APPENDICES

CALIFORNIA
AQUATIC INVASIVE SPECIES
MANAGEMENT PLAN

January 2008

Appendices

APPENDIX A:
DRAFT
AUGUST 2007

RAPID RESPONSE PLAN
FOR AQUATIC INVASIVE SPECIES IN CALIFORNIA

Prepared by:

California Department of Fish & Game
Habitat Conservation Branch
The Invasive Species Program

RAPID RESPONSE PLAN
FOR AQUATIC INVASIVE SPECIES IN CALIFORNIA
TABLE OF CONTENTS

I. INTRODUCTION

Goal: The purpose of this plan is to provide a framework for an effective rapid response to the discovery of any aquatic invasive species (AIS) that is new to California, or of a population of established AIS that is outside of its known distribution in California.

In this document, "rapid response" means that soon after an aquatic species new to the State of California or a specific region of the state is discovered, 1) the state will make a determination of whether it is potentially detrimental and/or invasive and 2) if that is the case, the state will develop and implement a course of action. This also would apply to AIS that are discovered in an adjacent state in a waterway or lake that ultimately enters California.

Possible courses of action for newly discovered AIS may include an effort to eradicate the species, control its spread, prevent future introductions, minimize or mitigate the damage it causes, or study it further before any other action is taken. Rapid response is the second line of defense after prevention to minimize the negative impacts of AIS on the environment and economy of California. Once non-native invasive species become widespread, efforts to control them are typically more expensive and less successful than rapid response measures. The damage caused by an AIS that becomes widespread, and the actions that are taken to control it, may be more harmful to the environment than a successful rapid response.

California does not have an official rapid response plan for AIS, does not have a designated funding source for providing a rapid response, and no agency is designated with overall responsibility for AIS management. For this reason, it is unknown whether the necessary elements to conduct a rapid response operation will come together when the need arises. If the commitment, expertise and funding fail to coalesce, the state could be faced with substantial environmental and economic consequences caused by AIS infestations. Even if an ad hoc rapid response effort is made, the following consequences may result:

1. The effort may be compromised by less than adequate staff levels, authority and funding to carry out necessary actions.

2. Staff assigned on an ad hoc basis are less likely to have received training in advance that would help them function as effectively and efficiently as possible in this situation (e.g. Incident Command System training).

3. The effort may be compromised indirectly by staff in charge of the ad hoc effort spending their time trying to secure staff and funding for the response instead of leading the response itself.

4. The effort may not have the level of organization and accountability to be gained from following an official plan.

5. Some governmental and non-governmental entities may be less cooperative with an ad-hoc response than they would be if the response is a standard procedure that is based on official agency agreements.

6. Any resulting confusion could lead to a perception that public funds are mismanaged, that environmental regulations are not being followed, or that the interests of community leaders have been disregarded.

To address the threat posed to California habitats by new AIS introductions, and the lack of an organized plan and funding to address this threat, Chapter 6 (Task 4A1) of the California Aquatic Invasive Species Management Plan (CAISMP) calls for the development and implementation of a rapid response plan. The CAISMP was completed by the California Department of Fish and Game (DFG) in 2007. The CAISMP acknowledges that rapid response

to AIS in California may often require cooperation among a variety of local, state and federal agencies and organizations, and that formal agreement on a plan, in advance of need, increases the likelihood of responding in an effective manner.

This draft Rapid Response Plan will be available for review by agencies and organizations that are likely to have an interest in rapid response. DFG's Invasive Species Program will revise the plan based on the comments received. The goal is to arrive at a plan that can be the basis for agreements to cooperate on rapid response to AIS. In order to finalize, fund and implement the plan, it is hoped that cooperating agencies will assign staff to participate. DFG Invasive Species Program staff will provide coordination for the interagency activities called for in the agreement(s).

Please note that the procedure section of this plan (Section III) is followed by the planning section (Section IV). The order of these sections is deliberate and meant to emphasize that the objective is to have a working product. Both the procedure and planning sections of this document discuss the need to collect data to evaluate the feasibility and success of the plan. This rapid response plan is meant to fit into an adaptive management strategy where evaluation can lead to improved procedures.

It is not possible to plan proactively for every species that might become a nuisance in state waters, hence the need for this generic plan. It stands to reason, however, that a generic plan cannot be implemented as efficiently as a species- or location-specific plan. Therefore, rapid response plans for individual species or related groups of species at high risk of being introduced and becoming destructive should be formulated. This step is called for in Action 4A3 of the CAISMP.

To effectively protect state aquatic habitats from the impacts of AIS, California needs to develop and implement a comprehensive AIS early detection and reporting plan. This document does not attempt to address the issue of early detection, nor provide a detailed discussion of mechanisms for reporting AIS. It focuses on what happens after detection of a suspect AIS. Since some early detection and reporting of AIS already occurs, a rapid response procedure is considered the most immediate need.

II. LEGAL AUTHORITY FOR RAPID RESPONSE

Appendices B and C in the CAISMP provide general information on the federal and state government agencies and regulations involved in the management of AIS. Rapid response activities could potentially require state and/or federal permits, consultations or agreements related to the placement of fill or structures into state and/or federal waters, protection of state or federally listed species, or the protection of other special status plant or animal species. The normal timeline for obtaining permits issued under these laws may critically delay rapid response efforts. A streamlined regulatory permitting process for implementing the Rapid Response Plan will need to be developed and approved by participating agencies. Additionally, permission is necessary to work on private and public properties. Clear protocols need to be developed to avoid misunderstandings or illegal trespassing, while making the process of obtaining access as efficient as possible.

In addition to the laws relevant to AIS discussed in the CAISMP, there are laws that specifically address taking action during an emergency or under special circumstances. These laws can facilitate the implementation of a rapid response procedure. Examples include:

Creation of Emergency Regulations

Under California Government Code Section 11346.1, rulemaking state agencies, departments, commissions, offices and boards can adopt emergency regulations, which can remain in effect for up to 120 days. These are regulations that must take effect immediately for "preservation of the public peace, health and safety or general welfare" and must meet other requirements of that code section. The process for adoption of emergency regulations can be found at the Office of Administrative Law's web site (www.oal.ca.gov/emer_reg.htm).

The California Department of Food and Agriculture (DFA) has specific statutory authority to establish quarantines to protect the state's agricultural industry from pests (Food and Agriculture Code Section 5301). If an AIS is discovered that has the potential to severely damage crops, water delivery, or flood control systems that support agriculture, DFA can invoke their authority to establish a quarantine area.

According to Section 660 of the Harbor and Navigation Code, any entity, local or state, authorized by law to adopt rules or regulations that govern matters relating to boats or vessels may adopt emergency measures within their jurisdiction as long as they are not in conflict with the general laws of the state relating to those matters. The emergency rules or regulations can be effective for up to 60 days and must be submitted to the Department of Boating and Waterways (DBW) on or before their adoption. DBW can authorize these emergency rules or regulations to be in effect for over 60 days if it is deemed necessary.

Use of a Pesticide Outside of its Registered Use

When dealing with species that are new to California, the technical experts participating in a rapid response incident may determine that the best solution is to use a pesticide outside of its registered use or to deploy a new end use product. Section 18 of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) allows states to apply to use a pesticide for an unregistered use for a limited amount of time if the EPA determines that emergency conditions exist (http://www.epa.gov/opprd001/section18). Under Section 6206 of Title 3 of the California Code of Regulations (CCR), the DFA Director is permitted to apply for a Section 18 exemption when emergency conditions exist. Section 24 of FIFRA authorizes states to register an additional use of a federally registered pesticide or a new end use product to meet a special local need (www.epa.gov/opprd001/24c).

Experimental Unregistered Use of a Pesticide

Section 6260 of Title 3 of the CCR provides the conditions for obtaining a Research Authorization for the experimental use of a pesticide outside of its registered uses. Research Authorizations are administered by the California Department of Pesticide Regulation (DPR).

III. RAPID RESPONSE PROCEDURE

The initial steps in this procedure result in the determination of whether an active response is immediately necessary after a potential invasive species is reported. If immediate action is necessary, and requires more than simple, highly localized measures, resource management staff may decide to implement an incident command system (ICS) response. A set of criteria will be developed to help in this decision making process. Many of the steps listed below are likely to take place simultaneously or overlap to some degree. Examples of these include outreach, rapid assessment, and containment activities. A flow chart showing the general steps of this rapid response procedure is provided as Chart 1.

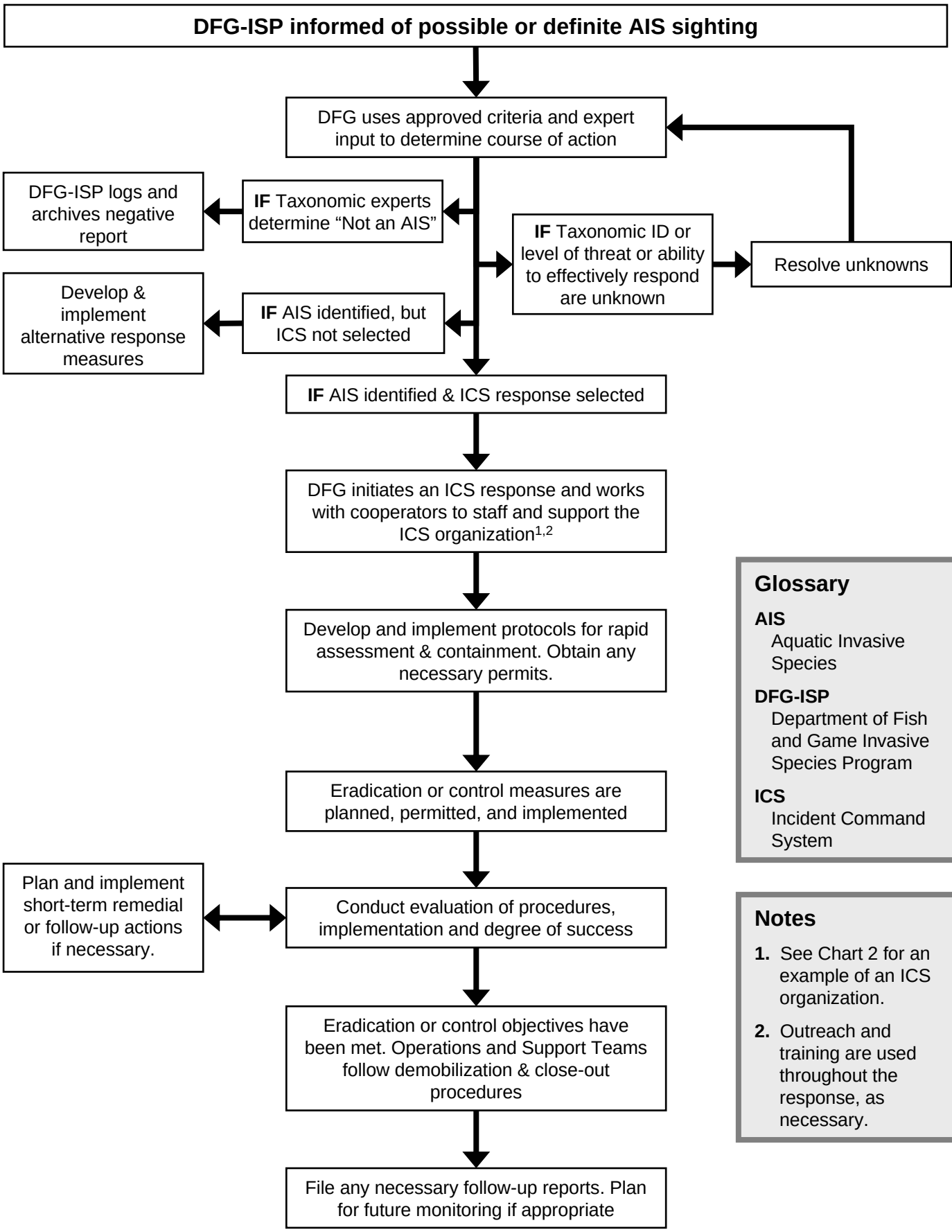
In an ICS response, participants are assigned specific roles in a well-defined hierarchical system that can be expanded or collapsed based on the size and complexity of the incident. The ICS was developed to allow staff from different government agencies and organizations to work

effectively and efficiently together to respond to a natural disaster. Participants essentially check their individual agency identities at the door and participate as members of the ICS organization, dedicated to responding to a particular incident. The system's success relies on participants understanding their role, a clear chain of command and communication, managers having an appropriate span of control, and a standardized process for identifying and communicating objectives, strategies, tasks and deadlines. Because of its proven effectiveness, the ICS has recently been integrated into the National Incident Management System (NIMS). For more information about the principles and features of the ICS go to Lessons 2 and 3 at http://emilms.fema.gov/ICS100G/index.htm. To learn more about the integration of ICS into NIMS, please visit www.fema.gov/emergency/nims. An example of how the ICS staff organization scheme has been applied to an AIS rapid response in California is provided in Chart 2.

Optimal use of this system requires that participants be trained in advance per Section IV (Planning) of this document. The Planning Section also discusses the need to develop the finer details of the procedure, the lists and directories that are referred to in the procedure, and the designation of alternates. This last item ensures that none of the positions described in the procedure are ever vacant.

The procedure that will be followed for a given incident may follow the generic plan provided below or be based on a species-specific rapid response plan approved by the participating agencies. As species-specific plans are developed and approved, staff that have been identified as potential responders will be notified of their approval and location on the Internet. Basic information about each species specific plan will be incorporated into AIS rapid response training.

Chart 1. DRAFT General Procedure for Rapid Response Following Detection of New Aquatic Invasive Species Infestation



Glossary

AIS
Aquatic Invasive Species

DFG-ISP
Department of Fish and Game Invasive Species Program

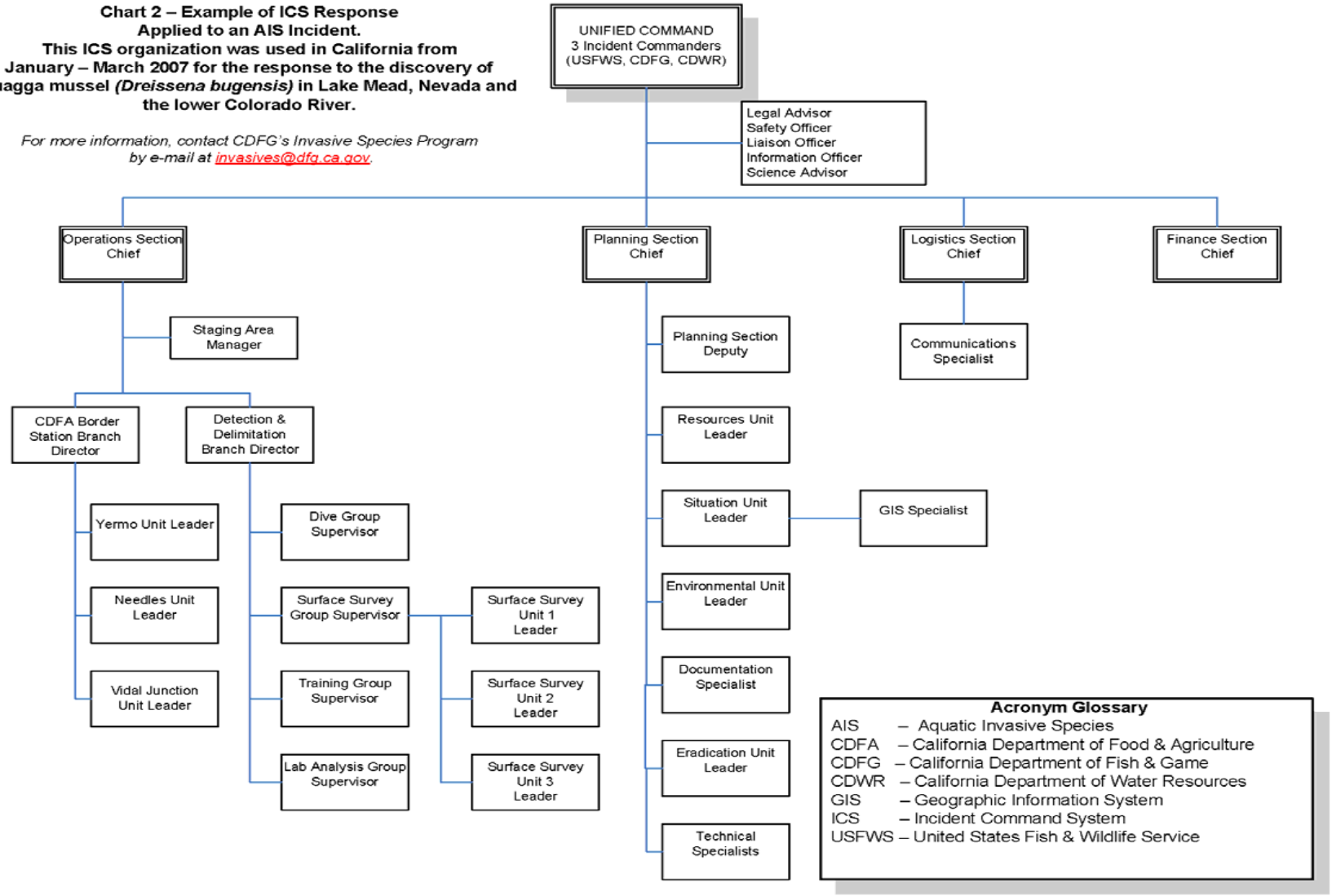
ICS
Incident Command System

Notes

1. See Chart 2 for an example of an ICS organization.
2. Outreach and training are used throughout the response, as necessary.

