

# 30<sup>th</sup> Annual Salmonid Restoration Conference

## April 4-7, 2012, Davis, CA

30 Years of Fisheries Restoration—  
Focusing on a New Generation of Watershed Recovery



### 2012 Conference Co-sponsors

AmeriCorps—Watershed Stewards Project, Balance Hydrologics, California Conservation Corps, California Department of Fish and Game, California Department of Water Resources, CalTrans, California Trout, CBEC, Inc., East Bay Municipal Utility District, ESA PWA, Graham Matthews and Associates, McBain and Trush, Michael Love and Associates, Northern California Council of Federation of Fly-Fishers—Steelhead Committee, Northwest Hydraulic Consultants, Pacific Coast Fish, Wildlife and Wetlands Restoration Association, PG&E, Pacific States Marine Fisheries Commission, Pacific Watershed Associates, Prunuske Chatham, Inc., Restoration Design Group, San Lorenzo Valley Water District, Solano County Water Agency, Sonoma County Water Agency, Stillwater Sciences, The Bay Institute, The Nature Conservancy, Trees Foundation, Trout Unlimited, UC Davis—Center for Watershed Science, U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, Winzler and Kelly

For more information, please visit [www.calsalmon.org](http://www.calsalmon.org)

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## 30<sup>th</sup> Annual Salmonid Restoration Conference April 4-7, 2012 in Davis, CA

Salmonid Restoration Federation is excited to produce the 30<sup>th</sup> Annual Salmonid Restoration Conference in Davis, California. This year's conference is entitled *30 Years of Fisheries Restoration—Focusing on a New Generation of Watershed Recovery*. SRF realizes that we are at a turning point with how we prioritize fisheries restoration and advance towards restoring natural processes and recovering functioning watersheds. This is an ambitious concept and we have a diverse and wide-ranging conference agenda to match our fish-eye view of the future of restoration.

This year's conference will focus on a broad range of salmonid and watershed restoration topics that are timely and of pressing concern including large and small dam removal opportunities, ensuring adequate instream flows, floodplain and coastal lagoon restoration, and innovations in monitoring techniques. The conference will feature workshops on Fish Passage and Protection, Analytical Measures to Determine Instream Flow Needs for Salmonids, Restoring Floodplain Processes to Increase Salmonid Populations, Community Partnerships to Promote Restoration, and Integrated Population Monitoring in California. Field Tours will include tours of the Yolo Bypass, Putah Creek, Cosumnes River and the McCormack Tract Floodplain, and Suisun Marsh Fish Habitat Restoration and UC Davis Center for Aquatic Biology and Aquaculture. Concurrent sessions will focus on biological, physical, and environmental issues that affect salmonid restoration and recovery including:

-  Genetic Effects of Hatcheries on Chinook Salmon Population Dynamics in the Central Valley
-  The Downstream End: the Role of Coastal Lagoons and Ocean Conditions on Salmonid Restoration
-  Restoring the San Joaquin: A Future for Chinook Salmon
-  Frontiers in River Restoration and Geomorphology
-  The Role of Artificial Propagation in Recovering Salmon Populations
-  Utilizing Existing Fish Tagging Data to Guide Restoration Planning, Monitoring, and Evaluation
-  Dam Removal to Benefit Salmonid Recovery
-  Floodplain Processes and Restoration: Research and Application
-  Managing the Bay Delta for Water and Fish
-  Steelhead Restoration and Recovery

Keynote speakers include Jim Lichatowich, author of *Salmon Without Rivers*, and the newly appointed DFG Director Chuck Bonham. Invited speakers include NOAA Fisheries Deputy Director Monica Medina and California Secretary of Resources John Laird.

Other conference events will include the SRF Annual Meeting and membership dinner on Thursday evening, a poster session and reception on Friday night, and a cabaret and banquet with a Wild Copper River salmon dinner and live dance band, Sambada! For more info about the conference, please visit [www.calsalmon.org](http://www.calsalmon.org)



*Field Tours*



*Poster Session*



*Sambada!*

# Streams as Drainage or Habitat Networks?

## Should Streams be Managed as Drainage or Habitat Networks?

by Michael M. Pollock, NOAA Fisheries

Many hydraulic engineers and fluvial geomorphologists have historically viewed stream systems as drainage networks that if functioning properly, should efficiently route water and sediment downstream. In this view, natural instream obstructions such as wood, rocks or beaver dams are not desirable because they may create unpredictable changes in channel morphology that would impact the movement of sediment and water and may affect stream stability. This view has extended to the science of stream restoration and the regulatory environment that guides restoration projects, where channels must often be engineered to remain vertically and laterally stable and to move sediment and water at the rate designed over the life of the project. If instream structures are included in a restoration project, they must often be designed to be stable and to not substantially impede the downstream movement of sediment or water.

Recent advances in stream restoration challenge this view, suggesting that instream obstructions that dynamically alter both the vertical and horizontal position of the stream are essential to the recovery of salmon habitat. There are spatial patterns to the numerous types of instream obstructions that historically existed in watersheds and the ecological functions provided by a particular type of obstruction depends on watershed position. For many types of obstructions, key to creating habitat beneficial to salmon is the ability to substantially decrease the sediment and water transport capacity of a stream, and to do so both stochastically and dynamically. From this perspective, salmon-sustaining streams are recognized as a network of dynamic habitat patches that move in three dimensions.

*Sanctuary Forest will quantify expected positive outcomes from this pilot project including increases in summer stream flows, pool habitat, off channel (overwintering) habitat, floodplain connectivity, channel sinuosity, spawning gravels and the extent of floodplain vegetation. The project will be conducted as a scientific research project with development of hypotheses, desired outcomes, potential risks analysis, and pre and post-project monitoring.*

photo: Tasha McKee



## Restoring Habitat Networks

by Tasha McKee, Sanctuary Forest

Over the last year, Sanctuary Forest has been working with Michael Pollock and a collaborative team of scientists, agencies and restoration partners to address salmonid habitat constraints. With Chinook, steelhead, and coho populations currently at historic lows, and coho nearly extirpated, we are reevaluating our approach to restoration. Over the last three decades restoration efforts have partially addressed historic impacts through sediment reduction projects, riparian planting and instream habitat structures. These projects were effective with regard to site-specific problems but did not restore the natural process needed for watershed-wide habitat recovery. Today we recognize the need for an ecosystem approach requiring greater collaboration and integration of fish biology, geology and hydrology. We are working together to answer key questions: *What are the constraints on recovery? What were the historic conditions when salmon thrived here? How can we learn from the limited habitat that is still functioning? How can we learn from other streams in the Pacific Northwest where salmon are thriving? Can we recover ecological processes by building a framework to support these processes?*

Together we have walked many headwaters streams, analyzing both the habitat that is functioning well and the habitat that is not. We have observed that

the best habitat exists where there is a lot of wood in the channel, particularly channel spanning logs that form scour pools downstream and backwater pools upstream. In these locations, backwater pools and floodplain connectivity provide slow water winter habitat. The pools also provide critical summer habitat and during extreme low flows are the only habitat available. Unfortunately most of the instream wood was removed from the Mattole in the 1950s – 1980s and most stream reaches are characterized by channel incision, disconnected floodplains, lack of off-channel habitat, lack of pool habitat and summer low-flow problems. We are just beginning to understand that large wood in the streams was key to the processes that supported fish habitat and that the removal of wood caused an unraveling of those processes. We are also learning that we cannot recover salmonids without restoring the processes that were lost. If we wait for nature to take its course, forest maturation and sufficient input of wood into streams will take hundreds of years.

