

## DWR WAREHOUSE

## Executive Summary

## I.

97 JUL 28 PM 12:15

- a. **Title.**—Abundance and seasonal, spatial and diel distribution patterns of juvenile salmonids passing the Red Bluff Diversion Dam, Sacramento River California.
- Applicant.**—U. S. Fish and Wildlife Service, Northern Central Valley Fish and Wildlife Office, 10950 Tyler Road, Red Bluff, California 96080. Phone: (916)527-3043, Fax: (916)529-0292, email: jim\_smith@mail.fws.gov.
- b. **Project Description.**—The goal of this project is to provide estimates of abundance and outmigration timing of downstream migrating juvenile chinook salmon *Oncorhynchus tshawytscha* (salmon) and steelhead trout *O. mykiss* (trout) near the Red Bluff Diversion Dam (RBDD). It will evaluate progress of actions addressing stressors effecting the following priority species: winter chinook, spring chinook, late fall chinook and green sturgeon. These stressors are water temperature, ~~passage~~, spawning habitat and restoration of riparian forests. The specific priority habitats would be: Instream aquatic and shaded riverine aquatic. Specific objectives are to estimate, 1) abundance of each of the four runs of juvenile salmon, steelhead trout and other fish species passing RBDD, 2) the seasonal and spatial distribution of juvenile salmon, steelhead trout and other fish species passing RBDD, and 3) diel patterns of abundance of juvenile salmon and steelhead trout passing RBDD. These objectives will be approached with a multiyear study program.
- The primary benefits of this project are more precise indices of juvenile production. These indices can be used to formulate trends which provide indicators of the success of restoration actions. The data from RBDD sampling is used for a variety of management purposes from indicators of run strength, run discrimination, genetic sampling, and triggers remedial measures pertaining to flow, temperature and entrainment. It also provides the clearest picture available of main stem salmonid population status, contributing extensively to our knowledge of the life history of these fishes. Additionally, this sampling includes other species, including the priority species green sturgeon. From July 1994 through June 1995, 90 thousand fish were sampled consisting of 28 different species.
- c. **Approach.**—Absolute abundance indices for juvenile salmon migrants passing RBDD will be estimated by the rotary screw trap efficiency method (Thedinga et al. 1994, Keenan et al. 1994). Indices for total fish passing the sampling transect will be calculated daily from catches in traps which are corrected by trap efficiency estimates. Absolute abundance indices will also be calculated from the proportion of catch per water volume sampled to total river discharge past the RBDD transect. Relative abundance of juvenile salmonids will be calculated from catch per water volume sampled.
- Absolute abundance indices for fall, late-fall, winter and spring chinook salmon, and steelhead trout will be analyzed by month. Absolute abundance indices will be used to evaluate seasonal patterns of abundance. Spatial distribution patterns will be determined by comparing relative abundance of salmonids between traps. Diel distribution patterns determined by comparing relative abundance of salmonids throughout the day.
- Tasks.**—This project has been funded by the Reclamation since 1994 as part of the evaluation of the Research Pumping Plant (RPP). This sampling is conducted four days per week, 24-hours per day. With additional funding (Task 1), sampling would expand an additional three days per week (7 total). U. S. Bureau of Reclamation funding will likely cease after fiscal year 1998 when inriver evaluations of the RPP are complete. Task 2 would fund the continuation of a full seven day a week main stem program.
- Schedule.**—Field work for the pilot program began in July 1994 and extended through summer 1995. Analyses for the pilot year and a progress report was completed July 1996. Field work has been continuous since 1994 and a second report will be completed summer of 1997.

**Report Schedule.**—Reports will be submitted annually and real time data provide through the Interagency Ecological Program web site.