Chart 2 – Example of ICS Response Applied to an AIS Incident.
This ICS organization was used in California from January – March 2007 for the response to the discovery of quagga mussel *(Dreissena bugensis)* in Lake Mead, Nevada and the lower Colorado River.

For more information, contact CDFG's Invasive Species Program by e-mail at invasives@dfg.ca.gov.



17-STEP RAPID RESPONSE PROCEDURE

Step 1. Identify species and notify authorities

a. Sighting Report: There are three ways in which DFG is likely to receive a report of an AIS sighting.

   1. Either a sighting is reported to DFG via a hotline phone number or e-mail address (Invasives@dfg.ca.gov), and catalogued on *RR Form 1: Suspect AIS Sighting Report* (see Section V).

   2. Staff from another agency or cooperator discovers the AIS and submits the collected information directly to DFG's Invasive Species Program staff.

   3. The initial report is made to one of the federal invasive species reporting systems (e.g. "United States Geological Survey Nonindigenous Aquatic Species Alert System" or the "100th Meridian Initiative") which in turn will alert DFG.

b. Sighting Transmittal: This initial information is transmitted to the DFG Invasive Species Coordinator (ISC). If there is uncertainty about the identification of the species, the Invasive Species Program staff will work with taxonomic experts to resolve the issue.

c. For the purpose of documentation, and to assist making a determination of how to proceed following the initial report, the more detailed *RR Form 2: AIS Alert Report* (see Section V) should be completed.

d. Negative ID: If the identification is negative for AIS no further action is necessary.

e. Indefinite ID and/or level of threat: If uncertainty remains after initial fact-finding, the DFG Invasive Species staff should continue to work with experts from cooperating agencies and research institutions to determine the status of the species reported and the level of threat.

f. Positive ID with a high level of threat: If the discovered organism is invasive and in the presence of vectors that could cause its spread to uninfested areas, DFG Invasive Species Coordinator will consult with DFG executive level staff to determine if an ICS response is appropriate.

   1. If the identification is positive, the DFG Invasive Species staff will ensure that a report is sent to the United States Geological Survey Nonindigenous Aquatic Species Alert System (http://nas.er.usgs.gov/SightingReport.asp). During the response, the alert system should receive updates on any additional locations of the AIS that are found.

   2. Fill out an Incident Brief Form (ICS Form 201).

   3. ICS forms are available at: http://training.fema.gov/EMIWeb/IS/ICSResource/ICSResCntr_Forms.htm

Step 2. Activate command-level participants

a. Incident Command Staff: The executive level DFG staff will work with the Invasive Species Coordinator and executive level staff of cooperating agencies to identify the Incident Command staff. They can utilize the Rapid Response Personnel Directory discussed in the Planning Section of this document.

1. The Incident Commander is the overall supervisor and coordinator for the incident. A detailed description of the responsibilities of an Incident Commander and the other Incident Command officers and General Staff positions, can be found in Lessons 3 and 4 at http://emilms.fema.gov/ICS100G/index.htm.

2. Executive level staff and the ISC will decide to pursue a single command response, with one Incident Commander, or a unified command response, with multiple Incident Commanders working as a team. A Unified Command approach is designed to be used in multi-agency or multi-jurisdiction responses.

b. Initial Unified Command Meeting: If a unified command approach is used the Incident Commanders in the Unified Command should meet to discuss and concur on important issues prior to starting the first operational period planning meetings.

Step 3. Implement the ICS Planning Cycle

a. Begin to utilize the ICS planning cycle to document the current status of the response, identify objectives, strategies, specific task assignments and operational period. See http://www.uscg.mil/hq/g-m/mor/media/Chapter_3.pdf for a description of the ICS Planning Cycle.

1. During every ICS planning cycle, an Incident Action Plan is developed for the following operational period. It contains objectives, safety measures, staff contact information, status of the incident and assignments for each organizational element that will be active during the next operational period. The plan must be approved by the Incident Commander(s).

a) The plan is comprised of standard ICS forms that are available in electronic form. Once the initial set of forms is completed, the Incident Action Plan can rapidly be revised and updated.

Step 4. Develop the Organization

a. Command Post: Establish a command post capable of supporting the space, logistic, communication and other technology needs for managing the operation. It may or may not be a high priority to have the command post located close to the infested site, based on the characteristics of a particular incident. Potential command posts will be listed in the AIS Rapid Response Resource Directory discussed in the Planning Section of this document.

b. Logistics and Finance: The Logistic and Finance Section Chiefs will establish the fundamental tools and means to run the organization, such as setting up the check-in routine, necessary ICS forms, communication services, spending authorizations, and tracking of resources.

c. Assemble Organizational Elements: Using the ICS system, develop an organization that is suitable for the size and complexity of the incident.

1. Directory of Approved Staff: To staff the organizational elements (e.g. sections, branches, units) the Incident Command and upper level General Staff will utilize (but are not limited to) staff directories of people approved to be assigned to rapid response efforts.

2. ICS training materials suggest that “it is better to initially overestimate the need for a larger organization than to underestimate it, as it is always possible to downsize the organization.” (National Wildfire Coordinating Group, 1994, p.3-19).

3. Logistics Section staff will utilize the Resource Directory discussed in the Planning Section of this document in their effort to procure the necessary equipment and supplies among cooperating agencies and organizations during a rapid response procedure.

d. Consider the need to assemble a science advisory panel that may include experts outside of the ICS organization to provide input on such topics as AIS biology, sampling techniques, eradication or control measures.

Step 5. Safety Plan

a. The standard ICS organization includes a Safety Officer who reports to the Incident Commander/Unified Command. One of the duties of the Safety Officer is to develop a Safety and Health Plan that assesses potentially hazardous situations that could exist throughout the operation for responders and the public, and outlines the safety measures that should be taken.

Step 6. Outreach

a. Outreach Plan: The incident's Information Officer develops an Outreach Plan for the incident that addresses short and long-term proactive communication objectives and strategies to be employed with relevant groups such as the media, government agency representatives outside of the ICS response, stakeholders, interest and community groups and the general public.

   1. Develop policy with the Incident Commander(s) and the Liaison Officer regarding protocols for disseminating information.

   2. Besides disseminating information the outreach plan should address obtaining input from stakeholder groups and other interested individuals.

b. The Media: Typically, the Information Officer is assigned to be the contact person for inquiries from the media.

   1. Typical tasks include preparation of press releases, briefings, public meetings, etc.

   2. The Information Officer reports to the Incident Commander.

c. Government Agencies: Typically, a Liaison Officer is assigned to be the point of contact for inquiries from government agencies that have an interest in the response.

   1. The Liaison Officer provides relevant updates on the response to representatives from these agencies.

   2. The Liaison Officer reports to the Incident Commander.

d. Stakeholder and Interest Groups: Outreach to these groups can be crucial, especially if their activities can result in spread of the AIS. Outreach to non-governmental groups needs to be assigned to the Information Officer or the Liaison Officer. A large stakeholder group for a large incident may warrant their own Assistant Liaison Officer or Assistant Information Officer to maximize cooperation from this group and be aware of concerns they may have.

e. General Public: Assign who will be responsible for responding to inquiries from individual members of the public. Determine whether it is advisable to establish and publicize a toll-free call-in number for the incident.

Step 7. Training

a. Develop a Training Plan: There is often a need to establish a training branch within the ICS. As the incident begins to unfold, the Training Director will be responsible for working with managerial level staff to assess and find appropriate means to provide the types of training that are needed, both for staff within the ICS and for cooperating agencies, organizations and volunteers.

   1. A training manual should be developed that contains any specialized protocols and associated training materials (e.g. survey or decontamination protocols).

Step 8. Regulatory Compliance

a. The Planning Section is typically responsible for addressing regulatory compliance with environmental laws, with input from the Legal Specialist assigned to the incident. The issues that are most likely to arise are related to water quality and effects on state or federally listed species during survey or control activities.

Step 9. Containment Actions

a. Take action to prevent the spread of the AIS. Examples of containment actions that might be taken include:

   1. Inspections: Working with public and private managers of infested and potentially infested waterbodies and waterways, locate and inspect potentially contaminated facilities, shorelines, boats, vehicles and equipment to the extent possible. Prioritize a list of potential sites that should be inspected. Some of this work is part of the rapid assessment described below.

      a) Survey boaters about previous and subsequent waterways visited and provide them with information about the AIS problem.

      b) If regulations allow, require, or otherwise, request that aquatic plant and animal material be removed from the watercraft, motor and trailer and for any remaining water to be drained.

      c) Request that boats and equipment be rinsed with high pressure or hot water and dried before launching. The time needed for drying is species specific.

      d) Boats that are found to be contaminated with a legally restricted species per F&G Code Sec. 671 cannot be launched until they are certified by DFG to be decontaminated.

b. Introductions from Out-of-State: Coordinate with California Department of Food and Agriculture's Border Protection Station Program, federal, and other state and national agencies if the introduction is known to have come from out of state or has potential to have come from out of state.

c. Prevent Spread from California: Coordinate with federal and state agencies on preventing spread from California into other states (especially states that border CA), Canada or Mexico.

d. Temporarily quarantine body(ies) of water that contain subject AIS.
   1. Establish a quarantine utilizing one of the methods discussed in legal authority section.
   2. In addition to sites known to contain the subject AIS, consider whether it is appropriate to quarantine areas where the AIS may have been introduced.

Step 10. Rapid Assessment

a. Extent of the Infestation: Get a qualitative "snapshot" of the extent of the infestation and identify potential vectors for spreading the AIS.

   1. Planning and Operations Section staff can work together to identify short vs. longer-term information needs and plan how various types of information should be gathered.

      a) Samples may need to be collected for gathering basic demographic information or more in-depth taxonomic work. Establish protocol for collecting, transporting, and storing samples. Develop appropriate permits for possession and transportation of specimens.

      b) In addition to noting the presence or absence of the AIS, consider whether it's appropriate to systematically get some basic information about the habitat at this point, collect samples of substrate or water, etc.

      c) Determine whether there are known occurrences of, or potential habitat for, state or federally listed species in the area that needs to be surveyed, and whether surveys may require consultation with DFG, the U.S. Fish and Wildlife Service or NOAA Fisheries.

b. Data collection is typically done by the Operations Section of the ICS, with the Logistics and Finance Sections providing assistance with the procurement of equipment, vehicles, travel, etc.

c. Impacted Parties: Obtain contact information for pertinent landowners, land managers, holders of water rights, water users and jurisdiction over the body(ies) of water involved. If it is necessary to enter private property to conduct rapid response work, assign an ICS member to obtain permission to enter.

Step 11. Plan Eradication or Control Measures

a. If appropriate, develop a plan to eradicate the AIS from CA or a control plan to prevent the spread of the AIS. It may not be feasible to finalize the plan during the rapid or ICS phase of the response. Some planning may occur after the ICS is demobilized.

   1. During the assessment phase of the response, the Planning Section can gather and review information on potential eradication or control techniques and confer with experts (Step 4D).

   2. As information is gained from the rapid assessment, and possibly from subsequent detailed sampling, a more refined version of an eradication or control plan can be prepared, discussing the specific measurable objectives, locations and methods for eradication or control, methods for evaluating the effectiveness of the plan, and the potential costs, benefits and impacts.

   3. Conduct any regulatory processes and obtain any regulatory permits that may be necessary prior to implementation of the plan.

Step 12. Implement the Eradication or Control Plan

a. Implementation of the eradication or control plan may place during the "rapid" part of a response; however, if this is not the case, eradication or control measures might be implemented during a later "post –ICS" phase of the response.

b. Document implementation of the eradication or control plan. Note any deviations from the plan and why those occurred.

Step 13. Prevent Reinfestation

a. Develop specific recommendations for actions that can be recommended to prevent reinfestation such as:

   1. Long-term monitoring
   2. Continued outreach and education
   3. Partnerships with business and interest groups
   4. Strengthening relevant regulations
   5. Identify staffing needs
   6. Identify research needs

b. Ensure the potential for introduction from nearby commercial operations (shipping, bait shops, aquaculture, aquarium shops) is removed or minimized to the extent possible.

Step 14. Prepare Demobilization Plan

a. During the response, the Planning Section is responsible for preparation of a Demobilization Plan and having it approved by the Incident Commander(s). The purpose of the Demobilization Plan is to assure that all participants understand their role in an orderly, safe and efficient demobilization of incident resources as rapid response procedures are completed. Equipment and supplies must be returned to appropriate locations, time and cost accounting reports must be completed within required timeframes, and any other required progress and final reports must be prepared and submitted.

Step 15. Monitor the outcome of the Rapid Response

a. Evaluate Eradication or Control Efficacy: If eradication or control actions were taken during the response, monitor and evaluate the efficacy of the treatment(s) used and conduct environmental monitoring that may be necessary to meet regulatory compliance requirements. Prepare a monitoring report and submit a copy to the ISC. If the control or eradication measures require months or years to implement, these evaluation reports may take the form of periodic progress reports.

   1. If the treatments were not successful or an acceptable level of progress is not being achieved, evaluate the potential for remedial measures to improve the results. If there is a strong possibility for improvement, propose possible remedial actions as part of the monitoring report.

b. If eradication or control measures were not taken, there may be a decision to conduct monitoring of the AIS population and provide monitoring reports to the DFG Invasive Species Program.

Step 16. Undertake remedial actions and long-term follow up

a. Remedial Action Approval: If there is efficacy monitoring prior to the demobilization of the incident and remedial actions are recommended, the Incident Commander(s) can approve the implementation of a remedial action plan and utilize the assembled rapid response personnel, assuming any environmental regulatory and/or fiscal issues are addressed.

b. Remedial Action Monitoring: Remedial actions and their results will require subsequent monitoring.

c. Follow-Up Actions: If longer-term actions are necessary, the Planning Section, with input from other rapid response personnel and outside expert input as necessary, will develop a follow-up plan that will be submitted to the DFG Invasive Species Program.

Step 17. Implement the Demobilization Plan

a. Implement the demobilization plan described in Step 14. The work will be carried out by the Incident Teams and Specialists with oversight and coordination from the Incident Command Staff. Reports will be submitted to the ISC for approval and appropriate distribution.

IV. PLANNING FOR RAPID RESPONSE

This section suggests 11 basic task areas necessary to plan for rapid response and completion of this plan.

Task 1. Collaborate to complete plan

Representatives from public agencies and other organizations that are currently involved in rapid response work, or likely to be involved in the foreseeable future, should collaborate to finalize the Rapid Response Plan (see Task 4). The goal is to have a plan that can be the basis for interagency agreements (Task 2). Note that not every item in Task 4 needs to be complete in order to have a plan that supports such agreements. This group could also prioritize and carry out parts of additional planning tasks listed below. The collaboration necessary to carry out the tasks in this section could occur through a technical advisory panel to the CAAIST or AISWG (collaborative groups described in the CAISMP), through the California Biodiversity Council (CBC) Rapid Response Working Group, or through executive or upper management staff of cooperating agencies assigning staff to an interagency Rapid Response Planning Team.

Task 2. Enter into cooperative agreements

DFG Invasive Species Program staff will work with cooperating agencies and organizations to produce a list of entities that should be invited to sign Memoranda of Understanding, Implementation Agreements or similar instruments to cooperate on rapid response to AIS. Existing information in the CAISMP and information collected by CBC Rapid Response Working Group will be used, among other sources, to generate this list. The proposed list and a conceptual outline for these agreements will be presented to CBC and/or directly to relevant agency executives.

Task 3. Secure funding

This Plan cannot be implemented without adequate, stable and dedicated funding. Agencies signatory to the Rapid Response agreement(s) should coordinate efforts to pursue funding options for Rapid Response program development, training and implementation.

Organizations and industries that have a vested interest in successful early detection and rapid response systems could participate in the development of funding sources.

a. Funding Analysis: Consider the following types of funding sources:

    1. A permanent funding source(s) maintained solely for rapid response actions. Without this, rapid response may not occur or may only occur by redirecting funds on short notice from other important programs.

    2. A user-fee system based on vectors for AIS introductions. This would be similar in concept to fees paid by the shipping industry for ballast water inspections or fees paid by the petroleum industry for an oil spill response program. Methods used by states that already have dedicated funding for rapid response can be emulated.

    3. Private/public partnerships for supporting rapid response efforts in the form of equipment, supplies, personnel or funding.

    4. One-time grants for specific planning or research projects related to rapid response.

b. Taxonomy Funds: Develop funding for taxonomic work to identify potential AIS specimens. In some cases, this will include genetic analysis (e.g. to determine presence or absence of microscopic larvae of AIS species, or help determine the origin of an introduction). Expert taxonomic work will bolster confidence that subsequent management decisions are based on solid information. There should also be funding to maintain specimens. The proper maintenance and documentation of specimens is especially important in cases where infestations are the subject of law enforcement actions and may also be beneficial for future AIS identification needs and research.

c. Professional Cost Analysis: Consider whether a detailed, professional analysis of rapid response costs to support funding requests is necessary (Task 10b).

d. Funding Development: Consider using funding for development purposes (i.e. grant writing).

