

**ERP DIRECTED ACTION**

**CALFED Non-Native Invasive Species  
Program**

**Reference**  
**Ecosystem Restoration Program**  
**Prop 50 Bond Funded**  
**Project No. DFG-05####**

**Prepared by:**  
**Jeffrey J. Herod**  
**U. S. Fish and Wildlife Service**  
**Non-Native Invasive Species Program**  
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## **PART A. Cover Sheet**

### **A1. Proposal Title:**

CALFED NIS Program

### **A2. Lead Applicant or Organization:**

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### **A3. Project Manager or Principal Investigator**

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U. S. Fish and Wildlife Service  
4001 N. Wilson Way  
Stockton, CA 95205-2486  
Phone Number: 209.946. 6400X 321  
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E-mail:jeffrey\_herod@fws.gov

### **A4. Cost of Project:**

The total cost over the term of the project is \$750,000 distributed across three program elements. Element costs are approximately \$400,000 for Non-native Invasive Species (NIS) Program Coordination, \$200,000 for Zebra Mussel Prevention, and approximately \$150,000 for Zebra Mussel Rapid Response.

### **A5. Cost Share Partners:\***

The U. S. Fish and Wildlife Service is providing cost share in support of NIS Program Coordination at a cost \$200,000.

### **A6. List of Subcontractors:\***

Funding for the Zebra Mussel Prevention element of this program will be competed through the federal grant process. A subcontractor will be identified upon completion of that process.

### **A7. Other Cooperators:\***

(If applicable) NA

### **A8. Project Topic Area\***

Primary: Non-native Invasive Species  
Secondary:

**A9. Project Type\***

Primary: Planning

Secondary: Pilot/ Demonstration

## **PART B. Executive Summary**

### **B1. Proposal Title:**

CALFED NIS Program

### **B2. Project Description:**

This project consists of three separate but coordinated elements as follows:

#### **NIS Program Coordination**

USFWS will continue to work with the NIS Agency and Stakeholder Teams to implement and administer the NIS program, as developed and documented in the NIS Strategic and Implementation Plans.

#### **Zebra Mussel Prevention**

This project will build on established partnerships and leverage federal monies used to address the prevention of zebra mussels entering into California waterways. The new action items will build on USFWS projects that targeted pathways for zebra mussels by surveying tailored boats and enhance traveler awareness by expanding these surveys as well as implementing Traveler Information Systems (TIS) in California. This two-prong approach will assist with targeting areas where the California TIS system will need to be placed as well as integrating with the current TIS that the 100th Meridian Group (FWS) has in the Western United States. Funds for this element will be competed through the federal grant process (Grants.gov).

#### **Zebra Mussel Rapid Response**

This project will attempt to build partnerships and leverage monies that will result in a rapid response plan and a working group with the capacity to assist with a response to zebra mussel infestations in California. Currently there are several products that relate to a potential zebra mussel threat in California. This project will incorporate works related to potential threats to California, past work on zebra mussels from areas in the eastern and western U.S., develop a working group for California to focus efforts and discuss responsibilities related to a potential zebra mussel infestation, and develop strategies to address zebra mussel concerns in California. All of which will result in a zebra mussel Rapid Response working forum and a viable plan to respond to a zebra mussel infestation in California.

## **PART C. Work Plan**

### **C1. Project Background and Information:**

Over the past one hundred years, many NIS have been introduced to the San Francisco Bay-Delta. Within the last few decades, the frequency of intra and international transfer has been greatly accelerated by various human activities. Some scientists fear that the international trend is toward species homogeneity. Some of the species introductions have been intentional, such as ornamental plants, certain agricultural crops and livestock. Others have been inadvertent; introduced through releases from the horticulture trade, pet trade, aquaculture activities, dumping of ballast water, escapees, etc. NIS affect ecosystems in several ways that are of concern. The extinction of native species can be attributed first to habitat destruction and secondly to introduced species, whose impacts may include habitat alteration, trophic alteration, community spatial alteration, gene pool deterioration, introduction of diseases and parasites, and contaminant dynamics.

### **NIS Program Coordination**

As CALFED developed goals and objectives for their Ecosystem Restoration Program (ERP), they recognized that NIS is a significant stressor of the Bay-Delta. The result was the initiation of a CALFED NIS Program (NISP) charged with the responsibility to develop a long-term Strategic Plan, an Implementation Plan, directed projects, an open solicitation for proposals, and coordination of the resulting projects. The U. S. Fish and Wildlife Service agreed to develop, implement, manage and coordinate the program in cooperation with CALFED programs and members. This program, with the contributions of CALFED staff, agencies, academia, non-profits and interested stakeholders, has focused on the San Francisco Bay-Delta, the Sacramento and San Joaquin Rivers and their watersheds.

Working with the public, watershed groups, and state agencies, NISP activities include outreach, control, research, and eradication efforts for a variety of terrestrial and aquatic NIS. Species of concern include Chinese mitten crab (*Eriocheir sinensis*), marine algae (*Caulerpa* spp.) and giant cane (*Arundo donax*). The national outreach campaign to prevent the westward spread of zebra mussel (*Dreissena polymorpha*) and other aquatic invasive species is also a high priority for the NISP. The NISP is dedicated to providing technical expertise and support to activities focused on preventing new NIS introductions and managing those already established.

### **Zebra Mussel Prevention**

Zebra mussels are freshwater bivalve mollusks that typically have a dark and white (zebra-like) pattern on their shells. They are alien to North America but since the '80s, zebra mussels have spread, unchecked by natural predators, east of the 100th Meridian from Ontario Canada and the Great Lakes to southern Louisiana. They currently infest much of the Great Lakes basin, the St. Lawrence Seaway, and much of the Mississippi River drainage system. They have begun to spread up the Missouri River and Arkansas River.

Zebra mussels reproduce quickly and in large numbers, typically creating large populations. Zebra Mussel densities have been reported to be over 700,000 individuals per square meter in some facilities in the Great Lakes area. Zebra mussels are biofoulers that occlude pipes in

municipal and industrial raw-water systems, requiring millions of dollars annually to treat. They produce microscopic larvae that float freely in the water column, and thus can pass by screens installed to exclude them. Monitoring and control of Zebra Mussels costs millions of dollars annually. As filter feeders, zebra mussels remove suspended material from the habitat in which they live. This includes the planktonic algae that is the primary base of the food web. Thus, zebra mussels may completely alter the ecology of water bodies in which they invade.

Once zebra mussels have established in a water body, there is no known method of eradication. Preventing spread remains our best course of action. Since zebra mussels have planktonic (free drifting) larvae, preventing spread to water bodies downstream from known infestations may not be possible. However, westward, overland spread is assumed to be largely due to trailered boat traffic. Thus, further westward spread of zebra mussels is highly preventable.

This project will build on established partnerships and leverage federal monies used to address the prevention of zebra mussels entering into California waterways. The new action items will build on USFWS projects that targeted pathways for zebra mussels by surveying tailored boats and enhance traveler awareness by expanding these surveys as well as implementing Traveler Information Systems (TIS) in California.

### **Zebra Mussel Rapid Response**

Efforts related to zebra mussel early detection and rapid response are underway in the western U.S. The 100<sup>th</sup> Meridian initiative is supported by the amendment of Public Law 101-636, which resulted in a collaborative effort toward the prevention of zebra mussels and other aquatic nuisance species moving westward beyond the 100<sup>th</sup> Meridian. This effort will be used as an interagency collaborative model of which the U.S. Fish and Wildlife Service is an active member. In addition, the Columbia River Basin Group of the 100<sup>th</sup> Meridian has drafted a Rapid Response Plan which has critical elements that will be incorporated into the California plan. Again, the U.S. Fish and Wildlife Service has been a key member in this effort. Elements of zebra mussel prevention, detection, and rapid response planning will be used.

U.S. Fish and Wildlife Service and California Department of Water Resources have been working on zebra mussel planning efforts and provide an opportunity to leverage efforts and monies that already have been expended. Products that currently exist are a literature review of probable high risk areas in California for zebra mussel establishment, database of volunteer monitoring activities, pilot study of sampling effort in the Delta, California boater surveys, and numbers of intercepted vessels at California inspection station that were carrying zebra mussels. These products and data need to be incorporated into a comprehensive strategy that will provide prevention, early detection, and rapid response capabilities to California. The U.S. Fish and Wildlife Service has staff that are experienced in sampling methodology, prevention techniques, life history, and ecology of the zebra mussel and have the capacity to integrate past and current efforts.

