

ROBERT W. HOLMES

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE • WATER BRANCH •
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CURRICULUM VITAE

EDUCATION

- 2000 **M.S. Natural Resources**, Humboldt State University, Arcata.
Thesis: *Effects of an anionic surfactant on early fertilization success of steelhead (Oncorhynchus mykiss)*
- 1997 **B.S. Conservation Biology**, California State University, Sacramento
- 1996 **Watershed Management and Fluvial Geomorphology**, UC Berkeley Extension

EMPLOYMENT

- 2015-present **Senior Environmental Scientist (Supervisory)**, California Department of Fish and Wildlife (CDFW), Water Branch, Sacramento, CA

Instream Flow Unit Supervisor: Provide leadership to instream flow program scientific staff in the CDFW Water Branch Instream Flow Unit. Oversee planning, development of study plans, execution of study plans, data analyses, and preparation of technical reports. Oversee environmental data collection in accordance with CDFW Quality Assurance Program to develop instream flow models and flow requirements for protection of critical life stages of salmonids and their habitats. Conduct and participate in public outreach efforts as part of instream flow investigations on priority rivers and streams. Lead CDFW statewide training for staff from all regions and programs on development of instream flow methods and models. Serve as technical resource expert on internal studies and for regional support and review of flow projects. Developed coastal stream flow report card investigation in collaboration with Regional Water Quality Control Boards for coastal salmonid streams. Contract and budget management. Legislative review. Grant proposal review. Briefed executive management on sensitive flow issues. Participated in SWRCB hearing.

- 2008-2015 **Senior Environmental Scientist (Specialist)**, CDFW, Water Branch, Sacramento, CA

California Statewide Instream Flow Coordinator: Developed the CDFW Instream Flow Program consistent with Coastkeeper Settlement Agreement (2008). Supervised scientific aids in Flow Program and lead staff on implementation of several study efforts on statewide scale. Authored Budget Change Proposal (BCP) that established a Senior Engineer and two scientists in the CDFW Flow Program. Developed and provided technical training's for CDFW and State Water Board staff on the Instream Flow Incremental Methodology (IFIM), one-dimensional Physical Habitat Simulation (PHABSIM) models, and several field-sampling methodologies. Directed development of the CDFW instream flow Quality Assurance Program that includes development of a statewide instream flow Quality Assurance Management Plan (QAMP), instream flow standard operating procedures (SOPs), instream FAQ sheets, templates, checklists and other resources. Provided technical oversight and guidance on flow studies implemented throughout California. Managed contracts and developed Request for Qualifications (RFQ) packages. Briefed executive management on sensitive issues. Served as the California representative on the Instream Flow Council.

- 2000-2008 **Environmental Scientist**, Central Valley Regional Water Quality Control Board (CVRWQCB), Sacramento River Watershed Unit, Rancho Cordova, California
- Lower Sacramento River Basin Surface Water Ambient Monitoring Program (SWAMP) Coordinator:** Designed and managed ambient biological, physical, and chemical scientific investigations, including studies using habitat suitability approaches for multiple salmonid species. Designed and implemented complex biological and water quality monitoring projects that included indicator selection, quality assurance, data management, data analysis and assessment, and reporting; Coordinated SWAMP with internal and external stakeholders and programs, including the Sacramento River Watershed Program (SRWP), CDFG, DPR, DWR, and the USGS. Prepared and gave oral presentations and briefings on SWAMP to Board management, at Board program meetings, at professional science meetings, and at other stakeholder meetings. Participated in program evaluations by the Scientific Planning and Review Committee (SPARC). Facilitated cooperative stakeholder teams including the Biological and Habitat Subcommittee of the Sacramento River Watershed Program. Managed contracts for environmental monitoring studies. Managed grants for water quality best management practice (BMP) projects administered through the SWRCB. Supervised student assistants.
- 1998-2000 **Assistant Manager**, Fish Hatchery, Humboldt State University, Arcata, California
- Managed spawning and fish stocking program of four varieties of salmonids; prepared and secured grant funding proposal; conducted electroshocking of streams in Humboldt County; supervised and trained employees; coordinated public outreach events with local schools.
- 1998-2000 **Graduate Research Assistant**, Humboldt State University, Arcata, California
- Developed and managed the Rainbow Trout and Invertebrate Toxicity Testing Program for the City of Arcata; conducted invertebrate bioassessment sampling and analyses; maintained organism cultures; conducted data analysis, interpretation, report preparation, and oral presentations.
- 1997-1998 **Post Graduate Researcher**, UC Davis Aquatic Toxicology Laboratory
Davis, California
- Assisted State Water Board and Regional Water Quality Control Board staff with ambient biological and toxicological studies; conducted EPA 3 Species Toxicity Tests.
- 1993-1997 **Student Intern**, State Water Resources Control Board, Division of Water Rights/Water Quality – Environmental Assessment Unit/Technical Support Unit
- Conducted environmental impact analyses of pending water rights/development projects pursuant to the California Environmental Quality Act (CEQA). Research, data analysis, and presentation to staff on various water rights and water quality issues including selenium, MTBE, dioxins, and pesticides.

