

# Salmonid Restoration Federation

Winter 2008/2009

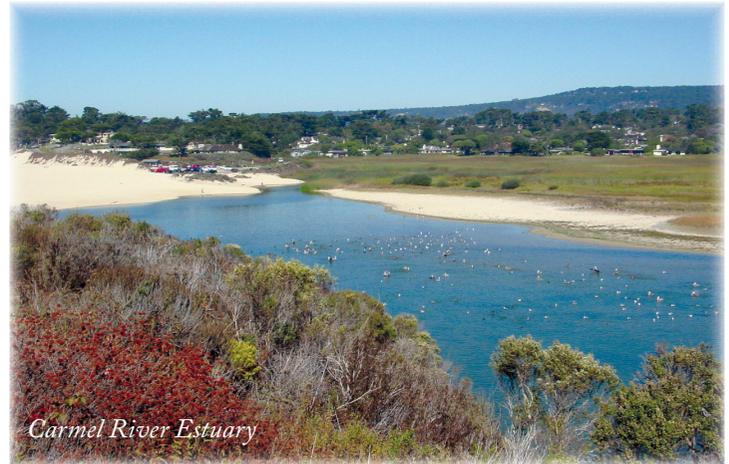
## 27<sup>th</sup> Annual Salmonid Restoration Conference

### *Elements of Watershed Restoration*

The 27<sup>th</sup> Annual Salmonid Restoration Conference will be held March 4-7, 2009 in Santa Cruz, California. This is the premiere habitat restoration conference in the Pacific Northwest and hosting the conference in Santa Cruz affords wonderful opportunities to view projects on the Central Coast and highlight issues that pertain to coastal watershed and coho salmon recovery.

This year the conference will feature workshops on topics including Estuary Restoration, Fish Passage Design and Implementation, Coho Use and Restoration of Off-channel Habitat, Watershed Monitoring and Assessment, and Sustainable Agriculture: Water Quality and Riparian Habitat Restoration. All day field tours will include tours highlighting Resource Management for Steelhead and Coho Salmon Conservation in Santa Cruz County: a Tour of San Lorenzo River and Soquel Creek projects; Carmel River Restoration Projects; Southern Coho Streams and the NOAA Lab and Broodstock Program; Coho Salmon and Steelhead Enhancement Projects on the Santa Cruz North Coast; Dams and Daylighting: Progress and Opportunities in San Francisquito Creek; and half-day tours of fish passage projects and sustainable agriculture projects in conjunction with those morning workshops.

The Plenary session will feature Dr. Peter Moyle and Dr. Josh Israel from UC Davis who will discuss the state of California salmonids in California, Mike Furniss from Redwood Sciences Lab who will address climate change and salmonid recovery, Dr. Astrid Scholz of Ecotrust will give a presentation on how economic challenges in the coastal zone affect salmonids, and Dr. Bob Curry of Watershed Systems



*Carmel River Estuary*

will highlight the status of restoration efforts in Monterey Bay and adjacent watersheds. SRF has also invited former Assembly member John Laird of the Santa Cruz region.

Concurrent sessions address biological, policy, environmental and physical issues affecting salmonids. Concurrent sessions include the following topics: Water Diversions & Water Wars in California; FERC Relicensing Restoration Opportunities; Central & South Coast Steelhead: Biology, Genetics, and Recovery Strategies; Fire Ecology, Forests, and Fisheries; Dam Removal and Modifications for Salmonid Recovery; Restoration at the Crossroads; Juvenile Steelhead and Coho Salmon: Central Coast Habitat and Population Research, Hydrologic and Geomorphic Legacy Issues: Solutions for the Past and the Future; Coho Salmon Recovery and Restoration: Putting Theory into Practice.

To learn more visit [www.calsalmon.org](http://www.calsalmon.org)

### Resource Management for Steelhead and Coho Salmon Conservation in Santa Cruz County

Coordinated by Chris Berry, Water Branch of Santa Cruz; and Kristen

Kittelson, Fishery Resource Planner, County of Santa Cruz; this field tour will visit the San Lorenzo River and Soquel Creek. Within these two key watersheds, the County and City of Santa Cruz, and the City of Capitola have a long history of attempting to balance resource protection, public safety, property rights, and regulatory requirements. Control and management of watershed-wide sediment sources, protection of large woody debris and

overall riparian functions, essential flood control activities, municipal water supplies and lagoon habitats will be described and illustrated. On the San Lorenzo River participants will learn how the City balances flood control, water supply, public access and steelhead habitat conservation. Participants will learn about managing the lagoon for steelhead and utilizing large woody material and vegetation management for flood control.



*San Lorenzo River estuary*

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*Happy Spawning Season!* Salmonid Restoration Federation was formed in 1986 to help stream restoration practitioners advance the art and science of watershed restoration. SRF is a statewide non-profit organization that promotes restoration, stewardship, and recovery of California native salmon, steelhead, and trout populations through education, collaboration, and advocacy. SRF accomplishes its mission by hosting the premier annual salmonid restoration conference in various regions throughout California; habitat restoration field schools focused on fish passage, bioengineering, and erosion control; and symposiums regarding Spring-run Chinook and coho salmon recovery efforts.

SRF is a small, grassroots organization with a big agenda. California's fisheries are devastated from over a century of unregulated logging and road building, dam building, rampant development, and loss of freshwater habitat. SRF is dedicated to recovering salmonids by offering affordable technical and hands-on trainings to the restoration community and educating the public about the plight of endangered salmon and the need to preserve and restore habitat to recover the species. SRF realizes that California's once magnificent runs of wild salmon and steelhead will not be saved solely by restoration and education, so we continue to advocate for protection of instream flows, wild stocks of salmon, key refugia habitats, and increased restoration funding.

SRF is excited to be hosting the 27<sup>th</sup> Annual Salmonid Restoration Conference in Santa Cruz, California. This year's conference is entitled, "Elements of Watershed Restoration," and will address physical elements that affect salmonid recovery including fire ecology, climate change, oceanic conditions, hydrology and geomorphic response. As you can see, we have a dynamic agenda with outstanding movers and shakers in the restoration field.

SRF will also be offering a host of other technical education trainings in 2009 including the 4<sup>th</sup> Annual Spring-run Salmon Symposium on the Salmon River, the 12<sup>th</sup> Annual Coho Confab on the Mendocino Coast, a Bioengineering Field School on the Central Coast, and a Roads Maintenance and Erosion Control Field School on the North Coast.

Despite our scope of work and successful track record of producing affordable trainings for restorationists, this is a challenging time for service-based organizations to stay afloat. Your membership dues help us advocate for the livelihoods of thousands of people who have devoted their lives to habitat restoration and Salmonid recovery. Please help us to help the restorationists who help fish.

Your contribution enables us to offer effective trainings, produce a dynamic annual conference, and share information about pressing issues that affect salmonids and habitat restoration efforts. Please join Salmonid Restoration Federation in our efforts to recover wild salmon and restore watersheds.

For wild salmon,

*Dana Stolzman*

Dana Stolzman, Executive Director



P.S. Your membership entitles you to two newsletters a year, a substantial discount at our annual conference, and a monthly electronic newsletter with posting regarding restoration funding opportunities, trainings, and job announcements.

# Passenger Pigeons, Dodo Birds...Condors and Coho?

## Central California Coast Coho Salmon and Our Last Chance to Save Them from Extinction

.....By Charlotte Ambrose, Recovery Coordinator, Santa Rosa, CA

Central California Coast (CCC) coho salmon are critically at risk of becoming extinct in the near future. National Marine Fisheries Service (NMFS) listed this species as threatened under the Federal Endangered Species Act in October 1996. The population continued to plummet towards extinction, and they were relisted to endangered in June 2005. More recent data reveals a continued precipitous decline of CCC coho salmon. A coordinated, strategic and range-wide effort must begin immediately or we face the loss of an iconic species. The dire status triggered a shift in the focus of Federal recovery planning: a shift from recovery to, first, halting coho's alarming pace towards extinction. The federal recovery plan for CCC coho salmon is targeted for public release in March 2009. Population data and criteria, developed by the NMFS Southwest Fisheries Science Center, set the foundation for the recovery scenario. To assess current instream conditions and threats, data were gathered from all possible sources willing to provide their information, including the public, stakeholders and agencies (especially the California Department of Fish and Game).

