

Antonio Llanos, P.E.

Senior Project Engineer



CONTACT INFORMATION

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EDUCATION

B.S. 1996
Environmental Resources
Engineering, Humboldt State
University, California

PROFESSIONAL ENGINEERING REGISTRATION

California Civil No. C 65621

AREAS OF PRACTICE

- Hydraulic and Hydrologic Analysis
- Stream Restoration
- Estuarine Restoration
- Aquatic Organism Passage
- Dam Removal
- Professional Resources Development
- Construction Supervision
- Survey and Drafting
- Civil3D Modeling
- 1D & 2D Hydraulic Modelling
- GIS Analysis
- Graphic Design

AFFILIATIONS

- Past President and Co-Founder, Engineers Without Borders Northcoast Chapter
- Past President Northcoast Chapter ASCE
- California Salmonid Restoration Federation
- River Restoration Northwest
- American Fisheries Society

EXPERIENCE

Antonio is a licensed civil engineer with over 25 years of engineering experience, including the design of habitat improvement and fish passage projects. His extensive range of experience encompasses hydrology, water supply, hydraulic modeling and design applied to fish passage, and stream and estuary restoration projects. He regularly collaborates with geologists and fisheries biologists to develop plans for construction and permitting. His projects include hydraulic analysis, design and construction of various fish passage, stream restoration, and estuary restoration projects. He has designed culvert replacements and fish passage structures, including pool and weir, pool and chute and roughened channel (nature-like) fishways.

Mr. Llanos provides expertise in the use of AutoCAD Civil 3D drafting and modeling software and specializes in their application to stream restoration projects. He uses GIS software for watershed scale hydrologic analysis and map making and regularly provides construction guidance for restoration and fish passage projects.

Salmonid Habitat Improvement Projects, Mattole River, Petrolia CA

Fisheries Engineer for restoration study of seasonal lagoon and tidal estuary along lower river to improve habitat availability for juvenile and adult salmonids. Implemented field monitoring protocol for groundwater and river water levels and water quality. Integrated data with LiDAR topography and historical photographs to develop sight specific design alternatives. Developed design plans for slough restoration (Completed: 2018, 2020) and Lower Bear Creek channel restoration (Designed: 2024)

Design Engineer in collaboration with Mattole Salmon Group to prepare wood loading plan for salmon bearing tributaries. Developed GPS based field data collection protocol, incorporated field data, LiDAR and modelling results to conduct basin wide hydrologic analysis, prioritized and reported on 21 miles of stream reaches for restoration potential. Prepared engineering designs for anchored wood using hand crews, heavy equipment and Helicopter applications with consideration for infrastructure. (Client: Mattole Salomon Group)

Rowdy and Dominie Creek Fish Passage Improvement, Smith River, CA

Prepared design plans, specifications and cost estimates and supervised construction to restore fish passage at Rowdy Creek hatchery. Construction involved removal of channel spanning concrete weirs and rebuilding of the creek with a 420-foot pool and chute roughened channel. Worked directly with operators to install and seal 10,000 tons of material ranging from gravel to 6-foot diameter rock. Project also included the redesign of the Rowdy Creek Hatchery's fish trapping facility and the water diversion intake structure. (Client: Tolowa Dee-ni' Nation, GHD)

Mendocino Rail Crossing and Fish Passage Projects

Design engineer and construction oversight for fish passage elements of three culvert replacements on the railway and adjacent timber roads. Antonio worked collaboratively with AECOM to develop designs and oversee construction. During construction, he worked directly with equipment operators to guide construction of 9 log and 4 rock steps along the 385 feet of restored channel for grade control and fish passage improvements. Post project monitoring was completed for 2 years. Designs included roughened channel applications for grade control and fish passage. (Client: Trout Unlimited)

Freshwater Creek and Jacoby Creek Off-Channel Habitat Projects

Design Engineer for restoration of four historical off channel ponds to provide high flow refugia for salmonids. The projects consisted of stream-side alcoves, ponds and approach channel with log steps designed to provide access for juvenile salmonids during winter. Oversaw earthworks, culvert installation and construction of various large wood structures anchored with log piles, and boulder ballast. Wood structures included log weirs, grade control structure and habitat elements. Provided construction monitoring and oversight, and fish passage monitoring reporting. (Client: PCFWWRA, RCAA)

Woodman Creek Restoration in Eel River Canyon

Design Engineer and Resident Engineer for restoration of river mouth at tributary in the remote Eel River Canyon. Prepared restoration plans, final engineering documents, and oversaw implementation for hydrogeomorphic restoration of historical creek. Conducted extensive topographic survey, integrated seismic refraction data and geomorphic analysis. Construction involved removal of 38,000 CY of railroad fill crossing, daylighting and restoring 500 ft of a bedrock and boulder channel. The pre-project channel was plugged with a constructed rock embankment with a water stop core of a concrete and geomembrane. Reconnected 14 miles of prime spawning and rearing habitat. (Client: California trout)

PUBLICATIONS

Love, M and K Bates. 2009. **Part XII: Fish Passage Design and Implementation.** California Salmonid Stream Habitat Restoration Manual. CDFW

Co-Author **FishXing V.3** software, manual and training materials (USFS 2006).

García Molinos, J, A. Llanos, A. Martínez de Azagra Paredes. 2005. **Diseño de obras de paso compatibles con la migración de peces.** Ingeniería Civil. CEDEX Madrid, España. Num. 139/2005.

Llanos, A., M. Love, M. Furniss, S. Firor, K Moynan, J. Guntle, and J. Molinos. 2004. Modeling Fish Capabilities and Culvert Hydraulics for Assessment and Design of Road Crossings. **Proceedings of 5th International Symposium on Ecohydraulics. Madrid, Spain.**