Sanctuary Forest is developing a pilot research project that involves placing instream logs to affect channel hydrologic and morphologic processes for the purpose of increasing groundwater recharge and ultimately aggrading an incised bedrock stream that currently has limited habitat value. The outcomes of this study should be relevant to recovery efforts throughout the range of salmon, but particularly in more arid climates.

# SRF 2012 Conference Registration

## 30 Years of Fisheries Restoration—Focusing on a New Generation of Watershed Recovery

Name: \_\_\_\_\_ Phone (work): \_\_\_\_\_

Address: \_\_\_\_\_ (home): \_\_\_\_\_

\_\_\_\_\_ Email: \_\_\_\_\_

Affiliation: \_\_\_\_\_ Please check box if you are a presenter

Advanced Registration Closes March 5, 2012

### Workshops & Field Tours

#### Wednesday, April 4

	Advanced Registration	Late Registration	Fee
1. Yolo Bypass Tour	\$55	\$65	_____
2. Suisun Marsh Habitat Restoration and UC Davis Fisheries Lab Tour	\$55	\$65	_____
3. Community Partnerships for Restoration Workshop	\$55	\$65	_____
4. Fish Passage and Protection Workshop	\$55	\$65	_____

#### Thursday, April 5

5. Putah Creek Tour: Restoring a Natural Hydrograph	\$55	\$65	_____
6. Cosumnes River and McCormack Williamson Floodplain Tour	\$55	\$65	_____
7. Restoring Floodplain Processes to Increase Salmonid Populations Workshop	\$55	\$65	_____
8. Integrated Population Monitoring in California Workshop	\$55	\$65	_____
9. Analytical Approaches to Determine Instream Flow Needs	\$55	\$65	_____
<b>Thursday Evening SRF Membership Meeting &amp; Dinner</b>	\$10	\$15	_____
Membership Meeting Free, Dinner for Non Members	\$15	\$20	_____

### Conference

#### Friday & Saturday, April 6 & 7

SRF Member	\$125	\$155	_____
Non-member	\$175	\$205	_____
Student (with ID)	\$75	\$85	_____
<b>Saturday Evening Banquet</b>	\$40	\$45	_____

### SRF Membership

#### Individual Membership:

\$35 Alevin     \$50 Fry     \$100 Smolt     \$250 Jack     \$500 Spawner    \_\_\_\_\_

Payment Total \_\_\_\_\_

Method of Payment:     Check     Money Order     Purchase Order

Purchase Orders will only be accepted for 5 or more people registering. Each registrant will need to fill out an individual form.

VISA     MasterCard    Credit Card# \_\_\_\_\_ Exp. Date \_\_\_\_\_

Approval Signature \_\_\_\_\_

Mail form and payment to: SRF Conference, PO Box 784, Redway, CA 95560 (Make checks payable to: SRF)

Phone: (707) 923-7501 • Fax: (707) 923-3135 • Email: srf@calsalmon.org

Please Note: We do not give refunds • Receipts are emailed, so print legibly • This form is available at [www.calsalmon.org](http://www.calsalmon.org)

# Workshops & Tours

**Wednesday, April 4**

## **Creating and Managing Seasonal Floodplain for Native Fish Habitat and Passage—A Tour of Northern Yolo Bypass**

**Tour Coordinators:** Ted Sommer and Dennis McEwan, California Department of Water Resources

The primary floodplain of the Sacramento River is Yolo Bypass, a 56,000 acre complex that includes seasonal salmon rearing habitat in the north and the tidal wetlands of Liberty Island in the south. This tour of the region provides an introduction to the ecology of the floodplain/tidal wetland complex for Chinook salmon and some of the major issues for habitat restoration.



*Suisun Marsh is important habitat for a variety of fishes including Delta and longfin smelt, Chinook salmon, Sacramento splittail, and striped bass. Over the last 32 years, Delta outflow, salinity, temperature, turbidity, and food supplies have strongly affected the ecology of fishes in the marsh, primarily on recruitment patterns.*

*photo: Angelo Garcia Jr*

## **Suisun Marsh Habitat Restoration and UC Davis Fisheries Lab Tour**

**Tour Coordinators:** Paul Garrison, California Department of Water Resources, and Lisa Thompson, UC Davis

Suisun Marsh is the largest contiguous brackish water marsh remaining on the west coast of North America and is a critical part of the San Francisco Bay/Sacramento-San Joaquin River Delta estuary ecosystem. The Marsh encompasses more than 10% of California's remaining natural wetlands and provides important habitat for more than 221 bird species, 45 mammalian species, 16 reptile and amphibian species, and more than 40 fish species.

Over 60 researchers are affiliated with the UC Davis Center for Aquatic Biology and Aquaculture (CABA), working across a wide range of aquatic specialties, with results that inform the management of ecosystems like the Sacramento-San Joaquin Delta and Suisun Marsh. After the marsh tour, participants will have a short indoor presentation on CABA projects and a walking tour of the main CABA facility.

## **Community Partnerships for Salmon Restoration**

**Workshop Coordinator:** Lisa Hulette, CA Salmon Initiative Project Director, The Nature Conservancy

Communities come in many shapes and sizes, whether they be the community of agencies that help you work through permitting challenges, or the landowners who allow conservation work to occur on private property—they are all infinitely important if Coho Salmon recovery is to be realized in our lifetime. The presenters during this workshop all carry the battle wounds of working deep in communities, and know how heightened the sense of achievement is when triumph is shared. Our identity as people concerned about the plight of salmon, and the ecological implications of their demise, tightly binds us together, no matter what our job title. It is this unique sustained kinship that will help determine what the future of salmon is in California and the Northwest.

**The North Coast Coho Project: Twelve Years of Collaborative Partnerships Working to Restore Coho Salmon Habitat,** Lisa Bolton, North Coast Coho Project, Trout Unlimited

**Partnerships to Demonstrate Cost-efficient Restoration Techniques for Rapidly Increasing Wood Cover and Habitat Availability in California Coho Streams,** Jen Carah, The Nature Conservancy

**Tools to Promote Restoration of Both Communities and Anadromous Habitats in the Shasta River and Beyond,** Amy Hoss, The Nature Conservancy's Klamath River Project

**Eating Totem Salmon: Exploring Extinction and Collaborative Restoration in a Coastal California Watershed Community,** Flora Brain, Mattole Salmon Group

**Bringing Back Beaver: Integrating Beaver into Community Based Salmonid Recovery Efforts,** Brock Dolman, Occidental Arts & Ecology Center's WATER Institute

**Partnerships for Restoration,** Maura Moody, NOAA National Marine Fisheries Service

**Putting the Salmon Back in Salmon Creek: Habitat and Streamflow Restoration through Public-private Partnerships,** John Green, Gold Ridge RCD

**Risk-Based Approach to Road Assessment and Mitigation of Road-Related Sediment Delivery,** Jeremy Wright, Green Diamond Resource Company

**Building Trust—The Key to a Successful Watershed Restoration Program,** Lauren Hammack, Prunuske Chathan, Inc.

**Watershed Stewards and Watershed Workers—Improving California's Watersheds with the California Conservation Corps,** Carrie Gergits, AmeriCorps Watershed Stewards Project

**Nine Years and Counting—A Stakeholder's Journey to Try to Restore Steelhead in a Local Creek,** Sally Kruger, Pismo Creek Watershed Forum, and Steph Wald, Central Coast Salmon Enhancement

## Fish Passage and Protection Workshop

**Workshop Coordinators:** Randy Beckwith, California Department of Water Resources, and Michael Love, Michael Love & Associates

This workshop will focus on employing new and innovative techniques and technologies for fish passage and protection. Project types will range from fish passage at barriers on small streams, to providing safe upstream and downstream passage over and around large dams and through other large water supply projects. The workshop will conclude with a panel discussion on providing passage over large dams in California.