Task 4. Finalize the Rapid Response Plan

Work that needs to be done to finalize the Rapid Response Plan includes:

a. Implementation Criteria: Develop the process and criteria for the State to use in determining the course of action to take for any new AIS introductions. Circulate for peer review.

b. Likely Species & Scenarios: Identify likely species and/or early detection scenarios for AIS. Run these scenarios through the criteria developed for Task 4a to fine-tune the criteria.

c. Agency Preparation: Develop information needed to help cooperating agencies designate and train, in advance, potential responders to AIS introductions.

d. Alternate Staff: Develop a procedure to designate and prepare potential alternate staff. This could avoid gaps in getting work done and minimize managerial time spent searching for substitutes during a response.

e. Personnel Directory: Develop a statewide Rapid Response Personnel Directory. These people could be called upon to participate during rapid response activities, and into an ICS response. Ideally the Directory should include staff that represent the full spectrum of knowledge and skills that might be necessary during rapid response activities (e.g. ICS

implementation, logistics, finance, legal and various technical experts). The development of this list and staff participation in Rapid Response planning and training will likely require support of executive level staff from the cooperating agencies.

f. Resource Directory: Develop and maintain a directory among cooperating agencies for equipment, operations centers, supply sources and associated contact people so that resources can be mobilized as quickly as possible during a response.

g. Taxonomic Experts: A list of taxonomic experts and protocols for requesting and using their services needs to be developed and periodically reviewed and updated. This would be a list of experts who have agreed to identify specimens for AIS Rapid Response efforts and appropriately preserve and catalog them.

h. Local Assistance Protocol: Develop a protocol for responding to a private entity or local government agency that wants to conduct a rapid response under its own direction but requests assistance or permits from one or more agencies signatory to the statewide Rapid Response Plan. Include this protocol in the rapid response training program.

i. Notification List: Develop a list of whom, outside of those directly involved, needs to be notified when rapid response procedures are being planned and implemented.

j. Database Compatibility: Consider whether information should be collected in a particular manner in order to be compatible with existing AIS databases. For example, the North American Weed Management Association has a list of required elements for weed mapping projects (www.nawma.org).

Task 5. Streamline permit processes for rapid response

DFG Invasive Species Program staff will coordinate with staff from relevant agencies to investigate and pursue possibilities for streamlining the regulatory permit processes that might be required for rapid response measures. General measures or best management practices necessary to comply with streamlined permitting can be incorporated into the Rapid Response Plan.

Task 6. Revise the Rapid Response Plan

a. Incorporate New Information: Periodically revise the Plan and incorporate anything learned by evaluating the Plan's effectiveness and consulting current scientific research and related technological developments. Revisions may also be necessary due to changes in funding, agency restructuring and environmental regulations. The interagency agreement(s) to cooperate on rapid response should include a procedure for making revisions to the Plan.

b. Notification of Plan Changes: DFG Invasive Species Coordinator should ensure that adopted changes to the Plan are circulated to people listed in the Rapid Response Personnel Directory and other appropriate staff among the cooperating agencies and organizations. Changes should be addressed in training activities.

c. Update Directories: DFG Invasive Species Program staff, with assistance and input from cooperating agencies and organizations, will be responsible for the periodic update and circulation of the Rapid Response Personnel Directory, the Rapid Response Resource Directory and the list of taxonomic experts.

Task 7. Develop species- or location-specific rapid response plans

Identify and prioritize certain species, groups of species or certain locations for the development of specific rapid response plans. Detailed technical information can allow this type of response plan to be implemented more efficiently than a generic response plan. The development of species- or location-specific rapid response plans is called for in Action 4A3 of the CAISMP. The process of prioritizing which species warrant the development of rapid response plans will also help guide the development of outreach materials for early detection efforts.

Task 8. Train employees, participants and team members

a. Training Program: Agencies that agree to cooperate on AIS rapid response need to participate in the development of a training program and train the employees likely to be involved in rapid response activities. Potential rapid response participants need to be familiar with the Rapid Response Plan, Incident Command System (ICS), and may need specialized training related to their likely duties during a rapid response. ICS training is available on-line at: http://training.fema.gov/IS/.

   There may be a need to develop supplemental training materials and presentations for information specific to California, AIS or other topics.

b. Drills: Ensure that training includes AIS rapid response drills using a variety of scenarios and locations around the state. This will also assist in fine-tuning the Rapid Response Plan.

Task 9. Conduct education and outreach

a. Outreach Planning: Outreach specialists from participating agencies and organizations should develop a plan of potential methods and protocols for conducting outreach to local communities, interest groups and the media during rapid response procedures. This could include sharing contact information for key groups such as boaters, anglers and marina owners.

b. Disruption of Regular Work: Within the cooperating agencies, supervisors of employees who are in the Rapid Response Personnel Directory should be made aware that rapid response work can supersede other projects on very short notice. Supervisors and employees who are on rapid response teams could discuss in advance how they plan to handle this potential source of disruption.

Task 10. Conduct research necessary for improved rapid response

a. Response Research: Academic institutions, government agencies and other organizations that agree to cooperate on rapid response should work together through various AIS working groups, professional and environmental organizations and commercial interests to promote research that can specifically improve or promote rapid response efforts.

b. Cost Research: Research the costs of rapid response, possible funding mechanisms (Task 3) and, if feasible, study the environmental and economic benefits and costs of conducting rapid response efforts versus not conducting rapid response. This may help governments decide how much to invest in rapid response measures.

Task 11. Develop interim rapid response protocols

This section addresses the question: What steps can be taken to prepare to implement a rapid response effort while a formal plan is going through the review and approval processes?

a. Memorandum of Understanding (MOU): The Directors of the appropriate agencies could sign an interim MOU directing their staff to participate in rapid response planning and implementation if a new AIS introduction occurs prior to the approval of the final plan.

b. Interim Funding: Management staff could identify and pursue interim funding sources for implementing a rapid response program.

c. Interim Strategy: Management level staff from cooperating agencies could informally agree upon an interim strategy regarding roles and responsibilities should an AIS introduction occur.

d. Permitting: Management level staff from cooperating agencies could discuss how, in the absence of a formal streamlined permitting process, their staff could work within the existing regulatory permit programs to facilitate a rapid response operation and direct staff to follow through on these interim measures.

e. Employee Assignment: Management level staff of cooperating agencies could assign employees to an interim core rapid response team or working group. This team could participate in some advance preparation and planning. In the event of a rapid response, this team would need to be augmented by additional staff based on the location of the response and the necessary areas of expertise.

V: Supporting Materials

Rapid Response Form 1. Suspect AIS Sighting Report

The reporter may not be able to provide all of the information requested below, but please fill in as many of the information fields as possible.

Report Tracking Number: _____ Date of Sighting: _____

Reporter's First and Last Name: _____

Reporter's Phone Numbers: Home: _____ Work: _____

Cell: _____

Reporter's E-Mail Address: _____

Reporter's Mailing Address:

_____

_____

Type of Organism (as specific a descriptive label as possible (e.g. submerged plant, shellfish, etc.):

Description of size, color, shape and other distinguishing characteristics:

Approximate number of individuals or area they occupy:

Location of sighting:

Directions and description of nearby landmarks:

Were any photographs taken or specimens collected? If so, where can they be obtained?

Landowner or Land Manager:

Possible Source of Introduction:

Name and Contact Information of Person Filling Out This Form:

Rapid Response Form 2. AIS Alert Report [1]

To be filled out by Species Identification Team member following up on a preliminary report of a possible AIS sighting (Form 1). The AIS Report will be expanded to two pages in the final draft to reduce the crowding on this form.

Species Name: Report Tracking #
Name of Person Filling out Form: Phone Number(s):
Agency:
Address: E-mail address:

Reporter's Name:
Reporter's Phone Number(s):
Reporter's e-mail:

Date of Pest Sighting:
If the identification was verified by expert, who provided the verification?
Verifier's phone number(s): E-mail:

Location of voucher specimens:

Sighting Location (if possible attach a map showing the location):
County: Body of water:

Landowner/Manager:
Describe location
(Relationship to nearby road intersection, pier, mile marker, buoy, other landmarks)

If possible, please provide map information (You choose the system):

T____ R____ Sec____, _____1/4 of ____1/4, Meridian: H__ M___ S___
T____ R____ Sec____, _____1/4 of ____1/4, Meridian: H__ M___ S___

Quad Name: Source of Coordinates (GPS, topo map & type):
GPS Make and Model: Horizontal Accuracy_____meters/feet

Datum: NAD27____ NAD83____ WGS84____
Coord. System Zone 10 ___ Zone 11___ or Geographic Latitude/Longitude_____

Describe pest species population (approximate number of individuals or stems, area they occupy)

Describe any evidence of reproduction (flowering, juvenile animals, egg masses, etc.)

Describe habitat: (e.g. plant community, associated plant species, host species, water depth, distance from bank, substrate characteristics (e.g. gravel, large rocks, silt, sand), etc.)

Photographs can be accessed at:

1 Based on California Department of Fish & Game, California Natural Diversity Data Base, "Native Species Field Survey Form" and the "Maui County Report A Pest Online Report Form," Maui County, HI.

VI. REFERENCES

Akers, P. California Department of Food and Agriculture (DFA): *Draft Rapid Response Plan*. Prepared for the Western Regional Panel on Aquatic Nuisance Species, 27 pp.

Anderson, LWJ. 2005. "California's reaction to *Caulerpa taxifolia*: a model for invasive species rapid response." *Biological Invasions* 7: 1003-1016.

California Department of Fish and Game, Office of Spill Prevention and Response. 2001 *California Oil Spill Contingency Plan*, Sacramento, CA, 34 pp. (plus appendices).

California Department of Fish and Game (DFG), Biogeographic Information Branch. 2003. "California Native Species Field Survey Form."

California Department of Food and Agriculture, Integrated Pest Control Branch, Plant Health and Pest Prevention Services. *Model Rapid Response Plan for Aquatic Nuisance Species*. Prepared for the Western Regional Panel on Aquatic Nuisance Species, 57 pp.

Federal Interagency Committee for the Management of Noxious and Exotic Weeds. 2001. *National Early Warning and Rapid Response System for Invasive Plants in the United States, Draft Action Plan*. Washington, D.C. August 28, 2001, 22 pp.

Federal Emergency Management Agency. 2006. *National Incident Management System Homepage*. www.fema.gov/emergency/nims.

Fraidenburg, M. 2005. *Rapid Response Plan for Zebra Mussels in the Columbia Basin*. Prepared for the Pacific States Marine Fisheries Commission, Olympia, WA. November 18, 2005, 35 pp.

Gulf of Mexico Regional Panel on Aquatic Invasive Species. 2004. *Rapid Response Plan for the Gulf of Mexico Region*. Prepared for the National Aquatic Nuisance Species Task Force, December 2004.

Great Lakes Commission Staff, Resource Management Program. 2004. *Model Rapid Response Plan for Great Lakes Aquatic Invasions, Iteration II*. Prepared for the U.S, Environmental Protection Agency, Great Lakes National Program Office. April 2004, 56 pp.

Heimowitz, P and S Phillips. 2006. *Rapid Response Plan for Zebra Mussels in the Columbia River Basin: A Comprehensive Multi-Agency Strategy to Expeditiously Guide Rapid Response Activities* (Working Draft). U.S. Fish and Wildlife Service and Pacific States Marine Fisheries Commission. September 2006.

Maui County, HI. 2006 Maui *County Report a Pest Homepage*. http://pbin.nbii.gov/reportapest/maui/. Also contact: reportapest-maui@hawaii.edu.

National Invasive Species Council. 2003. *General Guidelines for the Establishment and Evaluation of Invasive Species Early Detection and Rapid Response Systems*. Version 1. 16 pp.

National Wildfire Coordinating Group. 1994. *Incident Command System National Training Curriculum: Organizational Overview, Module 3*, I-200. National Interagency Fire Center, Publication NFES #2443. October 1994. 36pp.

U.S. Coast Guard. 2001. *Incident Management Handbook, Incident Command System (ICS)*. Commandant Publication P3120.17, Washington, D.C. http://www.lartu.org/ics/USCG%20FOG.pdf

Veldhuizen, T. 2004. *Zebra Mussel Detection and Outreach Program*, California Department of Water Resources.

Veldhuizen, T. 2004. *Zebra Mussel Rapid Response Plan for California*. Prepared for the California Bay-Delta Authority (CBDA Project No. 99-F07) and the U.S. Fish and Wildlife Service. Sacramento, CA. June 30, 2004.

APPENDICES B-D

Introductory Notes

These appendices provide a detailed description of the primary federal and state laws, regulations and public policies that empower and direct different government agencies to manage AIS in California. They also describe the primary activities of government agencies – state, federal and regional – involved in AIS management, as well as most of the major committees and boards set up to coordinate and oversee such activities. These details are provided to support and expand on the information contained in the Management Framework provided in Chapter 4 and the Summary of Laws provided in Chapter 5 of this plan (as such, there is some repetition of information). While these appendices attempt to be comprehensive, there is inadequate space to present every single AIS program, law or activity in the state and nation. Through the web links provided below and further information in the appendices, more details on legal authorities and AIS stakeholders is available to all interested parties. A key to the acronyms used in these appendices can be found in the Acronym Glossary in the introductory pages of this plan. (*Note: Some laws and policies refer to ANS, aquatic nuisance species, rather than AIS, aquatic invasive species.)*

APPENDIX B: FEDERAL AUTHORITIES, LEGISLATION & AGENCIES

FEDERAL AUTHORITIES

No single federal agency has comprehensive authority for all aspects of aquatic invasive species management. Federal agencies with regulatory authority over the introduction and transport of aquatic species that may be invasive or noxious include the U.S. Department of Agriculture Animal Plant Health Inspection Service, the U.S. Department of Agriculture Agricultural Marketing Service, the U.S. Fish and Wildlife Service (USFWS), the U.S. Department of Commerce (DOC), and the U.S. Coast Guard (USCG). Many other agencies have programs and responsibilities that address components of AIS, such as importation, interstate transport, exclusion, control and eradication.

The primary federal authorities for managing and regulating AIS derive from the National Environmental Policy Act, the Nonindigenous Aquatic Nuisance Prevention and Control Act (NANPCA, 1990), the National Invasive Species Act (NISA, 1996), the Lacey Act, the Plant Pest Act, the Federal Noxious Weed Act, and the Endangered Species Act. An Executive Order signed by President William J. Clinton on February 3, 1999 expanded federal efforts to address AIS. The order created a National Invasive Species Council charged with developing a comprehensive plan to minimize the economic, ecological and human health impacts of invasive species.

Brief descriptions of the President's Executive Order, NANPCA and NISA are provided below, followed by an explanation of how federal activities are now coordinated through the national Aquatic Nuisance Species Task Force (ANSTF) and the National Invasive Species Council (NISC), and by descriptions of some of the earlier acts and laws still enforced in AIS management.

Primary Federal AIS Authorities

1990 – Nonindigenous Aquatic Nuisance Prevention and Control Act
(NANPCA; Title I of P. No.101-646, 16 U.S.C. 4701 et seq.)
http://www.anstaskforce.gov/default.php

The Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA) established a federal program to prevent the introduction and control the spread of introduced aquatic nuisance species. The act provides an institutional framework that promotes and coordinates research, develops and applies prevention and control strategies, establishes national priorities, educates and informs citizens, and coordinates public programs. The act calls upon states to develop and implement comprehensive state management plans to prevent introduction and control the spread of aquatic nuisance species (ANS). Section 1002 of NANPCA outlines five objectives of the law, as follows:

1. Prevent further unintentional introductions of nonindigenous aquatic species;
2. Coordinate federally funded research, control efforts, and information dissemination;
3. Develop and carry out environmentally sound control methods to prevent, monitor and control unintentional introductions;
4. Understand and minimize economic and ecological damage; and
5. Establish a program of research and technology development to assist state governments.

Section 1201 of the act established the national ANSTF, co-chaired by the USFWS and the National Oceanic and Atmospheric Administration. The Task Force is charged with coordinating governmental efforts related to ANS prevention and control. The ANSTF consists of 10 federal agency representatives and 12 ex officio members representing nonfederal governmental agencies (see Other AIS Interests, Appendix D).

1996 – National Invasive Species Act
(NISA; P. No.104-332)

In 1996, the National Invasive Species Act (NISA) amended the NANPCA of 1990 to mandate ballast water exchange for vessels entering the Great Lakes and to implement voluntary ballast water exchange guidelines for all vessels with ballast on board that enter U.S. waters from outside the U.S. Exclusive Economic Zone (U.S. EEZ). Though the act did not make exchange mandatory, it did require all vessels to submit a report form to the USCG documenting specific ballast water management practices. It also authorized the USCG to toughen requirements if compliance proved unsatisfactory, which it did in 2004 (see below). NISA authorized funding for research on aquatic nuisance species prevention and control in Chesapeake Bay, the Gulf of Mexico, the Pacific coast, the Atlantic coast, and the San Francisco Bay-Delta Estuary. In addition, NISA required a ballast water management program to demonstrate technologies and practices to prevent ANS from being introduced into and spread through ballast water in U.S. waters. It modified both the composition and research priorities of the ANSTF and requirements for the zebra mussel demonstration program.

1999 – Executive Order 13112
(64 Fed. Reg. 6183)
http://www.invasivespeciesinfo.gov/council/main.shtml

President William J. Clinton signed Executive Order 13112 on Invasive Species on February 3, 1999. The order seeks to prevent the introduction of invasive species, provide for their control and minimize their impacts through improved coordination of federal agency efforts under a National Invasive Species Management Plan developed by the newly created National Invasive Species Council (NISC). The order directs all federal agencies to address invasive species concerns, as well as to refrain from actions likely to increase invasive species problems.