PROFESSIONAL ACCOMPLISHMENTS

- 2014-2015 **“Director” Instream Flow Council (Region 1)**
(AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA, WY)

LEADERSHIP TRAINING

Leadership - Effective Management Practices (UC Extension Management Development Program)
Leadership - The 21 Irrefutable Laws of Leadership
Leadership - Team Communication
Leadership - Developing Success
Leadership - Perspectives on Leadership (M. Stopher)
Supervision (80 hrs.)

TECHNICAL TRAINING

System for Environmental Flow Analysis (SEFA) and Habitat Suitability Criteria (HSC)
Instream Flow Incremental Methodology (IFIM)
Riverine Habitat Simulation (RHABSIM) and River2D Hydraulic Habitat Modelling
USFWS Instream Flow Field Standards

PROFESSIONAL ORGANIZATIONS

American Fisheries Society (AFS)
Instream Flow Council (IFC)
Salmonid Restoration Federation (SRF)

PUBLICATIONS

de Vlaming V., Biales A., Riordan D., Markiewicz D., Holmes R., Otis P., Zander R., Lazorchak J. 2007. Screening California surface waters for estrogenic endocrine disrupting chemicals (EEDC) with a juvenile rainbow trout liver vitellogenin mRNA procedure. *Sci. Total Environ.* 15:385 (1-3):66-79.

Holmes, R.W., M.A. Allen, S. Bros-Seeman. 2014. Seasonal microhabitat selectivity by juvenile steelhead in a central California coastal river. *California Fish and Game Journal* 100(4):590-615.

Holmes, R.W., V. de Vlaming. 2003. Monitoring of diazinon concentrations and loadings, and identification of geographic origins consequent to stormwater runoff from orchards in the Sacramento River watershed, USA. *Environmental Monitoring and Assessment* 87(1):57-79.

Holmes, R.W., B.S. Anderson, B.M. Phillips, J.W. Hunt, D.B. Crane, A. Mekebri, V. Connor. 2008. Statewide investigation of the role of pyrethroid pesticides in sediment toxicity in California's urban waterways. *Environmental Science and Technology* 42(18):7003-9.

Holmes, R.W., D.E. Rankin, M. Gard, and E. Ballard. 2014. Evaluation of steelhead passage flows using hydraulic modeling on an unregulated coastal California river. *River Research DOI:10.1002/rra.2884.*

Hwang, H., P.G. Green, R.W. Holmes. 2009. Anthropogenic impacts on the quality of streambed sediments in the lower Sacramento River watershed, California. *Journal of Environmental Science and Health* 44(1):1-11.

Phillips, B.M., B.S. Anderson, J.P. Voorhees, J.W. Hunt, R.W. Holmes, A. Mekebri, V. Connor, R.S. Tjeerdema. 2010. The contribution of pyrethroid pesticides to sediment toxicity in four urban creeks in California, USA. *Journal of Pesticide Science* 35(2).

Weston, D.P., R.W. Holmes, M.J. Lydy. 2008. Residential runoff as a source of pyrethroid pesticides to urban creeks. *Environmental Pollution* 157(1):287-94

Weston, D.P., R.W. Holmes, J. You, M.J. Lydy. 2006. Aquatic toxicity due to residential use of pyrethroid insecticides. *Environmental Science and Technology* 39(24):9778-84.

PROJECT MANAGEMENT

- Acute Toxicity of Sacramento Area Urban Creeks to *Ceriodaphnia dubia*. (2007).
- Alamo Creek Use Attainability Study for Chinook salmon and steelhead. (2004).
- Big Sur River Instream Flow Study. (2010-2014).
- Central Valley Benthic Macroinvertebrate Bioassessment Committee. (Coordinator 2002-2004).
- CDFW Instream Flow Program Quality Assurance Program. (2009-Present).
- Morrison Creek Use Attainability Study for Chinook salmon and steelhead. (2004).
- Sources, Seasonality, and Toxicity of Pyrethroid Pesticides in the Sacramento-San Joaquin River Delta. (2007-2008).
- South Fork Eel River Tributary - Habitat Suitability Criteria Development for Salmonids. (2016-present).
- Tissue Residues of Organochlorine Pesticides and Polychlorinated Biphenyls in Fish Collected from Waterways in the Central Valley. (2007-2008).
- Ventura River Instream Flow Study. (2016-present).