**Methods for Monitoring Fish Passage Structures,** Joey Howard, Northwest Hydraulic Consultants

**Two Approaches to Improving Fish Passage on the Cosumnes River: Restoring Connectivity on an “Undammed River”,** Donald Ratcliff, U.S. Fish and Wildlife Service

**Budiselich Flashboard Dam Fish Passage Improvement Project: A Rock Ramp Roughened Channel Fishway in the Calaveras River System,** Randy Beckwith, California Department of Water Resources

**Lessons Learned from the Design and Construction of Five Low-Water Crossings on Tajiguas Creek, Gaviota Coast, California,** Rachel Shea, Michael Love & Associates, and Erin Brown, South Coast Habitat Restoration

**Willow Slough Weir and Fish Ladder Replacement: Removing the Last Barriers on Lower Butte Creek,** Harry Spanglet and Nancy Snodgrass, California Department of Water Resources

**Georgiana Slough—Bio Acoustic Fish Fence,** Jacob McQuirk, California Department of Water Resources

**Developing Successful Fish Screen Projects: Lessons Learned,** Les Perkins, Farmers Conservation Alliance

**Fish Protection at the Red Bluff Diversion Dam Emergency Pumping Plant,** Darryl Hayes, Intake Screens, Inc.

**The Need for Fish Passage Above Rim Dams in the Central Valley,** Alice Berg, National Marine Fisheries Service

**Fish Passage Feasibility Evaluation at Shasta and Folsom Dams,** John Hannon, U.S. Bureau of Reclamation

**Anadromous Fish Passage and Reintroduction Opportunities in the Yuba River,** Rick Wantuck, National Marine Fisheries Service

**Volitional Up and Downstream Fish Passage at a Regulating Reservoir in Oregon,** Andrew Talabere, Eugene Water and Electric Board

**The New Selective Water Withdrawal and Fish Passage Facilities at the Pelton Round Butte Project on the Deschutes River in Central Oregon,** Don Ratliff, Portland General Electric Company

**The Response of Spring Chinook Salmon Inhabiting the South Fork McKenzie River, OR Following the Construction of Cougar Dam,** Greg Taylor, U.S. Army Corps of Engineers

## Thursday, April 5

### Putah Creek: Restoring a Natural Hydrograph

**Tour Coordinators:** Libby Earthman, Putah Creek Council, and Jacob Katz, UC Davis Moyle Fisheries Lab

This tour will begin in Winters, CA with a discussion with fisheries expert Dr. Peter Moyle, streamkeeper Rich Marovich, and restoration expert Robin Kulakow about the success of the Putah Creek Accord, which ensured a natural flow regime for native fishes, including salmonids. Participants will walk to two channel enhancement sites, one completed in 2005 and another in 2011, to view efforts aimed at improving habitats for a multitude of species. From there we will drive to sites of future projects intended to enhance salmonid migration into Putah Creek from the Yolo Bypass Wildlife Area.

### Cosumnes River and McCormack Williamson Floodplain Tour

**Tour Coordinators:** Carson Jeffres, UC Davis, and Leo Winternitz, The Nature Conservancy

The Cosumnes River tour will highlight the effects of floodplain habitat restoration efforts with an emphasis on witnessing hydrologic flows and connectivity among various habitat types. We will visit several areas either restored or in the process of being restored. The tour will culminate at the McCormack-Williamson Tract (owned and managed by The Nature Conservancy). Because of its location and elevation, the tract has been viewed as a prime site for restoration of fresh water marsh, seasonal wetlands and riparian forest.

### Restoring Floodplain Processes to Increase Salmonid Populations Workshop

**Workshop Coordinator:** Eric Ginney, Floodplain Restoration Program Manager, ESA PWA

This workshop explores the functions of, and linkages between, the channel and its floodplain. It provides instruction on how salmonids and aquatic ecosystems utilize floodplains, and on how floodplain morphology influences channel geomorphology (and salmonid habitat). Restoration practitioners will present the latest scientific information on floodplain restoration design and implementation for project at multiple scales.



*Side-by-side mile-long culverts being installed to move water from the upstream to the downstream extent of the Putah Creek channel project, summer 2011.*

photo: Libby Earthman

**Floodplain Ecology and the Role of Floodplains in the Aquatic Ecosystem**, Alex Fremier, PhD, University of Idaho, Moscow

**The Ecology of Salmonids in the River Ecosystem: How Fish Utilize Pools, Riffles and Floodplains**, Joseph Merz, PhD, Cramer Fish Sciences

**What's a Floodplain without the Flood? How Different Flood Types Influence Floodplain Function**, Eric Ginney and Betty Andrews, PE, ESA PWA

**Floodplain Resetting Floods: Impacted River Processes and How They Influence Channel and Floodplain Restoration Design**, Andrew Collison, PhD, ESA PWA

**Floodplain Maintenance Floods: The Floodplain's "Sustaining Sponsor" in Generating Complexity and Productivity**, Eric Ginney, ESA PWA, and Alex Fremier, PhD, University of Idaho, Moscow

**Floodplain Activation Floods: The Floodplain Activation Flow (FAF) Concept as a Restoration Metric and Design Tool**, Betty Andrews, PE, ESA PWA

**What Makes Good Floodplain Habitat for Salmon? Insights from Long-term Studies in Yolo Bypass**, Ted Sommer, PhD, California Department of Water Resources

**High Elevation Floodplains and Fish: Opportunities for Native Trout Recovery through Mountain Meadow Restoration and Enhancement**, Rene Henery, PhD, University of Nevada, Reno and Trout Unlimited

**Applying Floodplain Design Criteria: Examples from the San Joaquin River**, Joseph Merz, PhD, Cramer Fish Sciences, and Betty Andrews, PE, ESA PWA



*Coastal lagoons are the gatekeepers to the survival of many salmonid species and play a critical role in supporting salmonid life history while oceanic ecosystems are the ultimate destination for salmon.*

photo: David Revell, ESA PWA



*Sunset over the Cosumnes River Floodplain and adjacent organic rice fields, showing a functioning floodplain and agricultural operation.*

photo: Carson Jeffres

## **Establishing Salmon and Steelhead Monitoring Programs in California Workshop**

**Workshop Coordinator:** Kevin Shaffer, California Department of Fish and Game

The monitoring workshop will focus on new programs and documents developed to establish scientifically rigorous, inter-agency monitoring programs for California's steelhead and salmon. The workshop shall be in two parts, focused on coastal populations and Central Valley populations. Those who have developed the scientific foundation for these programs shall be speaking, and recent documents will be distributed to attendees.