The NISC has three co-chairs: the secretaries of Agriculture, Commerce, and the Interior. Members also include the secretaries of State, Defense, Homeland Security, Treasury, Transportation and Health and Human Services, as well as the administrators of USEPA, the U.S. Agency for International Development, the U.S Trade Representative and the National Aeronautics and Space Administration. The NISC released the first National Invasive Species Management Plan in 2001. The NISC is currently working to establish federal and non-federal task teams to implement the plan's action items.

The NISC actively works with the Invasive Species Advisory Committee (ISAC), also established under the order. The ISAC is composed of stakeholder representatives from state governments, industry, conservation groups, academia and other interests. Its role is to advise the federal government on the issue of invasive species.

To help coordinate the work of the NISC and the ANSTF, the Department of Commerce (DOC) Policy Liaison to the NISC also serves as the DOC representative to the ANSTF. In addition, NISC and the ANSTF have formed joint working groups on each of the following topics: pathways, risk analysis and screening.

The ANSTF and the NISC are similar in that they perform coordinating functions but differ in their responsibilities: the NISC addresses all invasive species, while the ANSTF focuses on aquatic invasive species. Although many of the same principles apply to managing aquatic and terrestrial invasive species, many management issues are unique to the aquatic environment and need to be addressed separately.

1993-2005 – Coast Guard Regulations under NISA
(33 CFR 151)

The USCG has promulgated a number of ballast water management regulations based on the authority given to it by NANPCA in 1990 and NISA in 1996. As directed by NANPCA, in 1993, the USCG implemented regulations requiring vessels entering the Great Lakes and the Hudson River to conduct ballast water management after operating outside the U.S. EEZ.

To comply with the NISA, the USCG established regulations and guidelines to control the introduction of ANS via ballast water discharges in U.S. waters other than the Great Lakes. Compliance with the resulting voluntary ballast management and mandatory reporting program was only 30%, according to a 2002 Report to Congress. Therefore, under the authority of NISA, the USCG established mandatory ballast water management requirements and penalties for non-compliance. The mandatory program requires ships to use one of three ballast water management methods: 1) retaining ballast water on board, 2) conducting a mid-ocean exchange, and/or 3) using an approved ballast water treatment method. All vessels are required to submit ballast water management reports (failure to submit a report can now result in penalties). These mandatory regulations came into effect on September 27, 2004. Federal regulations also require vessels to maintain a ballast water management plan that is specific for that vessel and assigns responsibility to the master or appropriate official to understand and execute the ballast water management strategy for that vessel.

Under NANPCA/NISA, states are specifically permitted to regulate ballast water on ships. Several states have elected to do so to various degrees. In addition to reporting requirements, California, Oregon and Washington have ballast water exchange requirements and California will soon specify a ballast water discharge standard (see California Authorities section).

Other Federal Authorities

Animal Damage Control Act (1931)
http://www.aphis.usda.gov/

Under the Animal Damage Control Act, the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service has authority to control wildlife damage on federal, state, or private land, including damage from invasive species. The act protects field crops, vegetables, fruits, nuts, horticultural crops and commercial forests; freshwater aquaculture ponds and marine species cultivation areas; livestock on public and private range and in feedlots; public and private buildings and facilities; civilian and military aircraft; and public health.

Animal Health Protection Act (2002)
(7 U.S.C Sec. 8301, et seq.)
http://www.aphis.usda.gov/

The Animal Health Protection Act provides a flexible statutory framework for protecting domestic livestock from foreign pests and diseases. This act authorizes the USDA to promulgate regulations and take measures to prevent the introduction and dissemination of pests and diseases of livestock. The scope of such regulatory authority extends to the movement of all animals, domestic and wild, except humans. The fact that a pest or disease primarily affects animals other than livestock, including humans, does not limit USDA's authority to regulate a species, so long as it carries a pest or disease of livestock. Further, the act defines "livestock" to mean all farm-raised animals, clarifying the USDA's authority to conduct animal health protection activities in connection with farm-raised aquatic animals.

Clean Water Act
http://www.epa.gov/r5water/cwa.htm
http://unds.bah.com/default.htm

Various sections of the Clean Water Act (CWA) regulate discharges of pollutants (such as AIS and ballast water) and fill material to waters of the United States. Section 402 of the act authorizes the National Pollutant Discharge Elimination System (NPDES), a permit program intended to reduce and eliminate the discharge of pollutants from point sources that threaten to impair beneficial uses of water bodies. The act defines point sources to include vessels (Section 502(14)) and prohibits all point source discharges of pollutants into U.S. waters unless a permit has been issued either under Section 402 (NPDES) or Section 404 (dredge and fill activities).

California's Waste Discharge Requirements, issued by the state's Regional Water Quality Control Boards (RWQCBs), incorporate the authority of the federal NPDES permitting program for discharges of wastes to surface waters. In addition, under Section 303(d) of the each of the RWQCBs has the requirement to establish "a total maximum daily load for those pollutants which the (Environmental Protection Agency (USEPA)) Administrator identifies under Section 304(a) (2) as suitable for such calculation." This section of the CWA was developed to support a water quality-based system of effluent limits for chemical pollutants; the interpretation of what an allowable load of invasive species is has not been defined.

Under Section 305(b) of the CWA, California's nine RWQCBs are required to assess water bodies for attainment of beneficial uses every two years and report to the USEPA. In cases where beneficial uses of water bodies are shown to be impaired, Section 303(d) requires the Regional Boards to list the impaired water bodies and "establish a priority ranking for such waters, taking into account the severity of the pollution and the uses to be made of such waters." Section 502(6) defines "pollutant" as dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, *biological materials,* radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal and agricultural waste discharged into water. Ballast water is considered to be a pollutant in discharges based on the above definition and definitions in the State Water Code.

Endangered Species Act of 1973
(ESA; 16 U.S.C.A. §§ 1531 to 1544)
http://www.fws.gov/endangered/

The ESA aims to protect endangered and threatened species. When non-native invasive species threaten endangered species, this act could be used as basis for their eradication or control by the USFWS or by the National Oceanic and Atmospheric Administration – National Marine Fisheries Service (NOAA-Fisheries Service) The potential to harm a federally-listed species and the need to obtain a permit from the USFWS or NOAA-Fisheries Service should be taken into consideration when selecting methods to manage AIS.

Lacey Act (1900; amended 1998)
http://www.fws.gov/laws/lawsdigest/lacey.html

As the first federal act that tried to control migrations and importations of nonindigenous species, the Lacey Act prohibits the importation of a list of designated species and other vertebrates, mollusks and crustaceans that are "injurious to human beings, to the interests of agriculture, horticulture, forestry, or to wildlife or the wildlife resources of the United States." Under this law, it is unlawful to import, export, sell, acquire, or purchase fish, wildlife or plants taken, possessed, transported, or sold: 1) in violation of U.S. or Indian law, or 2) in interstate or foreign commerce involving any fish, wildlife, or plants taken possessed or sold in violation of State or foreign law.

The Lacey Act allows for the import of species for scientific, medical, education, exhibition or propagation purposes. The USFWS is the lead agency for enforcing the Lacey Act's prohibition of fish and wildlife imports.

National Environmental Policy Act of 1970
(NEPA; 42 U.S.C.A. §§ 4321 to 4370e)
http://www.epa.gov/compliance/nepa/index.html

NEPA requires the consideration of environmental impacts for any federal action, including direct federal activities, permitting and federal funding of activities by another entity. NEPA environmental documents may include a "finding of no significant impact (FONSI)," an "environmental assessment (EA)," or a full "environmental impact statement (EIS)." Potential impacts of invasive species, both direct and indirect, may be among the issues that should be considered under NEPA.

Noxious Weed Act
(1974; 7 U.S.C. § 360)

Section 15 of the Federal Noxious Weed Act requires federal land management agencies to develop and establish a management program for control of undesirable plants that are classified under state or federal law as undesirable, noxious, harmful, injurious or poisonous, on federal lands under the agency's jurisdiction (7 U.S.C. 2814(a)). The act also requires the federal land management agencies to enter into cooperative agreements to coordinate the management of undesirable plant species on federal lands where similar programs are being implemented on state and private lands in the same area (7 U.S.C. 2814(c)). The Secretaries of Agriculture and the Interior must coordinate their respective control, research and educational efforts relating to noxious weeds (7 U.S.C. 2814(f)). USDA's Departmental Regulation 9500-10 sets forth departmental policy relating to the management and coordination of noxious weeds activities among the agencies within USDA and other entities.

Plant Protection Act
(2000; 7 U.S.C. 7701)
http://www.aphis.usda.gov/

The Plant Protection Act (PPA) authorizes the USDA to prohibit or restrict the importation or interstate movement of any plant, plant product, biological control organism, noxious weed, article or means of conveyance if the Secretary of Agriculture determines that the prohibition or restriction is necessary to prevent the introduction into the United States, or the dissemination within the United States, of a plant pest or noxious weed.

The PPA specifically authorizes USDA to develop integrated management plans for noxious weeds for the geographic region or ecological range where the noxious weed is found in the United States. In addition, the act authorizes the USDA to cooperate with other federal agencies or entities, states or political subdivisions of states, national governments, local governments of other nations, domestic or international organizations or associations, and other persons to carry out the provisions of the act.

FEDERAL AGENCIES

Numerous federal agencies, presented here in alphabetical order, have authority to implement the laws and policies described above. Other federal agencies have mandates impacted by AIS and thus engage in research, monitoring, prevention or control programs. Still others delegate primary responsibility for implementation to state and regional agencies (see next section). The following descriptions attempt to provide a general introduction to the scope of each agency's work, as well as a brief review of the agency's recent (as of 2006) major AIS-related activities.

Bureau of Reclamation
http://www.usbr.gov/

The Bureau of Reclamation is involved in several important projects related to this issue. The Bureau has partnered with the DFG, USFWS and others to investigate the Chinese mitten crab infestation in the Sacramento-San Joaquin Delta. The agency participates in the Giant *Salvinia* Task Force's efforts to limit the spread of this invader in the Colorado River (see Appendix D), has a detection program for water hyacinth and participates in activities related to the New Zealand mudsnail infestation in Putah Creek. The agency also participated in DFA's *Hydrilla* Eradication Program.

National Oceanic and Atmospheric Administration (NOAA)
http://www.noaa.gov/

NOAA is the primary federal agency charged with management of marine resources. NOAA is the co-chair of the ANSTF and has been designated the Department of Commerce lead as co-chair of the National Invasive Species Council. Within NOAA, a number of national, state and regional agencies and programs are actively involved in AIS issues in California. These include: National Estuarine Research Reserve System (NERRS), a network of protected areas established for long-term research, education and stewardship; National Marine Fisheries Service, which works to protect fisheries habitat, commercial fisheries and endangered fish; National Marine Sanctuaries, the nation's system of marine protected areas, and Sea Grant, a nationwide network of 30 university-based programs that work with coastal communities and conduct scientific research and education projects designed to foster science-based decisions for the use and conservation of U.S. aquatic resources.

National Estuarine Research Reserve System (NOAA – NERRS)
http://nerrs.noaa.gov/
http://sfbaynerr.org
http://www.elkhornslough.org/
http://nerrs.noaa.gov/TijuanaRiver/

There are three reserves in California that provide a platform to increase communication between scientists, decision-makers, land managers, and the public in order to better deal with AIS issues. The San Francisco Bay reserve protects two large, relatively pristine, tidal wetlands: China Camp State Park in Marin County and Rush Ranch Open Space in Solano County. These sites are part of an AIS early detection and assessment study and detailed vegetation maps are being created to serve as a baseline to evaluate future invasions. China Camp serves as an uninvaded reference site for marshes invaded by *Spartina* hybrids in San Francisco Bay. Rush Ranch is a site of active research on invasive fish and invertebrates. The Elkhorn Slough reserve protects approximately 1,400 acres, including Elkhorn Slough, one of the few coastal wetlands remaining in California. Elkhorn estuarine habitats have over 60 species of non-native invertebrates, over 20 species of non-native plants and a few non-native fish and algae. All of these are currently widespread, so eradication seems impossible. Efforts are focused on early detection and eradication of species identified as "least wanted" invaders such as Chinese mitten crabs and *Caulerpa*. The reserve launched an early detection program for aquatic non-native invaders in 2002. The Tijuana River reserve's 2,500 acres encompass beach, dune, mudflat, salt marsh, riparian, coastal sage and upland habitats surrounded by the growing cities of Tijuana, Imperial Beach and San Diego. Critical invasive species issues include: tamarisk, ice plant and other exotic plants displacing native species in the salt marsh and upland habitats; ongoing surveys to understand the dynamics of AIS; and efforts to understand ecosystem recovery following eradication of invasives.

National Marine Fisheries Service (NOAA – Fisheries Service)
http://www.nmfs.noaa.gov/

NOAA-Fisheries Service is in charge sustaining the nation's fisheries, many of which are being directly impacted by AIS, and is involved in many AIS projects in California. It has a key role on the Southern California Caulerpa Action Team. NOAA-Fisheries Service is also involved with a variety of other collaborative research projects including: ballast water exchange, AIS risk evaluation research and hull fouling research funded by the Port of Oakland; analysis of biofouling communities and community effects; and surveys and experimental treatments of several invasive species in San Francisco Bay. NOAA-Fisheries Service also participates on several AIS advisory and coordinating committees including: the Pacific Ballast Water Group, Non-Native Invasive Species Advisory Council and the West Coast Ballast Outreach Project Advisory Team.

National Marine Sanctuaries (NOAA – NMS)
http://sanctuaries.noaa.gov/
http://channelislands.noaa.gov/
http://cordellbank.noaa.gov/
http://farallones.noaa.gov/
http://montereybay.noaa.gov/

California has four sanctuaries – Channel Islands NMS, Cordell Banks NMS, Gulf of Farallones NMS and Monterey Bay NMS. The latter two sanctuaries are in the process of developing aquatic invasive species management plans and have conducted monitoring programs for AIS.

National Sea Grant (NOAA – Sea Grant)
http://www.seagrant.noaa.gov/
http://www-csgc.ucsd.edu
http://ballast-outreach-ucsgep.ucdavis.edu/

The National Sea Grant Program is a partnership between the nation's universities and NOAA (under the Office of Oceanic and Atmospheric Research) that began in 1966. The California Sea Grant program is the largest of these programs. Sea Grant began the West Coast Ballast Outreach Project in 1999 (co-sponsored by the CALFED Bay-Delta Program) to address concerns that ballast water discharges could be introducing foreign marine species into the state's coastal and estuarine ecosystems. The project educates the maritime industry about the ecological seriousness of aquatic exotic species by publishing the newsletter "Ballast Exchange," maintaining an educational Web site and coordinating workshops. In addition, California Sea Grant provides two major services to the state. First, the research arm of California Sea Grant, operating out of the Scripps Institute for Oceanography in La Jolla, funds critical coastal and marine research through an annual request for proposal and a National Strategic Initiative (NSI) program. Through both of these avenues, the college program funded approximately $2.6 million in research on invasive species between 1995 and 2003. Second, Sea Grant and the University of California Cooperative Extension jointly fund a network of eleven advisors and specialists who work on applied research and outreach projects throughout the state, including those related to AIS. Sea Grant funding has supported a wide variety of research projects on key invasive species, such as the Chinese mitten crab, European green crab, an exotic Australian isopod, several invasive seaweeds, and *Spartina* hybrids. Sea Grant sponsored research led to the eradication of the South African *sabellid* worm at the site near Cayucos, California, where it had become established.

National Park Service (NPS)
www.nps.gov

NPS strives to preserve the unimpaired natural and cultural resources of the national park system for the enjoyment, education and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country. The NPS has several invasive species monitoring, control, research and eradication programs in California. Eradication and control are supported by two programs. The first is the (California) Exotic Plant Management Team (EPMT), which travels around the state to national parks that have requested assistance in removal and control projects. The EPMT has traditionally focused on terrestrial non-natives but could work on aquatic invaders. Through the second program, individual parks can request funds from Washington or the NPS Western Region for control and eradication projects. Natural resource inventories and monitoring activities occur in all of the National Parks in California, and these programs are well positioned to alert state managers to emerging and growing threats from invasive species. Information from these programs could be shared among the California AIS plan partners and benefit the state's early detection efforts. Finally, the NPS actively supports and hosts research projects on impacts of invasive species on ecological communities. National Parks in California, that participate with the EPMT, conduct invasive species inventories, monitoring and research on lands totaling about 2.4 million acres and include hundreds of miles of coastline. Significant education and outreach occurs at all of these sites.

U.S. Army Corps of Engineers (COE)
http://www.usace.army.mil/

The COE provides engineering, construction and environmental project services for the military and local governments. Congress authorizes the COE to assist local governments with water resource development needs, which include flood control, navigation, ecosystem restoration and watershed planning. For ecosystem restoration, this includes research on invasive species. Specific programs addressing invasive species issues include the Aquatic Nuisance Species Research Program, the Aquatic Plant Control Research Program and the Water Operations Technical Support Program. COE is also responsible for permitting aquaculture projects, including oyster farms, which often involves AIS considerations.

U.S. Coast Guard (USCG)
http://www.uscg.mil/hq/g-m/mso/bwm.htm

The USCG has established a mandatory program aimed at keeping aquatic nuisance species out of U.S. waters using ballast water management methods. USCG activities focus on enforcement and monitoring to ensure compliance with the program, which includes regular on-board inspections. USCG coordinates with California's State Lands Commission, manager of the state's ballast water program. In 2004, USCG issued "Ballast Water Management for the Control of Aquatic Nuisance Species in the Waters of the United States," a guidance document concerning ballast water management.