### **C2. Project Goals and Objectives:**

The goal of this project is to continue critical activities in support of NIS management, prevention, and eradication. Three primary objectives include:

- Continued management of the NISP
- Successful solicitation of research proposals that will result in the selection of projects
- Viable rapid response plan for zebra mussels and technical assistance working group for response to zebra mussel infestations

### **C3. Approach/Methodology:**

The Non-native Invasive Species Program (NISP) has been providing leadership and coordination for activities related to invasive species in the western U.S. and CALFED focus area. The program will continue its role by coordinating a comprehensive approach to zebra mussel rapid response. New staff brings practical research and experience with zebra mussels from work conducted in the eastern U.S. as well as activities related to Columbia River zebra mussel rapid response plan. Through the coordination of NISP, several elements critical to responding to zebra mussels are completed. This request for funding will result in integration of these critical elements, coordination and training to partners, and a viable rapid response plan for zebra mussels.

The proposed project will build capacity and implement critical steps necessary for Zebra mussel rapid response in California. The new action items would be to enhance the current plan and develop a working group that would implement the plan and begin working on addressing commitments and responses to the introduction of Zebra mussels into California waterways. The first activities would be involvement of NISAC as short term *Ad Hoc* committee. It is anticipated that there will be multiple workshops conducted. Many of the perceived stakeholders will need training materials, monitoring protocols, and coordination activities. These will be developed during the process.

C4. Tasks and Deliverables: See Exhibit A- Schedule and List of Deliverables.

### **Task 1. Project Management and Administration**

USFWS will continue to work with the NIS Agency and Stakeholder Teams to implement and administer the NIS program, as developed and documented in the NIS Strategic and Implementation Plans.

#### **Subtask 1.1 Technical Oversight and Administrative Management**

Provide all technical and administrative services associated with performing and completing the work for this project. Technical and administrative tasks shall include: project management, budgeting, scheduling, coordination, report preparation, invoicing, data collection, subcontract management, and all other tasks that may be necessary to complete the scope of work specified for this project. Progress reports shall detail work accomplished, discuss any problems encountered, and recommend potential solutions to those problems; detail costs incurred during the subject quarter, and document delivery of any intermediate work products. A brief outline of upcoming work scheduled for the subsequent period should also be provided.

### Subtask 1.2 Stakeholder Team Coordination and Participation

Stakeholder Coordination and participation will be incorporated into this aspect of the project by using NISAC as *Ad Hoc* committee as well as bringing in various water user groups to discuss rapid response and early detection procedures for Zebra mussels in the CalFed focus area. NISP will also provide updates and coordination with other groups in the western U.S. and California such as California Biodiversity Council subgroup on Invasive Species, Western Regional Panel, U.S. Fish and Service Fisheries (ANS group) and Ecological Services (ESA group), BoR, and state agencies such as DWR, DFG, DFA.

### Subtask 1.3 Outreach

Outreach activities will be targeted for agencies, public, and water user groups. Awareness and basic biology and ecology facts on zebra mussels will be provided through poster and oral presentations. NISP will still promote and distribute materials from various organizations and campaigns such as 100<sup>th</sup> Meridian, STOP AQUATIC HITCHHIKERS, HABITATTITUDE.

### **Task 1 Deliverables:**

- Semi-Annual Progress Reports
- Quarterly Invoices
- Project Close Out Report
- Final Invoices

### **Task 2. Zebra Mussel Prevention Project**

#### Subtask 2.1 Proposal Solicitation Planning and Development

Develop proposal solicitation package to be competed on Federal grant proposal solicitation process. Coordinate with NIS Program to ensure consistency in approach and content of project goals defined in the final solicitation package. A two-pronged approach will be defined that could include expanding surveys of trailered boats and implementing Traveler Information Systems (TIS) in California.

#### Subtask 2.2 Proposal Review and Selection

Establish selection criteria and review submitted proposals for grant award.

### **Task 2 Deliverables:**

- Proposal Solicitation posted on Grants.gov
- Subcontract documentation

### **Task 3. Zebra Mussel Rapid Response**

#### Subtask 3.1 Working Group Development



Update and incorporate response methods and principles from other areas that have dealt with zebra mussels through collaborative working groups. Formation of a Technical Advisory Working Group that would develop and implement the plan and begin working on addressing commitments and responses to the introduction of zebra mussels into California waterways. The actions would be involvement of NISAC as short term *Ad Hoc* committee and the team would evolve to address other NIS issues as the team builds capacity. Records of Technical Advisory Working Group evaluations and decisions, support materials, and action items will be maintained. Development of training materials, monitoring protocols, and coordination activities are expected.

**Subtask 3.2 Rapid Response Plan Development**

Incorporate existing products and data into a comprehensive strategy that will provide prevention, early detection, and rapid response capabilities to California. Products that currently exist are a literature review of probable high risk areas in California for zebra mussel establishment, database of volunteer monitoring activities, pilot study of sampling effort in the Delta, California boater surveys, and numbers of intercepted vessels at California inspection station that were carrying zebra mussels. Draft Zebra Mussel Rapid Response Plan.

**Task 3 Deliverables:**

- List of Technical Advisory Working Group members (agencies and representatives)
- Draft and Final Rapid Response Plan for Zebra Mussels

**C5. Subcontractors:**

(If Applicable; description of tasks and qualifications)  
NA

**C6. Work Schedule**

See Exhibit A, Schedule and List of Deliverables.

The project term is July 1, 2006 through June 30, 2009

**C7. Special Equipment and Supplies Required:**

NA

**C8. Project Impacts (beneficial or adverse):**

Beneficial impacts would be raised awareness and procedures for responding to zebra mussel infestations.

**C9. Stakeholders and Interested Parties:**

This project will be coordinated with the Aquatic Nuisance Species (ANS) Task Force. The ANS Task Force is an intergovernmental organization dedicated to preventing and controlling aquatic nuisance species, and implementing the Nonindigenous Aquatic Nuisance Prevention and Control Act (NANPCA) of 1990. The various NANPCA mandates were expanded later with the

passage of the National Invasive Species Act (NISA) in 1996. The Task Force consists of 10 Federal agency representatives and 12 Ex-officio members, and is co-chaired by the U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration. The Task force coordinates governmental efforts dealing with ANS in the U.S. with those of the private sector and other North American interests via regional panels and issue specific committees and work groups.

**C10. Consistency with CALFED ERP Goals:\***

1). Identify Project Applicability to Eco-Elements

Primary: *Zebra Mussel*

**Description:** Zebra mussels are a highly invasive exotic bivalve first discovered in the Great Lakes region in 1988. Although the zebra mussel is not currently known to occur in California, its introduction into the Bay-Delta watershed would be an environmental and economic catastrophe.

**Vision:** The vision for zebra mussel is to establish procedures to prevent or delay their introduction and to set up protocols to swiftly treat and eliminate any introduction.

**Approaches:**

- Interdict potential sources of zebra mussels at all border check stations and other potential sources of introduction
- Initiate an emergency response strategy to quickly contain and eradicate any suspected or proven mussel colonies
- Prevent ballast water introductions

**Reference:** ERPP Volume 1, p. 487-490

Secondary: *Invasive Aquatic Organisms*

**Description:** Invasive aquatic organisms are those non-native fish and invertebrates that have invaded the Bay-Delta at the expense of native species.

**Vision:** The vision for invasive aquatic organisms is to reduce their adverse effects on the food web and on native species resulting from competition for food, habitat and direct predation.

**Approaches:**

- Prevent or reduce additional introductions,
- Developing a better understanding of how non-native species affect ecological processes and biological interactions
- Develop effective control and eradication programs
- Establish habitat conditions that favor native over non-native species

**Reference:** ERPP Vol. 1, pp. 469-477

2). Identify Project Applicability to ERP Goals and Objectives:

*Goal 5: Non-native Invasive Species*

*Objective 3: Halt the unauthorized introduction and spread of potentially harmful nonnative introduced species of fish or other aquatic organisms in the Bay-Delta and Central Valley.*

*Objective 8: Prevent the invasion of the zebra mussel into California*

3). Identify Project Applicability to Environmental Water Quality Constituents:

Primary: *NA*

Secondary: *NA*

4) Identify Project Applicability to CALFED ERP Stage 1 Milestones.

This project does not directly address any of the Stage 1 Milestones. (Note: Stage 1 Milestones were intended to be a subset of milestones established for the first seven years of the 30 year ERP program. This project may apply to future milestones as current milestones are refined or new milestones are developed.)