## **Morning Session: California Monitoring Program for Coastal Salmon and Steelhead Populations**

**Overview of the CMP: Managing a New Program, its Goals and Activities, and the Role of Collaboration**, Kevin Shaffer, California Department of Fish and Game

**The Foundation of a Strategic Plan and Key Elements that Drive CMP's Plan**, Pete Adams, retired, NOAA Fisheries, Science Laboratory, Santa Cruz

**The Statistical and Sampling Foundation of the CMP Plan**, Trent McDonald, West Inc.,

**CMP's Data Utility Trend and Status Analysis**, Michael Lacy, California Department of Fish and Game

**The Mendocino Coastal Monitoring Project, the Prototype for CMP**, Sean Gallagher, California Department of Fish and Game

## **Afternoon Session: Central Valley Chinook Salmon and Steelhead Monitoring Plans**

**Overview of the Central Valley Adult Chinook Salmon Escapement Monitoring Plan**, Alice Low, California Department of Fish and Game

**Revised Statistical Techniques for Development of CV Adult Chinook Salmon, Escapement Estimates**, Ryan Nielson, West, Inc.

**Development of Abundance Estimates from Juvenile Chinook Salmon Monitoring Data**, Ryan Nielson, West, Inc.

**Overview of the Central Valley Steelhead Monitoring Plan**, Russell Bellmer, California Department of Fish and Game

**Integration of Steelhead Population Monitoring into Comprehensive Life Cycle Investigations**, Joshua Israel, U.S. Bureau of Reclamation

## **Analytical Approaches to Determine Instream Flow Needs for Salmonids and River Ecosystems**

**Workshop Coordinator:** Darren Mierau, North Coast Area Manager, California Trout

Currently numerous instream flow studies or programs are being implemented in California, several of which have

employed new approaches to data analysis and integration. Setting aside the often-debated topic of instream flow methods, this workshop will (1) offer a set of principles to guide flow study data analysis and integration, (2) describe several flow studies currently being implemented or just completed that utilize different analytical approaches, and (3) allow instream flow practitioners and others an opportunity to discuss concepts and approaches that may contribute to improving the application of study results.

**Overview of Instream Flow Analytical Approaches, Principles, and Practices**, Darren Mierau, North Coast Manager, California Trout

**Determining Streamflow Requirements Under the North Coast Instream Flow Policy**, Brian Johnson, California Director, Trout Unlimited

**Identifying Hydraulic Habitat Thresholds to Protect Summer Low-Flows in the Mattole River Headwaters, CA**, Gabe Rossi, Hydrologist and Engineering Technician, McBain and Trush, Inc.

**Real-Time Management of a Watershed's Instream Flow Needs with Multiple Dispersed Water Users**, Tasha McKee, Co-Executive Director, Sanctuary Forest

**Developing Interim Minimum Instream Flows for the Shasta River Big Springs Complex and Shasta Canyon**, Bill Trush, River Ecologist, McBain and Trush, Inc., and Institute for River Ecosystems

**Stream Ecosystem Flows for Geomorphic, Riparian, and Fisheries Recovery and Maintenance in Mono Basin Tributaries, CA**, Ross Taylor, Fisheries Biologist, Ross Taylor and Associates

**Instream Flow Analysis in the FERC Relicensing of PG&E's McCloud River Project**, Scott Wilcox, Senior Fisheries Biologist, Stillwater Sciences

**CA Department of Fish and Game Statewide Instream Flow Policy on Development of Flow Recommendations**, Robert Holmes, California Department of Fish and Game, Water Branch Instream Flow Program



*The Sanctuary Forest storage and forbearance program encourages landowners in the headwaters of the Mattole River to help preserve instream flows for salmon during the dry summer months.*

photo: Tasha McKee

## 2012 Conference Logistics & Events

### Conference Location

The conference is being held at the Davis Veterans' Memorial Hall at 203 East 14th Street, Davis, CA, 95616

### Conference Host Hotels

SRF has arranged discounted rates at the Hallmark Inn and the Aggie Inn in Davis. **The Hallmark Inn** is located at 110 F Street in Davis, CA. This premier hotel features a nightly cocktail reception and buffet breakfast. Group rates for doubles are \$125 and singles are \$115. This hotel will honor state and federal rates. To book a reservation, please call (530) 753-3600 by March 3, 2012. The group code is SRF. [www.hallmarkinn.com](http://www.hallmarkinn.com). **The Aggie Inn** is located at 245 1st Street, Davis, CA. The group block includes double rooms for \$99, single queens for \$89, King rooms for \$95, and cottages with a bedroom and living room with a sofa bed for \$115. To book a reservation, please call (530) 756-0352 by February 25, 2012. The group code is SRF. [www.aggieinn.com](http://www.aggieinn.com)

### 2012 Conference Poster Session

If you are interested in presenting at the 2012 Salmonid Restoration Conference Poster Session, scheduled for Friday evening, April 6, please contact [poster@calsalmon.org](mailto:poster@calsalmon.org)

Poster presenters must register in advance to ensure a space. For more information about the poster session, please see the FAQ section of the SRF website.



### SRF Call for Awards Nominations for 2012 Conference

SRF Presents Awards for Outstanding Achievements in the Salmonid Restoration Field. If you would like to nominate someone for the Restorationist of the Year award, the Lifetime Achievement award or the Golden Pipe award, please submit 200 words describing the accomplishments of the nominee by February 4, 2012 to [srf@calsalmon.org](mailto:srf@calsalmon.org)

### Field Tours

Field tours depart from the Conference facility at 9am. If you are going on a field tour please arrive early so you can pack a lunch and be ready to depart at 9am. Tours will return by 5 pm.

### Banquet

The Saturday evening conference banquet will include a wild Copper River salmon dinner with fine wines and beer, an awards ceremony, a cabaret, and the fantastic dance band, Sambada! If you would like to participate in the cabaret, please email [srf@calsalmon.org](mailto:srf@calsalmon.org). This event will sell out so buy your tickets in advance.





# Restoring Floodplain Processes to Increase Salmonid Populations

by Eric Ginney, ESA PWA

Rivers and their floodplains are among the most productive and diverse ecosystems on Earth. In California, particularly its Central Valley, they are also one of the most-altered ecosystems. Water supply and flood management systems generally overlay the network of natural waterways that are host to habitats and species that have been dramatically affected by human change—in some cases pushed to near-extinction

or beyond. There is increasing recognition of the importance of rivers and creeks being connected to their floodplains in supporting key ecosystem functions that can increase the number of successfully out-migrating smolts and sustain key in-channel habitats such as pools and riffles. While physical, institutional, and legal constraints on transportation, water supply, and flood management systems create enormous challenges in restoring

river-floodplain connectivity, there are also new drivers at work: recognition of species dependence on functional floodplains; deficiencies in existing infrastructure systems to meet societies needs; and the need to rethink society's infrastructure—particularly our flood management and water supply systems—in light of ongoing climate change.

In this workshop, we explore the functions of, and linkages between, the channel and its floodplain. We examine how fishes use floodplains, and how rivers and creeks interact with floodplains relative to the fluvial geomorphic process that create and maintain the habitat necessary for sustaining salmonid populations. We also explore strategies and design criteria for restoring floodplain habitat that benefits salmonids. Lastly, we touch on how these restoration techniques provide other benefits to society, chiefly increased options for safely managing floodwater, especially when changes in climate are considered.



