



IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE

FI-164

JUL 30 1997

1

**Sacramento Fish and Wildlife Office  
3310 El Camino Avenue, Suite 130  
Sacramento, California 95821-6340**

July 28, 1997

Mr. Lester S. Snow  
Executive Director  
CALFED Bay-Delta Program  
1416 Ninth Street, Suite 1155  
Sacramento, California 95814

Subject: San Francisco Estuary Institutes's Category III Exotic Species Control Proposals

Dear Mr. Snow:

The Sacramento Fish and Wildlife Service Office supports the eight proposals submitted by the San Francisco Estuary Institute for exotic species research and control in the Sacramento-San Joaquin Bay-Delta estuary. These eight projects fit within the recommended actions in the Delta Native Fishes Recovery Plan and will help recover listed species in the estuary.

The Service recommends funding of these projects. Such projects are consistent with our mission of preserving fish and wildlife and recovering natural ecosystems and watersheds.

If you have any questions or concerns about the above, contact Robert Pine at (916) 979-2725.

Sincerely,

*Wayne* Wayne S. White  
Field Supervisor

CC: San Francisco Estuary Institute, Richmond, California

**a. Project Title:** The Current Legal Basis for Managing the Release of Nonindigenous Species via Ships' Ballast Water. DWP WAREHOUSE

**Applicant's Name:** The San Francisco Estuary Institute. 97 JUL 28 PM 2:55

**Principal Investigator:** Dr. Andrew N. Cohen, SFEI

**b. Project Description and Objectives.** This project will assess existing legal avenues for managing the release of nonindigenous species by ships' ballast water. SFEI will work with the Environmental Law Community Clinic (ELCC) and U.C. Berkeley's Boalt Law School students to investigate the rights and opportunities provided under existing law to manage the discharge of ballast water to prevent species introductions. This project will review existing enactments and non-regulatory sources of law and will evaluate and synthesize all potential legal approaches.

**c. Approach/Tasks/Schedule.** The tasks to be completed are to: (1) canvas existing statutory and regulatory enactments that might be relevant; (2) examine in detail existing enactments identified in (1) for applicability to the control of ballast water discharges; (3) prepare legal memoranda on the results of research on enactments; (4) identify and examine possible non-regulatory sources of law (such as common law doctrines of negligence) that might be relevant and examine their applicability to the control of ballast waetr discharges; (5) prepare legal memoranda on the results of research on non-regulatory sources; (6) evaluate and synthesize all legal approaches (7) prepare report for submission to CALFED, and prepare and submit article on findings for publication, either in a law review or a public policy journal.

The final report will be submitted to CALFED within eight months of the project start date.

**d. Justification for Project Funding by CALFED.** The San Francisco Bay Estuary is recognized as the most invaded aquatic ecosystem in North America, with more than 200 introduced invertebrates, fish, plants, and microorganisms. The introduction of nonindigenous species has been identified as a critical factor affecting the health of the Bay/Delta Estuary by water agencies, environmental groups, the CCMP, BCDC, USFWS, CALFED and others. It is one of the seven non-flow factors targeted for research and management by Category III funding, and is one of the main stressors listed by the technical teams as appropriate for near-term funding and priorities. Introductions of nonindigenous species have affected all of the priority habitats listed, and reearchers have demonstrated or suggested negative impacts from nonindigenous species on several priority species (salmon, trout Delta smelt, sturgeon). Future introductions occurring through ballast water discharges could affect any of the priority species and most or all of the priority habitats. As this project provides information and analysis that is needed for efforts to prevent or reduce introductions via ballast water discharges, it will be of benefit to these habitats and species. Determining available legal means of controlling introductions from ballast water discharges could provide a very cost-effective and continuing means of reducing the rate of invasion.

**e. Budget Costs and Third Party Impacts.** The total cost of the project is 18,529, of which \$8,870 would support staff work at SFEI and \$9,660 would be subcontracted to the Environmental Law Community Clinic. No third party impacts are anticipated.