- d. **Justification for Project Funding by CALFED.**—The RBDD site is below the spawning areas of priority species: winter chinook, main stem spring chinook, late-fall chinook and steelhead trout. Additionally, rotary- screw-trap sampling has documented young-of-year and older green sturgeon and splittail. Sampling at this site would benefit numerous programs involving the restoration of these fishes. Juvenile sampling at RBDD is consistent with recommendation of other ecosystem restoration programs, such as: Central Valley Project Improvement Act (CVPIA), Red Bluff Diversion Dam CVPIA (3406 [b] 10) actions and planning process, Anadromous Fisheries Restoration Program (AFRP), Comprehensive Assessment and Monitoring Program (CAMP) and Red Bluff Research Pumping Plant Evaluations .
- e. **Budget Costs.**—~~Project costs~~ for Task 1, which is an expansion of the existing Reclamation evaluation of the Research Pumping Plant at RBDD project which extends through FY '98 are \$312,000; and annual costs for Task 2, which continues a full scale project for FY '99 and '00 \$696,000 per year. This project is envisioned and multiyear and would continue as long as the data is needed by managers and researchers working on restoration projects in the basin.
- Third Party Impacts.**—No third party impacts will occur during this project.
- f. **Applicant Qualifications.**—The Northern Central Valley Fish and Wildlife Office (NCVFWO) was established in 1978 as part of the U.S. Fish and Wildlife Service's (Service) responsibility to facilitate restoration of Pacific salmonids. The construction and operation of dams and water diversion projects and the subsequent degradation and loss of habitat have been the primary contributors to the decline in all anadromous salmonid stocks in the upper Sacramento River. Specific goals of the NCVFWO are to: 1) Stabilize or increase the runs of anadromous salmonids in the Sacramento River system, 2) Improve the effectiveness of federal fish propagation facilities in California and Nevada, 3) Protect and restore the productivity of natural habitats in the Sacramento River system, and 4) Continue development of information and strategies for protecting the natural habitats of the Sacramento River system as migration routes, spawning areas, and nursery areas for anadromous salmonids. The staff consists of 30 biologists and support personnel which have working experience in the upper Sacramento River.
- g. **Monitoring and Data Evaluation.**—This is a monitoring project whose data will be used in a variety of management and research efforts. Data evaluation and peer review are critical to the success of this project. Primary project review will occur within the Service, Reclamation, IEP and California Department of Fish and Game. This data is integrated into the RPP evaluation and IEP programs.
- h. **Local Support/Coordination with other Programs/Compatibility with CALFED Objectives.**—Sampling at the RBDD benefits numerous restoration programs, coordinating and interating data for the RPP, IEP, CAMP and AFRP programs. RBDD sampling is supported by the Salmon Project Work Team of the IEP. Main stem juvenile monitoring at RBDD have been identified in all current restoration planning documents: *Upper Sacramento River Fisheries and Riparian Habitat Management Plan*, *Central Valley Salmon and Steelhead Restoration and Enhancement Plan*, *Restoring Central Valley Streams: A Plan for Action*, and *Steelhead Restoration and Management Plan for California*, and *Working Paper on restoration needs: habitat restoration actions to double natural production of anadromous fish in the Central Valley of California. Volume 1, 2 and 3.*

**ABUNDANCE AND SEASONAL, SPATIAL AND DIEL DISTRIBUTION  
PATTERNS OF JUVENILE SALMONIDS PASSING THE RED BLUFF  
DIVERSION DAM, SACRAMENTO RIVER CALIFORNIA**

U.S. Fish and Wildlife Service  
Northern Central Valley Fish and Wildlife Office

Principal Investigators—Rich Johnson and Craig Martin

10950 Tyler Road  
Red Bluff, California 96080

Phone Number—(916)527-3043  
Fax Number—(916)529-0292  
Email—Jim\_Smith@mail.fws.gov