### NMFS' preliminary findings:

1. CCC coho salmon populations are at critically low levels, or no longer exist (e.g., extirpated), in all but a few watersheds south of the Navarro River.
2. CCC coho salmon survival through, and between, life stages are poor due to impaired habitats for egg survival and emergence, juvenile summer and over-winter rearing, and smolt outmigration. Generally, poor habitats are the result of a region-wide lack of complex pools/off-channel/floodplain habitats, high summer water temperatures and excessive instream sediment. Habitat impairment has been linked

with roads, timber harvesting and conversion, channel modification, water diversion and impoundment, climate change and agricultural practices.

3. Poor ocean conditions also have a prominent role in the species' decline, and are acting in synchrony with poor instream conditions. Coho have evolved under fluctuating conditions for centuries, but the rate of change in the freshwater systems (due to human activities) has accelerated habitat impairment and, thus, population declines. A year or two of poor marine survival has different implications for the population in a watershed that produced 200 smolts versus one producing 20,000 smolts.

### The federal recovery plan's immediate goals for CCC coho salmon are to:

1. Prevent extinction by protecting all existing populations and their habitats
2. Maintain current populations and expand them through focused and prioritized restoration actions in critical areas
3. Prevent degradation of existing high quality habitats across the historical range (especially areas that have supported populations within the last four generations)
4. Restore habitat conditions and watershed processes across the range

5. Control and abate future threats to provide for their long term survival and recovery

### The top ten priority actions to attain these goals are:

- 1. Implement Statewide Coastal Monitoring as soon as possible
- 2. Target restoration funds to critical areas and needs (e.g., current watersheds with CCC coho salmon persisting, emphasizing large woody debris (LWD) and floodplain/off-channel areas)
- 3. Improve and enforce water resource regulations
- 4. Work with key counties on general plans, ordinances and LWD retention programs
- 5. Promote improvements in all local/State/Federal policies and practices for roads
- 6. Encourage State Board of Forestry to develop no-take rules or apply for a Statewide HCP, provide incentives to retain forestlands and reduce forest conversions
- 7. Conduct outreach on climate change and encourage all local/State/Federal planning to account for anticipated droughts and climate change
- 8. Create incentives to promote immediate species protection and habitat enhancement
- 9. Ensure continuous funding for the CCC coho salmon Russian River Captive Broodstock Program
- 10. Immediately create a coho strike team to respond to issues, conduct outreach and develop multidisciplinary groups to work on preventing CCC coho extinction and facilitate recovery implementation



A juvenile coho

photo: NMFS Science Center



# Paradise: the 11<sup>th</sup> Annual Coho Confab on the Smith River

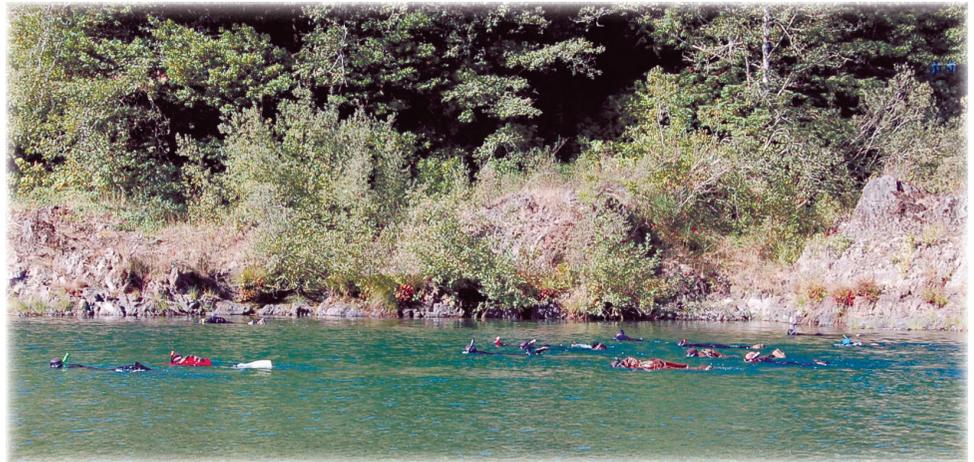
Over 100 fishheads migrated to the pristine South Fork of the Smith River to participate in the 11<sup>th</sup> Annual Coho Confab this September. The Confab is a symposium to explore watershed restoration, learn restoration techniques to recover coho salmon populations, and to network with other fish-centric people. To confabulate literally means to informally chat or to fabricate to compensate for gaps in one's memory. (Not to imply that restorationists are prone to hyperbole when recounting the size of a rescued fish, the magnitude of the waterfall coming out of the culvert, or the heroics of a particular restoration job!) The Confab is an informal gathering of restorationists that allows participants to learn skills and practices that can be applied to restore habitat in their home watershed.

The 11<sup>th</sup> Annual Coho Confab is annually hosted by the Salmonid Restoration Federation and Trees Foundation. This year's additional co-sponsors included the California Department of Fish and Game, Smith River Alliance, Smith River Advisory Council, and Cal Trout.



*Rich Nelson and Thomas Dunklin preparing wild Klamath salmon that was generously donated by Yurok tribal members to the Confab. The fish was smoked on redwood stakes around an alder fire.*

Orientation presentations included opening talks about the significance of the Mill Creek watershed acquisition in protecting and restoring a salmon stronghold, by Grant Werschull of Smith River Alliance and Zack Larson of the Smith River Advisory Council. Tom Weseloh of Cal Trout discussed Coho Salmon from State CESA listing to Local Restoration Projects. Research



*Zack Larson led an underwater fish identification and snorkeling workshop on the Smith River.*  
all Confab photos by Dana Stolzman

Ecologist Frank Lake presented on how upslope fire and forest management affect fish by providing a review of tribal and scientific knowledge about the effects of fires on fisheries.

This year's Confab featured restoration tours in the Mill Creek watershed, tributaries of the South Fork, Yontocket Slough and the Smith River estuary. Randy Lew of Pacific Watershed Associates led a tour of road decommissioning and erosion control projects in Dominie and Rowdy Creeks. State Park geologist Rocco Fiori discussed experimental wood loading designs to enhance stream function and salmonid habitats. A full-day tour of Mill Creek restoration projects included presentations by Dan Burgess of Rural Human Services who led a tour of the native plant nursery for Mill Creek restoration, Lathrope Leonard of Redwood National and State Parks who led a forestry tour focused on restoring late seral forests, and Brian Merrill of California State Parks who discussed

backcountry road management in North Coast Redwoods State Parks and rehabilitating watershed function. Rod McLeod of the Mill Creek Monitoring Program led a hands-on workshop assessing juvenile coho summer abundance estimation in Mill Creek.

Additionally, Zack Larson facilitated a Smith River fish identification workshop. Antonio Llanos of Mike Love & Associates led a tour of fish passage projects and co-led a tour of Yontocket Slough and the Smith River estuary with Zack. Other workshops included instream fish identification, and macro-invertebrate sampling and stream health assessment.

Each year the Confab is held in a different location on the North Coast. The 12<sup>th</sup> Annual Confab will be held near the Big River on the Mendocino Coast. Please join us!