**f. Applicant Qualifications.** The San Francisco Estuary Institute (SFEI) is a non-profit research institute charged with fostering scientific understanding of the Estuary, and with promoting the implementation of a comprehensive, coordinated *Regional Monitoring and Research Strategy* that addresses the physical, biological and chemical health of the Estuary. The creation of SFEI responds to a recommendation of the Comprehensive Conservation and Management Plan (CCMP) for the San Francisco Estuary adopted by the Governor of California and the Administrator of the U.S. Environmental Protection Agency in late 1993. The Institute's 22 staffmembers provide an interdisciplinary team of scientists, education specialists, data analysts, and support personnel. The Institute also employs graduate students and undergraduate interns from area Universities. The Institute conducts or provides science support

for four major programs: the San Francisco Estuary Regional Monitoring Program for Trace Substances, the Bay Area Wetlands Ecosystem Goals Project, the Bay Area Watershed Science Program, and the Biological Invasions Program.

SFEI's Biological Invasions Program researches issues of scientific and policy interest related to the introduction of nonindigenous species into marine and freshwater ecosystems. The research program is directed toward five objectives: (1) assisting efforts to prevent future invasions through scientific and policy research on vectors and the control of vectors; (2) developing an effective regional monitoring program to identify new invasions and track the spread of nonindigenous species that are present in the region; (3) understanding how factors in the environment affect the success of invasions; (4) assessing the impacts of invasions; (5) developing, prioritizing and assessing methods to control nonindigenous species that are present in the region.

The Environmental Law Community Clinic is an independent 501 (c)(3) organization that opened a store front law office in Berkeley in January 1994 to provide legal services and education and organizing support to community groups working to promote environmental quality, health, and safety, and sustainable development. It was founded by students and faculty at Boalt Hall (The University of California, Berkeley, School of Law), in consultation with the community groups in the Bay Area to augment the resources available to community groups unable to afford private legal representation. ELCC provides these services at no charge through its professional staff and its training of law students, who receive course credit for their work. ELCC has no formal connection to and does not receive any funds from the University of California. ELCC has worked on over 50 cases and projects in the past three and a half years. About 20% of them have involved issues of water quality in the Bay/Delta Estuary.

Principal Investigator: Dr. Andrew Cohen holds M. S. and Ph. D. degrees in Energy and Resources from the University of California at Berkeley. He is the author of the 1995 USFWS report on nonindigenous species in the San Francisco Estuary and of papers on other aspects of marine and aquatic invasions. Dr. Cohen has worked on and written about water system planning and economics, public health and contaminants in fish, and environmental mitigation; and has written articles and books for the general public on water and environmental policy and history. His work on invasions in the Estuary was profiled last year in the *New York Times* Science Page, and he was recently nominated to co-chair the Western Regional Panel on Aquatic Nuisance Species. He currently directs the San Francisco Estuary Institute's research program on biological invasions.

Anne Simon is a director of the ELCC and a Lecturer at Boalt School of Law. Prior to becoming Director of ELCC, she was Chief Administrative Judge in the Massachusetts Department of Environmental Protection. Her previous work includes positions as staff attorney at the Center for Constitutional Rights and the NOW Legal Defense Fund, both in New York. Her publications include: "Ethics, Ecology and Power: the Environmental Justice Movement," and "Whose Move? Breaking the Stalemate in Feminist and Environmental Activism."

- g. Monitoring and Data Evaluation.** The data to be examined are largely legal enactments and concepts. The law students doing the research will have available to them advice and review from interested law faculty members, and from researchers at SFEI with knowledge of biological invasions, as well as their normal supervision at ELCC. Peer review at the time of publication of the results of the project will also occur.
- h. Local Support/Coordination with other programs/Compatibility with CALFED objectives.** All habitats and species included as priorities in the Ecosystem Restoration Program Plan could be directly or indirectly affected by the establishment of new exotic species, and thus stand to benefit from any means of preventing their introduction.