#### **C11. Related Projects\***

1). If this project is related to another restoration project, identify other projects by number and program (e.g. CALFED, CVPIA), and if CALFED, identify that relationship by category:

*NA*

#### **PART D. Budget Summary**

**D1. Budget.** See attached Exhibit B: Budget Detail

#### **PART E. Project Location Information**

##### **E1. Project Location:**

Program-Wide

##### **E2. County or Counties Project is Located In:**

Program-Wide

##### **E3. ERP Eco-Region, Eco-Zone, and Eco-Unit Project is Located In:\***

Program-Wide

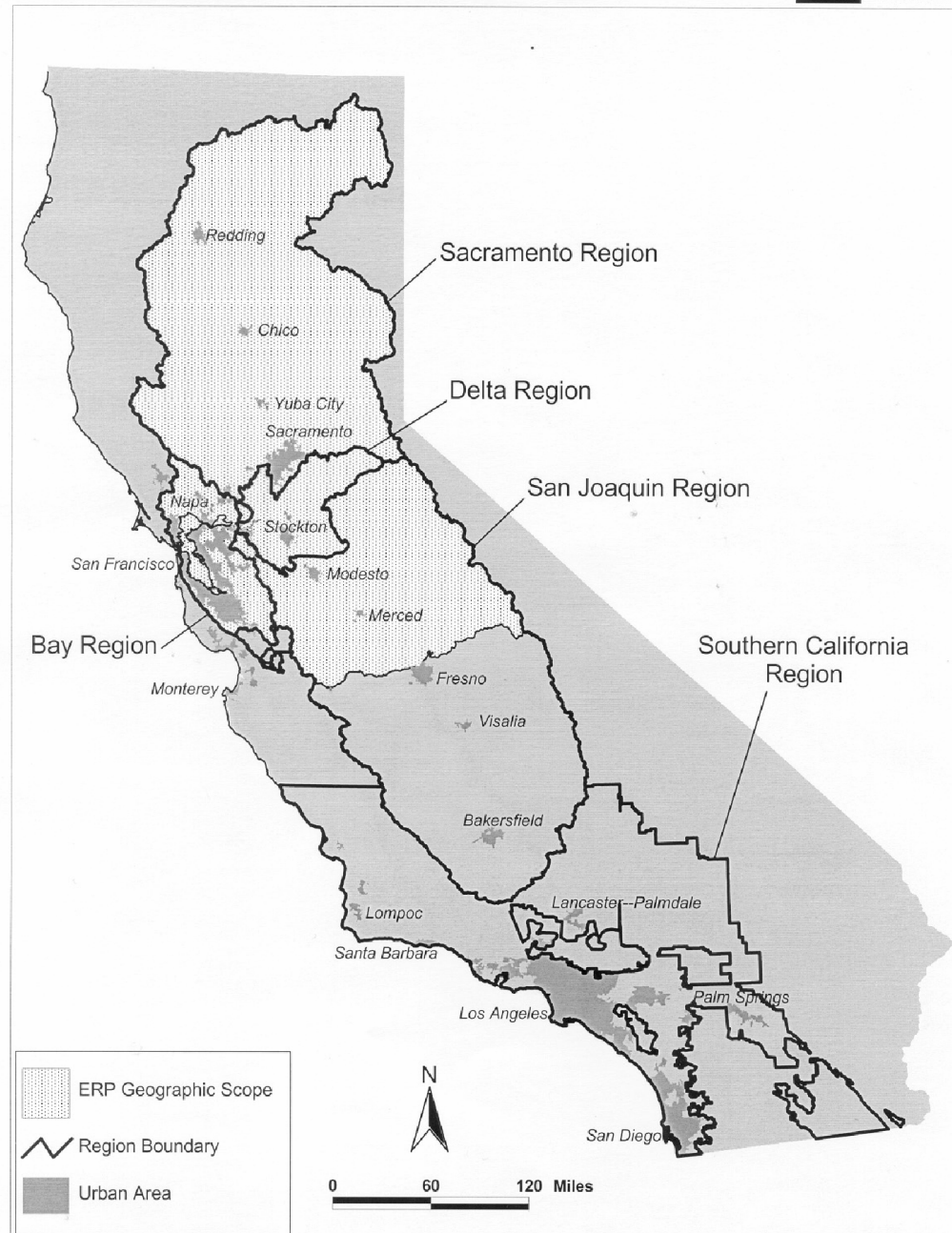
##### **E4. Project Centroid:**

Latitude/Longitude Coordinates

Program-Wide

##### **E5. Project Map:** see below

## **CALFED Regions and ERP Geographic Scope**



**E6. Digital Geographic File:** *\*Program-Wide (for multi-region projects)*  
**E7. Congressional District:** *1-53 (Program-Wide)*

## **PART F. Environmental Information**

### **F1. CEQA/NEPA Compliance**

1). Will this project require compliance with CEQA, NEPA, both, or neither:\*

*NO*

2). Is your project covered by either a Statutory or Categorical Exemption under CEQA or a Categorical Exclusion under NEPA:\*

*NO*

3). If your project requires additional CEQA/NEPA analysis, please indicate which type of documents will be prepared:

- Initial Study/Negative Declaration
- Environmental Assessment/FONSI
- EIR/CEQA Findings of Fact
- EIS/ Record of Decision

4). If the project will require CEQA and/or NEPA compliance, identify the lead agency(ies).

- CEQA Lead Agency:
- NEPA Lead Agency (Must be a Federal Agency):

*NA*

5). If your project is not covered under items 2 or 3, and you checked no to question 1, please explain why compliance is not required for the actions in this proposal:

*NA*

6). If the CEQA/NEPA process is not complete, please describe the estimated timelines for the process and the expected date of completion:

*NA*

7). If the CEQA/NEPA document has been completed, what is the name of the document and provide State Clearinghouse number:

*NA*

### **F2. Environmental Permitting and Approvals**

Please indicate what permits or other approvals may be required for the activities contained in your proposal and which have already been obtained. Please indicate all that 1) are needed, and 2) if needed, have been obtained:

1). Local Permits and Approvals

- Conditional use permit
- Variance
- Subdivision Map Act
- Grading permit
- General plan amendment
- Specific plan approval
- Rezone
- Williamson Act Contract cancellation

- Other
- 2) State Permits and Approvals:
- Scientific collecting permit
  - CESA compliance: 2081.1; Take authorization
  - CESA compliance: 2080.1; Consistency determination
  - CESA compliance: NCCP
  - 1602: Lake or Streambed Alteration Permit
  - CWA 401 certification
  - Coastal development permit
  - Reclamation Board approval
  - Notification of DPC or BCDC
  - Other
- 3) Federal Permits and Approvals:
- ESA compliance Section 7 consultation
  - ESA compliance Section 10 permit
  - Rivers and Harbors Act
  - CWA 404
  - Other

## **PART G. Land Use Questionnaire**

### **G1. Land Use Changes**

1). Do the actions in the proposal involve physical changes in the land use, or potential future changes in land use (Yes/No):

- If yes, describe what actions will occur on the land involved in the proposal.
- If no, explain what type of actions are involved in the proposal (i.e., research only, planning only).

*NO*

2). How many acres of land will be subject to a land use change under the proposal:

*NONE*

3). Is the land subject to a land use change in the proposal currently under a Williamson Act contract (Yes/No):

*NO*

4). For all lands subject to a land use change under the proposal, describe what entity or organization will manage the property and provide operations and maintenance services.

5). Does the applicant propose any modifications to the water right or change in the delivery of the water (Yes/No):

- If yes, please describe the modifications or changes:

### **G2. Current Land Use and Zoning**

*N/A*

1). What is the current land use of the area subject to a land use change under the proposal:

2). What is the current zoning and general plan designation(s) for the property:

3). How is the land categorized on the Important Farmland Series (IFL) maps (published by the California Department of Conservation):

### **G3. Land Acquisition**

1). Will the applicant acquire any land under the proposal, either in fee or through a conservation easement (Yes/No):

- If yes, describe the number of acres that will be acquired and whether the acquisition will be of fee title or a conservation easement:
- Total number of acres to be acquired under proposal:
- Number of acres to be acquired in fee:
- Number of acres to be subject to conservation easement:

2). For land acquisitions (fee title or easements), will existing water rights be acquired (Yes/No):

#### **G4. Land Access**

1). Will the applicant require access across public or private property that the applicant does not own to accomplish the activities in the proposal (Yes/**No**):

- If yes, attach written permission for access from the relevant property owner(s).



## PART H. Qualifications

### H1. Qualifications

#### Jeffrey J. Herod

Invasive Species Program Coordinator for U.S. Fish and Wildlife Service and CalFed programs

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#### EDUCATION

1990-1992 A.S. Fish/Wildlife Management, Hocking College, Nelsonville, OH

1993-1995 B.S. Fisheries/Wildlife Biology, Arkansas Tech University, Russellville, AR

1995 NOT COMPLETED M.S. Biology, Murray State University, Murray, KY

Thesis Title: *Ecology and Population Dynamics of the zebra mussel*

*(MOLLUSCA:BIVALVIA:DREISSENIDAE): Size Demography, Morphometry, and*

*Recruitment in the Ohio River and Kentucky Lake, Tennessee River*

#### PROFESSIONAL RESEARCH INTERESTS

Adaptive management of aquatic systems and organisms with an emphasis on population biology, ecology, and metapopulation dynamics of freshwater bivalves; Morphometrics and systematics of bivalves; Population dynamics and life histories of nongame and nonindigenous fishes and mollusks.