*Antonio Llanos of Mike Love & Associates giving a presentation on local fish passage projects before the group departs to check out the on-the-ground work.*

# Salmonid Restoration Federation's

## 27<sup>th</sup> Salmonid Restoration Conference

### Elements of Watershed Restoration

March 4-7, 2009  
Santa Cruz, CA



### Co-Sponsors:

American Fisheries Society Cal Neva Chapter; Americorps Watershed Stewards Project; Balance Hydrologics, Inc.; The Bay Institute; Bureau of Reclamation, Central CA Area Office; California Conservation Corps; California Department Fish & Game; Cal Trout; California Hydropower Reform Coalition; City of Santa Cruz-Water Branch; Coastal Conservancy; Coastal Watershed Council; County of Santa Cruz Environmental Health Services; County of Santa Cruz Fish and Game Advisory Commission; Department of Water Resources; D.W. Alley & Associates; East Bay Municipal Utility District; East Bay Regional Park District; Fall Creek Engineering; Greening Associates; Kittleson Environmental Consulting Services; Marin Municipal Water District; NOAA Restoration Center; Northern California / Nevada Council Federation of Flyfishers; Pacific Coast Fish, Wildlife and Wetlands Restoration Association; Pacific Watershed Associates; Pacific Gas & Electric; Pacific States Marine Fisheries Commission; Philip Williams and Associates, Ltd.; Prunuske Chatham, Inc.; Restoration Design Group; San Francisco Estuary Institute; San Gregorio Environmental Resource Center; Santa Cruz Fly Fishermen; Santa Cruz Group of the Ventana Chapter of Sierra Club; Santa Cruz Resource Conservation District; Solano County Water Agency; Sonoma County Water Agency; Stoecker Ecological Consultants; Trout Unlimited; US Fish & Wildlife Service; Winzler and Kelly



# Searsville Dam Removal: A Unique Opportunity

.....By Matt Stoecker, Stoecker Ecological Consultants and Beyond Searsville Dam

For over a century Searsville Dam has had an enormous impact within Stanford University lands, the San Francisquito Creek watershed, and greater San Francisco Bay estuary. The 65-foot tall Searsville Dam is an excellent sediment trap, and since its construction the reservoir has lost over 90% of its original water storage capacity as almost 1.5 million cubic yards of sediment has filled in the reservoir.

San Francisquito Creek is home to several sensitive species including one of the last, wild, self-sustainable runs of threatened steelhead trout in the South San Francisco Bay. A recent 2007 report by the Center for Ecosystem Management and Restoration identified San Francisquito Creek as one of eight "Anchor Watersheds" for steelhead in San Francisco Bay, which is "critical" to steelhead recovery. Another recent report states that San Francisquito Creek "possibly supported coho salmon" and that in the years immediately following the construction of Searsville Dam the

caretaker for the dam described that "salmon" would swim upstream as far as the dam. Using a pitchfork, the caretaker could spear them below the dam to supplement the family's diet (Liedy 2006). The Department of Fish and Game also considers the watershed home to one of the key steelhead populations left on the Central California Coast.

The impassable and obsolete Searsville Dam blocks anadromous fish and other aquatic species from accessing the largest tributary in the watershed where native rainbow trout still persist. The artificial habitat of Searsville Reservoir supports numerous exotic and invasive species, including a variety of fish and bullfrogs that compete with and prey upon native species both within the reservoir and downstream where they spill over. With the removal of Searsville Dam and elimination of the reservoir's stillwater habitat, populations of exotic fish would be eliminated or greatly reduced.

The reservoir behind the dam also flooded a unique "confluence valley"

where five streams merged among adjacent wetland ponds before squeezing through a small gorge where the dam now stands. Restoration of this submerged valley may provide an extremely valuable and needed flood control function as a natural sponge that can soak up winter flows and releases them gradually while providing excellent wetland habitat.

Managers of ongoing wetland restoration projects in San Francisco Bay have expressed a need for millions of cubic yards of clean sediment over the next few decades, and dam removal could provide some of this sediment back to the bay where it was intended to go before the dam was built.

Across the country and around the world owners of obsolete dams are now collaborating with local communities and resource agencies to remove these aging structures because of recognized benefits, ranging from long-term cost savings, eliminated risk, reduced environmental regulatory disputes, improved ecosystem health, project cost sharing, and in many cases improvements to flood protection and water supply operations. The removal of Searsville Dam has the potential to provide most or all of these benefits to Stanford University as well as the greater watershed and San Francisco Bay. There are many questions to be answered as to the trade-offs, technical design planning, costs, and outcomes of numerous dam removal options that could be chosen. These are answers that we can and must pursue.



*Upstream of the dam Corte Madera Creek supports native trout where steelhead once spawned.*

photo: by Matt Stoecker

## Logistics

**Conference Facility:** City of Santa Cruz: Civic Auditorium [www.ci.santa-cruz.ca.us](http://www.ci.santa-cruz.ca.us) at 307 Church Street

**Lodging:** SRF has arranged discounted rates at the Best Western and Continental Inn in Santa Cruz, both of which are on Ocean St., walking distance to the conference facility at the Civic Auditorium in downtown Santa Cruz.

**The Continental Inn** at [www.continentalinnsantacruz.com](http://www.continentalinnsantacruz.com), is offering rooms for \$75 with a continental breakfast. To receive this rate, please call (831) 429-1221 by February 4 and let them know that you are with SRF. The group rate for the **Best Western Inn** in Santa Cruz is \$106 for single or double rooms with a full breakfast. To receive this rate, please call (831) 458-9898 by January 24 and let them know that you are with the salmon group.

**Awards:** 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 for innovations in the restoration field, please email [srf@calsalmon.org](mailto:srf@calsalmon.org) 200 words describing the nominee's accomplishments by January 16, 2009.

**Cabaret, Poster Session, or Work Trade:** to learn more about these opportunities please email [srf@calsalmon.org](mailto:srf@calsalmon.org)  
**Scholarship Info:** SRF has limited scholarships available. To apply please email [srf@calsalmon.org](mailto:srf@calsalmon.org) a paragraph by February 15 describing how you would benefit from attending the conference.

**Other Logistical Info:** Check out [www.calsalmon.org](http://www.calsalmon.org)

# Salmonid Restoration Federation 2009 Conference

Individual Registration Form, **Please Use One Per Person** • Advanced Registration Must Be Postmarked By February 13, 2009

Name: \_\_\_\_\_ Phone (work): \_\_\_\_\_  
 Address: \_\_\_\_\_ (home): \_\_\_\_\_  
 Email: \_\_\_\_\_  
 Affiliation: \_\_\_\_\_ Please check box if you are a presenter

## Training Workshops & Field Tours

### Wednesday, March 4, 2009

|   | Advance<br>Registration | Late<br>Registration | FEE   |
|---|-------------------------|----------------------|-------|
| 1. Estuary Restoration Workshop   | \$55                    | \$65                 | _____ |
| 2. Sustainable Agriculture:<br>Water Quality and Riparian Habitat Restoration           | \$55                    | \$65                 | _____ |
| 3. Southern Coho Streams: Research and Recovery   | \$55                    | \$65                 | _____ |
| 4. Coho Salmon and Steelhead Enhancement Projects<br>on Santa Cruz County's North Coast | \$55                    | \$65                 | _____ |
| 5. Dams and Daylighting:<br>Success and Opportunity on San Francisquito Creek           | \$55                    | \$65                 | _____ |

### Thursday, March 5, 2009

|   |      |      |       |
|---|------|------|-------|
| 6. Coho Off-Channel Habitat Workshop  | \$55 | \$65 | _____ |
| 7. Watershed Monitoring & Assessment  | \$55 | \$65 | _____ |
| 8. Fish Passage at Road Stream Crossings:<br>Design, Planning, and Implementation Workshop & Tour       | \$55 | \$65 | _____ |
| 9. Resource Management for Steelhead and Coho Salmon<br>A Tour of San Lorenzo River and Soquel Projects | \$55 | \$65 | _____ |
| 10. Carmel River Restoration Tour   | \$55 | \$65 | _____ |

\* Field tours include a bagged lunch and transportation. Please wear clothing, raingear, and shoes appropriate for field tours.

|  |      |      |       |
|--|------|------|-------|
| Evening: Wild and Scenic Environmental Film Festival | \$10 | \$12 | _____ |
|--|------|------|-------|

## Conference

**March 6-7, 2009** (includes Friday and Saturday lunch and a copy of the Proceedings)

|   |       |       |       |
|---|-------|-------|-------|
| SRF Member (individual membership only) | \$120 | \$150 | _____ |
| Non-member                              | \$170 | \$200 | _____ |
| Student (with photocopy of student ID)  | \$70  | \$80  | _____ |

## Saturday Banquet

|   |      |      |       |
|---|------|------|-------|
| (Preference: Salmon _____ Chicken _____ Vegetarian _____) | \$30 | \$35 | _____ |
|---|------|------|-------|

## Membership

New  Renewal

Individual Memberships:  \$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 provided upon request • This form is available at [www.calsalmon.org](http://www.calsalmon.org)**

# Training Workshops & field tours

**Wednesday, March 4**

## *Workshops*

### **Estuary Restoration Workshop**

**Workshop Coordinators:** Gillian O'Doherty and Leah Mahan, NOAA Fisheries

This workshop will focus on assessment, planning, and design considerations for estuarine restoration in California. Topics covered will include site evaluation, design considerations, regulatory compliance, and public outreach.