## The Current Legal Basis for Managing the Release of Nonindigenous Species via Ships' Ballast Water

Principal Investigator: Andrew Cohen  
San Francisco Estuary Institute  
1325 South 46th Street  
Richmond, CA 94804  
phone: (510) 231-9423  
fax: (510) 231-9414  
email: acohen@sfei.org

Organization Type: Nonprofit research institute  
503(c)(3) nonprofit organization

Tax identification number: 94-2951373

Contact person: Andrew Cohen

Participants/Collaborators: Anne Simon, Director  
Environmental Law Community Clinic

Project Group Type: Services

## **Introduction: Biological Invasions in the Estuary**

The San Francisco Bay Estuary is recognized as the most invaded aquatic ecosystem in North America, with more than 200 introduced invertebrates, fish, plants, and microorganisms. The introduction of nonindigenous species has been identified as a critical factor affecting the health of the Bay/Delta Estuary by water agencies, environmental groups, the CCMP, BCDC, USFWS, CALFED and others. It is one of the seven non-flow factors targeted for research and management by Category III funding, and is one of the main stressors listed by the technical teams as appropriate for near-term funding and priorities. Nonindigenous species may in general affect and have affected all of the priority habitats listed in this RFP. Researchers have also demonstrated or suggested that nonindigenous species have caused significant negative impacts on several priority species (salmon, trout, Delta smelt, sturgeon).

The San Francisco Estuary Institute has initiated a research program to address issues of scientific and policy interest related to the introduction of nonindigenous species into marine and freshwater ecosystems. The research program is directed toward five objectives: (1) assisting efforts to prevent future invasions through scientific and policy research on vectors and the control of vectors; (2) developing an effective regional monitoring program to identify new invasions and track the spread of nonindigenous species that are present in the region; (3) understanding how factors in the environment affect the success of invasions; (4) assessing the impacts of invasions; (5) prioritizing and assessing efforts to control nonindigenous species that are present in the region. Proposals in several of these areas are being submitted in the current funding cycle.

## **Project Description and Approach**

This project will assess existing legal avenues for managing the release of nonindigenous species by ships' ballast water. SFEI recently assisted the Environmental Law Community Clinic (ELCC) in identifying the potential under the California Porter-Cologne Water Quality Act to regulate the discharge of ballast water containing exotic organisms into the waters of the state. Petitions based on this approach were subsequently submitted by the San Francisco BayKeeper and DeltaKeeper to the Central Valley and San Francisco Bay Regional Water Quality Boards, where they are now under consideration. In the course of this research, however, it became clear that there are other areas of existing law that may provide opportunities to manage the discharge of ballast water to prevent species introductions. In this project SFEI will work with ELCC and U. C. Berkeley's Boalt Law School students to investigate the rights and opportunities provided under these other areas of law for state and regional agencies to influence the discharge of ballast water.

## **Location/Geographic Boundaries**

This project will analyze state and federal laws as they relate to the discharge of ballast water into the Bay/Delta system or adjoining coastal waters, including discharge from ships calling at freshwater ports (Sacramento and Stockton) and brackish/salt water ports (from Suisun Bay to the South Bay). Much or all of the results, however, will likely apply to all ports in California, and in part to ports elsewhere on the Pacific Coast. Since nonindigenous species do not recognize jurisdictional boundaries, and may be more readily spread or be transported into the Bay/Delta system once introduced to sites on the Pacific Coast, the application of information developed by this project to prevent introductions anywhere on the Pacific Coast will be of benefit to the Bay/Delta system.

## **Expected Benefits**

Past introductions of nonindigenous species have affected all of the priority habitats and probably affected many of the priority species listed by CALFED (although these interactions have not been well studied), and future introductions occurring through ballast water discharges could affect any of the priority species and most or all of the priority habitats. As this project provides information and analysis that is needed for efforts to prevent or reduce introductions via ballast water discharges, it will be of benefit to these habitats and species.

This project is designed to identify and analyze the legal background necessary for the development of regulatory approaches to the control of ballast water discharges. To date, there has been no systematic exploration of the full range of potential legal bases for such regulatory activity in the Bay/Delta Estuary. Because of the complexities involved, research into legal underpinnings for such regulation is a necessary first step in mobilizing appropriate regulatory strategies. The benefits of this project are the facilitation of the development of legally-sound regulatory activities that will be able to prevent or reduce introductions from ballast water discharges.