#### PROFESSIONAL KNOWLEDGE, SKILLS, AND ABILITIES

Professional knowledge, skills, and abilities culminate from development, management, and personnel supervision for research based on diverse indigenous and nonindigenous aquatic faunal groups within the Southeastern United States-- with a focus on freshwater fishes and mollusks over the past 9 years. I have sampled various locations throughout the Southeastern United States (e.g., Everglades National Park; Okefenokee Swamp; streams in the Ozark and Ouachita Mountains; Ohio River; Tennessee River; Coosa River; Savannah River; Arkansas River; as well as many major and minor reservoirs, canals, and rivers in the Southeastern U.S.) using various methodologies that incorporated such gear and techniques as SCUBA, tactile searches, snorkeling, backpack electrofishing, boat electrofishing, trap nets (i.e., hoop net, fyke net, midwater trawl, gill net, and trammel net), seine, benthic dredge, suction dredge, plate samplers, tags (e.g., chemical, internal, and external), and many biometric instruments. Topics investigated in aquatic systems stem from population biology issues that include distributional surveys, faunal complexity, age and growth, reproduction, size demography, and morphology. Applications of research and experiments focus on answering questions pertinent to impacts of invading organisms, anthropogenic impacts, health indices, and food webs. Knowledge, skills, and abilities allowed exploration and development of methodologies to produce robust datasets that are reproducible and testable with a focus on novel approaches in experimental aquatic ecology. Resulting information from these studies are found in venues such as five peer-reviewed scientific journal articles (e.g. *Journal Freshwater Ecology*, *Transactions of the American Fisheries Society*, and *Biodiversity and Conservation*), +20 presentations/ posters at professional meetings (e.g. AR Academy of Science, Freshwater Mollusks Conservation Society, SE American Fisheries Society, G.E.E.R., and SEAFWA), and +10 technical reports provided to clients (Fish and Wildlife Service, AL Power, KY DNR, Dept. of Defense-Air Force, and ENTERGY Corporation). UFWS fisheries biologist position for Panama City FL is divided between two main duties: research/ technical assistance and management of field station. Research activities are assessing stream condition by developing, calibrating, and deploying and Index of Biotic Integrity for Eglin Air Force Base, which is located in the Northeast Gulf Coast region as well as support recreational fisheries. Managerial activities include, but not limited to: development and implementation of a program scope of work, individual study plan QA/QC, workload development, fiscal oversight, and purchasing. My current position is the USFWS Aquatic Nuisance Species Coordinator for California/Nevada Operations and the Calfed Non-native Invasive Species Program Coordinator. These positions require managerial activities for supervising two GS-11 FTEs (IDPs, EPAP, T&A), budget planning, co-chairing several advisory groups, assisting with cooperative agreements, and providing

briefings to Fisheries ARD and Deputy Regional Director on issues related to invasive species in the CNO focus area.

### **PROFESSIONAL EXPERIENCE**

1993-1994 Fisheries Research Technician, Dept. of Biology, Arkansas Tech University, Russellville, AR  
1994-1995 Field Crew Chief for Fisheries Research, Dept. of Biology, Arkansas Tech University, Russellville, AR  
Supervisor and Mentor: Dr. Charlie Gagen 501.964.0814  
1995-1997 Research Assistant and Assistant Malacologist, Dept. of Biological Sciences, Murray State University, Murray, KY  
Supervisor and Major Professor: Dr. James B. Sickel 270.762.6326  
1998-1999 Biological Technician (GS-7), USGS Gainesville, FL  
Supervisor: Dr. James D. Williams 352.378.8181  
1999-1999 Contract hire AScl Corp as General Biologist, USGS, Gainesville, FL  
1999-2002 Fishery Biologist/ Research Assistant (GS-9), USGS, Gainesville, FL  
Supervisor: Dr. Leo Nico 352.378.8181  
2002-2003 Fishery Biologist (GS-9/11), USFWS, Panama City, FL  
Project Leader: Gail Carmody 850.769.0552  
2003- 2005 Fishery Biologist (GS-11), USFWS, Panama City, FL  
Project Leader: Gail Carmody 850.769.0552  
2005- Supervisory Fishery Biologist (GS-11/12), USFWS, Stockton, CA  
Deputy Project Leader: Kim Webb 209.946.6400 X 311

### **HONORS AND AWARDS**

1994-1993 Marky Butterworth Scholarship (\$1,500), Arkansas Tech University  
1994 Arkansas BASS Association Grant (\$1,000), Arkansas Tech University  
1995 Graduate Research Assistantship, Biology Dept., Murray State University  
1997 Sigma Xi award of recognition for research at Murray State University  
2004 Invited Reviewer for Southeastern Naturalist  
2004 Invited Reviewer for Southeastern Association of Fish and Wildlife Agencies 2004  
STAR AWARD (USFWS Region 4)  
2004 STAR AWARD (USFWS Region 4)  
2005 STAR AWARD (USFWS Region 4)  
2005 STAR AWARD (USFWS California-Nevada Operations)  
Invited Reviewer for North American Journal of Fisheries Management

### **PROFESSIONAL SOCIETIES and TECHNICAL COMMITTEES**

Eglin Working Group for Ecological Management (EWGEM) 2002-2004  
Okaloosa Darter Working Group 2002-2004  
AFS Southern Division Non-game Aquatics Technical Committee, Secretary 2004  
Florida State Wildlife Grants- freshwater fishes 2004  
California State Wildlife Grants- invasive species 2005  
Non-native Invasive Species Program, Co-chair 2005- current  
California Interagency Noxious and Invasive Plant Committee (CINIPC), Co-chair current  
California Biodiversity Council Invasive Species Session, State Plan Working Group Chair 2006

### **(Selected) PRESENTATIONS**

Sickel, J.B., **J.J. Herod**, and D.P. Reed. 1998. Impact of zebra mussels and commercial mussel harvest on native unionid mussels in Western Kentucky. Presentation and abstract at the Southern Division of the American Fisheries Society 1998 Midyear Meeting, Lexington, KY, February 27-March 1, 1998.

Reed, D.P., **J.J. Herod**, and J.B. Sickel. 1998. Annual variations in zebra mussel (*Dreissena polymorpha*) veliger densities throughout 1996 at Dam 52 on the lower Ohio River. Presentation and abstract at the Southern Division of the American Fisheries Society 1998 Midyear Meeting, Lexington, KY, February 27-March 1, 1998.

