

NOTICE OF INTENT TO AWARD

This Funding Announcement is not a request for applications. This announcement is to provide public notice of Reclamation's intention to fund the following project activities without full and open competition.

ABSTRACT	
Funding Announcement	R10AS20074 CESU
Project Title	Pelagic Organism Decline/Habitat Study Group Investigations
Recipient	San Francisco State University
Principle Investigator	Dr. Wim Kimmerer
Total Anticipated Award Amount	\$ 3,969,356.00 (\$1,157,159.00 for FY10)
Cost Share	None
New Award or Continuation?	New Award
Anticipated Length of Agreement	30 months
Anticipated Period of Performance	Date of execution through December 31, 2012
Award Instrument	Cooperative Agreement
Statutory Authority	Public Law 102-575, Central Valley Project Improvement Act, , Title 34, Section 3406 (b)(1) and Section 3407(e) and Public Law 93-205, Endangered Species Act, 16 USC 1531, et seq
CFDA Number	15.512
Single Source Justification Criteria Cited	(4) - Unique Qualifications
Reclamation Point of Contact	Maria E. Castaneda, mcastaneda@usbr.gov

OVERVIEW

Reclamation operates the Federal Central Valley Project (CVP) in coordination with the State Water Project (SWP) which is operated by the California Department of Water Resources. The diversion of water by the CVP and the SWP from their pumping facilities in the southern portion of the Sacramento-San Joaquin Delta (Delta) have been implicated as one of the possible causes of an apparent step-decline in the indices of abundance of a number of pelagic fish populations including the delta smelt (*Hypomesus transpacificus*), an endemic species listed as 'threatened' under the Federal Endangered Species Act (ESA). This agreement is directed at investigating the causes of this apparent decline and providing scientific information necessary to formulate ways to reverse it.

This cooperative effort between Reclamation and the San Francisco State University would be conducted under a CESU program. The Cooperative Ecosystem Studies Units (CESU) National Network is a network of cooperative units established to provide research, technical assistance, and education to resource and environmental managers. A key feature of CESU is the requirement that projects be conducted by a federal and academic co-principal investigator.

RECIPIENT INVOLVEMENT

Working closely with their Department of Interior co-principal investigators (co-PIs), the San Francisco State University (SFSU) co-PIs will supervise their staff in accomplishing the data collection activities of the investigations, including all logistics associated with this work; laboratory analyses; data management, data storage and retrieval; and the analysis and subsequent reporting of the results of the field and laboratory work.

This will be a three-year project under the direction of multiple co-PIs. The project will consist of six tasks, each under the direction of a SFSU co-PI and a Department of Interior (DOI) co-PI. In each case, the two co-PIs will work together to formulate the study design and coordinate the data collection, analysis and interpretation for each component of the project. Specifically, the project will include the following tasks and sub-tasks:

Task 1 - Delta smelt feeding and food web interactions

The purpose of this 3-year task is to investigate the food supply for delta smelt (*Hypomesus transpacificus*), how it is affected by predators and competitors, and how these interactions depend on freshwater flow. This task seeks to answer two questions: (i) To what extent is growth or survival of delta smelt food limited; and (ii) What limits the availability of food for delta smelt? The work required to answer these questions comprises 4 sub-tasks: (a) Conduct food limitation experiments using early juvenile delta smelt; (b) Conduct fish behavior experiments; (c) Quantify population dynamics and production of zooplankton prey of delta smelt; and (d) Determine gelatinous zooplankton abundance, distribution and predatory impact.

Task 2- Hydrodynamic and particle tracking modeling of delta smelt habitat and prey

This task will use existing modeling tools and laboratory and field data to accomplish two broad goals. The first goal is to better understand the variability of physical habitat with variation in X2 for key fish species including delta smelt. The second goal is to better understand the population dynamics of calanoid copepods, the most important food for delta smelt in summer and fall. These two goals are closely linked in that the same hydrodynamic simulations can be used to achieve both goals. This task seeks to answer three research questions: (i) How can existing or new monitoring data, modeling, or other methods be applied to better define and monitor smelt habitat; (ii) How do abiotic or biotic conditions during spring and summer influence how flow affects smelt habitat and ecological processes important to smelt during fall; and (iii) How much food is available for delta smelt in the LSZ, what is its quality and how are they affected by flow variability? The work required to answer these questions comprises 3 sub-tasks: (a) Quantify flow-habitat relationships; (b) Model copepod vertical migration, retention and transport; (c) Simulate population dynamics of *Pseudodiaptomus forbesi*.

Task 3 - Metabolic responses to variable salinity environments in field-acclimatized *Corbula amurensis*

This task seeks to characterize the metabolic physiology of *Corbula amurensis* in locations representing the extremes of their salinity distribution ranges in the northern San Francisco estuary. The overarching questions addressed by this research is: How does *Corbula amurensis* affect the food web supporting delta smelt, how is *Corbula* physiology affected by flow variability, and what are the seasonal carry-overs between fall flow and physiology of clams in the spring? This task will establish a year-round monthly sampling regime to collect clams at 9 stations along a salinity gradient. Sampling will include: water quality (e.g., water temperature, pH, specific conductance and turbidity), size distribution of plankton *in vivo* shipboard physiological performance assays of clam filtration, metabolic rate determinations, biochemical assays to determine osmotic content, growth, reproductive output potential, energy storage and biochemical indicators of metabolic state of clams will be performed using field-frozen specimens.