## **Background and Biological/Technical Justification**

The San Francisco Bay Estuary is recognized as the most invaded aquatic ecosystem in North America, with more than 200 introduced invertebrates, fish, plants, and microorganisms, and such introductions have in many cases had substantial effect on native species and habitats through predation, competition, habitat disturbance and alteration, changes in trophic dynamics, and other mechanisms. Introductions resulting from ballast water discharge have been increasing in recent decades, and are likely to increase further with the current rapid expansion that is occurring in international trade (for which, for example, the Port of Oakland is currently undergoing a major expansion with cargo volume reportedly projected to triple by

the year 2020, with a concomitant increase in ballast water transport). Recent ballast water introductions include the Asian clam, *Potamocorbula amurensis*, which has completely altered the trophic dynamics of the northern part of the Estuary, and seven species of Asian copepods and mysid shrimp that have appeared, and in many cases dominated, the zooplankton fauna in the North Bay and Delta.

The absence of any current regulation of ballast water discharge in the Bay/Delta Estuary means that any attempts to craft effective regulatory strategies are in effect starting from scratch, from a legal point of view. This project will provide building blocks for regulatory activities, by identifying legally promising avenues and eliminating legally unlikely ones. The research program will identify and evaluate existing laws that could be the basis for, or be adaptable to, the regulation of ballast water discharge.

This project grows out of work on the potential use of the Porter-Cologne Water Quality Act to regulate ballast water discharges. Investigation of that aspect of regulatory legal approaches is now being pursued by the San Francisco BayKeeper and DeltaKeeper through petitions to regional water quality control boards. The present project will look at other possible legal bases for regulation. The project will make its research findings generally available, through report to CALFED and through publication, to all interested parties or agencies.

### Proposed Scope of Work

Phase 1: Canvas existing statutory and regulatory enactments that might be relevant.

Phase 2: Examine in detail existing enactments identified in Phase 1 for applicability to the control of ballast water discharges.

Phase 3: Write legal memoranda setting forth the results of this research.

Phase 4: Identify and examine possible non-regulatory sources of law (such as common law doctrines of negligence) that might be relevant and examine their applicability to the control of ballast water discharges.

Phase 5: Write legal memoranda setting forth the results of research on non-regulatory sources.

Phase 6: Evaluate and synthesize all legal approaches. Write final report for submission to CALFED and prepare and submit article on findings for publication, either in a law review or a public policy journal.

The final report will be the deliverable to CALFED.

### **Monitoring and Data Evaluation**

The data to be examined in this project are largely legal enactments and concepts. The development of new technical and biological information is not needed; although further information is necessary for other purposes, a sound basis for the legal investigation proposed can be found in the existing data. The law students doing the research will have available to them advice and review from interested law school faculty members, and from researchers at SFEI with knowledge of biological invasions, as well as their normal supervision at ELCC. Peer review at the point of publication of the results of the project will also occur.

### **Implementability**

There are no anticipated implementation issues. Legal research tools are generally available and have no special requirements.

**Budget Costs**

SFEI	Direct Labor Hours	Direct Salary and Benefits	Overhead	Sercvice Contracts	Total Cost
Andrew Cohen (a) Subgrant to ELCC	100	5835.00	3034.20	9660	18529.20
<b>TOTAL</b>		5835.00	3034.20	9660.00	18529.20

(a) Andrew Cohen will manage the contract; serve as resource for information on ballast water practices, ballast water invasions, and state and federal law related to biological invasions; and participate in writing the report and article.

Project Tasks - ELCC	Direct Labor Hours	Direct Salary and Benefits	Overhead	Other Direct Costs	Total Cost
Legal Research, Phases 1, 2, 4 Anne Simon (b) Law Student Interns Overhead - ELCC (3) Other Direct Costs (4)	8 100	240.00 (1)	1470.00	200.00	1910.00
Internal memoranda, Phases 3, 5 Anne Simon Law Student Interns Overhead - ELCC (3) Other Direct Costs (4)	20 100	600.00 (1)	1750.00	100.00	2450.00
Report and Article, Phase 6 Anne Simon Law Student Interns (2) Overhead - ELCC (3) Other Direct Costs (4)	80 50	2400.00 (1)	2700.00	200.00	5300.00
<b>TOTAL</b>		3240.00	5920.00	500.00	9660.00

(b) Anne Simon will oversee the work of the Law Student Interns, and participate in writing the report and article.

