



## CONTACT INFORMATION

427 F St. Suite 223  
Eureka CA 95501  
707.476.0998  
shea@h2odesigns.com

## EDUCATION

M.S. 1994 Geomorphology  
The Johns Hopkins University,  
Maryland  
B.S. 1991 Geology  
Bloomsburg University of  
Pennsylvania

## PROFESSIONAL ENGINEERING REGISTRATIONS

California Civil C72614  
Oregon Civil 79492PE

## AREAS OF PRACTICE

- Geomorphic Assessment
- Aquatic Organism Passage
- 1D & 2D Hydraulic Modeling
- Stream and Estuarine Restoration
- Wetland Enhancement
- Bioengineering Design
- Watershed Studies
- Stormwater Management
- Construction Supervision

## AFFILIATIONS

- American Fisheries Society
- California Salmonid Restoration Federation
- River Restoration Northwest

## EXPERIENCE

Rachel specializes in the application of fluvial geomorphology, sediment transport, hydrology, and hydraulic analyses to riverine systems, watersheds, and coastal estuarine environments. She has over 19 year of multidisciplinary experience in the field of stream, fish passage, and coastal restoration projects. Her specialties include geomorphic analysis, hydrologic and hydraulic analyses, bridge scour analyses, aquatic and terrestrial habitat enhancements, design development, permitting, and construction supervision.

### Alameda Creek Fish Passage over ACWD Facilities and BART Weir, Alameda County, CA

Prepared designs with GHD for a roughened channel in an ACOE flood channel to provide tailwater control and attraction flow for a fishway over two water supply rubber dams and the BART weir. Prepared a HEC-RAS hydraulic model to assess fish passage hydraulic conditions. Coordinated project design with GHD to ensure no changes to the 100- and 500-year FEMA flood elevations. Prepared hydraulic models to assess fish passage conditions through the juvenile spillway.

**Client:** Alameda County Public Works Agency, CEMAR

**Completed:** Anticipated 2016

### Zinfandel Lane Fish Passage Retrofit: Napa River, CA

Part of design team to provide fish passage at a perched concrete apron under an historical bridge. Tasks included topographic and geomorphic survey, development of fish passage design flows, coordination with geotechnical engineer, and development of fish passage retrofit alternatives using NOAA/CDFW hydraulic design criteria. Performed a geomorphic analysis of potential channel degradation resulting from lowering of culvert apron. Assessed 100-year floodplain impacts by modifying preexisting FEMA CLOMR model.

**Client:** Napa County Resources Conservation District

**Completed:** 2011

### Tajiguas Creek Fish Passage Barrier Removal Project: Santa Barbara, CA

Geomorphologist for assessment 8,000 feet of stream and design to remove five perched low-water crossings with significant upstream aggradation that created migration barriers to southern steelhead. Designed self-adjusting channels and used HEC-RAS and FHWA methods to perform scour analysis for new bridge crossing. Designed rock scour countermeasures to protect bridge abutments from contraction scour channel adjustment of up to 3 feet. Performed construction oversight.

**Client:** MAZ Properties/South Coast Habitat Restoration

**Completed:** 2011



**Feliz Creek Fish Passage Improvements, Mendocino County, CA**

Assessed the feasibility of lowering an existing dam to re-establish adult and juvenile salmonid passage. Project constraints included adjacent infrastructure, unstable hillslopes, and assessment of upstream sediment mobility and channel incision that would result from the dam modifications. Performed a geomorphic survey of approximately 1,500 feet of stream channel, performed hydrologic analyses, hydraulic and sediment transport assessments to develop restoration alternatives.

**Client:** Mendocino County Water Agency

**Completed:** 2010

**Manly Gulch Fish Access and Habitat Restoration Project, Mendocino, CA**

Performed geomorphic assessment and developed design plans and specifications for new stream crossing and restoration of 600 feet of channel that is severely aggraded. Surveyed reference reaches to identify stable channel cross section and profile. Prepared HEC-RAS analysis of project area to design a bridge opening to accommodate the bankfull channel and remain stable during overbank flow events. Hydraulic analyses included consideration of backwater effects and overbank flows from a downstream river confluence. Prepared a bridge scour analysis that considered potential channel incision, horizontal and vertical (contraction scour, and effects of overbank flows from the channel upstream and the river downstream. Scour countermeasures at the new bridge will include rip rap banks and embedded keyways to maintain abutment stability in the event of downstream channel incision.

**Client:** California Department of Parks & Recreation, Mendocino Resource Conservation District

**Completed:** Anticipated 2015

**Jack of Hearts Creek Fish Passage Barrier Removal, Branscomb, CA**

Developed conceptual design to remove an approximately 20-foot high dam and to restore 550 feet of upstream channel. Design included identification of the pre-dam stable stream profile and estimate of aggradation. To accommodate site constraints, the design includes a reach of over-steepened channel that will be stabilized using large wood structures. The configuration of wood structures will allow the channel to self-adjust downward to the predicted stable grade, slowly releasing aggraded sediments while maintaining streambank stability.

**Client:** California Department of Fish and Wildlife

**Completed:** Anticipated 2016

**Stony Brook Creek Fish Passage Assessment and Barrier Removal Design: Alameda County, CA**

Updated conceptual design of 2001-study recommendations of 8 crossings on Stony Brook Creek, a tributary of Alameda Creek, that are currently barriers for fish passage. Performed hydraulic computations for stream-simulation crossing replacements and designed profile-controls downstream of perched crossings where replacement is infeasible. Developed construction cost estimates for each crossing. Currently preparing design plans for a bridge replacement and boulder step-pool channel at one crossing and restoration of a step-pool channel and new baffles at a second crossing. Design for the bridge replacement included sizing and positioning the bridge opening to reduce the potential for both contraction and local scour. Performed scour analysis using standard FHWA procedures and HEC-RAS.

**Client:** Alameda County and Alameda County RCD

**Completed:** Anticipated 2015