*Looking upstream at the Three Rivers Levee Improvement Authority's (TRLIA) Feather River levee setback—which increased the floodplain by nearly 1,200 acres.*

photo: courtesy ESA PWA archives

## Analytical Approaches to Determine Instream Flow Needs for Salmonids and River Ecosystems

by Darren Mierau, California Trout

Instream flow studies share many common traits, the first of which is the need to identify streamflows that protect basic ecological attributes (e.g., processes, populations) of rivers and streams. In the face of competing demand for water resources, instream flow studies are often contentious and highly scrutinized. Studies typically involve some level of data collection to quantify instream conditions (e.g., water temperature) and relationships between physical conditions and water quantity (e.g., habitat-flow curves), evaluation of water supply availability, and often negotiation to establish instream flow requirements.

Perhaps the most challenging step in developing instream flow recommendations is the analysis and

integration of disparate data sets to identify a flow regime that balances competing ecological attributes (e.g., fluvial processes, riparian ecology, water temperature, and physical habitat structure). The integration stage of instream flow analysis often must address spatial and temporal variability in flow and habitat conditions, and consider habitat capacity (spatial habitat factors), biological productivity (growth rates, inter-specific competition, survival), and life history diversity (phenotypic and genotypic). Additionally, flow studies must conduct this analysis in a transparent manner that allows non-technical stakeholders to participate in decision-making. Ultimately the instream flow needs must be weighed against diversion needs and hydrograph

manipulation necessary to meet existing and future water demand.

Currently numerous instream flow studies or programs are being implemented in California, several of which have employed new approaches to data analysis and integration. Setting aside the often-debated topic of instream flow methods, this workshop will (1) offer a set of principles to guide flow study data analysis and integration, (2) describe several flow studies currently being implemented or just completed that utilize different analytical approaches, and (3) allow instream flow practitioners and others an opportunity to discuss concepts and approaches that may contribute to improving the application of study results.

# Conference Sessions

Friday, April 6

## Plenary Session

**Plenary Master of Ceremonies:** Mike Furniss, Pacific Northwest Research Station

**Salmon, People and Place: The Search for Sustainable Recovery,** Jim Lichatowich, author of *Salmon Without Rivers*

**Salmon: Past, Present, and Future and What the California Department of Fish and Game Can Do,** Chuck Bonham, Director, California Department of Fish and Game

**Managing the Delta for Fish and People,** John Laird, California Secretary of Resources

**Watershed Recovery from the Perspective of the North Pacific,** Xanthippe Augerot, author of *Atlas of Pacific Salmon*

## Friday Afternoon Concurrent Sessions

### Frontiers in River Restoration and Geomorphology

**Session Coordinator:** Gregory Pasternack, Department of Land, Air, and Water Resources, UC Davis, and Rocko A. Brown, ESA PWA and UC Davis

**River Assessment, Management, and Rehabilitation Using “Near-Census” Data and Models in the 21<sup>st</sup> Century,** Professor Greg Pasternack, Department of Land, Air, and Water Resources, UC Davis

**Should Streams be Managed as Drainage Networks or Habitat Networks?,** Michael M. Pollock, NOAA Fisheries, Northwest Fisheries Science Center

**Ecological Meaningful Flows in Restoration; Examples from California Salmon Streams,** Joseph Merz, Institute of Marine Sciences, UC Santa Cruz

**Community Assemblage in a Riparian Community: Investigating Phylogenetic Patterns Across an Abiotic to Biotic Environmental Gradient on the Sacramento River Floodplain,** Alex Fremier, PhD, College of Natural Resources, University of Idaho, Moscow

**Synthetic River Valleys,** Rocko A. Brown, ESA PWA and UC Davis

**Tools to Improve Water Temperature Management on the Lower American River,** Chris Hammersmark, Ecohydrologist, cbec eco engineering

### Managing the Bay Delta for Water and Fish—An Overview and Update on the Bay-Delta Planning Processes and Future Implementation

**Session Coordinator:** Campbell Ingram, Executive Officer of the Sacramento-San Joaquin Delta Conservancy

**Bay-Delta Recovery Efforts for Anadromous Fisheries—Will the State of California Delta Plan and the Federal HCP—Bay Delta Conservation Plan (BDGP)—Actually Lead to Recovery of Salmon and Steelhead in the Central Valley of California?,** Dr. Mark Rockwell, D.C., Northern California Council, Federation of Fly Fishers and Endangered Species Coalition



*After nearly a decade of anadromous fishery collapse in the central valley of California, there are significant efforts being made to both stabilize water reliability for 24 million Californians, and recover the Delta's ecosystem.*

photo: courtesy Delta Conservancy archives

**A New Era of Governance—In 2009 the Legislature Passed Historic Delta Legislation: Why? And Where are we Now?,** Tina Cannon Leahy, Principal Consultant, Assembly Water, Parks & Wildlife Committee

**The State of Freshwater Flows in the Bay Delta: an Overview and Reality Check for Delta Planning Processes,** Christina Swanson, Director, Science Center, Natural Resources Defense Council

**An Overview of the Delta Stewardship Council's Delta Plan from the Lead Scientist's Perspective,** Lead Scientist for Delta Science Program

**Delta Stewardship Council Bay Delta Conservation Plan,** Karla Nemeth, CA Natural Resources Agency

**An Overview of the Sacramento-San Joaquin Delta Conservancy and our Efforts to Balance Ecosystem Restoration with Economic Development,** Campbell Ingram, Executive Officer of the Sacramento-San Joaquin Delta Conservancy

### Utilizing Telemetry Studies to Guide Restoration Planning, Monitoring, and Evaluation

**Session Coordinator:** Cynthia LeDoux-Bloom, UC Davis and CA Department of Water Resources

**Using Radio Telemetry to Access Juvenile Steelhead Use of Thermal Refugia in the Klamath River,** Kim Brewitt, Graduate Student, UC, Santa Cruz, CA

**Using Acoustic Telemetry to Identify Habitat Associations During the Downstream Migration of Hatchery-reared Chinook Salmon and Steelhead Smolts in the Highly Modified Lower Sacramento River**, David Zajanc and Sharon H. Kramer, H.T. Harvey & Associates

**Using Radio Telemetry to Determine Seasonal Habitat Preference of Brown Trout in a Moderate-Gradient Stream in the Eastern Sierra Nevada Mountains**, Ross Taylor, Fishery Scientist, Ross Taylor and Associates

**Using Acoustic Telemetry to Determine Movements, Behavior, and Critical Spawning Habitat for Green Sturgeon in the Sacramento River**, Michael J. Thomas, UC Davis

**Using Acoustic Telemetry to Identify Predator Habitat and Route Preference of Sub-adult Striped Bass in the San Francisco Estuary Watershed**, Jennifer Hemmert, Salmonid Restoration Federation, and Cynthia LeDoux-Bloom, Ph.D Candidate, UC Davis

**Using Two-dimensional Acoustic Telemetry Along with Modeling Tools to Evaluate Fish Response to Habitat Features for Evaluating Project Designs Alternatives**, Brian M. Mulvey, Sacramento District, U.S. Army Corps of Engineers

### **Steelhead Restoration and Recovery**

**Session Coordinator:** Wendy Katagi, CDM

**Southern California Steelhead Recovery Plan**, Mark H. Capelli, National Marine Fisheries Service

**Restoration Opportunities Spurred by Steelhead Recovery in Southern California**, Wendy Katagi, CDM

**Framing Climate Change for Steelhead Recovery and River Restoration**, David Boughton, NOAA Fisheries

**Population Trends of Southern Steelhead as They Relate to Restoration Project Completion and Environmental Variables on the Lower Santa Ynez River**, Timothy H. Robinson, Cachuma Project Water Agencies

**Influence of Geology and Implications for Salmonid Habitat and Restoration: A Case Study on Sediment Loads and Bed Conditions from Two Adjacent Watersheds in the Santa Cruz Mountains, CA**, Brian Hastings, Balance Hydrologics, Inc.