**Budget Explanation**

- (1) Students work at ELCC for course credit, not pay. There are therefore no direct salary or benefit expenses for them. law students working in a comparabl setting for a salary during the academic year would be paid about \$15/hour.
- (2) Overhead includes allocation of overhead to cover student work needs.
- (3) Copying, travel, telephone.

### Cost Sharing

#### In-kind contribution of labor by law students

250 hours calculated at \$15/hr plus 11.5% benefits = \$4181

### Schedule

The following schedule assumes a project start date of September 1, 1997, which is contingent upon timely signing of a contract and availability of funds. Should this start date not be met, a similar schedule would apply beginning at the start of the academic semester following the signing of the contract.

Phases 1 and 2: Research	9/1/97-10/31/97
Phase 3: Legal memoranda	11/1/97-11/15/97
Phase 4: Research	11/15/97-11/30/97
Phase 5: Legal memoranda	12/1/97-12/7/97
Phase 6: Report and article	2/1/98-4/30/98

### **San Francisco Estuary Institute**

The San Francisco Estuary Institute (SFEI) is a 501(c)(3) non-profit created in 1994. SFEI is charged with fostering scientific understanding of the Estuary, and with promoting the implementation of a comprehensive, coordinated *Regional Monitoring and Research Strategy* that addresses the physical, biological and chemical health of the Estuary. The creation of SFEI responds to a recommendation of the Comprehensive Conservation and Management Plan (CCMP) for the San Francisco Estuary adopted by the Governor of California and the Administrator of the U.S. Environmental Protection Agency in late 1993.

The Institute has a staff of 22 headed by an Executive Director, and comprised of an interdisciplinary team of scientists, education specialists, data analysts, and support personnel. The Institute also employs graduate students and undergraduate interns from area Universities. The Institute conducts or provides science support for four major programs: The San Francisco Estuary Regional Monitoring Program for Trace Substances, the Bay Area Wetlands Ecosystem Goals Project, the Bay Area Watershed Science Program, and the Biological Invasions Program.

SFEI's Biological Invasions Program researches issues of scientific and policy interest related to the introduction of nonindigenous species into marine and freshwater ecosystems. The research program is directed toward five objectives: (1) assisting efforts to prevent future invasions through scientific and policy research on vectors and the control of vectors; (2) developing an effective regional monitoring program to identify new invasions and track the spread of nonindigenous species that are present in the region; (3) understanding how factors in the environment affect the success of invasions; (4) assessing the impacts of invasions; (5) prioritizing and assessing efforts to control nonindigenous species that are present in the region. Current projects include:

- Developing methods for prioritizing efforts to control exotic marsh plants in the Estuary.
- Assessing the potential range and abundance of zebra mussels in California waters.
- Research on the introduction of organisms in the marine baitworm trade.
- Research on the invasion of the California coast by a Japanese foraminifer.
- Developing a regional monitoring plan for exotic organisms.
- Modelling the effect of invasion "incubators" on the success of obligate sexually-reproducing invaders.
- Review of open coast invasions, with a case study of the invasion of the Southern California Bight by a New Zealand sea slug.

**Andrew N. Cohen**  
Environmental Scientist  
San Francisco Estuary Institute

Dr. Cohen received an M. S. and Ph. D. in Energy and Resources from the University of California at Berkeley. He is the author of a 1995 USFWS report on nonindigenous species in the San Francisco Estuary and of papers on other aspects of marine and aquatic invasions. Dr. Cohen has also worked on and written about water system planning and economics, public health and contaminants in fish, and environmental mitigation; and has written articles and books for the general public on water and environmental policy and history. His work on invasions in the Estuary was profiled last year in the *New York Times* Science Page, and he was recently nominated to co-chair the Western Regional Panel on Aquatic Nuisance Species. He currently directs the San Francisco Estuary Institute's research program on biological invasions.