USCG activities related to AIS are diverse. The agency is working on the development of chemical and engineering methods to verify that a mid-ocean ballast water exchange has occurred. It is also evaluating technologies for the treatment of ballast water. USCG has determined that due to difficulties in establishing the effectiveness of ballast water exchange as it varies across ship types, voyages and from tank to tank, treatment technologies are best evaluated through a ballast water discharge standard (a benchmark for maximum numbers of organisms that may be discharged in ballast water). Such a standard will not only be helpful in evaluating the effectiveness of treatment technologies but also clearly establish when the ballast water no longer contains quantities of organisms that pose a significant risk. A Programmatic Environmental Impact Statement, detailing the evaluation of environmental impacts to the U.S. by several potential ballast water discharge standard alternatives, is currently in development.

USCG has also initiated several projects designed to provide information on the state of development of treatment technologies and the basic characteristics of treatment processes. These efforts have included scientific audits that tested and evaluated three approaches: filtration, ultraviolet light and hydro cyclonic separation. In addition, USCG developed and launched the Shipboard Technology Evaluation Program (STEP) in 2004 to encourage ship owners and operators to participate in evaluating technologies for shipboard application (see also CAISMP Action 7C3). This program allows for the review of experimental plans and treatment technology installations aboard ships. If they perform largely as designed and show promise for reducing the risk of introductions, treatment technology installations will be granted an equivalency with regulations for ballast water management and the Ballast Water Discharge Standard.

U.S. Department of Agriculture (USDA)
http://www.aphis.usda.gov/
http://www.ars.usda.gov/main/main.htm
http://www.invasivespeciesinfo.gov

USDA provides leadership on food, agriculture, natural resources and related issues. USDA conducts a number of programs and activities related to invasive species. USDA's Animal and Plant Health Inspection Service's (APHIS) deals with invaders like the South American wetland rodent, nutria, in the Mississippi Delta region and has also worked on other invasive animal, fish and crab problems around the country. APHIS has done extensive noxious weed work, including exclusion, permitting, eradication of incipient infestations, surveys, data management, public education, and (in cooperation with other agencies) integrated pest management of introduced weeds, including biological control. Aquatic weeds are included in the federal noxious weed list through the APHIS Cooperative Agricultural Pest Survey (CAPS).

The USDA's Agricultural Research Service (ARS) has three Exotic and Invasive Weed Research (EIWR) units in the west: at Davis and Albany, California, and at Reno, Nevada. Scientists at these facilities are responsible for research, the transfer of technology for improvement of management and control, and eradication of invasive aquatic and riparian weeds affecting agriculture and natural resources. These projects address three current ARS program priorities: 1) the reduction of dependence on pesticide use (specifically herbicides); 2) implementation of Executive Order 13112 (see above subsection on this order); and 3) water-quality improvement.

Research is conducted on the biology, reproduction, ecology, management or eradication of several important invasive aquatic weeds. The program provides technology transfer for the eradication and management of several problem species. The EIWR units are also involved in aquatic and riparian weed education for public, state and federal stakeholders.

U.S. Environmental Protection Agency (USEPA)
http://www.epa.gov/owow/invasive_species

USEPA leads the nation's environmental science, research, education and assessment efforts. It develops and enforces regulations, offers financial assistance, performs environmental research, sponsors voluntary partnerships and programs, furthers environmental education and publishes information. USEPA is responsible for enforcing the Clean Water Act (CWA). USEPA released its *EPA Authorities for Natural Resource Managers Developing Aquatic Invasive Species Rapid Response and Management Plans* in December 2005. This document provides an overview of USEPA authorities that apply to state or local AIS rapid response and control actions. The document summarizes relevant sections of the CWA and the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); summarizes how to apply for CWA Section 404 permits to discharge dredged or fill material; summarizes how to apply for FIFRA Section 18 emergency exemptions and FIFRA Section 24(c) special local need registrations; and describes case studies in which state and local natural resource managers successfully obtained FIFRA emergency

exemptions and special local need registrations for AIS eradication or control actions.

Within USEPA, there are three members of the National Estuary Program in California whose activities encompass AIS management.

National Estuary Program (USEPA – NEP)
http://www.epa.gov/nep
San Francisco Estuary Project: http://www.abag.org/bayarea/sfep/sfep.html
Morro Bay National Estuary Program: http://www.mbnep.org/index.php
Santa Monica Bay Restoration Commission: http://www.santamonicabay.org/

Congress established the National Estuary Program in 1987 to protect and improve the water quality and natural resources of estuaries nationwide. There are three programs in California. The San Francisco Estuary Project (SFEP) was formed in 1987 as a cooperative federal/state/local program to promote effective management of the San Francisco Bay-Delta Estuary, and created a consensus-based management plan for the Estuary including concrete actions related to invasive species. More recently, SFEP identified invasive species as the number-one priority issue in estuary restoration. SFEP holds an ex officio seat on the ANSTF and is a member of the Western Regional Panel.

The Morro Bay National Estuary Program was established in July 1995. The estuary contains the most significant wetland system along California's south-central coast. It supports many species of internationally-protected migratory birds, offers rare wetland habitat to a number of threatened native plant and animal species, and provides a protected harbor for marine fisheries. There are plans to suppress or eliminate at least two aquatic invasive species present in the estuary: giant cane and Sacramento pikeminnow. Efforts to eliminate a pioneer population of giant cane growing along Chorro Creek, a major estuary waterway, and its tributaries, are ongoing; eradication is expected by 2008. Efforts to suppress the pikeminnow to the point where native steelhead populations can begin recovery are expected to begin in 2007.

The Santa Monica Bay Restoration Project was established in 1988 to ensure the long-term health of the 266-square-mile Santa Monica Bay and its 400-square-mile watershed. In 2003, this project became an independent state organization, the Santa Monica Bay Restoration Commission. In terms of invasives, the commission has focused most recently on coastal bluff, wetland and riparian vegetation, funding extensive removal and replanting programs as well as outreach on "California friendly" gardens. The newest threat is the arrival of the New Zealand mudsnail in some Santa Monica mountains streams. The commission has convened experts to strategize how to slow the snail's spread.

U.S. Fish and Wildlife Service (USFWS)
http://www.fws.gov/
http://www.100thmeridian.org

USFWS has multiple programs that address AIS management. USFWS serves as co-chair of the Federal ANSTF and is the agency that provides federal funding for the implementation of Task Force approved state AIS management plans. USFWS also provides technical assistance to states regarding AIS management. USFWS administers the Lacey Act, which prohibits importation and interstate delivery of listed species. USFWS prevention programs include the 100th Meridian Initiative (see Appendix D), which focuses on preventing the western spread of zebra mussels. In cooperation with the ANSTF, the USFWS has developed planning documents for Chinese mitten crab, European green crab, New Zealand mudsnail and *Caulerpa.* USFWS refuges support invasive species control programs as part of their overall habitat restoration activities.

U.S. Geological Survey (USGS)
http://www.usgs.gov
http://nas.er.usgs.gov/

USGS acknowledged its role in non-native species management in a White Paper on Invasive Species, which identifies the goal of developing new strategies for the prevention, early detection and prompt eradication of new invaders. The USGS further identifies information management and documentation of invasions as a priority for the agency. In keeping with this objective, the USGS developed and maintains an extensive, spatially referenced database of non-native species, which is accessible online.

APPENDIX C: STATE AUTHORITIES, LEGISLATION & AGENCIES

In California, many state agencies have authority over and regulatory roles for managing natural resources. While diverse agencies have some authority to regulate AIS, there has been no centralized authority or management structure to coordinate AIS activities before this plan. The legal frameworks that apply to control of aquatic invasive species introductions are broad and varied. This section describes the existing authorities that various state agencies and entities have for managing AIS in California, and overlaps somewhat with information presented in Chapters 4 and 5. For help with acronyms, see the Acronym Glossary in the introductory pages of this plan.

CALIFORNIA AUTHORITIES

California Environmental Quality Act (CEQA)
(CA Public Resources Code §§ 21000 et seq.)
http://ceres.ca.gov/ceqa/

The California Environmental Quality Act (CEQA) requires public disclosure of all significant environmental effects of proposed discretionary projects. If a project would cause significant effects, final documents in the CEQA process show: 1) what mitigation measures will be required to reduce particular effects to a less significant level; and 2) provide justifications for the approval of the project with particular significant effects left unmitigated (i.e. a finding of overriding consideration). CEQA also contains lists of project types exempt from this process. A "significant" impact is a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, [and] fauna . . .". The documented adverse impacts associated with invasive species can fit this broad definition.

California Porter-Cologne Water Quality Control Act
(CA Water Code §§ 1300 et seq.)
http://www.swrcb.ca.gov/water_laws/docs/portercologne.pdf

Under California's Porter-Cologne Water Quality Control Act, "any person discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the state" must file a report of the discharge with the appropriate Regional Water Quality Control Board (RWQCB). Pursuant to the act, the RWQCB then prescribes "waste discharge requirements" related to control of the discharge. The act defines "waste" broadly, and the term has been applied to a diverse array of materials. The San Francisco Bay RWQCB, for example, has determined that "ballast water and hull fouling discharges cause pollution as defined under the Porter-Cologne Water Quality Control Act."

The act, (California Water Code, Division 7), lists a number of types of pollutants that are subject to regulation by the State Water Resources Control Board (SWRCB). Section 13050, for example, specifically includes the regulation of "biological" pollutants by defining them as relevant characteristics of water quality subject to regulation by the Board: AIS are an example of this kind of pollutant if they are discharged to receiving waters. The SWRCB also regards the application of pesticides to control AIS in waters of the state as a discharge of a pollutant requiring an NPDES permit. Several of the Regional Boards have taken legal policy and enforcement actions related to AIS (see also CWA in Appendix B and SWRCB in California Agencies).

Fish and Game Code and Title 14 of the California Code of Regulations
http://www.fgc.ca.gov/html/regs.html
http://www.dfg.ca.gov/ospr/organizational/scientific/exotic/exotic%20report.htm

The Fish and Game Code consists of the laws passed by the state legislature that pertain to fish and wildlife resources. Under statutes in the Fish and Game Code, the California Fish and Game Commission has the responsibility for the adoption of regulations that provide details on how certain Fish and Game laws are to be implemented. These regulations are published in Title 14 of the California Code of Regulations. A summary is provided below of Fish and Game Code Sections that address invasive species issues or may relate to control actions.

F& G Code §§ 2080 – 2089 DFG regulates the take of species listed under the California Endangered Species Act. In addition to the instructions in the Fish and Game Code, guidelines for this process are located in Title 14, Division 1, Subdivision 3, Chapter 6, Article 1 of the California Code of Regulations. These statutes and regulations should be consulted if AIS control measures have the potential to impact State-listed species.

F & G Code §§ 2118, 2270-2300: DFG is responsible for enforcement of importation, transportation and sheltering of restricted live wild animals; places importation restrictions on aquatic plants and animals; and prohibits nine species of *Caulerpa*.

F & G Code §§6400-6403: It is unlawful to place live fish, fresh or saltwater animals or aquatic plants in any waters of this state without a permit from DFG.

F & G Code §§15000 et seq.: DFG is responsible for regulations pertaining to the aquaculture industry, including disease issues.

Harbors & Navigation Code

The Harbors & Navigation Code, Article 2, Section 64, authorizes the Department of Boating and Waterways to manage aquatic weeds affecting the navigation and use of the state's waterways.

Ballast Management for Control of Nonindigenous Species Act (AB 703) of 1999

This act charged the California State Lands Commission (SLC) with oversight of the state's first program to prevent nonindigenous species (NIS) introductions through the discharge of ballast water from commercial vessels of over 300 gross registered tons (GRT). The 1999 act required that vessels originating from outside the United States Economic Exclusive Zone (U.S. EEZ) carry out mid-ocean exchange or use an approved ballast water treatment method, before discharging in California state waters. The SLC was tasked with: receiving and processing ballast management reports from all such vessels, monitoring ballast management and discharge activities of vessels through submitted reports, inspecting vessels for compliance and assessing vessel reporting rates and compliance. The activities and analyses of the first few years of the program are detailed in the 2003 biennial report of the California Ballast Water Management Program. Upon the sunset of the act, the Marine Invasive Species Act (AB 433) was passed in 2003, revising and widening the scope of the program to more effectively address the invasion threat (see below).

Marine Invasive Species Act (AB 433) of 2003
(Public Resources Code, Sections 71200-71271;
Title 2, California Code of Regulations, Section 2271)

The Marine Invasive Species Act, passed in 2003, revises and recasts the state's law pertaining to control of nonindigenous species and ballast water management (AB 703). It imposes additional requirements upon vessel masters, owners, operators and persons in charge of vessels to prevent the introduction of nonindigenous species into waters of the state or waters that may impact the waters of the state. The bill deletes exemptions for specified vessels from compliance with the act and revises the qualifications for the vessels subject to the act.

Ballast water management is required of all vessels greater than 300 gross registered tons (GRT) that intend to discharge ballast water in California waters, though the regulations differ depending on voyage origin. All qualifying vessels coming from ports within the Pacific Coast region must conduct near-coast exchange (in waters at least 50 nautical miles offshore and 200 meters deep) or retain all ballast water and associated sediments. There are exceptions that address safety concerns and for vessels that transit wholly within defined shared waters (San Francisco/-Stockton/Sacramento Delta, and Los Angeles/Long Beach/El Segundo Complex).

All vessels must complete and submit a ballast water report form upon departure from each port of call in California. They must also comply with the good housekeeping practices, ranging from avoiding discharge near marine sanctuaries to rinsing anchors and removing fouling organisms from the hull. They must maintain a ballast water management plan prepared specifically for the vessel; keep a ballast water log outlining ballast water management activities for each ballast water tank on board the vessel, and make the separate ballast water log available for inspection; conduct training of vessel master, person in charge, and crew regarding the application of ballast water and sediment management and treatment procedures; and pay a fee for each qualifying voyage at their first port of call in California.

In addition to requirements imposed upon vessels operating in state waters, the SLC was charged with the development of several legislative reports offering policymaking guidance on commercial vessel AIS issues including: a Report on Commercial Vessel Fouling in California, Analysis, Evaluation and Recommendations to Reduce Nonindigenous Species Release from the Non-Ballast Water Vector; a Report on Performance Standards for Ballast Water Discharges in California Waters; and a Report on the California Marine Invasive Species Program. These efforts have resulted in the development of regulations to stem transport of AIS in the ballast water of vessels operating with the Pacific Coast Region; and legislation directing SLC to adopt regulations on performance standards for ballast water discharges.

Finally, the legislation also requires DFG to conduct a series of biological surveys to monitor new introductions to coastal and estuarine waters of the state and to assess the effectiveness of the management provision of the Act. AB 703, passed in 1999, required a baseline survey of the state's ports, harbors and bays. AB 433 expanded the baseline to include outer coast sites and required continued monitoring of all sites to determine if the ballast control measures have been successful in reducing the number of new introductions.

Coastal Ecosystems Protection Act of 2006
(Public Resources Code, Sections 71204.7 – 72423)
(Revenue and Taxation Code, Section 44008)

The Coastal Ecosystems Protection Act, passed in 2006, adds to the state's law pertaining to the discharge of ballast water (AB 433). It requires the SLC to adopt regulations that require an owner or operators of a vessel carrying, or capable of carrying, ballast water that operates in the waters of the state to implement certain interim and final performance standards for the discharge of ballast water.

California Ocean Protection Council Strategic Plan
http://resources.ca.gov/copc/strategic_plan.html
http://resources.ca.gov/copc

The California Ocean Protection Council, formed to coordinate the activities of ocean-related state agencies and improve state efforts to protect ocean resources, among other mandates (see California State Agencies), adopted a five-year strategic plan in 2006. The strategic plan supports the completion and implementation of both the state rapid response plan and this California Aquatic Invasive Species Management Plan, as well as the California Noxious and Invasive Weed Action Plan.

Delta Protection Act
www.delta.ca.gov

California's 1992 Delta Protection Act recognizes the natural resource significance of the 738,000 acre-Sacramento-San Joaquin Delta. The act seeks to preserve and protect Delta resources for the use and enjoyment of current and future generations and recognizes the threat posed by urban encroachment to the Delta's agriculture, wildlife habitat and recreation uses. Pursuant to the Act, a Land Use and Resource Management Plan for the Primary Zone (Management Plan) was completed and adopted by the Commission in 1995. The Management Plan sets out findings, policies and recommendations resulting from background studies in the areas of environment, utilities and infrastructure, land use, agriculture, water, recreation and access, levees and marine patrol boater education/safety programs. As mandated by the act, the policies of the Management Plan are incorporated in the General Plans of local entities having jurisdiction within the Primary Zone. Some of the plan sections relevant to AIS management include: Environment, Finding 8 and Recommendations 3 & 4; Water, Policy 2; and Marine Patrol, Boater Education & Safety, Policy 6 (see also Delta Protection Commission, Appendix D).

CALIFORNIA STATE AGENCIES

San Francisco Bay Conservation and Development Commission (BCDC)
http://www.bcdc.ca.gov/

The Bay Conservation and Development Commission is dedicated to the protection and enhancement of San Francisco Bay and to the encouragement of the Bay's responsible use. Any person or government agency wishing to place fill, extract materials or make any substantial change in use of any water, land or structure within the area of the Commission's jurisdiction requires a Commission permit or federal consistency determination. The Commission's jurisdiction includes San Francisco Bay, including tidal flats, subtidal areas and marshlands lying between mean high tide and five feet above mean sea level and a 100 foot shoreline band measured inland from the Bay shoreline, as defined by Section 66610 of the McAteer-Petris Act. The Commission recognizes the threat of non-native invasive species to the Bay's ecosystem and the *San Francisco Bay Plan* contains policies regarding the monitoring, control and eradication of aquatic invasive species in the Bay.

