John H. Bair

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BACKGROUND

I am a botanist that focuses on the inter-relationship between riparian plants, river geomorphology, and hydrology, I relate physical channel dynamics to riparian stand evolution to assess how vegetation patterns relate to river hydrology and geomorphology. I am a recognized expert in willow and cottonwood taxonomy and physiology and have investigated the inter-relationship between riparian plant dynamics, geomorphology, and hydrology to recommend flow management and channel restoration approaches that would improve the conditions on regulated rivers. I am part of a team that has developed the Tool for Achieving Riparian Germination and Establishment of Target Species, or TARGETS model to assess the success of managed streamflows at promoting cottonwood and willow colonization of floodplains and inhibiting riparian encroachment. The model is based on the relationship between seed dispersal period of riparian hardwoods, root growth rate, soil capillarity, channel topography, and streamflow magnitude and recession rate. I have conducted detailed field-based riparian inventories on the Tuolumne River, Trinity River, and Mono Lake tributaries. As part of these projects, I developed an extensive expertise in ground and aerial photograph based riparian plant taxonomy and air photo identification. Most recently I have been developing a quantitative basis of revegetation design that relies on detrended topography (i.e., ground surface as a function of height above river) and existing vegetation. My current job responsibilities include experimental design and plant sampling, riparian plant taxonomy, riparian mapping, and soil moisture analyses. I also have riparian revegetation design expertise and have designed several projects which have been successfully implemented along Clear Creek (tributary to the Sacramento River), Trinity River, Tuolumne River, and Mono Lake tributaries. I have designed and implemented stream bank bioengineering on San Geronimo Creek (tributary to Lagunitas Creek). I work with agencies and Tribes to conduct aspects of NEPA and CEQA and the monitoring/reporting aspects of regulatory compliance. I have recently completed a paper called "*A new data driven riparian revegetation design method.*". The paper describes a methodology that I developed to utilize commonly available data sets in a GIS analysis to develop an informed (quantitative) revegetation design for riparian and aquatic environments.

EDUCATION

- **Master of Arts (2001), Biology**
  Humboldt State University, Arcata, CA 95521
  Thesis Title: *Riparian Stand Initiation, Establishment, and Mortality, on Cleared Channel Margins of the Trinity River, California.*

- **Bachelor of Science (1994), Biology**
  Humboldt State University, Arcata, CA 95521

- **Bachelor of Science (1994), Botany**
  Humboldt State University, Arcata, CA 95521

EXPERIENCE

- **Senior Riparian Ecologist (1995-present), McBain Associates.**
  - Developed, planned, and implemented riparian studies in conjunction with the development or implementation of streamflow recommendations on the Upper Tuolumne River (2007-2019).
  - Developed, planned, and implemented studies focusing on riparian vegetation interactions and life history associations with snowmelt hydrographs on bedrock rivers on the Clavey River and Cherry Creek (2006-2007).
  - Developed, planned, and implemented GIS based riparian habitat inventories in conjunction with the development or implementation of restoration strategies on the Tuolumne River (1996), Mono Basin (1999 and 2004), and the Trinity River (2003-2019).
  - Developed the riparian science framework component on the Trinity River (2003-2010).
  - Developed riparian restoration strategies to combine active revegetation (i.e., plantings) with passive opportunities provided through streamflow management on the Trinity River (1998-2019), the Yuba River (2008-2013), the Tuolumne River (2000), the Merced River (2001), Dry Creek (a tributary to the Russian River; 2016-2019) and on Clear Creek (1998-2001; 2018-2019).
  - Developed revegetation designs that combine active revegetation with passive opportunities provided through tidal restoration in the Freshwater Creek estuary (1999-2007), Rocky Creek/Gulch (2003-2008), the Salt River (2013), Williams Creek (2013) and Cochran Creek (2019).
  - Developed, designed, and implemented revegetation methods that are both cost effective and ecologically sensible on Clear Creek (2000), the Yuba River (2010-2013), and the Trinity River (2006-2019).
  - Part of a team that developed an ecologically friendly park master plan and designed and constructed ecologically functional floodplains, riparian vegetation restoration and combined them with native grasslands and oak savannahs while supporting many public amenities typical of a park in downtown Modesto on the Tuolumne River (2001-2008).
  - The revegetation lead for a team that is designing a restoration on Prairie Creek with an new Visitor Center for Redwood National Park. The visitor center development will be integrated into a broader ecologically friendly site plan. The Prairie Creek restoration has been designed and with ecologically functional floodplains, backwaters and a new mainstem channel morphology. (2016-2018).
  - Oversaw development of a riparian recruitment model (TARGETS) that takes the input of daily streamflows, physical topography, and seed dispersal and predicts how these factors interact to predict channel bank locations where seedlings grow for a given species.
  - Worked in an interdisciplinary environment that often required working with diverse stakeholder and landowner groups/interests
  - Developed proposals, budgets, and implemented work including scheduling, project and staff management, and reporting.
- **Teaching Associate (1994-1996), Humboldt State University, Arcata, CA.**
  - Taught and tutored introductory botany laboratory, lecturing on many fundamental, yet complex, topics in the course.
  - Prepared and graded lab exercises.
  - Prepared and presented lectures and assisted in course development.

