool that estimates functional riparian width based on channel type and associated riparian functions. The tool provides reach-scale functional riparian width estimates based on average height of mature riparian vegetation, the steepness of hillslopes adjacent to the channel, and the floodplain inundation extent for large storm events. The appropriate width estimate for a reach is then determined based on the riparian functions associated with different channel types, which range from steep headwater channels to low-gradient, meandering channels with broad floodplains.

RipZET has been tested to date in the San Francisco Bay Area, as well as in the Tahoe Basin and Central Coast, and has been reviewed by regional science and management experts. This presentation will provide an example of applying the tool in the Bay Area to estimate functional riparian widths using readily available topographic, vegetation, and hydraulic data. The tool is now ready for use by the watershed management community and can be downloaded at http://www.sfei.org/projects/ripzet.

Keywords: Riparian Restoration Watershed Habitat Management Tools Ecological services Water quality

Poster Topic: Watershed Management

Using Multiple Indicators and Assessment Methods to Develop an Ecological Baseline

Tami Church, Zone 7 Water Agency, tchurch@zone7water.com
Elke Rank, Zone 7 Water Agency, erank@zone7water.com
Carol Mahoney, Zone 7 Water Agency, cmahoney@zone7water.com

The Zone 7 Ecological Baseline Conditions Report (Baseline) describes the condition of ecological resources within the delineated Study Area in eastern Alameda County. A suite of seven assessment methods including calculation of five multi-metric indices were selected to characterize different watershed attributes as well as address the U.S. EPA's Level 1-2-3 assessment framework. Selected methods included standardized protocols such as the Surface Water Ambient Monitoring Program (SWAMP) Bioassessment Methodology, and California Rapid Assessment Method (CRAM), as well as field and desktop methods to assess conditions for riparian forests, fish, birds, reptiles and amphibians. Of the seven assessment methods selected, four assessment methods in this Baseline followed the probability-based survey design—CRAM, SWAMP, RiVR, and fish.

In general, the overall condition of streams and riparian resources within the Study Area can be described as "Fair" condition overall. The landscape and its resources have been affected by urbanization and its associated anthropogenic effects—landcover is largely dominated by non-native vegetation types and historical channelization has simplified the arroyos and riparian vegetation in many places. However, fish communities as well as a number of other watershed attributes appear to be in good condition suggesting that there are areas where management actions could maintain or improve existing conditions.

Most importantly, this extensive baseline data collection effort has established an ecological benchmark of great value to understanding the current conditions in the Study Area. This Baseline was critical to Zone 7's ability to properly manage watershed resources and mark progress toward established goals. The data and analyses developed through this Baseline will guide specific recommendations for the management of resources in the Study Area. Three complementary courses of action —conservation, restoration, and management— will be explored and their probable costs and outcomes estimated.

This work was completed with financial assistance from the Coastal Conservancy.

Keywords: bioassessment, baseline monitoring, CRAM, SWAMP, watershed assessment

Poster Topic: Watershed Management