Perform statistical analyses to determine how water quality variation affects *Corbula* physiological performance.

Task 4 - Distribution, concentration and fate of ammonium in the Sacramento River and the low salinity zone

The goal of Task 4 is to determine the distribution, concentration, and fate of ammonium (NH₄⁺) in the Sacramento River and low salinity zone (LSZ) of the San Francisco Estuary/Delta. Specifically, this research will quantify two key biological processes influencing NH₄⁺ distribution: bacterial nitrification (NH₄⁺ oxidation) and phytoplankton uptake. The first year of this 3-year effort will focus on developing a protocol for measuring water column nitrification using 15N-labeled NH₄⁺ as a tracer. The subsequent two years will focus on determining how river flow affects these processes.

Task 5- Influence of elevated ammonium (NH₄) on phytoplankton physiology in the Sacramento-San Joaquin Delta during fall

The goal of Task 5 is to quantify differences in nutrients and phytoplankton in the Sacramento and San Joaquin Rivers during fall and how variation in irradiance via changing river flow, modulates NH₄ effects. The overarching questions addressed by this 3-year effort are: (1) How do nutrients affect the food web supporting delta smelt in the low salinity zone; and (2) How are they affected by flow variability. Task 5 comprises two sub-tasks: (a) Measure phytoplankton growth and N uptake rates, DIN composition and community composition along Sacramento and San Joaquin River transects; and (b) Perform enclosure experiments to establish phytoplankton N-light relationships.

RECLAMATION INVOLVEMENT

Dr. Lenny Grimaldo of Reclamation’s Applied Science Branch will serve as one of the federal co-principal investigators. In that capacity, Dr. Grimaldo will be part of the team that designs the study, oversees its implementation, analyzes the results and reports and defends the findings. He will also be a co-author of the peer reviewed journal articles called for as deliverables under this agreement.

SINGLE-SOURCE JUSTIFICATION

DEPARTMENT OF THE INTERIOR SINGLE SOURCE POLICY REQUIREMENTS
Department of the Interior Policy (505 DM 2) requires a written justification which explains why competition is not practicable for each single-source award. The justification must address one or more of the following criteria as well as discussion of the program legislative history, unique capabilities of the proposed recipient, and cost-sharing contribution offered by the proposed recipient, as applicable.
In order for an assistance award to be made without competition, the award must satisfy one or more of the following criteria: (1) Unsolicited Proposal – The proposed award is the result of an unsolicited assistance application which represents a unique or innovative idea, method, or approach which is not the subject of a current or planned contract or assistance award, but which is deemed advantageous to the program objectives; (2) Continuation – The activity to be funded is necessary to the satisfactory completion of, or is a continuation of an activity presently being funded, and for which competition would have a significant adverse effect on the continuity or completion of the activity;

- (3) Legislative intent – The language in the applicable authorizing legislation or legislative history clearly indicates Congress’ intent to restrict the award to a particular recipient of purpose;
- (4) **Unique Qualifications** – The applicant is uniquely qualified to perform the activity based upon a variety of demonstrable factors such as location, property ownership, voluntary support capacity, cost-sharing ability if applicable, technical expertise, or other such unique qualifications;
- (5) Emergencies – Program/award where there is insufficient time available (due to a compelling and unusual urgency, or substantial danger to health or safety) for adequate competitive procedures to be followed.

Reclamation did not solicit full and open competition for this award based on the following criteria:

CONTINUATION/UNIQUE QUALIFICATIONS

This agreement provides funding to continue San Francisco State University (SFSU) participation in the Fall Habitat Adaptive Management Program stipulated in the Reasonable and Prudent Alternative of the U.S. Fish and Wildlife Service Biological Opinion of June 2009 for the California Central Valley and State Water Project Operations (OCAP). It would not be cost effective for the government to work with another university cooperator on these particular aspects of the program because it would require that most of the work conducted during previous phases of this effort be repeated. The SFSU team is thus uniquely qualified to continue this study of processes affecting delta smelt food supply and habitat quality.

STATUTORY AUTHORITY

Central Valley Project Improvement Act, Public Law 102-575, Section 3406 (b)(1):

(b) FISH AND WILDLIFE RESTORATION ACTIVITIES- The Secretary, immediately upon the enactment of this title, shall operate the Central Valley Project to meet all obligations under State and Federal law, including but not limited to the Federal Endangered Species Act, 16 U.S.C. 1531, et seq., and all decisions of the California State Water Resources Control Board establishing conditions on applicable licenses and permits for the project. The Secretary, in consultation with other State and Federal agencies, Indian tribes, and affected interests, is further authorized and directed to:

(1) develop within three years of enactment and implement a program which makes all reasonable efforts to ensure that, by the year 2002, natural production of anadromous fish in Central Valley rivers and streams will be sustainable, on a long-term basis, at levels not less than twice the average levels attained during the period of 1967-1991; Provided, That this goal shall not apply to the San Joaquin River between Friant Dam and the Mendota Pool, for which a separate program is authorized under subsection 3406(c) of this title; Provided further, That the programs and activities authorized by this section shall, when fully implemented, be deemed to meet the mitigation, protection, restoration, and enhancement purposes established by subsection 3406(a) of this title; And provided further, That in the course of developing and implementing this program the Secretary shall make all reasonable efforts consistent with the requirements of this section to address other identified adverse environmental impacts of the Central Valley Project not specifically enumerated in this section.