California Department of Boating and Waterways (DBW)
http://www.dbw.ca.gov/

DBW works to help develop convenient public access to California waterways, promote on-the-water safety and keep waterways free of navigational problems. General activities include boating law enforcement, boater education, improvements to boating facilities and vessel sewage management. In addition, DBW manages the state's largest and oldest aquatic weed control program, working with other public agencies to control water hyacinth, and more recently Brazilian elodea, in the Sacramento-San Joaquin Delta, its tributaries and the Suisun Marsh. DBW also leads the California Clean Boating Network, a collaboration of government, business, boating and academic organizations working to increase and improve clean boating education efforts, including invasive species education, across the state.

California Coastal Commission (CCC)
http://www.coastal.ca.gov/

The CCC is mandated to protect and enhance public access, recreation, wetlands, visual resources, agriculture, commercial activity, industrial activity and environmentally sensitive habitats within the coastal zone through coastal development permits, local coastal programs and federal consistency review. The CCC has responsibility to protect both the biology of aquatic ecosystems and the special uses associated with the marine environment, such as commercial fishing and recreation. The CCC regulates development activities in state waters under its coastal development permit authority and is responsible for working with local governments within the coastal zone. The CCC is also the designated coastal management agency administering the federal Coastal Zone Management Act (CZMA) over Pacific waters offshore of California (outside of San Francisco Bay). As such, the Coastal Commission exercises federal consistency review authority over all federal activities and federally licensed, permitted or funded activities affecting the coastal zone, regardless of whether the activity occurs within, landward, or seaward of the coastal zone boundary. Federal agency activities, including permits and plans, are subject to the consistency determination process, and must be "consistent to the maximum extent practicable" with the state's coastal management program, in this case, the Chapter 3 policies of the California Coastal Act (15 CFR § 930.32).

California Department of Fish and Game (DFG)
http://www.dfg.ca.gov/
http://www.dfg.ca.gov/ospr/

DFG has jurisdiction over the conservation, protection and management of fish, wildlife, plants and habitat necessary for biologically sustainable populations of those species. DFG conducts a number of programs related to aquatic invasive species, including serving as the lead agency in developing this statewide AIS management plan, as well as a rapid response plan for invasions (see Appendix A). DFG is responsible for enforcement of regulations concerning the aquaculture industry; the importation and transport of live wild animals, aquatic plants and fish into the state; and the placement of any such animals in state waters. The agency is also responsible for conducting biological surveys to assess the amount and types of AIS present in state waters, and the degree of success of ballast water management activities. Starting in 1999 with ballast management legislation, these surveys have been undertaken by DFG's Office of Spill Prevention and Response (DFG/OSPR). DFG/OSPR also manages the California Aquatic Non-Native Organism Database (CANOD) and is working to establish consistency among the various major databases being used to analyze similar types of AIS-related information. Lastly, DFG has been an active manager or partner in numerous AIS eradication and control programs, especially for those AIS that threaten at-risk species or the conservation and restoration of aquatic or riparian ecosystems.

California Department of Food and Agriculture (DFA)
http://www.cdfa.ca.gov/

DFA is the lead agency for regulatory activities associated with aquatic weeds. This regulatory authority includes quarantine, exterior pest exclusion (border protection stations and inspections), interior pest exclusion (pet/aquaria stores, aquatic plant dealers and nurseries) and detection and control/eradication programs. In addition, the DFA Plant Pest Diagnostic Center identifies plant species and assigns plant pest ratings. DFA maintains a rated list of noxious weed species. "A"-rated pests require eradication, containment, rejection or other holding actions at the state-county level. Quarantine interceptions are to be rejected or treated at any point in the state. For "B"-rated pests, eradication, containment, control or other holding actions are taken at the discretion of the agricultural commissioner. State-endorsed holding actions and eradication of "C"-rated pests occur only when these pests are found in a nursery. Action is taken to retard spread outside of nurseries at the discretion of the commissioner. Rejection occurs only when found in a crop seed for planting or at the discretion of the commissioner. "Q" ratings are temporary "A" ratings pending determination of a permanent rating. DFA is also responsible for the *Hydrilla* eradication program (see Chapter 2).

County Agricultural Commissioners (CACs)
http://www.cdfa.ca.gov/exec/cl/cacasa.htm

CACs have long been at the forefront in the battle against invasive species throughout the state. They work collaboratively with DFA and other agencies to exclude, detect and eradicate or manage a wide range of pest species. CACs perform numerous inspections of incoming plant materials, checking for compliance with quarantine requirements and for noxious weeds and other pests. Nurseries and pet stores are also inspected. The CACs have worked with DFA to obtain additional resources to fund more effective programs. Once plant materials enter the state, it is generally the CACs who perform inspections and carry out most of the weed eradication and management activities. While the CACs are not a "state" agency, they form a statewide system, represented at the state level by California Agricultural Commissioners and Sealers Association (CACASA) and have specific authorities granted by state law to carry out pest prevention programs.

California Department of Parks and Recreation (PARKS)
http://www.parks.ca.gov/

PARKS manages more than 270 park units and approximately 1.4 million acres, of which more than 280 miles is coastline and 625 miles of lake and river frontage. Management objectives of individual properties within the system depend on a unit's classification and range from a preservation mandate to a recreation emphasis. Units of the state park system can be established in either the terrestrial or underwater environment. Management to restore natural processes is basic to many types of state park units. This management includes removal of exotic species and is expected to extend below the waterline in units that are primarily terrestrial.

California Department of Pesticide Regulation (DPR)
http://www.cdpr.ca.gov/

DPR is vested with primary responsibility to enforce federal and state pesticide laws and regulations pertaining to the proper and safe use of pesticides in California. The Department regulates pesticides under a comprehensive program that includes enforcement of pesticide use in agricultural and urban environments, prevention of environmental contamination, environmental monitoring for emergency eradication projects and other related functions. DPR conducts monitoring of emergency eradication projects to ascertain that the public and the environment are being protected and the correct amounts of pesticides are being applied. DPR conducts sampling in consultation with the County Agricultural Commissioners, Department of Fish and Game, the RWQCBs and other stakeholders. DPR works cooperatively with other government agencies sharing information and monitoring results.

California Department of Water Resources (DWR)
http://www.water.ca.gov/

DWR addresses invasive species issues that impact water supply, water delivery and flood control. In general, DWR administers programs involving flood control for the Central Valley, dam safety for more than 1,200 dams statewide, design and construction of water facilities, water quality improvement and water supply data collection and studies. DWR also operates and maintains the State Water Project (SWP).

Recent activities related to invasive species are diverse. DWR conducts monthly monitoring of benthic (bottom-dwelling) invertebrates, zooplankton and phytoplankton throughout the upper San Francisco Estuary and reports trends in invertebrate abundance and community composition, including newly introduced species, to the State Water Resources Control Board. DWR is documenting the distribution of the invasive algal species *Microcystis spp*. in the upper San Francisco Estuary, investigating which strains (toxic versus non-toxic) are present and examining effects on the aquatic food web. DWR is also investigating the impacts of the Chinese mitten crab on the benthic invertebrate community in the Sacramento-San Joaquin Delta and co-authored a white paper on its life history.

On the prevention front, DWR implemented the California Zebra Mussel Watch Program until June 2005 (which included risk assessment, early detection, public outreach, the development of a rapid response plan for the Central Valley watershed and a centralized reporting system for mussel sightings). The future of this program depends on funding. At Lake Davis, DWR has been coordinating with DFG on northern pike control and downstream protection (including the installation of a structure to prevent pike escape over the dam). DWR contributes to programs aimed at controlling invasive weeds along eroding Sacramento River banks, within flood control and water conveyance structures and along urban streams. The agency coordinates its activities with other state and federal agencies as a member of the CALFED Non-native Invasive Species Advisory Council (NISAC).

California Ocean Protection Council (OPC)
http://www.coastalconservancy.ca.gov/

The OPC, created in 2004, is a state cabinet level council consisting of the Secretaries for Resources and the California Environmental Protection Agency, the chair of the State Lands Commission and two members of the Legislature. The OPC is a policy making body and also prioritizes the expenditure of various funds appropriated to other State departments for ocean protection purposes. The OPC has authorized funding for the completion of this AIS plan and is considering inclusion of implementation of this plan in its strategic plan as a major objective over the next five years. OPC's policies are administered by the Coastal Conservancy with direction from an Executive Policy Officer housed at the Resources Agency.

California State Lands Commission (SLC)
http://www.slc.ca.gov

SLC manages the mandatory, statewide, multi-agency Marine Invasive Species Program. This program works to implement regulations governing ballast water management for vessels operating on the West Coast of North America. Commission inspectors board approximately 25% of all vessels that arrive in California to verify compliance with regulations and to disseminate outreach materials to vessels and crews new to California. In addition to its regulatory activities, the Commission facilitates scientific research and technology development to enhance management efforts of the program and to inform policymakers. Limited funding is provided for research that targets priority information gaps and to technologies that show exceptional promise for the treatment of ballast water. In recent years, the SLC has also prepared a number of reports for the state legislature documenting commercial vessel fouling in California, proposing performance standards for ballast water discharges, and summarizing vessel ballast water activities and compliance in California (see also Ballast Water Management, California Authorities, and Chapter 5). In addition to the mandated Marine Invasive Species Program, the SLC has been coordinating interagency efforts to manage invasive aquatic plants such as Eurasian watermilfoil in Lake Tahoe (see Case Study, Chapter 8).

State Coastal Conservancy (SCC)
http://www.coastalconservancy.ca.gov/

SCC has been involved for over twenty years in the control and eradication of aquatic invasives, pursuant to Division 21 of the Public Resources Code. SCC developed, funded and operates the Invasive *Spartina* Project in San Francisco Bay that shows great promise in eradicating nonindigenous species of *Spartina* and their associated hybrids. SCC is also involved in efforts to control *Arundo* in many coastal watersheds. SCC directly develops projects and provides grant funds related to resources enhancement and restoration, including control and elimination of invasives. SCC is also a partner in developing this management plan.

The San Francisco Estuary Invasive *Spartina* Project (ISP)
http://www.spartina.org/

SCC established the ISP in 2000. Its overall goal is to develop and implement a regionally coordinated project to eradicate the four introduced and highly invasive *Spartina* species in the San Francisco Estuary. The ISP is comprised of a number of components, including outreach, research, permitting, mapping, monitoring and allocation of funds for efforts to eliminate populations of nonindigenous *Spartina*. In 2005 the Conservancy and ISP began full-scale implementation of the regionally coordinated *Spartina* Control Program (SCP), employing an aggressive treatment strategy to target nearly all infested sites in the San Francisco Estuary. Initial results show on average about 85% efficacy at treated sites. SCC will continue to coordinate the regional control effort through the ISP, and to allocate funds to land owners and managers around the San Francisco Bay for aggressive treatment activities consistent with the SCP. If funding

continues, it's expected that invasive *Spartina* will be effectively eradicated from the San Francisco Estuary between 2009 and 2011 (see also Case Study, Chapter 8).

State Water Resources Control Board (SWRCB)
http://www.swrcb.ca.gov/

The SWRCB's mission is to preserve, enhance and restore the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations. The Board has joint authority over water allocation and water quality protection. Under the State Board are nine Regional Water Quality Control Boards (RWQCBs). The SWRCB and regional boards have been working in support of, and in an advisory capacity to, other state agencies on various AIS activities, such as hull fouling and ballast water management. Invasives come under water board purview as part of the state's efforts to implement and enforce the Clean Water Act (CWA, see also Appendix B). A 2005 federal court ruling defined non-indigenous species as "pollutants" present in discharges from vessels and found that such discharges are not exempt from permitting requirements (NPDES, see also CWA, Appendix B).

In terms of AIS management activities, some of the regional boards have also sought to place specific water bodies within their regions on the CWA's 303(d) list, as impaired by exotics. S.F. Bay was listed in 1998. In 2006, the State Board placed the Delta, the Cosumnes River and a portion of the San Joaquin River on the 303 (d) list. Once on the 303(d) list, the regional boards are required to develop discharger/source based programs for managing pollutants, including the determination of "total maximum daily loads" (TMDLs)), which in the case of exotics have proved somewhat difficult to develop. Trying to allocate loads or goals for zero loads, among dischargers, water users and municipalities is challenging when most of the water bodies in question are already heavily invaded. Despite the implementation challenges, the S.F. Bay Water board's work on the state's first exotics TMDL did, however, widely publicize the problem and led to other successful AIS management and legislative programs.

Other regional boards have become involved in AIS-related water quality issues through watershed management projects, non-point source pollution management programs and wetland mitigation and restoration programs (raising issues about the use of non-native aquatic plant species for these programs, and the control of invasives, for example). The State Board has also participated in AIS management activities concerning the use of aquatic pesticides.

University of California (UC)
www.universityofcalifornia.edu
www.ipm.ucdavis.edu/

UC conducts extensive research on invasive species issues and has a substantial pool of scientists devoted to biological invasions and management. UC faculty serve on NGO, and state and federal government panels and committees charged with invasive species management. They also provide expertise and management for a variety of cooperative government units such as UC's Division of Agricultural and Natural Resources' (ANR) Integrated Pest Management Program and the Center for Invasive Species Research (UC Riverside). This center has managed the Exotic Species Research Program for USDA for almost five years. UC ANR also has Marine Advisors in most coastal counties in the state as part of the Sea Grant extension program. This provides a direct academic presence for extension outreach and applied research collaboration with agencies and campus faculty (see also National Sea Grant, Appendix B). UC also has formal graduate training programs on invasive species, such as the Integrative Graduate Education and Research Traineeship, based at UC Davis, in which the students intern with DFG, USFWS and other government agencies.

APPENDIX D: OTHER AIS INTERESTS

COORDINATING COMMITTEES, EDUCATIONAL INITIATIVES & SPECIAL INTEREST GROUPS

AIS spread across so many jurisdictions and impact so many different types of human activities and environmental priorities that diverse efforts have been made to promote coordination among AIS-involved agencies, organizations and stakeholders. Some of these, such as CALFED or the Western Regional Panel serve important functions in implementing federal and state mandates for coordination. Others provide ongoing forums for information sharing and priority setting among different agencies, organizations and interest groups, or among those attempting to restore or preserve specific waterways.

COORDINATING COMMITTEES & PARTNERSHIPS

Aquatic Nuisance Species Task Force
www.anstaskforce.gov

Federal legislation established the national Aquatic Nuisance Species Task Force (ANSTF), co-chaired by the USFWS and NOAA. ANSTF is charged with coordinating governmental efforts related to ANS prevention and control. ANSTF consists of 10 federal agency representatives and 12 ex officio members representing nonfederal governmental agencies.

Adopt-A-Riverway Program

This program is a government-volunteer partnership established in 2003. Participation in the program includes management of noxious and invasive weeds. Authorized program activities include planting and establishing native seedling trees, shrubs, native grasses, wildflowers, and removing litter and weeds, consistent with an integrated weed management plan. AB 66, a state bill, established an Adopt-A-Riverway Fund for proceeds donated, appropriated, transferred or otherwise received for purposes pertaining to the Adopt-A-Riverway Program.

Association of Fish and Wildlife Agencies (AFWA)
http://www.fishwildlife.org/

AFWA represents the government agencies responsible for North America's fish and wildlife resources. It promotes sound management and conservation and speaks with a unified voice on important fish and wildlife issues. AFWA was awarded a recent grant to create communications strategies on issues related to unwanted invasive aquatic species. This project will help states develop comprehensive programs to address aquatic nuisance species issues within their states and will collectively help the Regional Associations and the AFWA nationally develop a stronger voice and greater capabilities when addressing regional and national aquatic nuisance species efforts.

CALFED Bay-Delta Program (CALFED)
http://calwater.ca.gov/

CALFED is a cooperative effort of more than 20 state and federal agencies working with local communities to improve the water quality and reliability of California's water supplies and restore the San Francisco Bay-Delta ecosystem. One goal of CALFED's Ecosystem Restoration Program (ERP) has been to "prevent establishment of and reduce impacts from non-native species." The goal includes 10 specific objectives, such as eliminating further introductions of new species in ballast water of ships and preventing the invasion of the zebra mussel into California. CALFED has also developed a strategic plan for managing non-native invasive species in the San Francisco Bay-Delta Estuary and the Sacramento and San Joaquin Rivers and associated watersheds. To date, CALFED has funded 31 projects that address preventing the establishment of, or reducing the impacts from, non-native invasive species in California.

CALFED also created a Non-native Invasive Species Advisory Council (NISAC), a council of agency and technical stakeholders to advise the program on non-native invasive species.

California Horticultural Invasives Prevention (Cal-HIP)
www.suscon.org/invasives

This partnership develops strategies to reduce introductions of invasive plants through horticulture. Partners include environmental NGOs, agency representatives, and nursery and landscaping trade organizations. Sustainable Conservation, a nonprofit organization, facilitates the partnership.

California Interagency Noxious & Invasive Plant Committee (**CINIPC**)
http://www.cdfa.ca.gov/phpps/ipc/CINWCC/cinwcc_hp.htm

This committee, formerly known as California Interagency Noxious Weed Coordinating Committee (CINWCC), was formed in 1995, with a memorandum of understanding among 14 federal and state agencies. The committee changed its name again in 2006. Its mission is to facilitate, promote and coordinate the establishment of an integrated pest management partnership between public and private land managers toward the eradication and control of noxious weeds on federal and state lands and on private lands adjacent to public lands.