- Herod, J.J.**, H.N. Blalock, and J.D. Williams. 1999. Baseline population biology of the freshwater mussel, *Elliptio mcmichaeli*, in the Choctawhatchee and Pea rivers in Florida and Alabama. Poster and abstract at 16<sup>th</sup> Annual Meeting of Alabama Fisheries Association, Gulf Shores, AL, 10-12 February 1999.
- Blalock, H.N., **J.J. Herod**, J.D. Williams, and S.W. McGregor. 1999. Freshwater mussels (Unionacea:Bivalvia) of the Pea River Watershed of Alabama and Florida. Poster and abstract at 16<sup>th</sup> Annual Meeting of Alabama Fisheries Association, Gulf Shores, AL, 10-12 February 1999.
- Herod, J.J.** and J.B. Sickel. 1999. Observations of degrowth in zebra mussels (*Dreissena polymorpha*) during field studies in Kentucky Lake, Kentucky. Poster and abstract at First Annual Symposium of Freshwater Mollusk Conservation Society, Chattanooga, TN, 16-19 March 1999.
- Sickel, J.B., C.C. Chandler, and **J.J. Herod**. 1999. Changes in unionid mussel community of the Tennessee River in the Kentucky section of Kentucky Lake since impoundment. Poster and abstract at First Annual Symposium of Freshwater Mollusk Conservation Society, Chattanooga, TN, 16-19 March 1999.
- Blalock-Herod, H.N., **J.J. Herod**, and J.D. Williams. 2000. Freshwater mussels of the Choctawhatchee River Drainage in Alabama and Florida. Poster presentation to the Southern Division American Fisheries Society Midyear Meeting, Symposium on the "Conservation of Freshwater Nongame Aquatic Fauna in the Southeast—Challenges for the New Millennium." February 5-6, 2000. Savannah, Georgia.
- Herod, J.J.** and L.G. Nico. 2000. The Asian swamp eel in Florida. Presentation and abstract at Aquatic Nuisance Species (ANS) Task Force Meeting, Miami, FL, 3-5 April 2000.
- Nico, L.G. and **J.J. Herod**. 2000. Nonindigenous fishes of Peninsular Florida: patterns and dynamics of invasion. Presentation to American Fisheries Society, Annual Meeting, Symposia Invited Session- "Aquatic invaders: Entry, Impact, and Control". August 20-24, 2000. St. Louis, MO.
- Nico, L.G., **J.J. Herod**, and W.F. Loftus. 2000. The Asian swamp eel: a recent invader in Peninsular Florida. Poster presentation to USGS- Biological Resources Division, Invasive Species Program Element Review- "Microbes to Mammals". October 23-25, 2000. Annapolis, MD.
- Blalock-Herod, H.N., **J.J. Herod**, and J.D. Williams. 2000. Distribution, Conservation Status, and Biology of the Southern Sandshell, *Lampsilis australis* Simpson, 1900 (Bivalvia: Unionidae). Presentation to the Florida Association of Benthologists 14<sup>th</sup> Annual Meeting. December 6-7, 2000. Sarasota, Florida.
- Nico, L.G., **J.J. Herod**, W.F. Loftus, and J. Trexler. 2000. Influence of hydrology on life history parameters of common freshwater fishes in southern Florida. Poster presentation to Greater Everglades Ecosystem Restoration (G.E.E.R)- "Defining Success". December 11-15, 2000. Naples, FL.
- Nico, L.G., **J.J. Herod**, and W.F. Loftus. 2001. The Asian swamp eel: a recent invader in Peninsular Florida. Poster presentation to Southern Division of American Fisheries Society. January 22-26, 2001. Jacksonville, FL.
- Herod, J.J.**, L.G. Nico, and W.F. Loftus. 2001. Life history and population dynamics of freshwater fishes of South Florida canal systems: common large-bodied species. Poster presentation to Southern Division of American Fisheries Society. January 22-26, 2001. Jacksonville, FL.
- Herod, J.J.**, H.N. Blalock-Herod, D.S. Ruessler, and J.D. Williams. 2001. Baseline glycogen levels for *Elliptio mcmichaeli* (Clench and Turner, 1956); seasonality between two sites in the Choctawhatchee River Watershed and laboratory holding. Poster presentation to Freshwater Mollusks Conservation Society. March 12-14, 2001. Pittsburgh, PA.
- Herod, J.J.**, H.N. Blalock-Herod, K.J. Kernaghan, D.S. Ruessler, J.D. Williams, T.S. Gross, and J.M. Pierson. 2001. Unionid fauna within a selected reach of the Coosa River, Alabama. Poster presentation to Freshwater Mollusks Conservation Society. March 12-14, 2001. Pittsburgh, PA.

Nico, L.G., **J.J. Herod**, and W.F. Loftus. 2001. Life history parameters and population dynamics of freshwater fishes of South Florida canal systems. Poster presentation to American Society of Ichthyologists and Herpetologists. July 5-10, 2001. State College, PA.

**Herod, J.** and T. Thom. 2002. Assessing stream condition on Eglin AFB: strategy, goals, objectives, and scale. Oral presentation to Eglin Working Group for Ecological Management. September 16-17, 2002. Jackson Guard Conference Center in Niceville, FL.

Thom, T., **J. Herod**, S. Laine, and K. Smith. 2002. Evaluation of Ecological Conditions: watersheds on Eglin Air Force Base. Oral presentation to Southeastern Water Pollution Biologists Association. October 29-31, 2002. Panama City Beach, FL.

**Herod, J.J.** 2003. Sampling Regime, Species, and Metric development; Variability and Predictability across Strata. Oral presentation to Aquatics focus group of EWGEM. 12-14 August, 2003. Niceville, FL.

**Herod, J.** and S. Laine. 2003. Monitoring and Assessing Threats to the Okaloosa darter, *Etheostoma okaloosae*, on Eglin AFB. Poster presentation to Southeastern Association of Fish and Wildlife Agencies. October 11-15, 2003.

**Herod, J.** and T. Thom. 2003. Developing Assessment Tools for Adaptive Management of Lotic Systems on Eglin AFB; Partnering to Reach Goals of Integrated Natural Resources Management. Poster presentation to Southeastern Association of Fish and Wildlife Agencies. October 11-15, 2003.

Blalock-Herod, H.N. and **J.J. Herod**. 2003. Biology and ecology of freshwater mussels in the Yellow River basin. Invited speaker to Pensacola Bay Area Resource Council Technical Committee. October 2003. Pensacola, Florida.

**Herod, J.**, T. Thom, and D. LaPlante. 2003. Stream Assessment Program: An Overview of Measures for Fishes, Aquatic Insects, Stream Morphology, and Habitat. Oral presentation to Panama City Field Office, U.S. Fish and Wildlife Service, Panama City, FL. 1 December, 2003. Panama City, FL.

**Herod, J.**, T. Thom, and D. LaPlante. 2003. Stream Assessment Program: An Overview of Measures for Assessing Stream Systems on Eglin AFB. Oral presentation to Aquatics focus group of EWGEM. 9 December, 2003. Niceville, FL.

LaPlante, D and **J. Herod**. 2003. U.S. Fish and Wildlife Service monitoring and research activities supporting imperiled fish management: investigating potential impacts from road crossing structure in Okaloosa darter (*Etheostoma okaloosae*) streams. Oral presentation to Panama City Field Office, U.S. Fish and Wildlife Service, Panama City, FL. 15 December, 2003. Panama City, FL.

Jett, R., **J. Herod**, L. Jenkins, and D. LaPlante. 2003. U.S. Fish and Wildlife Service monitoring and research activities supporting recreational fish management: investigating fishery stocks in Indigo Pond, Eglin Air Force Base. Oral presentation to Panama City Field Office, U.S. Fish and Wildlife Service, Panama City, FL. 14 June, 2003. Panama City, FL.

Blalock-Herod, H.N., **J.J. Herod**, C.K. Metcalf, and J.W. Ziewitz. 2004. Fish community structure before habitat restoration in Big Escambia Creek, Escambia County, Florida. Poster presentation to Southern Division American Fisheries Society. February 2004. Oklahoma City, Oklahoma.

Herrington, S.J., K.J. Popp, H.N. Blalock-Herod, **J.J. Herod**, and L. Jenkins. 2004. Long-term Assessment of the Unique Fishery in Okefenokee National Wildlife Refuge. Poster presentation to Southern Division American Fisheries Society. February 2004. Oklahoma City, Oklahoma.

LaPlante, D and **J. Herod**. 2004. U.S. Fish and Wildlife Service monitoring and research activities supporting imperiled fish management: investigating potential impacts from road crossing structure in Okaloosa darter

(*Etheostoma okaloosae*) streams. Poster presentation to Southern Division American Fisheries Society. February 2004. Oklahoma City, Oklahoma.

**Herod, J.**, D. Bergendorf, L. McLaughlin. 2005. Developing a toolbox for non-native invasive species: how the NIS and ANS Program can assist you. Oral presentation to Upper Sacramento River Management Partnership Working Team. March 15, 2005. Red Bluff, California.

Thom, T and **J. Herod**. 2005. Woody Debris: Linking Stream Morphology and Aquatic Biota in Southeastern Coastal Plain Streams, USA. 2005 AGU/NABS (North American Benthological Society) Annual Meeting. May 23-27, 2005. New Orleans, Louisiana.

**Herod, J.**, D. Bergendorf, and L. McLaughlin. 2005. Ecological Surveys in California: Phase I and II. Oral presentation to the Aquatic Nuisance Species Task Force. May 24-26, 2005. Monterey, California.

Bergendorf, D., A. Marrone, L. McLaughlin, and **J. Herod**. 2005. Preliminary survey for New Zealand Mudsnaills (*Potamopyrgus antipodarum*) in California: range delineation and field observations. Oral presentation to Annual New Zealand Mudsnaill Conference. August 16-17, 2005. Bozeman, Montana.

Bergendorf, D., **J. Herod**, and S. Bynum. 2005. Boater Assessment in California: Understanding a Potential Pathway for Zebra Mussels (*Dreissena polymorpha*) and Other Non-Native Species. 7<sup>th</sup> Biennial State of San Francisco Estuary Conference. October 4-6 2005. Oakland, California

McLaughlin, L., **J. Herod**, R. Fairey, T. Light, E. Grosholz, and P. Moyle. 2005. Ecological Surveys of Non-native Aquatic Species in the Sacramento-San Joaquin Delta. 7<sup>th</sup> Biennial State of San Francisco Estuary Conference. October 4-6 2005. Oakland, California

**Herod, J.J.**, H.N. Blalock-Herod, and P.D. Cadrett. 2005. Considerations Regarding Non-native Fishes and Adaptive Management Activities in the Sacramento and San Joaquin Delta. 7<sup>th</sup> Biennial State of San Francisco Estuary Conference. October 4-6 2005. Oakland, California

**Herod, J.**, E. Stitt, P. Balfour, and S. Ellis. 2005. Eastern Snakes in Western States: Watersnakes (*Nerodia*) in California and Arizona. Oral presentation to the Aquatic Nuisance Species Task Force. October 19-21, 2005. Herndon Virginia.