*Pescadero Marsh Restoration: Identifying Problems and Exploring Solutions*, **Jill Marshall, P.G.**, San Francisco Bay Regional Water Quality Control Board and **Joanne Kerbavaz**, California State Parks

*Estuary Enhancement in the Humboldt Bay Watershed—Can Adaptive Management Reduce Design and Permitting Costs?*, **Don Allan**, Redwood Community Action Agency

*Water Quality Dynamics of Pescadero Lagoon and Implications for Fish Mortality*, **Rebecca Sloan**, TRA Environmental

*Assessment of Hydrologic and Geomorphic Constraints on Estuarine Restoration*, **Conor O'Shea**, USFWS Coastal Program

*Estuarine Enhancement Strategies that Target Nutrient Availability*, **Nicole Beck**, 2nd Nature

*Restoration in a Restless Society: Working with Stakeholder Groups in Coastal California*, **Brannon Ketchum**, Point Reyes National Seashore

### **Hang Fin! Sustainable Agriculture and Salmonids in Surf City, U.S.A Workshop & Tour**

**Workshop and Tour Coordinator:** Kent Reeves, Yolo County Department of Parks & Resources

The classroom portion of the workshop will address the challenges of sustainable agriculture with an emphasis on water quality and riparian habitat restoration in the Monterey Bay Area. The field tour will visit several farms and ranches in the region that highlight sustainable practices that benefit riparian habitat and water quality.

*Biodiversity and Agriculture*, **Jo Ann Baumgartner**, Wild Farm Alliance

*Developing Healthy Riparian Habitat on Farms for Biodiversity*, **Sam Earnshaw**, Community Alliance with Family Farms

*Sustainable Grazing for Improving Water Quality and Riparian Habitat*, **Kent Reeves**, Yolo County Department of Parks & Resources

*Understanding the Environmental Toxicology of Pesticide Exposures to Salmon*, **Christopher A. Pincetich**, Salmon Protection and Watershed Network (SPAWN)

## *Field Tours*

### **Coho Salmon and Steelhead Enhancement Projects on Santa Cruz County's North Coast Tour**

**Tour Coordinator:** Kristen Kittleson, County of Santa Cruz

**Tour Leader:** Matt Baldzikowski, Midpeninsula Regional Open Space District

This field tour will visit a number of successful restoration and enhancement projects on the beautiful and rugged North Coast of Santa Cruz County, including stream channel rehabilitation sites in the Waddell, Scott, and San Vicente Creek watersheds.

### **Southern Coho Streams: Research and Recovery Tour**

**Tour Coordinator:** Kristen Kittleson, County of Santa Cruz

**Tour Leader:** Sean Hayes, NOAA Fisheries, Carla Moss and Dave Streig, Hatchery Managers, and Carlos Garza and Erick Sturm, Coho Salmon Broodstock Program

This field tour will visit sites important to research and recovery of coho salmon in Santa Cruz County, which is the most southern distribution of the population on the West Coast. Tour sites include Scott and Waddell Research stations, Monterey Bay Salmon and Trout Project's Conservation Hatchery at Big Creek, and NOAA's Santa Cruz broodstock program and genetics laboratory.

### **Dams and Daylighting: Success and Opportunity on San Francisquito Creek Tour**

**Tour Coordinator:** Matt Stoecker, Stoecker Ecological and Beyond Searsville Dam

San Francisquito Creek provides critical habitat to one of the last wild steelhead runs in the south San Francisco Bay. Participants will tour the Jasper Ridge Biological Preserve, Searsville Dam, other small dams and fish ladders, and Portola Valley's brand new LEED certified green Town Center project where we will observe the first year of flow along the newly daylighted and restored Sausal Creek.

*Participants in the Dam Removal Tour will visit Stanford University's private Jasper Ridge Biological Preserve and tour Searsville Dam with the preserve director to discuss future challenges and opportunities with the nearly sediment filled reservoir and major steelhead migration barrier.*

photo: by Matt Stoecker



## Thursday, March 5

### Workshops

#### Fish Passage at Road Stream Crossings: Design, Planning, and Implementation Workshop & Tour

**Workshop Coordinator:** Mike Love, Mike Love & Associates

The morning workshop will include a presentation on the newly completed fish passage design manual and an overview of regional planning efforts that have addressed numerous fish passage problems in Santa Barbara, Santa Cruz, and Marin Counties. The afternoon tour will visit retrofits of existing road-stream crossings that used different approaches to address passage.

*California Department of Fish and Game Fish Passage Design Manual, Mike Love, Michael Love & Associates*

*Restoring Steelhead in Carpinteria Creek, Santa Barbara County, Mauricio Gomez, South Coast Habitat Restoration*

*Seasonal Juvenile Portable Fish Ladder Boxes on Zayante Creek, Felton, California—Design, Implementation, and Adaptive Operation and Management Plan, Peter Haase, P.E., Fall Creek Engineering*

*Vanquishing Barriers in Marin County—Project Based Experience and Lessons Learned From the Field, Kallie Kull, Marin County Public Works Fish Passage Program*

#### Coho Use of Off-Channel Habitat Workshop

**Workshop Coordinator:** Kit Crump, NOAA Restoration Center

This workshop will present examples of coho use of off-channel habitat and restoration techniques that directly support the creation and maintenance of off-channel habitat features as a key recovery action for CCC coho.

*Overview of Off-Channel Habitats and their Use by Coho Salmon, Kit Crump, NOAA Restoration Center*

*History and Coho Use of Off-Channel Habitats on San Vicente Creek, Mike Podlech, Independent Fisheries Biologist*

*Design Constraints of the Lower and Upper San Vicente Pond Off-Channel Habitat Projects, Brian Hastings, Balance Hydrologics*

*Permitting Issues Associated with Off-Channel Habitat Restoration Projects, Jim Robins, Alnus Ecological*

*Steelhead and Chinook Salmon use of Two Engineered Side Channels in the Central Valley, a Look at Pros and Cons of Design Implementation, Walter Heady, UC Santa Cruz*

*Coho Use of Off-channel Habitat in the Lower Klamath River, Dan Gale, Yurok Tribal Fisheries Program*

*Visions and Goals: Tracking the Success of Off Channel Restoration for Juvenile Salmonids, Joe Merz, Cramer Fish Sciences*

*Juvenile Salmonid Use of a New, Artificial Off-channel Pond in the Scott River, Siskiyou County, Mark Pisano and Mary Olswang, California Department of Fish and Game*

#### Watershed Monitoring and Assessment Workshop

**Workshop Coordinators:** Armand Ruby, Coastal Watershed Council (CWC) and Chris Choo, Marin County Department of Public Works

Salmonid streams are subject to a variety of stressors, from water quality impacts to loss of habitat. This workshop will focus on the methods and results of watershed monitoring and assessment, and will cover urban, agricultural and rural environments.

*Presence and Impacts of Current-Use Pesticides in Coastal Watersheds, Armand Ruby, Coastal Watershed Council*

*Legacy Pesticides in Central Coast Rivers: the Land-Sea Connection, Dane Hardin, CCLEAN/Applied Marine Sciences*

*Using Watershed Stewardship Planning Efforts in Marin County to Inform Stormwater Program Activities, Monitoring, and Watershed Assessment, Terri Fashing, Marin County Stormwater Pollution Prevention Program*

*Marin County Watershed Stewardship Planning: Getting to Realistic Targets and Habitat Goals, Chris Choo, Marin County Dept. of Public Works and Lauren Hammack, Prunuske Chatham, Inc.*

*How Healthy is your Watershed? Recent Progress on Developing Indicators of Ecological Health and the Potential Applications in the San Francisco Bay Area and Beyond, Kat Ridolfi, San Francisco Estuary Institute*

*How Monitoring Can Guide us in Urban Watershed Restoration—Developing an Improved Understanding of the Causes of Aquatic Life Use Impacts in Lower South San Francisco Bay Salmonid Streams, Chris Sommers, EOA, Inc.*

*Towards a Comprehensive Monitoring Strategy for the Sonoma Valley Watershed, Lisa Micheli, Ph.D., Sonoma Ecology Center*

### Field Tours

Please see [www.calsalmon.org](http://www.calsalmon.org) for a full list of the tour leaders.