*Both lagoons and oceanic systems are incredibly dynamic, combining coastal processes, fluvial discharge, sediment transport, and ecological resiliency.*

photo: David Revell, ESA PWA

**Using DIDSON to Provide Adult Steelhead Escapement Estimates in a Small Coastal Drainage of Central California**, Kerrie A. Pipal, NOAA Fisheries, Southwest Fisheries Science Center

### *Contributed Papers Session 5-7 pm*

**The Beneficial and Harmful Effects of the Pescadero Intermittent Estuary-marsh Ecosystem**, Eric Huber, UC Berkeley

**Bowling for Coho, Restoration of Large Wood Habitat and Flood Plain Activation on Straightened, Homogenous Reaches of San Vicente Creek**, Denis Ruttenberg, Stream Engineer, Natural Resources Conservation Service, USDA, and Jim Robins, IWRP Project Coordinator, Resource Conservation District of Santa Cruz County

**A Boulder and Log Moment Stability Analysis Toolkit for Channel Restoration and Design Elements**, Mark Strudley, Balance Hydrologics

**Can Eleven Years of Coho Salmon Adult, Parr, and Smolt Abundance Data Help Guide Restoration Planning, Monitoring, and Evaluation?** Sean P. Gallagher, California State Department of Fish and Game

**Feeding Habits of a Population of Southern Steelhead Trout (*Oncorhynchus mykiss*)**, Jenna Krug, Resource Conservation District of the Santa Monica Mountains

## **Saturday, April 7**

### *Saturday Morning Concurrent Sessions*

#### **Floodplain Processes and Restoration: Research and Application**

**Session Coordinator:** Eric Ginney, ESA PWA

**2D Hydrodynamic Modeling in the Yolo Bypass to Support Habitat Evaluation**, Chris Campbell, cbec inc.

**Application of Width Variation in Floodplain Design**, Jason White and Andy Collison, ESA PWA

**Hypothesis Driven Ecohydraulic Channel and Floodplain Design: Merced River, CA**, Rocko Brown, ESA PWA and UC Davis

**Trials and Tribulations: The Rocky Road of Restoration Implementation, A Case Study**, J.D. Wikert, U.S. FWS Anadromous Fish Restoration Program

**Restoring Floodplain Processes on the Sacramento River and Deer Creek, Tehama County, CA: Hyporheic Flow and Sediment Transport Implications of Enhanced River Corridor Complexity Associated with Restored Floodplain Connectivity**, Mark Tompkins, NewFields

**Colonization and Assemblage Structure of Aquatic Invertebrates in Seasonal Floodplain Habitat of the Lower American River, CA**, Steven Zeug, Cramer Fish Sciences

## **The Role of Artificial Propagation in Recovering Salmon Populations**

**Session Coordinator:** Michael Lacy, California Department of Fish and Game, Fisheries Branch

**Background and Recent Information on the Livingston Stone National Fish Hatchery's Role in Assisting in the Recovery of Endangered Winter Chinook Salmon in the Sacramento River,** Laura J. Mahoney, U.S. FWS, Red Bluff Fish and Wildlife Office

**Fin Clips: Implementation of Parentage Based Tagging at the Feather River Hatchery, CA,** Anthony J. Clemento, National Marine Fisheries Service, Southwest Fisheries Science Center

**The Role of Artificial Propagation in Restoring Spring-run Chinook Salmon to the Upper San Joaquin River, CA,** Molly R. Stephens, Genomic Variation Laboratory, University of California, Davis, CA

**Preventing Extirpation of Coho Salmon in the Central California Coast ESU,** Manfred Kittel, California Department of Fish and Game, Bay Delta Region

**The Use of a Captive Broodstock Program to Prevent Extinction and Assist in the Recovery of Coho Salmon (*Oncorhynchus kisutch*) Runs in Scott Creek, Santa Cruz County, CA,** Erick A. Sturm, National Marine Fisheries Service, Southwest Fisheries Science Center, Fisheries Ecology Division

**Monitoring Coho Salmon in the Russian River,** Paul G. Olin, University of California Sea Grant Extension Program

**Realistic Expectations for Hatchery-mediated Recovery: Can Hatcheries Help us Restore Salmonid Populations?,** Michael K. Lacy, California Department of Fish and Game, Fisheries Branch

## **The Downstream End: the Role of Coastal Lagoons and Ocean Conditions on Salmonid Restoration**

**Session Coordinators:** David Revell, Christina Toms, and Doug George, ESA PWA

**Comparing Coastal Processes and Lagoon Functioning along the Central Coast,** David Revell, ESA PWA

**Salt Trap Estuaries,** John Largier, Professor Bodega Marine Lab, UC Davis

**Modeling Restoration Scenarios in a California Bar-Built Estuary,** Dane K. Behrens, PhD Candidate, UC Davis



*Engineers have begun removing two dams on the Elwha River in Washington, to restore water flow and salmon runs  
photo: <http://imjustpuffy.blogspot.com/2011/11/fall-abb-abb-uugh.html>*

**Impacts of Urbanizing Watersheds, Climate Change and Altered Coastal Processes on the Breaching and Closure Patterns of a California Lagoon,** Andrew Rich, PhD Candidate Department of Earth Sciences, UC Santa Barbara

**A Feasibility Study Of Passive Managed Aquifer Recharge (MAR) Of MF/RO Concentrate At The Lower Carmel River Lagoon For Steelhead Habitat,** Mark Strudley, Balance Hydrologics, Inc.