California Invasive Plant Council (**Cal-IPC**).
www.cal-ipc.org

This Council is a nonprofit organization that works to protect California wild lands from invasive plants through research, restoration and education. Cal-IPC proposes and facilitates solutions to problems caused by invasive plants. Membership includes public and private land managers, ecological consultants, researchers, planners, volunteer stewards and concerned citizens. Cal-IPC is recognized as an authoritative source of new information on all aspects of wild land weed management.

California Invasive Weed Awareness Coalition (**CALIWAC**)
www.cal-ipc.org/policy/state/caliwac.php

This coalition, made up of primarily industry stakeholders, was formed in 2001 to increase awareness of the invasive weed issue in California. The coalition's goals are to support the development of a statewide management plan for invasive weeds; provide a public forum to increase awareness of the detrimental environmental and economic effects of invasive weeds and contribute to solutions for invasive weed issues; promote increased funding for management of invasive weeds; and influence state and national policy on invasive weeds

California Weed Science Society (**CWSS**)
http://www.cwss.org/

This Society was founded in 1948 to promote environmentally sound proactive research and develop educational programs in weed science; support undergraduate/graduate students seeking a career in weed science; and encourage and support educational activities to promote integrated weed management systems.

County Weed Management Areas (**WMA**)

A Weed Management Area (WMA) is a local organization that brings together landowners and managers (private, city, county, state, and federal) in a county, multi-county or other geographical area for the purpose of coordinating and combining action and expertise in combating common invasive weed species. The WMA Support Program in DFA provides coordination and training opportunities and allocates state funding earmarked for WMAs.

Delta Protection Commission (DPC)
www.delta.ca.gov

California's 1992 Delta Protection Act created a Delta Protection Commission in recognition of the natural resource significance of the 738,000 acre-Sacramento-San Joaquin Delta. The Act seeks to preserve and protect Delta resources for the use and enjoyment of current and future generations and recognizes the threat posed by urban encroachment to the Delta's agriculture, wildlife habitat and recreation uses (see also Appendix C, State Authorities). The 19-member Delta Protection Commission provides for stakeholder representation in the areas of agriculture, habitat, and recreation. A land use and resource management plan for the primary zone of the Delta, completed in 1995 and updated in 2002, acknowledges the impacts of exotic species on Delta resources and makes recommendations for preventing impacts on native fish, and on aquatic, channel island and seasonal wetland habitats (including mosquito abatement projects).

Pacific Ballast Water Group (PBWG)
http://www.psmfc.org/ballast/

This group was formed by representatives from the shipping industry, state and federal agencies, environmental organizations, and others who recognized the need for a cooperative and coordinated regional approach to ballast water management to prevent the introduction of invasive species on the West Coast. The PBWG meets regularly and is currently addressing the development of ballast water discharge standards and inter-jurisdictional issues related to ballast water management on the West Coast.

Pacific States Marine Fisheries Commission (PSMFC)
http://www.psmfc.org/

PSMFC is one of three interstate commissions dedicated to resolving fishery issues. Representation includes the states of California, Oregon, Washington, Idaho and Alaska. The PSMFC does not have regulatory or management authority; rather, it serves as a forum for discussion, works towards coast wide consensus on state and federal authorities and addresses issues that fall outside state or regional management jurisdiction. Over the past four years, the Pacific States Marine Fisheries Commission's AIS program has concentrated on four species of aquatic invaders: Chinese mitten crab, European green crab, zebra/quagga mussel and Atlantic salmon. Program activities include research and monitoring, educational outreach, interjurisdictional planning and coordination, and funding and contracting services for numerous partners.

Western Governors' Association
http://www.westgov.org/

The Western Governors' Association is developing a new program to address undesirable nonindigenous aquatic and terrestrial species in the west. In 1998, the Western Governors passed a resolution on Undesirable Aquatic and Terrestrial Species to develop and coordinate western strategies and to support management actions to control and prevent the spread and introduction of undesirable species; support the use of integrated pest management concepts; encourage broad-based partnerships; and urge adequate support for the U.S. Department of Agriculture's Animal and Plant Health Inspection Service. The Association has formed a working group of state and federal agencies, industry, non-governmental organizations and academia to develop western strategies to limit the spread of these species.

Western Regional Panel (WRP)
http://www.fws.gov/answest/

This panel on Aquatic Nuisance Species was formed as a committee of the ANSTF after the passage of NISA to help limit the introduction, spread and impacts of aquatic nuisance species into western North America. This panel includes representatives from federal, state, and local agencies, Native American tribes, and private environmental and commercial interests, as well as a representative from Canada.

The general goals of the WRP are to prevent nuisance species introductions, coordinate activities of the western states among federal, local and tribal agencies and organizations, and minimize impacts of already established nuisance species. The purposes of the WRP, as described in NISA, are to: identify western region priorities for responding to aquatic nuisance species; make recommendations to the ANSTF regarding an education, monitoring (including inspection), prevention, and control program to prevent the spread of the zebra mussel west of the 100th meridian; coordinate other aquatic nuisance species activities in the west not conducted pursuant to the act; develop an emergency response strategy for federal, state, and local entities for stemming new invasions of aquatic nuisance species in the region; provide technical assistance to public and private stakeholders for preventing and controlling aquatic nuisance species infestations; and submit an annual report to the ANSTF describing activities related to ANS prevention, research and control.

MAJOR NATIONAL EDUCATION CAMPAIGNS

100th Meridian Initiative, USFWS
http://www.100thmeridian.org

The primary goal of the 100th Meridian Initiative is to prevent the further spread of zebra mussels. At the time it was formed, the western limit of the zebra/quagga mussel roughly coincided with the 100th meridian. It is the first large-scale, cross-jurisdictional effort to combat the spread of an aquatic invasive species. Participating entities include federal, state, local and tribal governments, potentially affected industries such as commercial boat haulers and other stakeholders. The initiative has produced an extensive public information and education campaign aimed at marina users, anglers and recreational boaters. It sponsors the production of posters, informational flyers and signs educating boaters about the risks of zebra mussels and other AIS. Its members conduct voluntary boat inspections and boater surveys to identify boats at highest risk for harboring AIS. Collected boater travel patterns are being used to model potential pathways for the mussel's spread. The initiative has supported the establishment of mussel monitoring stations across the west, as well as the development of regional rapid response plans should the mussel establish new populations. Recent programs include the Lewis and Clark Initiative, a program aimed at increasing outreach efforts to recreational boaters retracing the path of the historic expedition during its bicentennial. Among other accomplishments, the effort resulted in the establishment of more AIS monitoring stations and a mussel monitoring database for the Columbia River Basin region.

Habitattitude
www.habitattitude.net

Habitattitude is an ANSTF collaboration of the Pet Industry Joint Advisory Council (PIJAC), the U.S. Fish & Wildlife Service, the NOAA National Sea Grant College Program, and the nursery and landscape industry. It was established in 2004 to educate aquarium hobbyists, backyard pond owners, water garden enthusiasts, and others on how to prevent the spread of potential aquatic nuisance species. Its web site includes information on how non-native fish and plants can harm ecosystems, suggests environmentally sound alternatives to releasing unwanted aquatic plants and animals in the wild and offers tips on how to prevent accidental releases. The site offers promotional materials, signage and decals for participating retailers and manufacturers. The initiative offers a means for industry and the USFWS to work together to promote their shared interests in preventing AIS impacts.

Stop Aquatic Hitchhikers
www.protectyourwaters.com

The Stop Aquatic Hitchhikers web site is part of the ANSTF public awareness campaign. It is sponsored by the USFWS and the USCG. It functions as a reputable, central source of information about aquatic nuisance species affecting the United States. Resources include photos and descriptions of common nuisance species, how they impact ecosystems, boaters and anglers, and tips for preventing their spread. A news page features stories from major news outlets as well as government news releases related to AIS. Video and audio clips geared toward traveler information centers are available for download as are outreach materials such as posters, flyers, stickers for tackle boxes, banners and signs. Clubs, state and government agencies, and private entities are encouraged to join the campaign and pledge to prevent the spread of AIS. In California, partners include the DFG, California Trout, the City of Davis, Heal the Bay (Santa Monica), and the Santa Ana Zoo, among others.

SPECIES- & PLACE-SPECIFIC COALITIONS, INITIATIVES & NONPROFITS

100th Meridian Initiative, USFWS
(see Major National Education Campaigns)

California Sea Grant
(see Appendix B, NOAA – Sea Grant)

Channel Islands National Marine Sanctuary
(see Appendix B, NOAA – NMS)

Cordell Banks National Marine Sanctuary
(see Appendix B, NOAA – NMS)

Elkhorn Slough National Estuarine Research Reserve
(see Appendix B, NOAA – NERR)

Gulf of the Farallones National Marine Sanctuary
(see Appendix B, NOAA – NMS)

Invasive Spartina Project
(see Appendix C, State Coastal Conservancy)

Lower Colorado River Giant Salvinia Task Force
http://lcrsalvinia.org/salviniahome.asp

On August 4, 1999, the USFWS found giant salvinia in the Imperial National Wildlife Refuge on the Colorado River. Plants were also seen floating down the Colorado River, on the Cibola National Wildlife Refuge, and in Pretty Water and Three Finger lakes. Subsequent investigation determined that the source of the infestation was the West Side/Outfall Drain of the Palo Verde Irrigation District near Blythe, California. To ensure a coordinated response to the infestation, a task force was formed. Teams focused on accomplishing steps to control and/or eradicate giant salvinia in the lower Colorado River. Teams address issues relating to research, monitoring, rapid response, field implementation, regulation and compliance, outreach, and financial and international issues.

Monterey Bay National Marine Sanctuary
(see Appendix B, NOAA – NMS)

Morro Bay National Estuary Program (USEPA National Estuary Program)
(see Appendix B, USEPA – NEP)

San Francisco Bay National Estuarine Research Reserve
(see Appendix B, NOAA – NERR)

San Francisco Estuary Institute
www.sfei.org/bioinvasions

SFEI was founded as a non-profit organization in 1986 to foster the scientific understanding needed to protect and enhance the San Francisco Estuary. It is governed by a board composed of Bay Area scientists, environmentalists, regulators, local governments and industries. SFEI's Biological Invasions program conducts scientific and policy research and provides information and analyses on the introduction of exotic organisms into marine and freshwater ecosystems. In the last decade, the program has been actively working to improve understanding and management of invasive species, to document the status of invasive species in San Francisco Bay and the increasing rate of invasions. The program is also involved in

helping develop regulatory standards for ballast water discharges. Most recently, SFEI is chairing the scientific advisory panel that is providing guidance from the research community to the government agencies responding to the recent discovery of quagga mussel in California and performing some of the research identified by the quagga mussel incident command.

San Francisco Estuary Project (USEPA National Estuary Program)
(see Appendix B, USEPA – NEP)

Santa Monica Bay Restoration Commission (USEPA National Estuary Program)
(see Appendix B, USEPA – NEP)

Southern California Caulerpa Action Team (SCCAT)
http://www.sccat.net/

SCCAT was established to respond quickly and effectively to the discovery of *Caulerpa* in Southern California. The group consists of representatives from local, state, and federal governmental entities and from private organizations. SCCAT's goal is to completely eradicate all infestations in Agua Hedionda Lagoon and Huntington Harbour and to prevent new infestations (see also Chapter 8, Case Study)

Tahoe Basin Weed Coordinating Group
(775) 784-4848

This group is coordinated through the University of Nevada Cooperative Extension to address the increasing aquatic weed problem in the two-state Lake Tahoe Basin. This group and local agencies have undertaken mechanical removal of Eurasian watermilfoil and efforts are now being expanded, incorporating a variety of removal methods (see also Case Study, Chapter 8).

Team Arundo
http://www.sawpa.org/arundo/

Team Arundo was formed in Orange County, California, in 1991 to control *Arundo* along the Santa Ana River, and has since become a statewide program. Chapters exist in the Bay Area, San Luis Obispo and surrounding counties, Greater Los Angeles County, and San Diego County.

Team Arundo Del Norte
http://ceres.ca.gov/tadn/

Team Arundo Del Norte is a forum of local, state and federal organizations dedicated to the control of *Arundo* in rivers, creeks and wetlands in Central and Northern California. The organization formed in the summer of 1996 and meets several times per year in the Sacramento area to explore opportunities for information exchange and partnerships in support of the ongoing work of eradicating Ar*undo*.

Tijuana River National Estuarine Research Reserve
(see Appendix B, NOAA – NERRS)

APPENDIX E: AIS PLAN DEVELOPMENT & PROCESS

An initial draft of this plan was developed for DFG several years ago with stakeholder input (see below). At that time the plan was not completed due to funding and staffing issues. In 2006, additional funding was awarded to SFEP from the OPC, through the SCC, to finish and begin implementation of the plan.

2006 Draft & Final Plan Process

The 2006 draft of the plan incorporated much of the text, research and public comments provided by the original 2004 draft (see below).

In early 2006, agency staff reviewed the 2004 version and suggested updates. The resulting draft was circulated two times for review and comment by AIS program managers within lead state and federal agencies. Two internal meetings – one in June, and one in July – were held to discuss the draft and documented in meeting notes. Revisions were made accordingly.

The resulting draft plan was posted for public review on August 22nd, 2006. Three public meetings were held in August and September 2006 in Oakland, Sacramento and Long Beach to review the draft plan. Public comments were reviewed and incorporated to the extent possible.

Attendees at one or more of 2006 internal interagency meetings included:

Susan Ellis, DFG
Abe Doherty, SCC
Julie Horenstein, DFG
Dan Wilson, DFG
Paul Ryan, DBW
Geoff Newman, DBW
Terri Ely, DBW
Marian Ashe, DFG/OSPR
Jeffrey Herod, USFWS
Marcia Carlock, DBW
Suzanne Gilmore, SLC
Tanya Veldhuizen, DWR
Lynn Takata, SLC
Ben Becker, NPS
Karen McDowell, SFEP
Maurya Falkner, SLC
Pat Akers, DFA

2006 Public Meetings Summary

Background

A Draft AIS Plan was publicly released in late August 2006 and three public meetings were held in August and September to solicit input. The following pages summarize the presentation used at all three meetings and present comments and questions raised by meeting attendees. In addition, the results from a "prioritization" exercise conducted at each meeting are presented.

Meeting Overview

The meetings were called to order by Austin McInerny, facilitator, from the Center for Collaborative Policy, California State University, Sacramento. After McInerny provided an overview of the meeting agenda, participants and staff involved in preparing the Draft AIS Plan, introduced themselves. Project staff participating in the meetings included:

- Susan Ellis, Invasive Species Coordinator, DFG
- Julie Horenstein, DFG
- Karen McDowell, Project Coordinator, SFEP
- Abe Doherty, Project Manager, SCC
- Paula Trigueros, SFEP (note taker)
- Debbi Egter Van Wissekerke, SFEP (logistics manager)

Karen McDowell provided a brief background and overview of the plan's development process and explained the need to complete the plan to qualify for federal funding. She further clarified that the plan is to provide a management framework for agency coordination and that the anticipated adoption timeline is very aggressive. She reviewed the required components of the plan and explained the proposed management framework and the Technical Advisory Panels. She highlighted the objectives, strategies and action items for implementation and noted the priority section would be completed following the public review process. She explained the appendices including the Rapid Response Plan. Next steps included posting updates on the website and including the public comments as an Appendix also to be posted on the web. The complete presentation is available online at:
http://sfep.abag.ca.gov/projects/invasive_species.html

Following the presentation, a short question and answer period was held to address questions on how the plan was developed. Then, meeting attendees provided feedback, comments, and questions regarding the Draft AIS Plan. Lastly, meeting attendees were asked to review the proposed Action Items proposed in the plan and identify what they believed were both "high" and "low" priority action items.

Comment forms were provided and copies of the Draft AIS Plan were available for review.

Public Meeting #1 (Sacramento) Summary

The meeting was held August 28 in the auditorium of the California Department of Food & Agriculture and had nearly 30 attendees. The following comments and questions were raised:

- Woody Schon, Sacramento/Yolo Mosquito & Vector Control District: Expressed concern with Action 2E4 regarding use of mosquito fish for mosquito control. His district uses fish to control mosquitoes in degraded habitats such as rice or agricultural fields that are not flowing into streams, rivers or vernal pools and does not want to see these fish excluded as a tool for mosquito control.

- Raynor Tsuneyoshi, Director, DBW: Would like to see Collaborative Center for AIS at a university. Concern with hull cleaning for small boats – it is 9 times more expensive to haul a boat out of the water for hull cleaning than to clean in the water. There is in-water technology for anti-fouling for large boats but not for small. Regarding cleaning stations, who would fund, and how would they be distributed around the state? Recommended the development of remedies for specific behaviors – fishing boats, trans-Pacific yacht racing. Recommends going slow to curtail copper based hull paint as it slows down hull fouling.

- Dave Breninger- General Manager Placer Co Water Agency; Director ACWA; Director RBOC: Concern with water quality issues (agricultural water and the delta). Need to link water agency and boating concerns (Objective 2I). His water district is plagued with non-natives. Need to eradicate in waterways. Likes use of native plants. Need to make recreational boaters part of the solution. *Egeria* should be eradicated. Need a positive way to put money into solution.