Federal Agency—Tax Exempt

Participants/Collaborators—U. S. Bureau of Reclamation

Group 3; Other Services

July 1997



### III.

### Project Description

- a. **Project Description and Approach.**—The goal of this project is to provide estimates of abundance and outmigration timing of downstream migrating juvenile chinook salmon *Oncorhynchus tshawytscha* (salmon) and steelhead trout *O. mykiss* (trout) near the Red Bluff Diversion Dam (RBDD). Sampling consists of up to four, eight-foot diameter rotary-screw deployed immediately downstream of the RBDD, and using the dam as an anchor. The traps are deployed laterally across the river to provide coverage in the river thalweg and edges. Traps are fished 24-hours per day, seven days per week. Specific objectives are to estimate, 1) abundance of each of the four runs of juvenile salmon, steelhead trout and other fish species passing RBDD, 2) the seasonal and spatial distribution of juvenile salmon, steelhead trout and other fish species passing RBDD, and 3) diel patterns of abundance of juvenile salmon and steelhead trout passing RBDD. These objectives are being addressed in a multiyear study program funded by the U. S. Bureau of Reclamation (Reclamation) which began in 1994 as part of the Research Pumping Plant evaluation. This element of the RPP evaluation will likely end after FY '98. Juvenile monitoring at RBDD would benefit from CALFED support to expand the program in FY '98, and maintain the program in FY '99 and '00 when Reclamation RPP funding ends.
- b. **Location and/or Geographic Boundaries of Project.**—The RBDD is located in the Sacramento River at river kilometer 388 (river mile 243) about 3 kilometers southeast of the city of Red Bluff, Tehama County. It was completed in 1964, and began operation in 1966. The purpose of the dam is to divert water into the Tehama-Colusa and Corning Canal system, for agriculture and wildlife refuges. The dam consists of eleven moveable gates which can be raised or lowered to impound and divert river flows into the canal.
- c. **Expected Benefits.**—This project will document trends in juvenile abundance which can be used to evaluate the numerous restoration actions that will, and/or have occurred, between Keswick Dam and Red Bluff Diversion Dam. Stressors in the upper Sacramento River are water temperature, fish passage (adult and juvenile), loss of spawning habitat and riparian forests, hatchery practices, and striped bass and squawfish predation at man made structures. These stressors effect priority species winter chinook, spring chinook, late fall chinook and green sturgeon, and priority habitats instream aquatic and shaded riverine aquatic. Restoration actions which would be supported by main stem juvenile monitoring at RBDD have been identified in all current restoration planning documents (Resources Agency 1989, Reynolds et al. 1990, Reynolds et al. 1993, Anadromous Fish Restoration Plan (AFRP) {U. S. Fish and Wildlife Service 1995}, and McEwan and Jackson 1996, Comprehensive Monitoring and Assessment Program {CAMP; U. S. Fish and Wildlife Service 1996}). The RBDD is an excellent sampling location below the spawning areas of winter chinook, main stem spring chinook, late-fall chinook, steelhead trout and green sturgeon. Adult splittail have also been captured recently marking their upper distribution.

The primary benefits of this project are more precise indices of juvenile production. These indices can be used to formulate trends which provide indicators of the success of restoration actions. The data from RBDD sampling is used for a variety of management purposes from indicators of run strength, run discrimination, genetic sampling, and triggers remedial measures pertaining to flow, temperature and entrainment. Secondary benefits include a better understanding of main stem salmonid population status, contributing extensively to our knowledge of the life history of these fishes. Additionally, this sampling includes other species, including green sturgeon. From July 1994 through June 1995, 90 thousand fish were sampled consisting of 28 different species.

Juvenile sampling at RBDD is consistent with recommendation of other ecosystem restoration programs, such as: Central Valley Project Improvement Act (CVPIA), Red Bluff Diversion Dam CVPIA (3406 [b] 10) actions and planning process, Anadromous Fisheries Restoration Program (AFRP), Comprehensive Assessment and Monitoring Program (CAMP) and Red Bluff Research Pumping Plant Evaluations .

- d. **Background and Biological /Technical Justification.**—The RBDD juvenile monitoring project is needed to expand and adapt new knowledge of salmonid life history to management needs of the Sacramento River. The project provides real-time data on migrational movements of salmonids out of the upper Sacramento River which are used to trigger remedial actions and provides indices of abundance. These data can be used to evaluate the effectiveness of restoration efforts on priority species designed to address stressors. The following paragraphs provide background on upper river stressors which have been identified for restoration actions and could be assessed by juvenile monitoring at RBDD.

**Spawning Gravel.**—Loss of gravel recruitment is believed to be a major contributing factor to declining chinook salmon *Oncorhynchus tshawytscha* productivity in the upper Sacramento River below Keswick Dam (Upper Sacramento River Fisheries and Riparian Habitat Advisory Council 1989 {plan}). Spawning gravel depletion has been most severe in the stretch of the Sacramento River from Keswick Dam (River Mile [RM] 302.0) to the mouth of Cottonwood Creek (RM 273.5). Historically, gravel in this river reach had been recruited from above Shasta Dam or by bank erosion. Because these sources of gravel are no longer available, the plan recommended placement of about one million yd<sup>3</sup> of spawning gravel in this reach of river. Subsequent to these recommendations, the California Department of Water Resources (CDWR) has added approximately 100,240 yd<sup>3</sup> of spawning gravel to the upper Sacramento River. Indices of juvenile abundance developed from the RBDD screw-trap data would be a valuable indicator of increased spawning success.