- **GS-7 Professional Series Botanist (1994), USDA Forest Service, Corvallis, OR.**
  - Conducted forest health monitoring as part of a California-wide project, with emphasis on the eastern Sierra Nevada.
  - Conducted floristic surveys for the eastern Sierra, Great Basin, and Mojave floristic provinces.
  - Identified plants from the ground surface to the canopy in a wide range of physical environments throughout the Inyo Mountains, White Mountains, Owens Valley, and the Eastern Sierra Nevada mountains.
  - Located field plots from pin pricks on aerial photographs, requiring photo interpretive skills.
  - Collected and recorded vegetation quadrat data, identifying every plant species from the ground to the canopy and assigning cover values.
- **Restorationist (1993-1994), Redwood Community Action Agency, Eureka, CA**
  - Implemented revegetation designs for restoration and mitigation of riparian and wetland projects working with excavators, backhoes, tractors, graders, and other major equipment and using McClouds, hoedads, digbars, polaskis, chainsaws, and other such hand tools.
- **Project Coordinator & Nursery Manager (1991-1993), Freshwater Farms, Eureka, CA**
  - Developed a wetland nursery using underlying principles in the ecology of salt water marshes, freshwater marshes, estuaries and riparian stands.
  - Collected native plant species that were primary and secondary riparian and wetland indicators for revegetation projects throughout California and the northwest.
  - Developed seed collection and propagation methods for revegetation projects.
  - Developed a large collection of native wetland grasses and riparian trees.
  - Developed a database and accession system for specimen plant and propagation materials.
  - Managed client consultation and oversaw production from propagation to transportation, and in some cases installation.

PROFESSIONAL MEMBERSHIPS

- Society for Ecological Restoration
- California Native Plant Society
- California Botanical Society
- Ecological Society of America

PUBLICATIONS AND PRESENTATIONS

Bair, J. H. 1998. Limiting riparian hardwood encroachment along the Trinity River, California. In D.E. Hayes (ed.), *Engineering Approaches to Ecosystem Restoration. Wetlands Engineering & River Restoration Conference, March 22-27, 1998*. American Society of Civil Engineers, Denver, CO.

Bair, J. H. 2001. *Riparian Stand Initiation, Establishment, and Mortality On Cleared Channel Margins of the Trinity River*. Masters Thesis. Humboldt State University, Arcata. 184p.

October 2001. SERCAL Invited speaker by the Society for Ecological Restoration conference in San Diego, CA. Presented "*Trending Toward Recovery, Riparian Vegetation along Rush and Lee Vining Creeks, Mono County, CA*." in Restoration of Riparian Zones in Arid Landscapes session.

March 2003. Invited speaker by the Rocky Mountain Research Station, Stream Systems Technology Center, Streamside Vegetation-Hydrologic Interactions Workshop in Tucson, AZ. Presented "*Trinity River Maintenance Flow Case Study: Hydrologic-geomorphic-riparian Integration.*"

April 2003 and 2005. Invited instructor. CSU Humboldt Herbarium, Arcata CA. *Introduction to the Willows of California (Salicaceae).*

July 2003 and 2005. Invited speaker by the Teton Science School, River Channels Workshop in Kelly, WY. Co-presented with Dr. Luna Leopold, Dr. William Trush, and Scott McBain.

