

**Third Panel Member Application
Federal Energy Regulatory Commission
Integrated Licensing Process
Formal Study Dispute Resolution Process
Docket No. AD04-4-000**

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References:

- 1. Professor Peter Moyle
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 - 2. Terry Waddle
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 - 3. Robert H. Deibel
National Instream Flow Coordinator
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- 1. Technical Expertise: Aquatic Resources:**
- a. Instream Flow**
 - b. Macroinvertebrates**
 - c. Water Quality**
 - d. General**

As a Fish and Wildlife Biologist with the U.S. Fish and Wildlife Service, I have over 10 years of experience in designing, implementing and reviewing studies, including refining of issues and analytical techniques, for determining flow regimes. I gained this experience while working at the U.S. Fish and Wildlife Service and through formal training in instream flow methods. My experience includes field data collection and analyses for different instream flow modeling approaches along with post-analysis and interpretation of results. Specifically, I have conducted instream flow studies for seven streams in California, ranging in size from 40 to 15,000 cfs. My specific areas of expertise are in developing habitat suitability criteria (including criteria for macroinvertebrates) and conducting hydraulic and habitat modeling with PHABSIM and two-dimensional modeling. I have authored a number of peer-reviewed articles on instream flow methodologies (see below).

In addition, I have served as a technical expert for the U.S. Fish and Wildlife Service on instream flow studies for the FERC relicensing of over 18 hydropower projects, reviewing the adequacy of study plans and results, and developing flow recommendations. My experience provided me the opportunity to participate at the project level covering study design, vetting and refining of issues, and working in a collaborative framework of the various elements of instream flow studies (eg. selection of method, discussion of biological, ecological, and physical habitat metrics, and analytical framework and interpretation for use by collaborative groups). I have also taken formal training in water temperature modeling and reviewed study results of water temperature modeling. In addition, while working for the U.S. Environmental Protection Agency (1984-1990), my responsibilities included assessing water quality impacts of a variety of human activities, including those resulting from alterations in flow regimes. As a result of my doctoral research at the University of California, Davis, I have extensive experience in planning and implementing study methodologies used to assess the effects of flow alterations on aquatic communities, including multiple-pass depletion electrofishing, seining, gill netting, snorkel surveys, tagging, and analysis of fish scales for growth and age determination. I published the results of my dissertation research in 5 peer-reviewed articles (see below).

My current responsibility requires me to understand the respective modeling techniques, data requirements and software available for modeling instream flow needs. In my current position, I participate in instream flow training and technical workshops to keep myself up to date on the various tools and techniques and cutting edge analytical methods as they evolve with the advancements of desktop computers and field collection methods (2-D modeling, total station, GIS technology, etc).

2. Knowledge of Effects of construction and operation of hydroelectric projects.

While working at the Fish and Wildlife Service, I have gained comprehensive knowledge of the various physical configurations and operational capabilities and constraints to understand project effects to aquatic resources and develop workable solutions to aquatic resource problems (instream flow, etc). My position as a technical expert for the Fish and Wildlife Service provides me the opportunity to provide technical assistance on a wide range of project configurations and operations along with the different physical and biological settings. In order to adequately do my job, I must understand the different project operations, their physical setting and their physical constraints in order to develop workable solutions to aquatic resource issues.

3. Working knowledge of laws relevant to expertise, such as: the Fish and Wildlife Coordination Act, the Endangered Species Act, the Clean Water Act, the Coastal Zone Management Act, the Wild and Scenic Rivers Act, the Federal Power Act or other applicable laws.

My experience at the Fish and Wildlife Service requires me to have a comprehensive understanding of the laws, regulations, and policies of FERC and Federal and State agencies involved in a FERC proceeding. For example, I have been involved in at least four FERC hearings related to flow regimes recommended by Federal and State fishery management agencies under section 10(j) of the Federal Power Act. While working at the U.S. Fish and Wildlife Service, the principal authorities to participate in FERC administered hydroelectric proceedings are the Fish and Wildlife Coordination Act, the Endangered Species Act, and the Federal Power Act.