**Fish Passage.**—Fish ladders at RBDD are inefficient at passing migrating adult salmon. This results in significant delays and blockage of upstream migrating chinook salmon and steelhead causing increased spawning downstream in waters too warm for successful egg incubation. Delay at the dam can produce elevated stress conditions in the adult salmon, especially when water temperatures along their migration passageways approach the upper limits of their temperature tolerance. Indices of juvenile abundance developed from the RBDD screw-trap data would be a valuable indicator of increased passage and spawning success.

Problems in passage of juvenile salmonids also exist at RBDD. A cause of mortality in juvenile chinook salmon is from the dysfunctional predator-prey relation created by RBDD—largely from the Sacramento squawfish *Ptychocheilus grandis*. The piscivorous nature of Sacramento squawfish, as well as their preference for salmonids, is well documented (Vondracek and Moyle 1982, 1983). The Sacramento squawfish is a native species that co-evolved in the river with chinook salmon and steelhead. In the natural free flowing river setting, the predator-prey relationship between the Sacramento squawfish and the native salmonids is intact and has no significant effect on salmonid populations (Brown and Moyle 1981). Whereas, man-made structures can provide increased feeding and ambush settings creating and unnatural advantage for predators. Other piscivores present below RBDD include striped bass *Morone saxatilis* rainbow/steelhead trout *Oncorhynchus mykiss*, and American shad *Alosa sapidissima* as well as numerous other fish and bird species. Indices of juvenile abundance correlated with predator abundance (from other ongoing studies at RPP) can be a valuable indicator of the success of operational and structural remedies to correct the dysfunctional predator-prey relation.

**Water Temperature.**—Water temperature in the Sacramento River has been identified as a major limiting factor to salmon and steelhead restoration in the upper Sacramento River (NMFS 1993). Water temperature of 62°F is believed to produce 100 percent mortality. The Shasta-Trinity Unit of the Central Valley Project has the ability to control water temperature in 60 miles of the Sacramento River downstream of Keswick Dam during most years which would provide adequate conditions for all life stages of salmon and steelhead. Indices of juvenile abundance developed from the RBDD screw-trap data would be a valuable indicator of successful spawning and incubation of eggs as a function of temperature control. This would be of particular interest in relation to the completion of the temperature control device at Shasta Dam.

**Riparian Forests.**—Many factors have resulted in considerable reduction in the amount of riparian habitat along the Sacramento River. Agricultural conversion is the principal reason for the decline. Completion of Shasta Dam as part of the Central Valley Project fostered further conversions of habitat to agriculture as decreasing flood risks allowed the planting of orchards and row crops in the historical floodplain. Bank protection also fostered conversion of forests by reducing bank erosion and meandering. The Central Valley Project dramatically altered the river's natural flow regime and sediment transport characteristics, changing patterns of forest regeneration. Other current and historical factors contributing to the degradation of the riparian system include timber and fuel harvesting, and urban and residential development.

For most of the length of the river, many of these factors currently preclude the reestablishment of an active meander zone. North of Cottonwood Creek, for example, lack of flooding has disrupted the historical pattern of vegetative succession, resulting in a reduction in early successional stages of riparian forests. While the river is not meandering in these reaches, valuable habitat remains, providing benefits to salmon and other wildlife species. The reestablishment of such a system along the Sacramento River would have several positive impacts on salmon populations. These include: 1) maintaining channel configurations suitable for creating spawning riffles; 2) supplying gravel from eroding banks for the creation of spawning riffles; 3) supplying woody-debris which provides habitat for juvenile fish and a source of organic material for aquatic invertebrates; 4) supplying a renewable source of shaded riverine aquatic habitat; 5) supplying terrestrial invertebrate food for juvenile fish, and 6) moderating the temperature regime of the river and the near shore and backwater areas.

Indices of juvenile abundance developed from the RBDD screw-trap data is a valuable indicator of successful spawning, egg incubation and rearing. These indices would hence provide evidence of the positive effects of successful riparian reforestation.

**Basis for Expected Benefits.**—Rotary-screw traps have provided estimates of abundance and outmigration timing of downstream migrating juvenile salmonids near the RBDD since July 1994. Since that time, up to four rotary-screw traps have sampled juvenile salmonids and other fishes almost continuously. Sampling has occurred in flows up to 65,000 ft<sup>3</sup>/s in the main river thalweg and shoreline areas. Data from this sampling will be used to estimate the vulnerability of juvenile salmonids to entrainment into the pumping plant, which will assist in impact analysis.