TECHNICAL REPORTS

- De Vlaming, V., K. Goding, D. Markiewicz, R. Wallace, R. Holmes. 2006. Survey of Zooplankton Community Structure and Abundance in Agriculture-dominated Waterways in the Lower Sacramento River Watershed. UC Davis Aquatic Toxicology Laboratory Technical Report. 69pp.
- De Vlaming, V., D. Markiewicz, K. Goding, T. Kimball, and R. Holmes. 2003. Macroinvertebrate Assemblages in Agriculture- and Effluent-dominated Waterways of the Lower Sacramento River Watershed. UC Davis Aquatic Toxicology Laboratory Technical Report. 149pp.
- Holmes, R.W. 2004. Monitoring of Sediment-bound Contaminants in the Lower Sacramento River Watershed. Central Valley Regional Water Quality Control Board Technical Report. 51pp.
- Holmes, R.W., V. de Vlaming, D. Markiewicz, K. Goding 2005. Benthic Macroinvertebrate Colonization of Artificial Substrates in Agriculture-dominated Waterways of the Lower Sacramento River Watershed. Central Valley Regional Water Quality Control Board Technical Report. 95pp.
- Holmes, R.W., D.E. Rankin, M. Gard, and E. Ballard. 2014. Instream Flow Evaluation: Steelhead Passage and Connectivity of Riverine and Lagoon Habitats Big Sur River, Monterey County. California Department of Fish and Wildlife, Water Branch Instream Flow Program Technical Report 14-3. 86pp.
- Holmes, R.W., M.A. Allen, and S. Bros-Seeman. 2014. Habitat Suitability Criteria Juvenile Steelhead in the Big Sur River, Monterey County. California Department of Fish and Wildlife, Water Branch Instream Flow Program Technical Report 14-1. 181 pp.
- Holmes, R.W., and W. Cowan. 2014. Instream Flow Evaluation: Steelhead Spawning and Rearing Big Sur River, Monterey County. California Department of Fish and Wildlife, Water Branch Instream Flow Program Technical Report 14-2. 62pp.

PRESENTATIONS

2017. Invited speaker for SWRCB Science Symposium Instream Flow Workshop. "Question-Driven Flow Criteria: Overview of Regional and Site-Specific Approaches for Assessing Instream Flow Needs for Fish and Wildlife in California."

2016. CDFW Office of Training and Development. "Instream Flow Study Design and Execution Training." One-day Training for various CDFW Programs and Regions whose work involves instream flows.

2015. Invited speaker for North Coast Regional Water Quality Control Board Meeting/Instream Flow Workshop. "Common Methods and Models for Instream Flow Assessments."

2015. Invited speaker for Instream Flow Council National Workshop in Portland OR. "Linking Data Collection with Decision Making – The California Perspective on Managing Uncertainty with Instream Flow Regime Assessments."

2015. Department of Fish and Wildlife Science Symposium. "Seasonal Microhabitat Selectivity by Juvenile Steelhead in a Central California Coastal River."

2014. California Aquatic Bioassessment Workshop. "Assessing Aquatic Habitat Connectivity and Low-flow Ecological Thresholds."

2013. Department of Fish and Wildlife Science Symposium. "Quality Assurance: Addressing Scientific Data Quality and Comparability to Protect Fish and Wildlife."

2012. Salmonid Restoration Federation Workshop. "Analytical Approaches to Determine Instream Flow Needs for Salmonids and River Ecosystems."

2008. CalFed Bay Delta Conference. "Statewide Investigation of the Role of Pyrethroid Pesticides in Sediment Toxicity in California's Urban Waterways."

2007. American River Watershed Conference. "Challenges in Stormwater Management."

2004. California Aquatic Bioassessment Workshop. "Status of Biomonitoring in Central Valley."

2003. CalFed Bay Delta Conference. "Habitat Condition and Benthic Community Assemblages in Agriculture-dominated and Effluent-dominated Waterways of the Lower Sacramento River."

2002. California Aquatic Bioassessment Workshop. "Benthic Habitat Assessment and Invertebrate Communities in Lower Sacramento River Watershed."

POSTERS

2014. CalFed Bay Delta Conference. "Development of a Quality Assurance System for the California Department of Fish and Wildlife Instream Flow Program". B. van Buuren, R. Holmes.

2003. Northern California Society for Environmental Toxicology and Chemistry. "NPDES Receiving Water Monitoring: Application of the Triad Approach to Identify Ambient Water Toxicity from Unknown Causes". S.L. Clark, S. Ogle, J. Cotsifas, R. Holmes, R. Gossett.