#### Resource Management for Steelhead and Coho Salmon Conservation in Santa Cruz County: San Lorenzo River and Soquel Creek Projects Tour

**Tour Coordinators:** Chris Berry, Water Resources Manager, City of Santa Cruz and Kristen Kittleson, Fishery Resource Planner, County of Santa Cruz

This field tour will visit sites to discuss the complex management issues and corresponding local practices associated with steelhead and coho salmon conservation within the San Lorenzo River and Soquel Creek, Santa Cruz's most heavily urbanized and impacted watersheds.

#### Carmel River Restoration Tour

**Tour Coordinator:** Michael Wellborn, President, California Watershed Network

**Tour Leaders:** representatives from Philip Williams & Associates, Ltd., Big Sur Land Trust, Carmel River Watershed Conservancy, Monterey Peninsula Water Management District, Planning and Conservation League Foundation, and Balance Hydrologics

The Carmel River tour will focus on restoration efforts current, past, and future to improve the opportunities for the native steelhead trout and will include presentations on flooding and drought regimes, dams and channel constraints, river mouth manipulations, as well as recent fires and resulting sediment issues.



*Wild and Scenic Environmental Film Festival*  
Pizza & Beer garden 5:30-7pm  
7-9pm at the Civic Auditorium



# Conference Events & Sessions

## Friday, March 6

### *Plenary Session 8: 30 am to noon*

*Status of Restoration Efforts: Monterey Bay and Adjacent Watersheds,* **Bob Curry, Ph.D.**, Watershed Sciences

*Economic Challenges on the Coastal Zone: How Oceanic Conditions Affect Salmonids,* **Astrid Scholz, Ph.D.**, Vice-President, Knowledge Systems, Ecotrust

*State of California Salmonids: Reasons for Pessimism, Reasons for Optimism,* **Peter Moyle, Ph.D.**, Fisheries Professor and **Josh Israel, Ph.D.**, Geneticist, UC Davis

*Climate Intensification: More Extreme Extremes of Floods, Droughts, Heat Waves, and Windstorms. Evidence, Uncertainties, and Implications for Salmon Conservation,* **Michael J. Furniss**, Pacific Northwest and Pacific Southwest Research Stations, Redwood Sciences Lab, Arcata, CA

### *Friday Afternoon Concurrent Sessions*

#### **Coho Salmon Recovery and Restoration: Putting Theory into Practice**

**Session Coordinator:** Darcy Aston, FishNet 4 C Coordinator

*Restoration of Coho Salmon in California: Where are We and Where Do We Want to Go?,* **Stephen Swales Ph.D.**, California Department of Fish & Game

*Condors, Passenger Pigeons, and Dodo Birds: Central California Coast Coho Salmon and our Last Chance to Save them from Extinction,* **Charlotte A. Ambrose**, NOAA Fisheries

*Coastal Streamflow Stewardship Project: Working with Landowners to Protect Instream Flows,* **Brian Johnson**, Trout Unlimited

*Lagunitas Creek, Long Term Monitoring and Enhancement,* **Gregory M. Andrew**, Marin Municipal Water District

*Barrier Removal and Coho Enhancement Planning in the Lagunitas Creek Watershed,* **Kallie Kull**, Marin County Public Works Fish Passage Program

*Testing Biological Effectiveness with the Little Browns Creek Migration Barrier Removal Project,* **Christine Jordan**, Five Counties Salmonid Conservation Program

#### **Dam Removal and Modifications for Salmonid Recovery**

**Session Coordinator:** Matt Stoecker, Beyond Searsville Dam and Stoecker Ecological Consultants

*The Big Five: Commonalities and Differences among Proposed Dam Removals in the California Coast Ranges,* **Clare O'Reilly**, University of California, Berkeley

*Up Your Creek—Dam Removal and Fish Passage Projects in Alameda Creek,* **Jeff Miller**, Alameda Creek Alliance

*Let the River Run Free: Dam Removal on the Klamath River,* **Michael Belchik**, Yurok Tribal Fisheries Program

*Geomorphic Stability and Fish Passage Potential for the Proposed San Clemente Dam Bypass Channel,* **Andy Collison**, Philip Williams & Associates, Ltd.

*It's About Dam Time! Lessons Learned in Dam Removal,* **Leah Mahan**, NOAA Fisheries

*Going Tidal—Restoring Natural Hydrologic Dynamics in Point Reyes National Seashore, Marin County, California,* **Brannon Ketchum**, Point Reyes National Seashore

#### **Restoration at the Crossroads: Challenges & Solutions in the Restoration Field**

**Session Coordinator:** Felice Pace, Klamath River Activist

*Humility or Hubris—Restoration at the Crossroads,* **Felice Pace**

*Restoring Rangeland Watersheds and Endemic Rainbow Trout in the Face of Climate Change,* **Lisa Thompson**, Wildlife, Fish, and Conservation Biology Department, University of California Davis

*The California Advisory Committee on Salmon and Steelhead Trout: An Epic of Good Intentions,* **Barbara Stickel**, California Advisory Committee on Salmon and Steelhead Trout

*Steelhead Restoration on the California Coast: a Common Sense, Collaborative Approach to Triage,* **Gordon Becker**, Center for Ecosystem Management and Restoration

*Headwater Tributaries of the Upper Lagunitas Watershed: Important Coho Spawning and Rearing Habitat?,* **Paola Bouley**, Salmon Protection and Watershed Network

*Navigating the Restoration Money Maze: Plotting a Course for Funding Support,* **Mel Krebs** and **Michelle Rankin**, California Conservation Corps

### *Poster Session and Reception 7-10pm*

Please email [srf@calsalmon.org](mailto:srf@calsalmon.org) to sign up for the poster session or call SRF at (707)923-7501 for more information.

## Saturday, March 7

### *Saturday Morning Concurrent Sessions*

#### **Central & South Coast Steelhead: Biology, Genetics, and Recovery Strategies**

**Session Coordinator:** Dougald Scott, Northern California / Nevada Council Federation of Flyfishers

*Steelhead Life History Trajectories,* **Susan Sogard**, National Marine Fisheries Service

*Genetics of Steelhead Populations in the Central and South Coast,* **Carlos Garza**, National Marine Fisheries Service

*The Role of Coastal Lagoons in Steelhead Survival,* **Morgan Bond**, University of Washington

*The Ecology of Steelhead Populations of the Big Sur Coast*, Dave Rundo, National Marine Fisheries Service

*The Recovery Status of Steelhead in the South Central and Southern DPSs*, Mark Capelli, National Marine Fisheries Service

*San Luis Rey Watershed Assessment: Steelhead Recovery Planning in Southern California*, Dave Kajtaniak, California Department of Fish and Game

### Hydrologic and Geomorphic Legacy Issues: Solutions for the Past and the Future

**Session Coordinators:** Eric Ginney, Philip Williams & Associates, Ltd.

*Hydrologic and Geomorphic Impacts of Residential Development on Legacy Roads*, John Green, Pacific Watershed Associates

*Upland Rehydration Strategies: Slow It, Spread It, & Sink It for Salmon*, Brock Dolman, Occidental Arts & Ecology Center

*The Klamath Dams: The End of an Era*, Eric Ginney, PWA, Ltd.