Juvenile salmon monitoring has been an activity of the U. S. Fish and Wildlife Service in Red Bluff since 1981 and has made significant contribution to our understanding of the life history of rearing salmon in the upper Sacramento River from Keswick Dam to Hamilton City. Trapping at RBDD has amassed a considerable baseline of juvenile outmigrant data which stretches from 1983 to the present and includes louver entrainment monitoring which occurred under all river flow conditions.

For 20 years the RBDD gates remained closed year-round, until winter of 1986 when the gates were raised during the nonirrigating season to improve upstream fish passage. During periods

will be used to test for differences between cumulative length distributions of released and recaptured fish during trap efficiency trials and for fish captured in beach seines, rotary screw traps and fyke nets. A K-S test will be used because it is sensitive to differences in location and dispersion, and is considered an omnibus test.

**Addressing Objectives 2 and 3.**—Seasonal, spatial and diel patterns of abundance will be analyzed using a 3 x 8 factorial arrangement of treatments, including three spatial distributions (west stream channel, mid-channel and east stream channel) and eight diel periods. Treatment effects will be analyzed using a two-way ANOVA. Additional analyses will be performed on diurnal, crepuscular, and nocturnal grouped diel period effects on the rate juvenile salmon outmigration.

**Schedule.**—Field work for the pilot program began in July 1994 and extended through summer 1995. Analyses for the pilot year and a progress report was completed July 1996. A second progress report will be available summer of 1997. Work will be continuous through FY '98, '99 and '00.

**Report Schedule.**—Reports will be submitted annually and real time data provide through the IEP web site. Annual reports will be provided in December '98, '99 and '00.

- f. **Monitoring and Data Evaluation.**—This is a monitoring project whose data will be used in a variety of management and research efforts. Data evaluation and peer review are critical to the success of this project. Primary project review will occur within the Service, Reclamation, IEP and local California Department of Fish and Game. This data is integrated into the RPP evaluation and IEP programs.

The program is currently coordinated with sampling at Balls Ferry, Glen Colusa Irrigation District, Knights landing and other IEP projects. Quarterly reports are currently reviewed by an Interagency Technical Team which consists of Reclamation, NMFS, CDFG, Service and stakeholder review. When inriver-RPP evaluations are completed in 1999, monitoring data will be circulated to agency personnel and stakeholders in a manner consistent with IEP, CAMP and AFRP.

g. **Implementability**

The RBDD monitoring project complies with all laws and regulations. It is included in the Service's Endangered Species section 10 permit for the directed take of winter chinook and the CDFG-MOA on Service sampling in the Sacramento River and its tributaries. CVPIA activities will be cover NEPA documentation with the completion of the Programmatic Environmental Impact Statement currently in preparation which should be completed soon.

An outreach opportunity exists by coordinating field activities with the Sacramento River Discovery Center. This would provide educational opportunities between a CALFED sponsored program and local school districts. To date, high-school students from the Center have worked with biologists on this project and have produced written reports of their activities. The project has also provided educational demonstrations for elementary aged students.

## References

- Brown, L.R. and P.B. Moyle. 1981. The impact of squawfish on salmonid populations: A review. *North American Journal of Fisheries Management*. 1:104-111.
- Keenen, J.G., S.J. Wisniewski, N.H. Ringler, and H.M. Hawkins. 1994. Application and modification of an auger trap to quantify emigrating fishes in Lake Ontario tributaries. *North American Journal of Fisheries Management* 14:828-836.

IV.

**Budget Costs**

- a. **Budget Costs.**—Table 1 has project costs for Task 1, which is an expansion of the existing Reclamation evaluation of the Research Pumping Plant at RBDD project which extends through FY '98; and annual costs for Task 2, which continues a full scale project for FY '99 and beyond. This project is envisioned and multiyear and would continue as long as the data is needed by managers and researchers working on restoration projects in the basin. This project uses existing equipment, such as boats, trucks and traps.

Table 1.—Budgets to complete Task 1 (3 days per week sampling) and Task 2 (7 days per week sampling).