**Utility Of A Newly Developed Rapid Assessment Tool For Describing The Condition And Ecological Services Of Central Coast Lagoons,** Ross Clark, Central Coast Wetlands Group at Moss Landing Marine Labs

## *Saturday Afternoon Concurrent Sessions*

### **Dam Removal to Benefit Salmonid Recovery**

**Session Coordinator:** Matt Stoecker, Stoecker Ecological Consultants

**Removing the Klamath River Dams—Results of Studies from a Landmark Restoration Program to Restore Anadromous Fisheries,** Ben Swann, CDM

**Marmot Dam: The Remains of the Day,** Gordon Grant, U.S. Pacific Northwest Forest Station

**An Update of Dam Removal Activities in the Elwha River—Dam Removal, Sediment Dispersal, and Fish Relocations,** Jeff Duda, U.S. Geological Survey, Western Fisheries Research Center

**Geomorphic Response to a Blow-and-Go Dam Removal on the Central California Coast,** Michael Love and Matt Stoecker, Mike Love & Associates

**Monitoring Fish and Habitat Responses to Barrier Removal Projects,** Leah Mahan, NOAA Restoration Center

**Freeing the Rogue: 4 Dams Down, 157 Miles of Stream Back,** Scott Wright, Water Resource Engineer, River Design Group

### **Genetic Effects of Hatcheries on Chinook Salmon Population Dynamics in the Central Valley**

**Session Coordinator:** Jacob Katz, UC Davis and Cal Trout

**Estimates of Hatchery Contribution to California's Central Valley Chinook—Results of 2010 Constant Fractional Marking Program Recovery Data,** Brett Kormos, California Department of Fish and Game

**Factors Contributing to Homogenization of the Central Valley Fall-run Chinook,** Brad Cavalo, Cramer Fish Sciences

**Do Salmon Hatchery 'Sources' Lead to In-River 'Sinks' in Conservation?,** Rachel Johnson, U.S. Bureau of Reclamation

**Temporal Trends in Hatchery Releases of Fall Chinook from California's Central Valley,** Stephanie Carlson, UC Berkeley

**Trans-generational Genetic Tagging as a Potential Means to Investigate Hatchery Effects: A Case Study from Lower Columbia River Fall Chinook,** Scott M. Blankenship, Cramer Fish Sciences

**Status Assessment of Central Valley Fall-Run Chinook,** Jacob Katz, UC Davis and Cal Trout

## Restoring the San Joaquin: A Future for Chinook Salmon

**Session Coordinators:** Michelle Workman, Fisheries Biologist, U.S. Fish and Wildlife Service, and Rene Henery, San Joaquin River Technical Advisory Committee

**Meeting the Information Needs for Restoration: Fisheries Studies for Water Year 2011/2012 on the San Joaquin River,** John Netto and Michelle Workman, U.S. FWS

**Evaluation of Hills Ferry Barrier Effectiveness at Restricting Chinook Salmon Passage on the San Joaquin River,** Don Portz, U.S. Bureau of Reclamation

**Restoration of Reach 2B—Integrating Salmon Restoration with Water Supply, Habitat Restoration and Fish Passage,** Tom Taylor, CardnoEntrix

**Migration Characteristics of Juvenile Fall-run Chinook Salmon through the San Joaquin River Restoration Area During Flood Operations,** Michelle Workman, U.S. FWS

**Application of the Emigrating Salmonid Habitat Estimation (ESHE) Model for San Joaquin River Chinook Salmon Restoration,** Paul Bergman, Cramer Fish Sciences

**Developing an Experimental Population Rule (10j) for Spring-run Chinook Reintroduction,** Rhonda Reed, National Marine Fisheries Service



# Telemetry: Getting the Fish Eye Perspective on Restoration Projects

by Cynthia LeDoux-Bloom

Biotelemetry is the transmission of ultrasonic signals at frequencies above the hearing range of humans, 20-500 kHz (20,000-500,000 cycles/sec). Ultrasonic and radio frequencies are used for transmitting data underwater and both have their utility. Transmitters (tag) are electronic devices implanted (preferred) or externally attached to a fish that transmits ultrasonic signals programmed with specific ping codes which identify individual fish. Acoustic receivers detect and decode transmissions from acoustic tags, actively tracking fish. Telemetry studies are commonly used to investigate fish behavior and define migration patterns, habitat use, and survival in the San Francisco Estuary Watershed (SFEW).

The SFEW encompasses 163,000 km<sup>2</sup> and is surrounded by the Sierra Nevada, Coast, and Cascade mountain ranges. It includes San Francisco Bay, the Sacramento-San Joaquin Delta and the Sacramento and San Joaquin rivers. It is composed of rivers, streams, and sloughs, some tidally influenced 160 km inland, which drain into the largest estuary on the west coast, and the Pacific Ocean. Over 42 reservoirs collect and store 15 million acre-feet of snow melt and rainfall from SFEW headwaters annually which is pumped to southern California to supply water to 27 million people and irrigate crops valued at \$37.5 billion per year.

To mitigate for past, current, and future aquatic habitat loss, government agencies, non-profit organizations, and private landowners collectively spend hundreds of millions of dollars annually on restoration projects. Outcomes of these projects focus on improving aquatic habitat conditions for critical life stages of listed species to facilitate increases in



*Relocating brown trout in Rush Creek, tributary to Mono Lake in January of 2006. Fish were located in low-velocity area underneath overhanging vegetation and shelfice.*

photo: Ross Taylor

survival and overall populations, with the ultimate goal of “delisting” and recovery. However, comparatively little money is spent on pre-project fish behavioral studies to determine life stage specific habitat preferences or to assess post-project monitoring and effectiveness.

Understanding aquatic habitat preferences in one of the world’s most heavily managed estuaries is crucial to

effective recovery planning which is often dependent on restoring critical habitat and defining “critical and preferred habitat” must be defined by fish. Telemetry provides an objective and defensible fish eye view into habitat preference. Existing telemetry data could be incorporated into the design, monitoring and evaluation of current restoration projects. Furthermore, designing telemetry studies which incorporate restoration planning may be mutually beneficial by expanding funding avenues and subsequent data utilization. Coupling project planning with telemetry studies would help assess project design guided by fish eye perspectives today, and into the future. Advances in acoustic transmitters can illustrate fish behavior in 2D, 3D, and in Real-time, giving detailed distribution and migratory movement. Hydroacoustics provide enumeration, presence/absence, abundance and distribution, and trajectory patterns. Incorporating the Fish Eye views provided by telemetry data can help prioritize restoration projects and increase the likelihood of success.

*VEMCO transmitters (top left) and receiver (above)*

photo: courtesy VEMCO



# Water Scarcity and Climate Change Adaptation in the Mattole Headwaters

by Tasha McKee, Sanctuary Forest

The Mattole River is located in coastal northwestern California and is part of the temperate rainforest ecosystem of the Pacific Northwest. The headwaters provide the key spawning and rearing habitat for endangered salmonids in the river system. For the last decade low streamflows have severely impacted this limited salmonid habitat.

The Mattole has a Mediterranean climate with most of the rainfall occurring in the winter and little to no rainfall in the summer. Water is abundant in the winter and scarce in the late summer and fall months. Prior to the last decade, the dry season averaged 3.5 months and streamflows in the headwaters mainstem and tributaries would become very low but never stopped flowing. However, in all of the extreme low flow years of the last decade the dry season has been observed to be significantly longer with rain ending sooner in the spring or starting later in the fall. In 2008, flows were the lowest ever recorded at the Petrolia USGS gage and the dry season was 4.7 months long. The mainstem stopped flowing in many locations along with 11 out of 13 fish-bearing tributaries including five tributaries with no human use. The way that humans use water and the land's capacity to store water will need to change to survive these longer dry seasons.

Sanctuary Forest developed two restoration strategies to improve Mattole flows. One strategy is based on changing human water use and the second strategy is based on restoring ground and surface water hydrologic functions impaired by land use practices. Both strategies are based primarily on storing water from the wet season for the dry season. Our storage and forbearance program was developed in response to the severe low flows of 2002, and outcomes from community meetings. This voluntary, incentive-

*A recharge pond  
in the winter*  
photo: Tasha McKee



based program helps landowners change their water use for the benefit of the river, fisheries and wildlife. Participating landowners forbear from exercising their riparian water rights during the low-flow season, and receive a water storage system and water management plan to ensure an adequate water supply. Over the last 5 years, 750,000 gallons of storage have been installed along with 12 forbearance agreements.