*El Corte de Madera Creek Redwoods Watershed Restoration*, Matt Baldzikowski and Meredith Manning, Midpeninsula Regional Open Space District

*Estimation of Passage Flows for Anadromous Fish Through Critical Riffles in Stevens and Coyote Creeks, Santa Clara County, California*, Shawn Chartrand, Balance Hydrologics

*Long-term Geomorphic Effects of Dams on Rivers in the Central Valley of California*, Toby Minear, UC Berkeley

### Fire Ecology, Forests and Fisheries

**Session Coordinator:** Frank K. Lake, Ph.D., US Forest Service-Pacific Southwest Research Station

*Wildfire and Native Fish: Scaling of Disturbance and Population Structure as Context for Restoration and Conservation*, Bruce Rieman, Ph.D., USDA, Forest Service Rocky Mountain Research Station

*Improving Our Understanding of Spatial and Temporal Effects of Wildfires on Forests, Riparian Zones, and Fisheries in the Klamath Mountains, United States of America*, Frank K. Lake, Ph.D., US Forest Service

*Forest Survivorship and Regeneration Following Crown Fires on Three Streams in the Santa Cruz Mountains, California*, Will Russell, Ph.D., San José State University

*Post-Fire Watershed Restoration: Protecting Water Quality, Fisheries, and Wildlife Resources from Soil Erosion Processes in the Aftermath of Wildfire in Santa Cruz County*, Rich Casale, USDA Natural Resources Conservation Service

### *Saturday Afternoon Concurrent Sessions*

#### Restoring Rivers through FERC Hydropower Relicensing

**Session Coordinator:** Keith Nakatani, California Hydropower Reform Coalition

*Overview of FERC Relicensing*, Keith Nakatani, California Hydropower Reform Coalition

*The Klamath River: Relicensing Process Update and Key Issues*, Steve Rothert, American Rivers

*The Yuba-Bear: Relicensing Process Update and Key Issues*, Jason Rainey, South Yuba River Citizens League

*Lessons Learned from License Implementation*, Dave Steindorf, American Whitewater

*Environmental Justice, Culture, and the Role of Tribes in the FERC Relicensing Process; The Klamath River as a Case Study*, Kate Sloan, Yurok Tribe Environment Program



*Adult coho* by Morgan Bond

### Juvenile Steelhead and Coho Salmon: Central Coast Habitat and Population Research

**Session Coordinator:** Kristen Kittleson, County of Santa Cruz

*Steelhead Use of Warm Water Habitat in Central California Coast Streams, with Management Implications*, Don Alley and Chad Steiner, D.W. Alley and Associates

*The Grow Zone: Ecology of Central Coast Lagoons*, Jerry Smith, Ph.D., San Jose State University

*Snorkel Surveys for Coho Salmon in Santa Cruz and San Mateo Counties*, Brian Spence, NOAA Fisheries

*Assessing the Effectiveness of Large Woody Material for Coho Salmon Habitat Enhancement*, Eric Ettlinger, Marin Municipal Water District

*A Limiting Factors Approach to Conserve Steelhead and Coho in San Gregorio Creek, San Mateo County, California*, Neil Lassette, Stillwater Sciences

*Integrated Watershed Restoration Program: Collaboration for Conservation*, Jim Robins, Principal, Alnus Ecological

### Water Diversions and Water Wars in California

**Session Coordinator:** Tom Stokely, California Water Impact Network

*Water Wars in California—Is Anybody Winning and Who is Losing?*, Tom Stokely, California Water Impact Network

*California's Water Resources: Private Interests in Public Property*, Tara Mueller, California Attorney General's Office

*California's Primary Fishery Resource is in the Modoc Plateau*, Robert R. Curry, Watershed Systems

*New Water Supplies for California—Reliability and Costs—Who Pays, Who Wins, and Who Loses*, Steve Evans, Friends of the River

*The Peripheral Canal: A Breach Of The Public's Trust and a Vision for Destruction of the Bay and Delta*, Dante John Nomellini Sr., Central Delta Water Agency

*Fish, Water and Science in the Sacramento-San Joaquin Delta: A Crisis is a Terrible Thing to Waste*, Christina Swanson, Ph.D., The Bay Institute

### Cabaret & Banquet

6:00pm Wild Salmon Banquet

7:00pm Awards & Cabaret

8:30pm Dance with Sambada



# Basins of Relations: Protecting and Restoring our Watersheds

By Brock Dolman, Occidental Arts & Ecology Center's WATER Institute

## Welcome to Planet Water

It is the copious presence of water on our blue and white planet that provides for the fundamental expression of life's diversity and beauty. Water ripples out and within to touch every aspect of our lives. Currently and increasingly in the very near future, there will be nothing more valuable than pristine watersheds with abundant pure water supplies.

The ceaseless flowing and dynamic processes of water—the evaporation, condensation, transpiration, sublimation, precipitation and infiltration that together comprise the water cycle—are truly amazing. Water is a substance that covers over 70% of Earth's surface, can be a solid ice that floats on its liquid self, which in turn can evaporate into the atmosphere as a vaporous distilled gas, and then can return purified again to earth as either a solid snow or liquid rain. Without water there would likely be no life on Planet Earth. From this perspective it may be more fitting, as suggested by biologist Lynn Margulis, to refer to our home as "Planet Water."

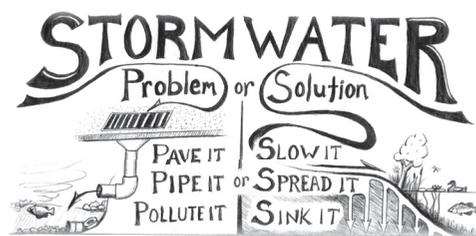
97% of the world's water by volume is held in the salty oceans and thus is undrinkable. Another 2% of the world's water is locked up in ice caps and glaciers. Less than 1% of the world's water, at any one time, is available as fresh water in lakes, rivers and accessible groundwater for shared use by humans and all other freshwater dependent beings. As sea levels rise due to global warming, the melting of polar ice caps and glaciers is increasing the percentage of water that is in the saline ocean. As we drain wetlands, clearcut forests, plow soils and pave over our watersheds we further reduce our available 1% of freshwater. Additionally, our widespread polluting of aquifers, rivers, lakes and the air dramatically reduces the quality of this critically limited clean freshwater available for human and environmental needs.

We must learn how to equitably and sustainably share the remaining 1% of available global freshwater for all agricultural, residential, manufacturing,

energy and personal needs, as well as the biological needs of all other terrestrial and aquatic life forms. Jacques Cousteau reminds us "not to forget that the water cycle and the life cycle are one." Every drop of water is precious!

## Watersheds: Our Basins of Relations

At the most basic level, a watershed encompasses all the land surface area that collects and drains water down to a single exit point. The continual cycle of erosive water flowing over uplifting and weathering land has sculpted all landscapes into distinct cradle-like entities known interchangeably as watersheds, basins, drainages or catchments. Everyone on the planet lives in a watershed, somewhere. Everything we do for work, play, school, shopping, farming, recreation and so on occurs in a watershed, somewhere. Watersheds can be as large as the Mississippi basin, the third largest in the world, which drains 41% of the lower 48 U.S. states into the Gulf of Mexico, or they can functionally be as small as all the land in your neighborhood that flows from your yard, roof, driveway and streets to the storm drain and on to your local creek or lake.



Watersheds at all scales are evolved living entities whose state of health provides a comprehensive benchmark for judging the wisdom of our past and future land and water use practices. Watersheds literally underlie all human endeavors and form the foundation for all future human aspirations and survival. Watersheds topographically define community, and the health of your watershed depends on collaborative relations between neighbors in your shared basin. Watershed is the geographic synonym for sustainability.