**Herod, J.**, D. Bergendorf, L. McLaughlin, and A. Marrone. 2005. Toolbox of resources: types of technical assistance offered by Non-native Invasive Species and Aquatic Nuisance species programs. October 26-27, 2005. Oral presentation at 13<sup>th</sup> Annual Tribal EPA Conference. Coarsegold, California.

**Herod, J.** and P. Heimowitz. 2006. Zebra mussels suck. Oral presentation at Colorado River Law Enforcement Association Conference. 26-27 January, 2006. Harrah's Laughlin Resort and Casino, Laughlin, Nevada.

#### **(Selected) PUBLICATIONS and TECHNICAL REPORTS**

Stoeckel, J.N., C.J. Gagen, D.O. McCollum, R.K. Beadel, **J.J. Herod**, S.D. Shook. 1993. 1993 Annual summary: ENTERGY Lake Dardanelle fish and zebra mussel study. 125 pp.

Gagen, C.J., J.N. Stoeckel, R.K. Beadel, **J.J. Herod**, and D.O. McCollum. 1994. Standard operating procedures for the fish monitoring project with ENTERGY Corporation. 18 pp.

Gagen, C.J., J.N. Stoeckel, R.K. Beadel, **J.J. Herod**, and D.O. McCollum. 1994. Standard operating procedures for zebra mussel monitoring project with ENTERGY Corporation.

Stoeckel, J.N., C.J. Gagen, **J.J. Herod**, R.K. Beadel, S.D. Shook, C.S. Howell, and P. Penny. 1994. 1994 Annual summary: ENTERGY Lake Dardanelle fish and zebra mussel study. 136 pp.

Sickel, J.B., **J.J. Herod**, and H.N. Blalock. 1996. Biological assessment of the commercial mussel resources in Kentucky and Barkley Lakes, Kentucky. Final report to Kentucky Department of Fish and Wildlife Resources, Frankfort, KY. 82 pp.

Sickel, J.B., **J.J. Herod**, and H.N. Blalock. 1997. Potential for the Kentucky Dam tailwater of the Tennessee River to serve as a mussel refuge from invading zebra mussels. Pages 214-219 in K.S. Cummings, A.C. Buchanan, C.A. Mayer, and T.J. Naimo, eds. Conservation and management of freshwater mussels II: initiatives for the future. Proceedings of a UMRCC symposium, 16-18 October 1995, St. Louis, Missouri. Upper Mississippi River Conservation Committee, Rock Island, Illinois.

**Herod, J.J.**, T.L. Frye, and J.B. Sickel. 1997. Blue catfish (*Ictalurus furcatus*; Ictaluridae) predation on the zebra mussel in the Ohio River near Paducah, Kentucky. Transactions of the Kentucky Academy of Science. 58(2):96.

**Herod, J.J.**, D.P. Reed, and J.B. Sickel. 1997. Distribution and population characteristics of zebra mussels, *Dreissena polymorpha*, (Bivalvia: Dreissenidae) in Kentucky Lake, Kentucky. Pages 74-84 in Scott, A.F., S.W. Hamilton, E.W. Chester, and D.S. White (eds.), Proceedings of the Seventh Symposium on the Natural History of Lower Tennessee and Cumberland River Valleys. The Center for Field Biology, Austin Peay State University, Clarksville, Tennessee.

Reed, D.P., **J.J. Herod**, and J.B. Sickel. 1997. A comparison of larval development in the zebra mussels, *Dreissena polymorpha*, (Bivalvia: Dreissenidae) up to the free-swimming trochophore stage in Tennessee and Ohio River water. Pages 85-98 in Scott, A.F., S.W. Hamilton, E.W. Chester, and D.S. White (eds.), Proceedings of the Seventh Symposium on the Natural History of Lower Tennessee and Cumberland River Valleys. The Center for Field Biology, Austin Peay State University, Clarksville, Tennessee.

Brinkley, K., J. Sickel, L. Duobinis-Gray, and **J. Herod**. 1997. Histological analysis of gonad development in zebra mussels (Bivalvia: Dreissenidae) from the Tennessee and Ohio Rivers. Pages 67-73 in Scott, A.F., S.W. Hamilton, E.W. Chester, and D.S. White (eds.), Proceedings of the Seventh Symposium on the Natural History of Lower Tennessee and Cumberland River Valleys. The Center for Field Biology, Austin Peay State University, Clarksville, Tennessee.

Reed, D.P., **J.J. Herod**, and J.B. Sickel. 1998. Variations in zebra mussel (*Dreissena polymorpha*) veliger densities throughout 1996 at Dam 52 on the lower Ohio River. Journal Freshwater Ecology 13(3): 255-261.

Blalock, H.N., **J.J. Herod**, and J.D. Williams. 1998. Freshwater mussels (Unionacea: Bivalvia) of the Pea River Watershed of Alabama and Florida. Final report to U.S. Fish and Wildlife Service, Jacksonville, FL. 61 pp.

Blalock, H.N. and **J.J. Herod**. 1999. A comparative study of habitat types and sediments utilized by *Corbicula fluminea* (Bivalvia: Corbiculidae) in the New River, Suwannee River System, Florida. Florida Scientist 62(2): 145-151.

Blalock, H.N., **J.J. Herod**, and R.S. Butler. 1999. Summary of freshwater mollusk survey conducted within O'Leno State Park. Technical Report. 3 pp.

Blalock-Herod, H.N., **J.J. Herod**, and J.D. Williams. 2000. Interim Report: Freshwater mussels of the Choctawhatchee River Drainage in Alabama and Florida. Report to U.S. Fish and Wildlife Service, Panama City, FL. 60 pp.

Williams, J.D., L.G. Nico, and **J.J. Herod**. 2000. Interim Report: Fish communities and swamp eel populations of south Florida canal and stream ecosystems as indicators of habitat quality and restoration success (Task EP/IS 99-1). Report to CESA and USGS-BRD. South Florida Ecosystem Restoration Program, Critical Ecosystems Studies Initiative-99. 15pp.

Loftus, W.F., J.C. Trexler, L.G. Nico, and **J.J. Herod**. 2000. Influence of hydrology on life-history parameters of common freshwater fishes from southern Florida. Fact Sheet and Project Progress Report for Integrated Natural Science Program. 3 pp.

McGregor, S.W., H.N. Blalock-Herod, and **J.J. Herod**. 2000. A survey of freshwater mussels in the Choctawhatchee/ Pea River System of Alabama and Florida, 1998-2000. Geological Survey of Alabama, Tuscaloosa, AL. 28 pp.

Nico, L.G. and **J.J. Herod**. 2001. [Review of] Nonindigenous freshwater organisms: vectors, biology, and impacts. *Transactions of the American Fisheries Society*. 130:347-350.

**Herod, J.J.**, H.N. Blalock-Herod, D.S. Ruessler, J.D. Williams, T.S. Gross, and N.J. Kernaghan. 2001. Examination of the freshwater mussel (Bivalvia: Unionidae) community, including the federally endangered southern Clubshell, *Pleurobema decisum*, within the Old Channel of the Coosa River, between Weiss Spillway Dam and Weiss Hydropower Dam, Cherokee County, Alabama. Report to Alabama Power Company, Birmingham, AL. 54 pp.

Nico, L.G., J.D. Williams, and **J.J. Herod**. July 2001. Black Carp (*Mylopharyngodon piceus*): a biological synopsis and updated risk assessment. Report to the Risk Assessment and Management Committee of the Aquatic Nuisance Species Task Force. 124 pp.

Blalock-Herod, H.N., **J.J. Herod**, and J.D. Williams. 2002. Evaluation of conservation status, distribution, and reproductive characteristics of an endemic Gulf Coast freshwater mussel, *Lampsilis australis* (Bivalvia: Unionidae). *Biodiversity and Conservation*. 11:1877-1887.

Thom, T. and **J. Herod**. 2002. Stream monitoring program FY2002 annual report and program summary for fiscal year 1999 – 2002. Report to Eglin Air Force Base, Jackson Guard, Niceville, Florida. 25 pp.

Blalock-Herod, H.N. and **J.J. Herod**. 2003. Fish Community Structure Before Habitat Restoration in Big Escambia Creek, Escambia County, Florida: Interim Report to U.S. Fish & Wildlife Service, Panama City, FL. 20 pp.