Project Phase and Task	Direct Labor Hours	Direct Salary and Benefits	Service Contracts	Material and Acquisition Contracts	Misc. and other Direct Costs	Overhead Labor (General, Administration and fee)	Total Costs
Task 1, 3 da/wk	8,000	\$250,000	\$0	\$0	\$12,000	\$49,780	\$311,780
Task 2, 7 da/wk	18,000	\$562,500	\$0	\$0	\$27,000	\$106,875	\$696,375

CALFED funding is needed to supplement current funding from the Reclamation. Future funding will be required at completion of RPP evaluations in FY '98. Funding could potentially be shared between AFRP and CAMP programs, if and when that funding becomes available.

- b. **Schedules and Milestones**— Field work for the pilot program began in July 1994 and extended through summer 1995. Analyses for the pilot year and a progress report was completed July 1996. A second progress report will be available summer of 1997. Work will be continuous through FY '98. The program could continue at different scales of effort indefinitely, but at the scale described in this proposal through the more active phases of restoration activity.
- c. **Third Party Impacts**—None.

V. **Applicant Qualifications**—The Northern Central Valley Fish and Wildlife Office (NCVFWO) was established in 1978 as part of the U.S. Fish and Wildlife Service's (Service) responsibility to facilitate restoration of Pacific salmonids. The construction and operation of dams and water diversion projects and the subsequent degradation and loss of habitat have been the primary contributors to the decline in all anadromous salmonid stocks in the upper Sacramento River. Specific goals of the NCVFWO are to: 1) Stabilize or increase the runs of anadromous salmonids in the Sacramento River system, 2) Improve the effectiveness of federal fish propagation facilities in California and Nevada, 3) Protect and restore the productivity of natural habitats in the Sacramento River system, and 4) Continue development of information and strategies for protecting the natural habitats of the Sacramento River system as migration routes, spawning areas, and nursery areas for anadromous salmonids. The staff consists of 30 biologists and support personnel which have experience or are currently working in the upper Sacramento River.

**Project Personnel and Qualifications**

**James G. Smith.**—Mr. Smith's position is with the U.S. Fish and Wildlife Service as Project Leader at the Northern Central Valley Fish and Wildlife Office at Red Bluff where he is responsible for the management of a 30 person office. Mr. Smith received a B. S. degree with major in Fishery Biology from Humboldt State University in 1975 and did post-graduate studies at the same from 1976-79. He has worked as a professional biologist for 18 years in Oregon, Washington and California. For the past fourteen years he has been personally involved with numerous fishery studies involving salmon including fish passage investigations at RBDD, monitoring downstream migrations of juvenile salmonids, hatchery evaluation efforts at Coleman NFH, and salmon spawning gravel restoration evaluation activities. The office has responsibilities that include identifying and defining factors affecting the abundance and survival of anadromous salmonids produced in the Sacramento River Basin, California. Mr. Smith works on a daily basis with numerous federal, state, and private entities in developing actions and programs for restoring, conserving, and enhancing anadromous salmonids in the upper Sacramento River.

**Richard R. Johnson.**—Mr. Johnson is a 1976 graduate from Humboldt State University (B.S.), with major in Fishery Biology. He did post-graduate work at the University of Alaska, Fairbanks from 1990-91. He has been a professional fishery biologist for 19 years. Mr. Johnson has experience as a commercial salmon fisherman, and in commercial and federal hatcheries in California, Ohio, and Michigan. He spent 7 years as a management biologist in Fairbanks, Alaska working with lake trout, Arctic char, northern pike and various whitefish species, before arriving at the Service's Northern Central Valley Fish and Wildlife Office in Red Bluff, California 6 years ago. Currently he is the Deputy Project Leader at this office.

**Craig Martin.**—Mr. Martin is a 1991 graduate from West Virginia University (B.S., wildlife management with fisheries emphasis) and a 1995 graduate from Oklahoma State University (M.S.; fisheries biology). He started his career working in West Virginia and Pennsylvania as a fisheries technician for West Virginia University and West Virginia Department of Natural Resources. While pursuing his Master's degree, he worked for the Oklahoma Cooperative Fish and Wildlife Research Unit evaluating native smallmouth bass stream fisheries. Mr. Martin has been with the U.S. Fish and Wildlife Service for 2 years and is currently a fisheries biologist with the Service's Red Bluff Office.

**VI. Compliance with Standard Terms and Conditions—We will provide the appropriate documents and signatures regarding Submittal/Compliance of Standard Terms and Conditions, prior to signing final contracts, as indicated in the Table D-1 matrix of Standard Clauses/Proposal Request for a public agency proposing a Group 3 (Services) application type.**