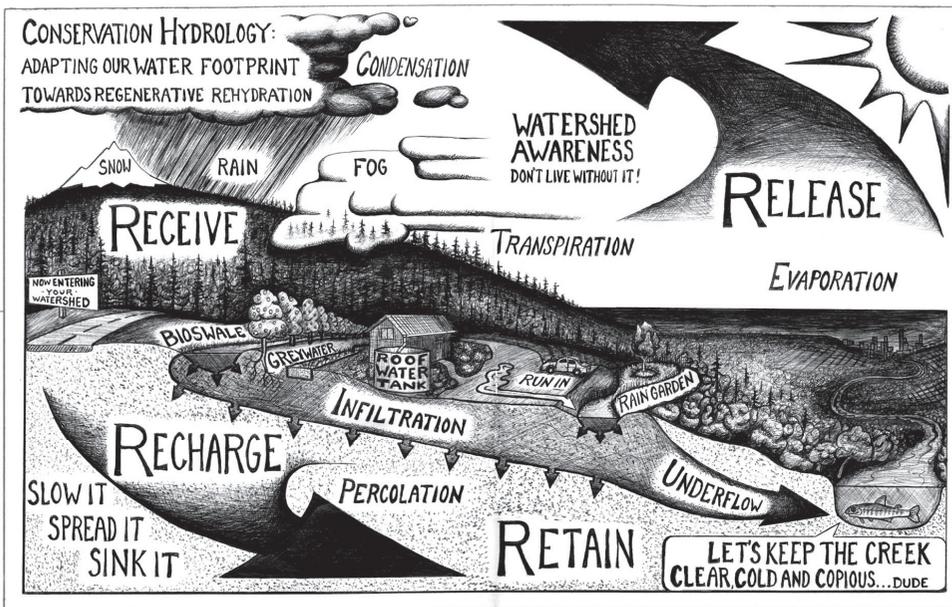
## Conservation Hydrology

We are calling our philosophical and practical responses to the water challenges and opportunities before us *Conservation Hydrology*. Conservation Hydrology utilizes the disciplines of ecology, population biology, biogeography, economics, anthropology, philosophy, planning and history, to guide community-based watershed literacy, planning, and action. Conservation Hydrology advocates that human development decisions must move from a "dehydration model" to a "rehydration model."

## Slow It—Spread It—Sink It

The opportunity before us is to retrofit existing development patterns, and design new ones, based on principles of rehydration and regeneration instead of dehydration and degradation. Water is the ultimate resource, not the problem. Thankfully at a national level, as part of the Clean Water Act, the "pave & pipe paradigm" engineering practices of capturing, concentrating, and conveying water away from a site as quickly as possible are now recognized as disastrously flawed and hydro-illiterate. The old drain-age is now being replaced by a new retain-age.

We're advocating for a new paradigm of stormwater management based on *waterspread* restoration, with a call to slow it, spread it, sink it: *Slow the water down, spread the water out, and sink the water into the land*. Practical waterspread applications, such as bioswales and raingardens serve to biologically filter stormwater, thus enhancing water quality. These applications can also enhance water quantity through optimizing groundwater recharge and reducing peak flood flows. For those that live in a flood plain area these ideas may be more challenging to implement. Thorough site-specific evaluations of slope stability, soil porosity, storm event size, run-off volumes, and amount of imperviousness are critical. When we think like a watershed, we can transform



Drawings by Jim Coleman from "Basin of Relations."

development practices that will protect water quality and quantity.

### What You Can Do by Working on Water at Different Scales

Watershed issues provide us many avenues for involvement at multiple levels and time scales. Some solutions are small, and only require making different choices as an individual or family and can be done today in your home or yard. Other solutions are more complex, will require neighborhood, local community or city level behavior changes and will take broad participation over some years to successfully implement. There also exists a whole class of democratic opportunities for social policy change that must be implemented at the county, state and national levels to set in motion changes in water security for future generations. The next section will discuss and offer ideas for how to strategically increase your participation with water security at the home, community, and national levels.

### Water Conservation: Choose Not to Use!

Practicing water conservation by reducing your demands for water is one of the most powerful acts we can individually and collectively do. Water conservation has a cascade of positive effects and can affect the overall quantity and quality of available fresh water. Every gallon of water you choose

not to use equals one gallon not taken from your river or aquifer. It means one gallon's worth of electricity to pump it and chemicals to make it potable are not needed. It means that one gallon is not being degraded into 'waste' water, additionally not needing electricity to pump it, to treat it and to dispose of it in our environment. Choosing not to use water saves water quantity and quality, saves energy, saves money, helps reduce demands on our watersheds and helps to mitigate climate change-induced water stresses by reducing the collective water footprint of humankind.

### You Can Organize Your Basin of Relation

We are perched on the tipping point of a 'watershed moment.' From the global scale to the local scale we are faced with a multitude of issues and decisions that will determine the future that our children will inherit. The time is now for our communities to come together to set in motion plans and processes that ensure our watersheds will remain healthy in perpetuity. Viewing your watershed as a shared 'basin of relation' allows you and your neighbors to truly define the boundaries of your community and organize around meaningful issues of true and lasting local social security. Each process, like every watershed and its associated community, is unique. Often times you will find that certain local, city, county, state and federal

jurisdictions are ready and waiting to collaborate with these efforts. In the absence of buy-in and support by the local community it is often impossible to achieve measurable objectives and resource management goals, especially in areas where the majority of the land is in private ownership.

### You Can Work for Systemic Political & Policy Changes for Water Security

Considering the importance of water, involving yourself in the politics of water resources is critically important. Do you know the members of your local, city, county, or regional water board, Irrigation District, Planning Commission, Board of Supervisors, or City Council? State and Federal legislators? How do they make decisions, and have you participated in the democratic process of helping them make decisions? Have you ever thought about running for a local office yourself?

Ultimately lasting change will have to occur via the arenas of politics and democratic decision making. We the People are responsible for water-sane policies and laws through our legislative, executive and judicial branches. Metaphorically you could conceive of these three branches as expressions of social sub-watersheds, and at their confluence the expression of health of the 'mainstream' is only as good as the health of each contributing sub-watershed branch. It is our collective responsibility to participate in making sure each branch of our democratic structure is adequately crafting mutually supportive conditions to care for our collective water resources.

Your Home Basin of Relations is your living Lifeboat. There are many things you can do to help. Together we can make a difference. "Yes we can!"

This article is an excerpt from the 20-page OAEC WATER Institute publication called *Basins of Relations: A Citizen's Guide to Protecting and Restoring our Watershed*. Available at [www.oaecwater.org](http://www.oaecwater.org)

# Water Storage Helps Preserve Instream Flows

By Eric Goldsmith, Sanctuary Forest

**L**ow summer stream flows have emerged as the most significant obstacle to the recovery of listed coho, Chinook and steelhead in the Mattole River watershed. Sanctuary Forest, a southern Humboldt County land trust, established the Mattole Flow Program in 2004 with the goal of restoring healthy in-stream flows for fish and people.

Early in the program hydrologic and water use studies identified that human use is a significant contributor to low flows and is the most controllable factor in restoring in-stream flows. Guided by these insights Sanctuary Forest actively promotes water storage and seasonal forbearance of water withdraws as a cornerstone of the Mattole Flow Program.

To help landowners develop large capacity water storage and benefit fisheries, Sanctuary Forest developed the “Water Storage Guide”. This handy manual is designed to be distributed by water storage retailers with the sale of a tank.

The information and concepts contained in the “Water Storage Guide”, while developed in the Mattole, are largely transferable to any watershed. Below is a summary of the main points of the guide. You can obtain a full version of the guide online at [sanctuaryforest.org](http://sanctuaryforest.org)

## Fish Friendly Water Storage

There are four key elements to fish-friendly water storage:

- Calculate your household’s water storage needs for the low-flow season.
- Fill and top your tank(s) outside of the low-flow season.
- Limit pump rates and use fish screens to protect small fish.
- Monitor your weekly water use to meet your water budget.

These guidelines, and other important steps you can take, are explained in the following sections. When we refer to the “low-flow season,” it is important

to realize that the calendar is not a perfect guide to when you should stop pumping from your creek or river. The most important guide is the actual level of streamflows at the point where you are pumping.

To get more detailed information about streamflows and recommended no-pump periods outside the Mattole, contact your local watershed group or your nearest Department of Fish and Game office, or check the data on streamflows available through the U.S. Geological Survey.

## Calculating Your Water Storage Needs

We recommend that every household store enough water to last for a dry season stretching three months, or 105 days.

- Household water use: 55 gallons per day (gpd) per person
- Garden water use: 18.5 gpd per 100 square feet of garden
- Fire protection water reserve: 2500 gallons

Sample storage calculation for a 3-person household with a 1600 sq ft garden:

- Household water need (Aug 1–Nov 15): 17,325 gallons (105 days x 3 people x 55 gpd)
- Garden water need (Aug 1–Oct 15): 22,496 gallons (based on 76 days x 1600 sq ft x 18.5 gpd per 100 sq ft; this assumes that households will stop irrigating their gardens after October 15, which is recommended)
- Fire protection: 2500 gallons
- *Total household storage need:* 42,321 gallons (for 3 months)

This figure represents the household’s required storage for the full 3 1/2-month dry season from August 1 through November 15. If you are unable to store enough water for this entire period, make sure at least that you have adequate storage to last through the two lowest-flow months of September and October—that is, at least 60 days’ worth of water.