#### Recent Publications

- Carlton, J. T. and A. N. Cohen. Episodic global dispersal in shallow water marine organisms: The case history of the European green crab *Carcinus maenas*, *J. Biogeogr.* (in press).
- Cohen, A. N. The exotic species threat to California's coastal resources, *Proc. California and the World Ocean '97 Conference*, March 24-27, 1997, San Diego CA (in press).
- Cohen, A. N. The invasion of the estuaries. *Proc. 2nd International Spartina Conf.*, Mar. 20-22, 1997, Olympia WA (in press).
- Carlton, J. T. and A. N. Cohen. Periwinkle's progress: The Atlantic snail *Littorina saxatilis* establishes a colony on Pacific shores, *Veliger* (in press).
- Cohen, A. N. and J. T. Carlton. Transoceanic transport mechanisms: The introduction of the Chinese mitten crab *Eriocheir sinensis* to California, *Pac. Sci.* 51(1): 1-11, 1997.
- Cohen, A. N. Biological invasions of the San Francisco Bay and Delta, *Proc. Nat'l Forum on Nonindigenous Species Invasions in U. S. Marine and Fresh Waters*, U. S. Capitol Building, Washington DC, Mar. 22, 1996.
- Cohen, A. N. and J. T. Carlton. *Nonindigenous Aquatic Species in a United States Estuary: A Case Study of the Biological Invasions of the San Francisco Bay and Delta*. U. S. Fish and Wildlife Service, Washington DC, Dec. 1995.
- Cohen, A. N., J. T. Carlton and M. C. Fountain. Introduction, dispersal and potential impacts of the green crab *Carcinus maenas* in San Francisco Bay, California, *Mar. Biol.* 122: 225-237, 1995.

#### Expert Testimony

- San Francisco Bay Regional Water Quality Control Board, Jan. 22 1997: Biological invasions.
- California State Water Resources Control Board, Oct. 5, 1994: Biological invasions.
- California State Water Resources Control Board, Nov. 13 & 16, 1991: Water system management.
- U. S. Senate, Committee on Energy and Natural Resources, Subcommittee on Water and Power, Mar. 18, 1991: Water system management.

### **Environmental Law Community Clinic**

The Environmental Law Community Clinic is an independent 501(c)(3) organization that opened a storefront law office in Berkeley in January 1994 to provide legal services and educational and organizing support to community groups working to promote environmental quality, health, and safety, and sustainable development. It was founded by students and faculty at Boalt Hall (the University of California, Berkeley, School of Law), in consultation with community groups in the Bay Area, to augment the resources available to community groups unable to afford private legal representation. ELCC provides these services at no charge through its professional staff and its training of law students, who receive course credit for their work. ELCC has no formal connection to, and does not receive any funds from, the University of California.

ELCC has worked on over 50 cases and projects in the past three and a half years. About 20% of them have involved issues of water quality in the Bay/Delta Estuary.

### **Anne Simon**

Anne Simon is director of the ELCC and a Lecturer at Boalt School of Law. Prior to becoming Director of ELCC, she was Chief Administrative Judge in the Massachusetts Department of Environmental Protection. Her previous work includes positions as staff attorney at the Center for Constitutional Rights and the NOW Legal Defense Fund, both in New York. Her publications include: "Ethics, Ecology, and Power: The Environmental Justice Movement," and "Whose Move? Breaking the Stalemate in Feminist and Environmental Activism."

**NONDISCRIMINATION COMPLIANCE STATEMENT**

COMPANY NAME

SAN FRANCISCO ESTUARY INSTITUTE

The company named above (hereinafter referred to as "prospective contractor") hereby certifies, unless specifically exempted, compliance with Government Code Section 12990 (a-f) and California Code of Regulations, Title 2, Division 4, Chapter 5 in matters relating to reporting requirements and the development, implementation and maintenance of a Nondiscrimination Program. Prospective contractor agrees not to unlawfully discriminate, harass or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, disability (including HIV and AIDS), medical condition (cancer), age, marital status, denial of family and medical care leave and denial of pregnancy disability leave.

**CERTIFICATION**

*I, the official named below, hereby swear that I am duly authorized to legally bind the prospective contractor to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.*

OFFICIAL'S NAME

Margaret R. Johnston

DATE EXECUTED

July 25, 1997

EXECUTED IN THE COUNTY OF

Contra Costa County

PROSPECTIVE CONTRACTOR'S SIGNATURE

PROSPECTIVE CONTRACTOR'S TITLE

Executive Director

PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME

San Francisco Estuary Institute