

THOMAS R. PAYNE
FISHERIES BIOLOGIST

Instream flow analysis and stream ecology

EDUCATION

M.S. Degree in Fisheries Biology, 1972

Thesis title: *Effect of prior residence on dominance in rainbow trout*. University of California, Humboldt, Arcata, CA. Specialized course work included fish diseases, reservoir management, fish population dynamics, and genetics.

B.S. Degree in Fisheries Biology, 1970

Minor in Psychology, Humboldt State College, Arcata, CA. Specialized course work included ichthyology, fisheries management, limnology, animal behavior, bacteriology, fish culture techniques, biometrics, freshwater fish ecology, technical writing, and psychobiology.

University of California, Irvine, CA. Course work included general biology core series, calculus, physics, inorganic and organic chemistry, and parasitology.

EXPERIENCE

Principal Associate

1982 - Present

Thomas R. Payne & Associates Fisheries Consultants, Arcata, CA

Conduct impact evaluation studies of water resource development projects affecting aquatic systems. Specialize in application of the Instream Flow Incremental Methodology (IFIM) to assess the effect of streamflow alterations due to hydroelectric power, irrigation, and water supply projects. Design and negotiate fishery protection provisions as part of licensing and permitting requirements. Provide biological expertise and expert witness testimony for these activities and others affecting fishery resources, including timber harvest and stream restoration. Develop habitat and water temperature software and teach workshops to public and private sector biologists. Manage small business and supervise staff of professional fishery biologists.

Fish and Wildlife Biologist

1981 - 1982

U.S. Fish & Wildlife Service, Olympia, WA

Performed environmental review of existing and proposed hydroelectric development projects in Washington State, including commenting on preliminary permits, negotiating license conditions, setting exemption terms and conditions, and establishing instream flows. Initiated multi-agency committee to coordinate and improve inter-agency and agency-developer communication. Performed and/or reviewed most hydropower-related instream flow studies conducted in the state. Functioned as technical adviser for IFIM applications to state, private, and tribal biologists.

Fisheries Management Biologist

1977 - 1981

U.S. Fish & Wildlife Service, Arcata, CA

Assisted in the monitoring and management of sport, commercial and Indian salmon fisheries on the Klamath and Trinity Rivers, recovered coded-wire tags and harvest information from Indian gillnet fishery, performed salmon population-estimate studies, inventoried and electrofished tributary streams for fish habitat quality, salmonid utilization, and accessibility, directed stream clearance operations for log-jam removal and fish habitat improvement, and built and operated a fish weir, trap, and small hatchery.

Fisheries Management Biologist

1975 - 1977

U.S. Fish & Wildlife Service, Olympia, WA

Advised Indian and other groups on siting, construction and operation of small streamside salmon hatcheries. Conducted spawning ground surveys to count spawning salmon and recover tags for estimating salmon populations. Assisted in inventory of herring spawning distribution in Puget Sound. Reviewed logging plans and wrote logging stream impact assessments.

Fisheries Biologist

1972 - 1974

Envirogenics Systems Company, El Monte, CA

Performed long and short-term toxicity tests on several fish species with various pesticides and toxic chemicals. Helped design and construct toxicant delivery apparatus and environmental control systems. Acquired and maintained fish stocks for laboratory testing.

Research Assistant

1971 - 1972

National Science Foundation Sea Grant Program, Humboldt State University, Arcata, CA

Assisted with the development and construction of experimental fish ponds which used tertiary-treated sewage to supplement food sources by nutrient enrichment. Monitored water quality in ponds. Helped build laboratory and fish culture facilities.

IFIM TECHNICAL TRAINING

Instream Flow Strategies and Negotiations (1981)

Instream Flow Field Techniques (1981)

Instream Flow Computer Analysis (1981)

Advanced Analytical Techniques in IFIM (1984)

Hydraulics in PHABSIM (1985 and 1989)

ACCOMPLISHMENTS

Special Achievement Award, U.S. Fish and Wildlife Service
Certified Fisheries Scientist, American Fisheries Society (1978, 2003)
California Department of Fish and Game, Directors Achievement Award
President, American Fisheries Society, Humboldt Chapter
Associate Professor of Fisheries, Humboldt State University
Secretary/Treasurer, Pacific Fisheries Biologists

PERTINENT PUBLICATIONS/PRESENTATIONS

Cardwell, R.D., and T.R. Payne. 1974. Acute toxicity of unknown toxicant to threespine stickleback (*Gasterosteus aculeatus microcephalus* Girard). Envirogenics Systems Company Report. El Monte, California. 8pp.