## Fill and Top Your Tanks Outside the Low Flow Season

As a general rule, you should fill your tank no later than May 31 to ensure minimal impacts to flows and optimum water quality. Ideally you should stop pumping entirely from August 1 until November 15.

Avoid overfilling your tank and causing significant water losses. Two recommended methods to ensure against overflow losses are installation of an automatic shut-off valve that turns your pump off when the tank is full, and overflow piping back to the water source.

To protect fish habitat and prevent direct harm to juvenile fish, pumping rates should never exceed 5% of the streamflows of the water source, and in general pump rates should never go above 11 gallons per minute (gpm), which is adequate to fill tanks in an efficient manner.

## Installing and Maintaining Fish Screens on Pumps

All pumps need to be equipped with intake screens to prevent damage to small fish. The screen openings must be small enough so that small fish can’t get sucked into the pump. Additionally, the total screened area needs to be large enough so that the suction pressure against the screen is almost non-existent. It is very important to clean pump screens regularly to avoid clogging. When pump screens become partly blocked by debris, the suction pressure on the remaining screen will be higher, potentially injuring juvenile fish.

## Monitoring Weekly Water Use

A water budget is an essential way to ensure that your stored water will last through the low-flow season, along with weekly monitoring of your water usage. In its simplest form, a water budget takes your total water storage capacity (excluding fire reserve) and divides it by the number of weeks when you will stop pumping. By measuring

your weekly usage you can ensure that you're staying "within budget"—and make adjustments if you are not.

The easiest way to measure usage is to install a water meter (cost: about \$200) on the outlet of your tank, and record usage on a weekly log. The water used per week is then easily calculated from the log and can be compared with the water allocation to make sure that water use is on budget.

Alternatively, you can manually calculate your weekly water use by taking depth measurements of your tank and using these to figure the change in volume. You can reduce water use by up to fifty percent during the dry season by following these tips:

- Reduce irrigation water by water-efficient gardening and landscaping techniques: dry farming and drought-resistant plants, drip irrigation, mulching, evening watering, avoiding overwatering.
- Reduce household water use by using efficient fixtures and turning the water off except when actually rinsing dishes, showering, brushing teeth, etc.

Replacing older, standard water fixtures and appliances with newer, more water-efficient versions can make a tremendous difference in reducing your daily household water use.

Leak-proofing your tank and water system is absolutely essential to ensure that your water lasts through the dry season. Two methods for leak proofing large-capacity water tanks are described below.

*Option 1:* Install a valve manifold on your tank to limit water loss in the event of leaks. The manifold divides the tank into sections so that only one section of the tank's capacity can be drained at a time. It is best to divide your tank into a minimum of three sections so that the maximum loss will be one third of your tank.

*Option 2:* Alternatively, you can use a small tank for all of your water supply needs and manually fill the small tank from the large capacity tank as needed. If the small tank is isolated from the large tank, then the maximum water

loss in the event of leaks is the volume in the small tank. Exposed pipes are a common cause for major loss of water from leaks. Burying your water pipes will protect them from most animal bites and the elements.

### Optimizing Quality of Stored Water

The quality of water from long-term storage in tanks is primarily dependent on the quality of the source water, the tank itself, and the two critical storage conditions of temperature and light. To obtain drinking water quality from either long- or short-term storage, it is recommended that both a drinking water filter and UV purification cartridge be installed at the drinking water faucet to remove common bacteria and other organisms.

Incoming water quality is critical for long-term water storage. It is important to fill the tank when the water source is clear. Filtering the incoming water is best; otherwise, be sure to use a pre-settling tank that allows the clear water to be pumped from the top while the sediment collects at the bottom.

Cool storage temperature is also important for water quality, and large tanks keep water cooler than small tanks. Exposure to light is also a critical factor for water quality. All sunlight must be excluded from the tank because sunlight encourages algae growth and water quality deterioration.

### Emergency Water Loss

The sudden loss of a large portion of stored water in the midst of the low-flow season is a serious problem for any household. But deciding to pump from the stream or river in order to refill the tank at that point would be potentially devastating for fish survival. In that circumstance, the most responsible choice you can make is to obtain the water you need to get through the dry season from a retail water supplier.

### Fire storage requirements

Fire protection storage requirements may vary by county. In Humboldt County, homes in State Responsibility Areas for fire are required to maintain a reserve of 2500 gallons at all times to



*The Mattole River*

fight fire. If this reserve is not kept in a separate tank, your larger tank must be plumbed in such a way that the 2500 gallons will not be bled down by other usage. A 2.5-inch standard male fire hose adapter is required for access to this water.

### Permits For Tanks and Water Storage

County installation requirements: permits or other requirements also vary for tank installation within different counties and for different zones within counties. Call your county building department to determine permit requirements for your location. In Humboldt County the following general requirements apply: grading permit, tank permit for those greater than 5,000 gallons, riparian setback requirements.

State Water Board permits: California requires an appropriative water right (or "small domestic use appropriation") for water that will be stored longer than 30 days. The riparian water rights held by landowners who withdraw water from a stream that passes by or through their property allows only for direct diversion. A small domestic use appropriation registration can be obtained from the State Water Resources Control Board (SWRCB) if the applicant qualifies for small domestic use as defined by the SWRCB.

Fish and Game Code requirements: DFG has authority under Fish & Game Code section 1602 to regulate any water withdrawal that may have an impact on fish or other aquatic life. According to the Code, anyone who undertakes an activity that might "substantially divert or obstruct the natural flow of any river, stream, or lake" is required to notify DFG of this activity.

## Salmonid Restoration Federation

PO Box 784

Redway, CA 95560



[www.calsalmon.org](http://www.calsalmon.org)

[srf@calsalmon.org](mailto:srf@calsalmon.org)

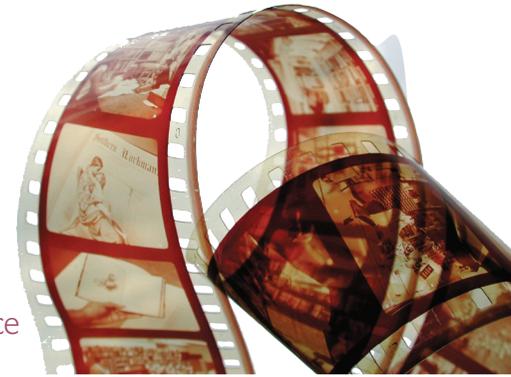
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## The Last Descent

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WORLD PREMIERE

## Red Gold

Lauren Oakes, Travis Rummel, Ben Knight

NORCAL PREMIERE

Join a group of world class whitewater kayakers to some of the worlds most amazing rivers...descending them possibly for the last time. The Marsyangdi River of Nepal, the Brahmaputra River in India and the White Nile River in Uganda are all threatened or are in the process of being destroyed by large scale hydroelectric projects. The film closes in California with the Tuolumne River and the growing movement to restore Hetch Hetchy Valley in Yosemite National Park. (US, 2009, 35min, EA) [www.thelastdescent.com](http://www.thelastdescent.com), [www.internationalriver.org](http://www.internationalriver.org)



The headwaters of the Kvichak and Nushagak Rivers in Bristol Bay, Alaska, are home to the two largest remaining sockeye salmon runs on the planet. And at that same spot, mining companies



Northern Dynasty and Anglo American have proposed to extract what may prove to be the richest deposit of gold and copper in the world. The filmmakers spent more than two months in Bristol Bay, documenting the tension between native fishermen who oppose the dam and mine officials who say they will build a 'clean' mine that will leave the salmon's habitat untouched. This exquisite film goes beyond the conflict, offering a portrait of a unique way of life that wouldn't exist if the salmon don't return with Bristol Bay's tide. Audience Choice Award, Director's Choice Award, Tellruide MountainFilm (US, 2008, 55min, E) [www.redgoldfilm.com](http://www.redgoldfilm.com), [www.savebristolbay.org](http://www.savebristolbay.org)