4. Ability to promote constructive communication about a disputed study.

As mentioned above, I serve as a technical expert for the Fish and Wildlife Service on instream flow quantification matters. I have been called in for internal and external discussions on technical merits of a proposed or completed study. My counsel and advice ranges from the proposed study design, refining and focusing on key aquatic issues to analytical methods that deliver the desired level of resolution on an instream flow matter. In my role, I reach out to other agency experts on the appropriate study design (eg. application of appropriate methods, need for statistical design vs. non-statistical design). I gain insight about how to understand the resource issues and the technical approaches needed to address the resource issue from participating in all these efforts. This in turn has helped me develop the skills necessary to communicate with Fish and Wildlife Service, other

agency, Tribal and non-governmental technical and management staff on appropriate courses of action.

I have extensive experience in speaking to large and small groups and in leading and managing teams. My public speaking includes giving presentations at professional society meetings and international conferences, delivering presentations at Fish and Wildlife Service training sessions, and delivering briefings to Fish and Wildlife Service management. I have also participated in two expert panels, with representation from resource agency and non-governmental technical staff, to develop protocols for national use in guiding the development and implementation of instream flow and monitoring studies used in assessing the effects of altered flow regimes.

I work comfortably in a group setting and am formally trained in negotiations that foster collaborative and constructive discussions that focus on creative solutions. I participated in a negotiation training course offered by the USGS, Policy Analysis and Science Assessment group in Fort Collins, Colorado, taking in the key points regarding concepts and participation in collaborative negotiations.

Education:

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| 1994 | Ph.D. in Ecology, University of California, Davis.
Dissertation Title: Biotic and Abiotic Factors Affecting Native Stream Fishes in the South Yuba River, Nevada County, California. |
| 1984 | M.S. in Environmental Engineering. University of California, Berkeley. |
| 1983 | B.S. in Civil Engineering, concentration in Environmental Engineering and Water Resources. Massachusetts Institute of Technology. |

Publications:

1. **Gard, M.** 1997. Threatened fishes of the world: *Ptychocheilus lucius* Girard, 1856 (Cyprinidae). *Environmental Biology of Fishes* 49: 292.
2. **Gard, M.** 1997. Technique for adjusting spawning depth habitat utilization curves for availability. *Rivers* 6: 94-102.
3. Gallagher, S.P. and **Gard, M.F.** 1999. Relationship between Chinook salmon (*Oncorhynchus tshawytscha*) redd densities and PHABSIM-predicted habitat in the Merced and Lower American rivers, California. *Canadian Journal of Fisheries and Aquatic Sciences* 56: 570-577.
4. **Gard, M.F.** 2002. Effects of sediment loads on the fish and invertebrates of a Sierra Nevada river, California. *Journal of Aquatic Ecosystem Stress and Recovery* 9: 227-238.

5. **Gard, M.** and Ballard, E. 2003. Applications of new technologies to instream flow studies in large rivers. *North American Journal of Fisheries Management* 23: 1114-1125.
6. **Gard, M.** 2004. Potential for restoration of a California stream native fish assemblage. *California Fish and Game* 90: 29-35.
7. **Gard, M.** and Randall, P. 2004. Setting priorities for native fish conservation: an example from the South Yuba River watershed. *California Fish and Game* 90: 1-12.
8. **Gard, M.** 2004. Interactions between an introduced piscivore and a native piscivore in a California stream. *Environmental Biology of Fishes* 71: 287-295.
9. **Gard, M.F.** 2005. Ontogenetic microhabitat shifts in Sacramento pikeminnow, *Ptychocheilus grandis*: reducing intraspecific predation. *Aquatic Ecology* in press.
10. **Gard, M.F.** 2005. Variability in flow-habitat relationships as a function of transect number for PHABSIM modeling. *River Research and Applications* in press.

Submission Contents

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