Cardwell, R.D., D.G. Foreman, T.R. Payne, and D.J. Wilbur. 1973. Acute toxicity of selenium dioxide to freshwater fishes. Chemico Process Plants Company, Envirogenics Systems Report. El Monte, California. 26pp.

- Cardwell, R.D., D.G. Foreman, T.R. Payne, and D.J. Wilbur. 1976. Acute toxicity of selenium dioxide to freshwater fishes. *Archives of Environmental Contamination and Toxicology* 4:129-144.
- Cardwell, R.D., D.G. Foreman, T.R. Payne, and D.J. Wilbur. 1976. Acute toxicity of selected toxicants to six species of fish. U.S. Environmental Protection Agency, Environmental Research Laboratory, Ecological Research Series Report EPA-600/3-76-008. Duluth, Minnesota. 125pp.
- Payne, T.R. 1975. Study on the development of the prior residence effect in rainbow trout (*Salmo gairdneri*). *Bulletin of the Southern California Academy of Sciences* 74:80-86.
- Payne, T.R. 1976. Skokomish initial project report. U.S. Fish and Wildlife Service, Northwest Fisheries Program Special Report. Tumwater, Washington. 19pp.
- Payne, T.R. 1987. One flow IFG4 - What it is and how it works. *Instream Flow Chronicle*, Vol. IV, No. 1. Ft. Collins, CO.
- Payne, T.R. 1988. PHABSIM analytical errors and implications for IFIM. *Instream Flow Chronicle*, Vol. V, No. 3. Ft. Collins, CO.
- Payne, T.R. 1988. A comparison of weighted usable area calculations using four variations of the IFG4 hydraulic model. Paper presented to American Fisheries Society Bioengineering Symposium, Portland, OR.
- Payne, T.R. 1992. Stratified random selection process for the placement of Physical Habitat Simulation (PHABSIM) transects. Paper presented to AFS Western Division Meeting, July 13-16, 1992, Fort Collins, CO.
- Payne, T.R. 1994. RHABSIM: User-friendly computer model to calculate river hydraulics and aquatic habitat. Proc. of the 1st International Symposium on Habitat Hydraulics, August 18-20, 1994, Trondheim, Norway.
- Payne T.R. 1994. The Instream Flow Incremental Methodology and stream habitat assessment: uses and abuses. Paper presented to Water: California's Liquid Gold Workshop, Santa Barbara, CA.
- Payne, T.R. 1995. IFIM: In Fact It's Magic. Review of The Instream Flow Incremental Methodology: A Primer for IFIM, written by National Biological Service, Bio. Rpt. 29, March 1995. *Rivers* 5(1):56-57.
- Payne, T.R. 2003. The concept of weighted usable area as relative suitability index. Paper presented to International IFIM User's Workshop, June 1-5, 2003, Ft. Collins, CO.
- Payne, T.R., S.D. Eggers, and D.B. Parkinson. 2003. The number of transects required to compute a robust PHABSIM habitat index. Paper presented to International IFIM User's Workshop, June 1-5, 2003, Ft. Collins, CO.

Payne, T.R., and D.J. Bremm. 2003 The influence of multiple velocity calibration sets on the PHABSIM habitat index. Paper presented to International IFIM User's Workshop, June 1-5, 2003, Ft. Collins, CO.

EXPERT WITNESS PARTICIPATION

1983 - Winchester Dam Hydroelectric Project, North Umpqua River, Oregon. Testified before county and state regulatory agencies in Roseburg on impacts of a small hydroelectric project on salmon and steelhead. Client - Elektra Power Company. Attorney - Steven Janik, Portland, OR

1984 - Roaring Creek Hydroelectric Project, Roaring Creek, California. Prepared affidavit for submittal to Federal Energy Regulatory Commission on the impacts of a small hydroelectric project on resident trout. Client - Mega Hydro, Inc. Attorney - Gary Bachman, Washington, D.C.

1985 - Sayles Flat Hydroelectric Project, South Fork American River, California. Prepared statements and affidavits on the impacts of a small hydroelectric project on resident trout. Client - Sayles Hydro Associates. Attorneys - Stuart Somach, Virginia Cahill (McDonough, Holland & Allen), Sacramento, California.