Ziewitz, J., C. Metcalf, H. Blalock-Herod, and J. Herod. 2003. Fish and Wildlife Coordination Act report Big Escambia Creek Aquatic Ecosystem Restoration Project near Flomaton, Alabama and Century, Florida. U.S. Fish and Wildlife Service, Panama City, FL. 35 pp + appendices.

Blalock-Herod, H.N., **J.J. Herod**, and J.D. Williams, B.N. Wilson, and S.W. McGregor. *In Review*. A historical and current perspective of the freshwater mussel fauna (Bivalvia: Unionidae) of the Choctawhatchee River drainage in Alabama and Florida. *Bulletin of the Alabama Museum of Natural History*.

Garner, J.T., H.N. Blalock-Herod, A.E. Bogan, R.S. Butler, W. R. Haag, P. D. Hartfield, **J.J. Herod**, P. D. Johnson, S.W. McGregor, and J.D. Williams. 2004. Freshwater mussels and snails. Alabama Non-Game Symposium. University of Auburn Press.

**Herod, J.** and T. Thom. 2004. Stream Assessment Program (SAP): Assessment tools targeting multiple scales and ecological parameters to provide decision support for managing Eglin stream systems. Report to Eglin Air Force Base, Jackson Guard, Niceville, Florida. 140 pp.

**Herod, J.J.** *In Review*. Monitoring the federally endangered Okaloosa darter: distribution and size demographics of Okaloosa darter (*Etheostoma okaloosae*), Brown darter (*Etheostoma edwini*), and Blackbanded darter (*Percina nigrofasciata*) from selected sites in streams entering Choctawhatchee Bay in Florida. Report to U.S. Fish and Wildlife Service, Panama City, FL. ++ pp.

LaPlante, D and **J. Herod**. *In Review*. U.S. Fish and Wildlife Service monitoring and research activities supporting imperiled fish management: investigating potential impacts from road crossing structure in Okaloosa darter (*Etheostoma okaloosae*) streams. Report to Eglin Air Force Base, Jackson Guard, Niceville, Florida. +47 pp.

**Herod, J.**, L. Jenkins, D. LaPlante, and R. Jett. DRAFT. U.S. Fish and Wildlife Service monitoring and research activities supporting recreational fish management: investigating fishery stocks in Indigo Pond, Eglin Air Force Base. ++pp.

**Herod, J.J.**, H.N. Blalock-Herod, J.D. Williams, and J.M. Pierson. *In Review*. Qualitative and quantitative examination of the mussel (*Bivalvia*: Unionidae) assemblage within an altered reach of the Coosa River below Weiss Spillway Dam, Cherokee County, Alabama. *Southeastern Naturalist*.

Herrington, S.J., K.J. Popp, H.N. Blalock-Herod, **J.J. Herod**, and L. Jenkins. *In Review*. Ten-year assessment of the unique fishery of the Okefenokee Swamp Proceedings of the Annual Conference of the Southeastern Association Fish and Wildlife Agencies.

### **LIA R. McLAUGHLIN**

*U.S. Fish and Wildlife Service,  
4001 North Wilson Way, Stockton CA 95205  
Phone: (209) 946-6400 ext. 337  
Fax: (209)946-6355*

**INTERESTS:** Non-native invasive species, ecosystem function, and effects on at-risk species.

**EDUCATION:**

M.S. UNIVERSITY OF MAINE 1996 - 1999

*Major: Zoology*

Thesis Topic: Diet of American Eels (*Anguilla rostrata*) in Five Freshwater Lakes, Maine, USA.

GPA: 3.88

Graduation Date: August 1999

B.S. UNIVERSITY OF CALIFORNIA AT SAN DIEGO 1989 - 1994

*Major: Evolution, Behavior, Ecology*

Provost's Honors

GPA: 3.43

NORTHEASTERN UNIVERSITY Spring Term 1992

*Major: Tropical Rainforest Field Studies Queensland, Australia*

GPA: 3.80

**EXPERIENCE:**

August 2004 – present CALFED NON-NATIVE INVASIVE SPECIES PROGRAM WATERSHED COORDINATOR (USFWS, STOCKTON CA)

- Manage 6 invasive species projects totaling over \$2.1 million dollars worth of grants and agreements
- Provide technical guidance, coordination and invasive species information to area watershed groups
- Developed a Non-native Invasive Species watershed group database
- Member of various invasive species advisory committees (e.g. NISAC, CINIPC)
- Hazard Analysis and Critical Control Point (HACCP) planning.

June 2003 – August 2004 SUPERVISORY FISHERY BIOLOGIST, IEP JUVENILE FISH MONITORING PROGRAM (USFWS, STOCKTON CA)

- Managed nine staff
- Coordinated monitoring field work for large, long term monitoring program
- Coordinated management of project's database (over 1 million records)
- Compiled and analyzed data and prepared written reports

July 2001 – May 2003 FISHERY BIOLOGIST, EZ PERCE TRIBAL HATCHERY MONITORING AND EVALUATION (NEZ PERCE TRIBE, OROFINO, ID)

- Evaluated the success of the spring Chinook salmon supplementation program and monitored potential effects of NPTH supplementation efforts on naturally spawning



populations.

- In charge of the screw trap operations, supervised 12 field technicians
- Compiled and analyzed data, prepared written reports and other technical documents.

June 2000 – July 2001 FISHERY BIOLOGIST, COLEMAN NATIONAL FISH HATCHERY MONITORING AND EVALUATION (USFWS, RED BLUFF, CA)

- Evaluated the success of the Coleman NFH Chinook salmon and steelhead trout mitigation programs and monitored potential effects of CNFH supplementation efforts on naturally spawning populations.

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- Compiled and analyzed data, prepared written reports and other technical documents.
- Designed, coordinated and conducted field investigations
- Assisted completion of preparing permit applications and reporting documents (e.g. CNFH Biological Assessment) required under Sections 7 and 10 of the federal Endangered Species Act.

February – June 2000 FISHERY BIOLOGIST, JUVENILE SALMONID MONITORING (USFWS, ANDERSON, CA)

October 1999 – January 2000 FISHERY BIOLOGIST, MAINE DEPARTMENT OF INLAND FISHERIES AND WILDLIFE (BANGOR, ME)

- Estimated abundance of American eel populations to assess effects of commercial harvest on eel populations.
- Compiled and analyzed data, completed written report with management recommendations, identified areas of concern and for future research.

May – July 1999 FIELD TECHNICIAN, UNIVERSITY OF MAINE (ORONO, ME)

- Collected and analyzed water samples, quantified vegetation, compiled and summarized data

#### **TEACHING EXPERIENCE:**

Fall Semester 1997 LABORATORY INSTRUCTOR, ZOOLOGY LABORATORY, UNIVERSITY OF MAINE (ORONO, ME)

Fall Semester 1998 and 1999 LABORATORY INSTRUCTOR, ANATOMY AND PHYSIOLOGY LABORATORY, HUSSON COLLEGE (BANGOR, ME)

Fall Semester 1998 LABORATORY INSTRUCTOR, COMPARATIVE ANATOMY LABORATORY, UNIVERSITY OF MAINE (ORONO, ME)

#### **SELECTED PRESENTATIONS AND PUBLICATIONS:**

Marrone, A. and L. McLaughlin. 2005. Non-native Invasive Species Program Reference Collection. 2005 State of the Estuary Conference. Poster.

McLaughlin, L., J. Herod, R. Fairey, T. Light, E. Grosholz, and P. Moyle. 2005. Ecological Surveys of Non-native Aquatic Species in the Sacramento-San Joaquin Delta. 2005 State of the Estuary Conference. Poster.

McLaughlin, L. 2005. Risks of Spreading Non-native Invasive Species: HACCP Planning for Natural Resources Pathways. 2005 CA-NV American Fisheries Society Conference. Poster.

McLaughlin, L.R. and J. McLain. 2004. Comparison of Relative Abundance of Adult Chinook Salmon (*Oncorhynchus tshawytscha*) in the Delta Cross Channel, Georgiana Slough, and Sacramento River, California 2001. Final report provided to Calfed. June 2004. 14pp.

Haro, A., T. Castro-Santos, K. Whalen, G. Whipplehauser, and L. McLaughlin. 2003. Simulated effects of hydroelectric project regulation on mortality of American eels. Pages 357-366 in D.A. Dixon editor. Biology, management, and protection of catadromous eels. American Fisheries Society, Symposium 33, Bethesda, Maryland.

Daniels, L.R., J. Trial, F.W. Kircheis. 2000. Density, biomass, and commercial freshwater pot fisheries for American eels in Maine. Report prepared for Maine Department of Inland Fisheries and Wildlife. January 1999. 16pp.