Bair, J. H. 2003. Current trends in low water encroachment by riparian hardwoods along the Trinity River, California. In P. Faber and E. Cummings (eds.), *Engineering Approaches to Ecosystem Restoration, Riparian and Floodplains Conference, March 12-15, 2001.* The Wildlife Society, Sacramento, CA.

Bair, J. H., Souza, J., and T. Griggs. 2003. New design approaches for floodplain restoration and riparian revegetation on Clear Creek, California. In P. Faber and E. Cummings (eds.), *Engineering Approaches to Ecosystem Restoration, Riparian and Floodplains Conference, March 12-15, 2001*. The Wildlife Society, Sacramento, CA.

October 2003. Invited speaker by the Scientific Advisory Committee for Estuary Restoration, Advancing the Science of Estuary Restoration in Humboldt Bay Symposium in Eureka, CA. Presented "*Site Rehabilitation Plan Development within the Freshwater Creek Estuary*" in Future Projects session.

February 2004. Invited speaker by Humboldt Bay Watershed Advisory Committee, The Future of Restoration and Salmonids in Humboldt Bay Watersheds Symposium in Eureka, CA. Presented "*Instream Wood Structures on Lower Freshwater Creek- Another Stick in the Mud*".

September 2005. Invited speaker. Trinity River Sediment Symposium, Weaverville, CA. "*On T.A.R.G.E.T.S.: Predicting Riparian Response to Management Actions*."

June 2005-2019 Invited instructor. CSU Chico Herbarium, Chico, CA. *Introduction to the Willows of California (Salicaceae)*.

October 2006. SERCAL Invited speaker by the Society for Ecological Restoration conference in Santa Barbara, CA. Presented "*Seed Release Periodicity and the Snowmelt Hydrograph as Restoration Tools*" in Mono Basin Restoration Ten Years Later session.

October 2006. SERCAL Invited speaker by the Society for Ecological Restoration conference in Santa Barbara, CA. Presented "Managing *the Snowmelt Signature in Rush Creek's Floodplain*" in Mono Basin Restoration Ten Years Later session.

Bair J. H., 2007. *Field Guide to the Common Trees and Shrubs of the Lower Trinity River.* McBain and Trush, Inc. Arcata, CA.

February 2007. Invited speaker. Trinity River Science Symposium, Weaverville, CA. "*WY2006 Riparian Monitoring at Hocker Flat*."

June 2007. Invited instructor. UC Santa Cruz Arboretum, Santa Cruz, CA. *Introduction to the Willows of California (Salicaceae).*

May 2014. SERCAL Invited speaker by the Society for Ecological Restoration conference in Santa Barbara, CA. Presented "*Current Revegetation Design Approaches on the Trinity River, CA.*" in Project Implementation and Monitoring: Lessons Learned Session.

May 2014. SERCAL Invited speaker by the Society for Ecological Restoration conference in Santa Rosa, CA. Presented "*Revegetation Outcomes at Previous Channel Rehabilitation Projects on the Trinity River, CA.*" in Riparian Restoration session.

April 2016. SRF Invited speaker by the Salmonid Restoration Federation in Fortuna, CA. Presented "*Riparian Area Rehabilitation After Gold Mining.*" in Gold Country - Legacy Mining Impacts and Restoration Strategies.

May 2018. SERCAL Invited speaker by the Society for Ecological Restoration conference in San Diego, CA. Presented "*Developing a Quantitative Basis for Revegetation Designs.*" in Habitat Design Session.

Bair, J., S. Loya, and J. Lee. 2018. "*Developing a Quantitative Basis for Revegetation Designs.*" Ecesis Fall Newsletter, California Society of Restoration.

Bair, J., S. Loya, B. Powell, and J. Lee. 2021. "*A new data-driven riparian revegetation design method.*" Ecosphere 12:e03718.

May 2022. SERCAL Invited speaker by the Society for Ecological Restoration conference in Carmel, CA. Presented "*TARGETS: Evaluating proposed Carmel River restoration effects on the early establishment of willows and cottonwoods.*" in the Thinking Big about the Carmel River session.

PROFESSIONAL REFERENCES

- Scott McBain, McBain Associates, Arcata, CA, 95521, (707) 273-1045
- Darren Mierau, North Coast Regional Manager, California Trout, Arcata, CA, 95521 (707) 845-7810
- Jeff Anderson, General Partner, Northern Hydrology & Engineering, McKinleyville, CA 95519, (707) 496-1983