1986 - Rock Creek Hydroelectric Project, Sacramento, California. Testified before State Water Resources Control Board on the impact of a small hydroelectric project on resident trout and warmwater fish species. Client - Rock Creek Limited Partnership. Attorney - Louis Touton (Jones, Day, Reavis & Pogue), Los Angeles, California.

1986 - American River Litigation, Sacramento, California. Prepared data on impact of flow alteration in the lower American River. Client - City of Sacramento. Attorney - Stuart Somach (McDonough, Holland & Allen), Sacramento, California.

1987 - Flathead Irrigation Project, Montana. Testified in Federal Court in Helena on the impact of drought relief flow regulations on irrigators in the Flathead Valley. Client - Confederated Salish and Kootenay Tribes. Attorney - Patrick Smith (C.S.K.T.), Pablo, Montana.

1987 - Rock Creek Hydroelectric Project, Washington, D.C. Testified before Federal Energy Regulatory Commission administrative law judge on the potential impact of a small hydroelectric project on resident trout and warmwater fish species. Client - Rock Creek Limited Partnership. Attorney - Louis Touton (Jones, Day, Reavis & Pogue), Los Angeles, California.

1990 - Ox Mountain Landfill Expansion, Oakland, California. Testified before Regional Water Quality Control Board on fisheries impacts and mitigation for a solid waste disposal project. Client - Browning-Ferris Industries. Attorney - Edgar Washburn (Washburn, Briscoe & McCarthy), San Francisco, California.

1990 - Santa Ynez River Hearings, Sacramento, California. Prepared testimony on fisheries impacts of groundwater infiltration project near Lompoc, California. Assisted with hearing before State Water Resources Control Board. Client - Santa Ynez River Water Conservation District. Attorneys - Stanley Hatch, Scott Slater (Hatch & Parent), Santa Barbara, California.

1992 - Yuba River Hearings, Sacramento, California. Presented testimony to the State Water Resources Control Board on instream flow and water temperature modeling studies. Client - California Department of Fish and Game. Attorney - Dennis Smaage, California State Attorney General's Office, Sacramento, California.

1992 - Lagunitas Creek Hearings, Sacramento, California. Presented testimony to the State Water Resources Control Board on instream flow studies. Client - California Department of Fish and Game. Attorney - William Cunningham, California State Attorney General's Office, Sacramento, California.

1993 - Bear Creek Hearings, San Bernardino, California. Prepared testimony for the State Water Resources Control Board on instream flow studies. Client - Big Bear Municipal Water District. Attorney - Kevin O'Brien (Downey, Brand, Seymour & Rohwer), Sacramento, California.

1993 - Mono Basin Hearings, Sacramento, California. Presented testimony to the State Water Resources Control Board on instream flow studies on tributaries to Mono Lake. Client - California Department of Fish and Game. Attorney - Harold Thomas, California State Attorney General's Office, Sacramento, California.

1994 - Yakima Basin Water Rights Adjudication, Yakima, Washington. Prepared affidavit on habitat use of Yakima River by anadromous fish. Client - Yakima Basin Defense Coalition. Attorney - Charles Flower (Flower & Andreotti), Yakima, Washington.

1996 - Putah Creek Water Rights Adjudication, Vacaville, California. Presented testimony on instream flow issues for warm and coldwater fish species. Client - Solano County Water Agency. Attorney - Tim O'Laughlin (Minasian, Minasian, Minasian, Spruance, Baber, Meith & Soares), Oroville, California.

1996 - Platte River Water Rights Adjudication, Lexington, Nebraska. Presented testimony on instream flow studies and associated issues. Client - Nebraska Water Conservation Cooperative. Attorney - James Doyle (Cook, Wightman & Doyle), Lexington, Nebraska.

1996 - River Kennet Public Inquiry, Newbury, England. Reviewed and reanalyzed instream flow study performed for the Environment Agency and provided proof of evidence on study interpretation and impact analysis. Client - Thames Water Utilities, Ltd. Queen's Counsel - Anthony Anderson (2MBC), London, England.

2002 - Tongariro River Consent Process, Turangi, New Zealand. Prepared direct testimony on instream flow analysis of the Tongariro Power Development in association with National Institute of Water and Atmospheric Research. Client - Genesis Power, Ltd. Counsel - Paul Majurey (Russell McVeagh), Auckland, New Zealand.