Management of the program involves low-flow season monitoring along with landowner notices and technical support needed to ensure forbearance. The program has been very successful with increased water security for people and increased streamflow for salmonids. Education and outreach have fostered community appreciation and pride in the program with many households practicing conservation and installing some storage on their own. The 10- year strategy for this program includes ending 80% of all summertime diversions along with implementing water conservation for households, school, businesses and small farms and improved flows in all inhabited reaches.

The second strategy is focused on restoration of hydrologic functions and increased groundwater storage. Research conducted since 2005 has shown that groundwater enhancement projects have the potential to restore healthy flows, even in drought years. Past land use practices including extensive logging and road systems have greatly decreased groundwater storage capacity resulting in higher winter runoff rates and lower summer flows. Removal of large wood from streams has also decreased groundwater storage through channel incision and loss of floodplain connectivity. In our analysis of Mattole groundwater conditions we have found it helpful to describe the groundwater as an underground tank with a limited capacity. Loss of the “infiltration sponge” and soil compaction has caused the “underground tank” to only partially fill up. Road cuts and channel incision cause rapid draining of groundwater and act as leaks in the “underground tank”. Extensive research, monitoring, and analysis of Mattole geology and hydrology show that groundwater recharge projects will need to be designed to either slow groundwater flow or utilize a design

whereby groundwater is continuously charged by adjacent surface water as occurs with beaver ponds, instream pools and offstream ponds. We are developing pilot projects to restore instream pools and groundwater storage in non-anadromous intermittent streams as well as anadromous incised streams. Pre-project analysis of expected outcomes include increased groundwater storage of

2 to 4 million gallons, increased summer streamflow of 10-20 gallons/minute, increased floodplain connectivity and wetland enhancement as well as improved summer and winter rearing habitat for anadromous projects.

While both of the strategies were developed specifically for the Mattole, they were informed by projects in other parts of the world. We have learned

from beaver pond stream restoration in Oregon and earthen dams (johads) built to slow monsoon rains and recharge groundwater in India. Restoration partners in the Mattole, agencies, funders, and our community have helped in this vital work to develop restoration strategies for water scarcity and climate change. We hope that our work also benefits other watersheds.

## Elwha Dam Removal

*Many in the salmon restoration community share great joy and optimism that we will witness major dam removals in our lifetime. Each year the list of small and large dam removals grows and with it a hint of what large-scale restoration can look like. The Elwha Dam removal is the largest dam removal in the history of our country. Over 80,000 dams are relics to the hydroelectric age and have become silt traps.*

*The Elwha dam removal is a \$351 million project that will occur in multiple stages and ultimately open up fish passage habitat for steelhead, Chinook, coho, sockeye, and pink salmon.*

*Removing the Elwha and Glines Canyon dams will free the Elwha River after nearly 100 years. Salmon populations will swell, from 3,000 to more than 300,000 as all five species of Pacific salmon return to more than 70 miles of river and stream.*

*The returning salmon and restored river will also help to renew the culture of the Lower Elwha Klallam Tribe, who have lived along the river since time immemorial. Tribal members will have access to sacred sites now inundated by water, and cultural traditions can be reborn.*

### Elwha River Dam Removal—Sediment Dispersal and Fish Relocations

by Jeff Duda, U.S. Geological Survey

After years of anticipation, volumes of Environmental Impact Statements, unprecedented mitigation projects, and the multifaceted collection of pre-dam removal data, the deconstruction phase of the Elwha River restoration project officially began this September. The removal of the 64 m Glines Canyon Dam and 33 m Elwha Dam represents one of the largest such projects of its kind in North America. The nearly 19

million m3 of sediment residing in the deltas and reservoirs will be eroded by the river in one of the largest releases of sediment into a river and marine waters in recorded history. The controlled release of sediment and the halting of dam notching and reservoir draw down during “fish windows” is largely determining a deconstruction schedule expected to last between 2 -3 years. High suspended sediment concentrations could last for up to 3-5 years following dam removal depending on weather conditions and river discharge. Anadromous fish, including three federally listed species (Puget Sound Chinook, steelhead, and bull trout), reside in the river downstream of Elwha dam for part of their life cycle. All five species of Pacific salmon and steelhead, which are either locally extirpated (sockeye) or persist in degraded spawning and rearing habitat, are expected to recolonize the watershed to degrees that will vary spatially and temporally due to life history characteristics and levels of human intervention. Because no fish passage structures were provided, naturally migrating salmon and their marine-derived nutrients have not seen the protected waters inside Olympic National Park since the Elwha dam was completed in 1913 at river kilometer 7.9. When passage is restored in 2014, salmon will have access to over 65 river kilometers of mainstem spawning and rearing habitat, at least as much floodplain channel habitat, and numerous tributaries, much of which occurs in wilderness.



*Every year, Chinook salmon still come back to the pool below Elwha Dam, where they have been blocked from continuing their journey to spawning grounds upstream since construction began on the dam in 1910. Contractors are taking down Elwha and Glines Canyon dams in the largest dam-removal project ever.*

photo: Steve Ringman / The Seattle Times

## Salmonid Restoration Federation

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# 30 Years of Fisheries Restoration— Focusing on a New Generation of Watershed Recovery

Dear Salmon Restoration Supporters,

Salmonid Restoration Federation is honored to be part of the ever-evolving fisheries habitat restoration movement. For nearly 30 years we have been producing one of the premier salmon restoration conferences. When I look back at old Proceedings and Conference Agendas it is easy to see how much this field has grown in scope, science, experience, diversity, and adaptive management.

The restoration movement is striving to restore habitat and recover fisheries as well as to restore ecological processes. This requires experimentation, cooperation from landowners, understanding fish, hydrology and geomorphology, and of course, funding!

SRF strives to offer a dynamic agenda that incorporates watershed thinking, pioneering ideas, and cutting-edge restoration and monitoring techniques. This particular conference agenda emphasizes the large-scale issues facing the fisheries restoration community including big dam removals, climate change, water shortages, fish passage and protection, as well as policy issues that shape how restoration and fisheries work is conducted.

SRF also represents the restoration field in our advocacy for increased restoration funding, the ability to utilize volunteers on restoration projects, and enhancing instream flows for fish.

SRF is a lean, grassroots organization. We don't have a lot of overhead and there are limited funding opportunities for technical education. SRF is dedicated to keeping the conference and our other trainings affordable for on-the-ground restoration practitioners. Membership dues help keep SRF afloat and provide some of our only non-designated income for advocacy on behalf of the restoration field.

A membership with SRF includes a discount at the conference, our bi-annual newsletter, and a membership vote for our illustrious Board of Directors. We encourage all of our supporters to become a SRF member. Please join SRF or renew your membership with the enclosed registration form or online at [www.calsalmon.org](http://www.calsalmon.org)

SRF is a small organization with a big agenda. With your support, we can continue to put on the annual Coho Confab, a Steelhead Summit, the Spring-run Chinook symposium, fish passage design and engineering field schools, and other trainings that benefit salmonid recovery.

Thank you for your contribution,

*Dana Stolzman*

Dana Stolzman  
Executive Director  
& Conference Agenda Coordinator