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Daniels, L.R. 1999. Diet of American eels (*Anguilla rostrata*) in five freshwater lakes, Maine, USA. Masters Thesis at University of Maine, Orono, Maine. 66pp.

Daniels, L.R. 1998. Abiotic factors that may influence seaward migration of maturing American eels (*Anguilla*

rostrata) in Maine. Report prepared for Maine Department of Inland Fisheries and Wildlife. June 1998. 21pp.  
maturing American eels (*Anguilla rostrata*) in Maine. Report prepared for Maine Department of Inland Fisheries and Wildlife. June 1998. 21pp.

**OTHER PROFESSIONAL ACTIVITIES:**

2006 Chair: Non-native Invasive Species Session (CA-NV AFS Conference, March 29 – April 1, 2006)

2005 Co-chair California Interagency Noxious and Invasive Weed Committee  
(formerly California Interagency Noxious Weed Coordinating Committee)

2005 Co-Instructor: Hazard Analysis and Critical Control Point (HACCP) Planning Workshop  
(CA-NV AFS Conference, March 17 – 19, 2005)

2004 Chair Non-native Invasive Species Session (Calfed Science Conference, October 2004)

**AWARDS:**

Performance Award 2005

On-the-Spot Award USFWS 2001

Horace Bond Scholarship 1997

Irvine Memorial Scholarship 1989 - 1993

Regents Scholarship 1989

**PROFESSIONAL ORGANIZATIONS:**

American Fisheries Society 1998 - present

Chair NED Outstanding Chapter Award 1998

Society for Conservation Biology 1997 - 2002

**EXHIBIT A – ATTACHMENT 1**  
**SCHEDULE AND LIST OF DELIVERABLES**  
**CALFED NON-NATIVE INVASIVE SPECIES PROGRAM**

<b>Task No.</b>	<b>Task Title</b>	<b>Deliverables</b>	<b>Estimated Completion Dates</b>
1	Project Management and Administration	1.1 Project Management 1.2 Quarterly Progress Reports 1.3 Quarterly Invoices 1.4 Related subcontractor selection documentation 1.5 Data Management 1.6 Project Close-Out Report; Final Invoice	1.1 Continuous during the term of the Agreement. 1.2 Due within thirty (30) days following each quarterly month following Grant execution. 1.3 Due within thirty (30) days following each quarterly month following Grant execution. 1.4 Due with Quarterly Progress Reports 1.5 Continuous during the term of the Agreement. 1.6 30 to 60 days after Final Report is approved
2	Zebra Mussel Prevention Project	2.1 Proposal Solicitation posted on Grants.gov 2.2 Executed Grant Agreement	2.1 Within 6 months of grant execution 2.2 24 months after grant execution
3	Zebra Mussel Response Plan Development	3.1 Draft and Final Plan (Zebra Mussel Response Plan) 3.2 Technical Advisory Working Group (List of agencies and representatives)	3.1 22 months and 24 months after grant execution 3.2 Within 12 months of grant execution

**EXHIBIT B - ATTACHMENT 1  
PRIMARY GRANTEE BUDGET SUMMARY  
CALFED NON-NATIVE INVASIVE SPECIES PROGRAM**

	TOTAL HOURS	TOTAL AMOUNT	YEAR 1 - FISCAL YEAR 06/07						YEAR 2 - FISCAL YEAR 07/08						YEAR 3 - FISCAL YEAR 08/09					
			YEAR 1 TOTAL			Task 1	Task 2	Task 3	YEAR 2 TOTAL			Task 1	Task 2	Task 3	YEAR 3 TOTAL			Task 1	Task 2	Task 3
			SALARY <sup>1</sup>	HOURS	AMOUNT	Amount	Amount	Amount	SALARY	HOURS	AMOUNT	Amount	Amount	Amount	SALARY	HOURS	AMOUNT	Amount	Amount	Amount
<b>Personal Services:</b>																				
Program Coordinator	3840	\$164,000	\$51,000	1,280	\$53,000	\$33,000	\$0	\$20,000	\$51,000	1,280	\$54,000	\$34,000	\$0	\$20,000	\$51,000	1,280	\$57,000	\$45,000	\$0	\$12,000
Watershed Coordinator	5040	\$90,405	\$40,000	1,680	\$0	\$0	\$0	\$0	\$40,000	1,680	\$44,100	\$44,100	\$0	\$0	\$40,000	1,680	\$46,305	\$46,305	\$0	\$0
Biological Technician	5040	\$121,000	\$30,000	1,680	\$57,000	\$42,000	\$0	\$15,000	\$30,000	1,680	\$32,000	\$16,000	\$0	\$16,000	\$30,000	1,680	\$32,000	\$16,000	\$0	\$16,000
	0	\$0	\$0	0	\$0	\$0	\$0	\$0	\$0	0	\$0	\$0	\$0	\$0	\$0	0	\$0	\$0	\$0	\$0
<b>Subtotal Personal Services</b>	13920	\$375,405		4640	\$110,000	\$75,000	\$0	\$35,000		4640	\$130,100	\$94,100	\$0	\$36,000		4640	\$135,305	\$107,305	\$0	\$28,000
<b>Benefits @ (Rate)</b>	0.0%	0			0	0	0	0			0	0	0	0			0	0	0	0
<b>Total Personal Services</b>		\$375,405			\$110,000	\$75,000	\$0	\$35,000			\$130,100	\$94,100	\$0	\$36,000			\$135,305	\$107,305	\$0	\$28,000
<b>Operating Expenses</b>																				
General Supplies <sup>2</sup>		\$60,000			\$30,000	\$20,000	\$0	\$10,000			\$25,000	\$20,000	\$0	\$5,000			\$5,000	\$0	\$0	\$5,000
Travel and Per Diem <sup>3</sup>		\$9,000			\$4,000	\$1,000	\$0	\$3,000			\$4,000	\$1,000	\$0	\$3,000			\$1,000	\$0	\$0	\$1,000
Misc. Expense		\$10,242			\$4,580	\$3,000	\$0	\$1,580			\$4,580	\$3,000	\$0	\$1,580			\$1,082	\$0	\$0	\$1,082
Subcontractor <sup>4</sup> (Competed on Grants.gov)		\$188,000			\$188,000	\$0	\$188,000	\$0			\$0	\$0	\$0	\$0			\$0	\$0	\$0	\$0
<b>Total Operating Expenses</b>		\$267,242			\$226,580	\$24,000	\$188,000	\$14,580			\$33,580	\$24,000	\$0	\$9,580			\$7,082	\$0	\$0	\$7,082
<b>Subtotal Personal Services and Operating Expenses</b>		\$642,647			\$336,580	\$99,000	\$188,000	\$49,580			\$163,680	\$118,100	\$0	\$45,580			\$142,387	\$107,305	\$0	\$35,082
<b>Overhead Costs (Personnel Only) @ (Rate)</b>	25.4%	\$95,353			\$27,940	\$19,050	\$0	\$8,890			\$33,045	\$23,901	\$0	\$9,144			\$34,367	\$27,255	\$0	\$7,112
<b>Overhead Costs (Competed Funds) @ (Rate)<sup>5</sup></b>	6.0%	\$12,000					\$12,000													
<b>Total by Task by Fiscal Year</b>					\$376,520	\$118,050	\$200,000	\$58,470			\$196,725	\$142,001	\$0	\$54,724			\$176,754	\$134,560	\$0	\$42,194
<b>Total by Fiscal Year</b>					<b>\$376,520</b>						<b>\$196,725</b>						<b>\$176,754</b>			
<b>Total Grant Amount</b>											<b>\$750,000</b>									

1. Salaries may receive an increase at an estimated 5% per year of the project which related to cost of living for each employee.

2. General Supplies include (office supplies, printing, educational materials, reference materials, presentation materials, facilities and facility maintenance, communications, postage)

3. Rates for Travel and Per Diem are set at the rate specified by the General Services Agency for employees. For more information, please visit . (<http://policyworks.gov/org/main/mt/homepage/mtt/perdiem/travel>). The Contractor is required to maintain copies of all records for auditing purposes, including: (1) airline ticket or ticketless itinerary with total charge; (2) lodging receipts showing name, single room rate, tax per day, and form of payment; (3) vehicle rental agreement showing daily rate with total charge; and (4) receipts for all gas, meals, etc.

4. Funds for the Zebra Mussel Prevention Element of this project will be competed through the Federal Grant process. Subcontract detail will become available upon selection of successful proposals.

5. Task 2 is a project that will be competed on [www.grants.gov](http://www.grants.gov) and will have a 6% overhead rate. The overhead rate is applied to the total competed fund allotment of \$200,000, leaving \$188,000 allocation for grants.