- Duane L. Schnabel, Primary State Biologist, DFA: Although the plan cites NEPA/CEQA in Appendix B there is no discussion of when an EIR will be done for the plan. People need to know if the actions will do more harm than good.

- Ted Grosholz, Dept. of Environmental Science & Policy, UC Davis: He is a cooperative extension researcher who developed the initial plan. The plan as written has an absence of university and research institution participation. The plan ignores non-agency participants in AIS work. Action 1A6 calling for a data base of AIS projects ignores already existing National Biological Species nodes at UC Davis and UC Santa Barbara. Actions 6A3-11 ignores cooperative extension and sea grant work in progress for years. Actions 7A1-2 to complete AIS studies ignores work under development at the universities. The plan needs to bring the University of California into the management plan. The Ocean Protection Council endorsed a university inter-agency center for AIS and the center is not included as part of this plan. The center needs to be part of the plan and needs to be stated explicitly.

- Rick Grosberg, Center for Population Biology, UC Davis: The threat of AIS was identified by the research community and not state agencies. The document completely ignores the contributions of the research community. UC Davis formed an AIS council that is not included or even mentioned. The management framework includes only agency leaders who will meet (When? For What?). The Document needs to integrate geographically and biologically. It does not provide a management framework for integration at all levels. There is a missing objective for coordination of research problems, ecological problems, biological problems; the structure for coordination is not listed as an objective. Document does a good job identifying problems but fails in coordination and development of policy.

- Rebecca Verity - UCOP: UCOP supports the University of California and CSU's disappointment at being left out of the plan. The state constitution designated the University of California as the research arm of the State of California. The university was

told there would be an AIS Center for coordination of research, surveys and development of new tools. All faculty were told the bones of the center would be in the management plan. They are very disappointed it is not.

- Jodi Cassell, Sea Grant: Has been involved in outreach and applied research on AIS. Jodi herself has been involved for 8 years. They are also a funding source having funded $1,800,000 in AIS projects and outreach. They are very disappointed the plan ignores all non-state agency work related to AIS. Sea Grant is not mentioned at all in the plan although they have done extensive outreach on ballast water management, newsletters, research on hull fouling, transport vectors, establishing a network of advisors, etc. She feels the agency role should be to coordinate ongoing programs. DFG is not in outreach; outreach is not a strong component of their mandate. She felt the plan needed to use existing resources and not push them out of the management plan.

- Elaine Sledge, National Paint and Coatings Association: The association concurs with the plan findings on the threat of AIS. They support prevention vs. control and eradication. Coatings must have copper for anti-fouling. Inter-coastal vessels transport AIS. There are also non-ballast vectors. Non-biocide coatings are preferred. Written comments will provide additional information.

- Ron Eng, DFA: Action 2I1 proposes adding staff and hours at DFA Border Protection Stations with no indication of how this would be funded.

- Clint Meyer, Project Manager, Michael Brandman Associates: There is already a good regulatory program through CEQA. CEQA should be updated to address terrestrial and aquatic invasive species.

Public Meeting #2 (Oakland) Summary
The meeting was held August 30 in the Association of Bay Area Governments / Metropolitan Transportation Commission's conference room and had nearly 25 attendees. The following comments and questions were raised:

- Karl Malamud-Roam, Mosquito Ecologist, Contra Costa Mosquito VCD: He stated the regulatory aspects on control of public health were good. AIS present a huge problem. Insects and the diseases that come with them require continual surveillance and rapid response which the districts have in place. There is confusion in tone in the introduction; the plan treats non-native species and invasives as synonymous. The definition of invasives is not clear; the federal definition emphasizes harm (as stated in first paragraph) but the second paragraph treats all non-natives as invasive. It should not assume that non-native is detrimental; there are benefits of non-natives. The mosquito fish comments need correcting. There is a presumption that mosquito fish are known to harm; be careful of context of usage. They are a tool for resource management.

- Steve Hajik, Lake Co. Dept. of Agriculture: Spraying requires a permit from the regulatory water agency. County only allows licensed sprayers and inspects all applicators. His county passed an ordinance that lists banned weeds. He commented the plan should not forget agricultural commission offices.

- Caitlin Sweeney, SF Bay Conservation & Development Commission (BCDC): There is a critical omission of BCDC in the management plan. They have enforceable policies on fill, dredging, tidal marsh restoration projects and require eradication permits in their jurisdiction.

- Doug Johnson, California Invasive Plant Council: Plan needs to emphasize the impacts of chemical treatment as well as the impacts of all treatments. High level coordination

under Strategy 1A should include agricultural and environmental groups; should be strengthened to advocate for AIS council not partitioned as aquatic, but all inclusive.

- Cathy McGowan, Office of Research, UCOP: Lawrence Coleman, Vice Provost will submit detailed comments in writing. Cathy read from a 4-page document (attached) with preliminary comments. Solutions must be cross-cutting; researchers, policy makers and managers must work together. There must be formation of a California Center for Invasive Species; UC supports this strongly and wants it added to the plan. The plan needs to include members of UC and Sea Grant on the CAAIST (1A2). The section on Education and Outreach needs to include the UC Riverside Aquatic Center and Sea Grant Extension outreach. The education of ongoing researchers needs to be added. Section 7 provides an excellent start but needs to be expanded to include an academic research center.

- Mike Connor, Executive Director, San Francisco Estuary Institute (SFEI): SFEI has been working on biological invasions for over a decade. The rate of invasions is increasing; at present they are working on a multi-agency rapid response effort to eradicate invasive oysters in the South Bay. The report needs three things; 1) transparency; 2) peer review; and 3) competitive funding. First, transparency, the public cannot figure out who is working on what and therefore cannot determine overall success. Second, there is no call for outside peer review, which is necessary to insure that implementation is up to date. This is crucial for incorporation into the report. Third, there should be provision for competitive funding of line items in the document. Funding should go through a competitive process to insure transparency and the best quality work.

- Cathy Roybal, Contra Costa Dept. of Agriculture: Local county agricultural offices need to be involved.

- Karl Malamud-Roam, Mosquito Ecologist, Contra Costa Mosquito VCD: Department of Health Services needs to be added to agencies; the Health & Safety Code needs to be added to statutes. Use of vector should be carefully defined; conventional use includes mosquito control. The Society of Wetland Scientists was the first concerned with invasive cord grass. Strong kudos for rapid response.

- Arthur Berlowitz, U.S. Department of Agriculture (USDA): Goal is to prevent invasive species if we can. USDA reviews plants for the aquarium trade. He does not see how USDA can interface with the plan; it is not clear how USDA fits in. Thinks a center is a great idea. Document should show who has jurisdiction over what part of invasive species control.

- Sarah Mannell, Mill Valley, CA: She wants to know who does the public contact about invasive species. There are large carp in Corte Madera Creek; a protected creek; with steelhead fry in their guts.

Public Meeting #3 (Long Beach) Summary

The meeting was held at the Port of Long Beach Board Room on September 1 and had eight attendees. While no comments were presented, meeting attendees did raise the following questions:

1. How does the plan articulate agricultural invasive plants?
   Answer: DFA is on the coordinating committee. The committee also worked with DPR.

2. For the Technical Advisory Committee, will there be one for the state, or will there be regional panels to focus on the issues for that region?
   Answer: Having regional coordinating panels is a good suggestion and will be considered during finalization and/or implementation of the plan.

3. How much public outreach was there for these public meetings? He did not see a full press announcement.
   Answer: There was targeted outreach to the OPC mailing list, stakeholder groups, web sites and DFG did a press release.

4. Is this a modification of an existing plan or a new plan?
   Answer: It is restructured and rewritten from an earlier draft.

5. How is the SFEP associated with the project?
   Answer: SFEP was contracted for one year by the SCC with funding from the Ocean Protection Council to finish the state AIS Plan.

6. Has there been outreach to shipping companies?
   Answer: SLC, which is in charge of the ballast water program, has been keeping shipping up to speed. The ballast water recommendations were taken from the proposed actions. The plan basically looks at vectors other than shipping.

Prioritization Exercise Results

At all three meetings, posters were provided on the walls for attendees to indicate which action items (as described in the Draft AIS Plan) they believed should be "high" and "low" priority. After the close of the public comment period, meeting attendees held informal conversations with project staff and added to the posters. The posters were brought to each subsequent meeting to allow attendees to see which action items other individuals had prioritized.

One action was identified as extremely important: 8A3. Pursue the authority for DFG and DFA to establish a Rapid Response Program.

The following information was collected. Some of the action numbers changed as comments were addressed and the draft plan was finalized. The action numbers below were updated to reflect the new numbers; some of the original actions were deleted or moved in the editing process. Some of the action language has been edited since this summary was made. A few actions are listed as both high and low priorities because of differing opinions among participants. For final priorities identified see Chapter 8.

Objective 1: Coordination & Collaboration

High Priority Actions

1A1. Develop an executive level consultation process.
1A2. Form the California Agencies AIS Team (CAAIST).
1A7. Identify lead state agencies for particular AIS, water bodies and invasion vectors.
1A8. Identify agency personnel required for AIS management.
1A9. Improve state websites related to AIS.
1A10. Assess effectiveness of and gaps in AIS programs.
1B4. Expand participation in local AIS efforts and task forces.
1B5. Expand participation in regional, national and international AIS task forces.
1B7. Participate in national and international conferences.
1C2. Establish stable, long-term funding to help implement this plan.
1C3. Provide state funding for the AIS positions.
1C4. Provide state funding for a rapid response program.
1C5. Hire a funding development specialist.
1C6. Provide new funding mechanisms.

Low Priority Actions

All remaining actions for this objective not shown as high priority above.

Objective 2: Prevention

High Priority Actions

- 2B1. Quantify the ballast water and hull fouling vectors and assess invasion risk.
- 2B2. Continue and improve state ballast water inspection and enforcement program.
- 2B3. Implement discharge standards for treated ballast water.
- 2B4. Identify and address gaps in the Marine Invasive Species Program.
- 2B7. Quantify and assess the role of commercial fishing vessels as AIS vector.
- 2C1. Quantify and assess the role of recreational boating as an AIS vector.
- 2C2. Develop a recreational boating outreach and management program.
- 2C3. Develop a watercraft inspection program for high priority boat launch sites.
- 2C4. Quantify and assess the role of recreational fishing as an AIS vector.
- 2C5. Develop a recreational fishing outreach and management program.
- 2C6. Develop guidelines for: disposal of invasive species, cleaning of gear disposal of live bait.
- 2D1. Quantify and assess live bait as an AIS vector.
- 2E1. Quantify and assess fisheries enhancement as an AIS vector.
- 2I1. Increase staffing and hours of operation at DFA Border Protection Stations.
- 2I2. Develop guidelines for border inspections.
- 2I3. Increase DFG enforcement of current regulations on prohibited and restricted species.
- 2I4. Ensure adequate staffing and cargo inspection guidelines at ports and airports.
- 2I5. Continue disease sampling for shipments and stocks of live aquatic species.
- 2I6. Identify mail order, online vendors selling CA prohibited and restricted species.

Low Priority Actions

- 2B3. Implement discharge standards for treated ballast water.
- 2B4. Identify and address gaps in the Marine Invasive Species Program.
- 2C All actions mandating hull cleaning and/or inspections.
- 2C10 Link activities to the national Stop Aquatic Hitchhikers campaign. (Action later deleted).
- 2E4. Weigh benefits of mosquito-fish introductions.

Objective 3: Early Detection & Monitoring

High Priority Actions

- 3A1. Assess current monitoring of the state waters for early detection opportunities.
- 3A3. Develop statewide approach to early detection.
- 3A4. Outreach to those regularly sampling state waters.
- 3A5. Create and train a statewide citizen monitoring network.
- 3B1. Assess long-term AIS monitoring of state waters.
- 3B3. Monitor locations with high invasion rates.
- 3B7. Review the efficacy of long-term monitoring systems.

Low Priority Actions

- 3B6. Include maps of existing AIS in California waters in DFG BIOS system.

Objective 4: Rapid Response & Eradication

High Priority Actions

- 4A1. Develop and implement a statewide rapid response plan.
- 4A2. Evaluate and coordinate existing systems for reporting AIS sightings.
- 4A3. Clarify among the agencies and organizations involved who is responsible for which areas and/or species. (This action from August ’06 draft has been deleted. It will be addressed through current actions 4A1 and 4A3).
- 4A4. Explore permanent funding to implement rapid response.
- 4B1. Review effectiveness of eradication programs.

4B2. Continue and complete current eradication efforts.
4B3. Standardize criteria for identifying priority species for eradication.
4B4. Develop a method to prioritize sites of AIS invasion concern.

Low Priority Actions

All remaining actions for this objective not shown as high priority above.

Objective 5: Long-Term Control & Management

High Priority Actions

5B All strategy action items; limit the dispersal of established AIS to new water bodies.
5C2. Coordinate entities to meet AIS protection and restoration objectives.
5C6. Assess guidelines for preventing AIS spread in habitat restoration and shoreline landscaping projects. (See 6C5)

Low Priority Actions

5B1. Establish boat washing stations and disposal facilities at infested water bodies.
5B3. Use volunteer monitors to conduct AIS inspections.

Objective 6: Education & Outreach

High Priority Actions

6A1. Inventory education and outreach efforts. Develop a state AIS communication strategy.
6A2. Partner with ongoing outreach campaigns.
6A4. Develop posters, brochures and articles for industry sectors and user groups.
6A5. Develop permanent interpretive displays at marinas, boat ramps, and fishing sites.
6A6. Work directly with industry trade shows to deliver the AIS message.
6A7. Present AIS information at public gatherings.
6A8. Include AIS information in state hunting, fishing and boating regulations and licenses.
6A9. Include AIS information in fishing and recreational publications.
6A10. Develop and distribute AIS identification cards
6A11. Encourage industries to offer noninvasive alternatives to AIS.
6A12. Partner with stakeholders and interest groups to broaden education efforts.
6A13. Educate waterfront and shoreline property owners about AIS.
6A14. Develop and offer AIS management classes for professional organizations.
6A15. Continue state education measures concerning ballast water.
6C2. Educate researchers on AIS containment, disposal methods and legal restrictions.
6C5. Disseminate guidelines to promote the use of native plants. (See 5C6)

Objective 7: Research

High Priority Actions

Note: suggestion was made to add “increase coordination of researchers and develop research agenda based on high priority research needs.”

7A1. Host workshops to develop AIS research priorities and identify gaps.
7A2. Assess, continue and complete current studies.
7A3. Develop a strategy to communicate and support research needs.
7C4. Identify opportunities for interagency funding of AIS management research.

Low Priority Actions

7C3. Consider test center to evaluate ballast water treatment technologies.

Objective 8: Policy

High Priority Actions

8A1. Establish a regulatory review committee.
8A2. Identify the potential for improved regulatory coordination.
8A3. Pursue the authority to establish an interagency rapid response program.
8A4. Explore the need for additional state authority for AIS management.
8A6. Review current system for regulating plant and animal importations. .

Low Priority Actions

None indicated

2006 California Invasive Species Management Plan Public Meeting Participants

Name	Affiliation	Email	*Mtg.
Alejandrino, Emily	Central Valley Water Board	ealejandrino@waterboards.ca.gov	Sac
Anderson, Tim P.	Friends of Seal Beach NNR	Tim@birdingbyboat.org	LB
Berge, John	PMSA	jberge@pmsaship.com	Sac
Berlowitz, Arthur	USDA/APHIS/PPQ	Arthur.berlowitz@aphis.usda.gov	Oak
Bohan, Drew	OPC	drew.bohan@resources.ca.gov	Sac
Breninger, Dave	Placer Co. Water Agency Recreational Boaters of CA	dbreninger@pcwa.net	Sac
Brockbank, Marcia	SFEP	mbrockbank@waterboards.ca.gov	Oak
Brusati, Elizabeth	Cal-IPC	edbrusati@cal-ipc.org	Oak
Carlock, Marcia	DBW	mcarlock@dbw.ca.gov	Sac
Cassell, Jodi	California Sea Grant	jlcassell@ucdavis.edu	Sac
Clamurro, Lori	Delta Protection Commission	loridpc@citlink.net	Sac
Coleman, Lawrence	University of California	Lawrence.coleman@ucop.edu	Oak
Connor, Mike	SFEI	mikec@sfei.org	Oak
Doherty, Abe	Coastal Conservancy	adoherty@scc.ca.gov	Sac Oak
Drill, Sabrina	UCCE	sldrill@ucdavis.edu	LB
El, Terri	DBW	tely@dbw.ca.gov	Sac
Ellis, Susan	DFG	sellis@dfg.ca.gov	Sac Oak LB
Eng, Ron	CDFA	reng@cdfa.ca.gov	Sac
Falkner, Maurya	CA State Lands Commission	falknem@slc.ca.gov	Sac
Fernandez, Linda	UC Berkeley – Dept. of Ag. & Resource Econ.	Linda.fernandez@ucb.edu	Oak
Fredrickson, Justin	Cal. Farm Bureau Federation	jfredrickson@cfbf.com	Sac
Fujioka, Kenn	Mosquito & Vector Control Assn. of Ca/San Gabriel Valley MVCD	kfujoika@sgvmosquito.org	LB
Gouvaia, John	Alameda Co. Dept. of Agric.	John.gouvaia@algov.org	Oak
Grosberg, Rick	UC Davis	rkgrosberg@ucdavis.edu	Sac
Grosholz, Ted	UC Davis	tedgrosholz@ucdavis.edu	Sac
Gurish, Jon	Coastal Conservancy	jgurish@scc.ca.gov	Oak
Hakjik, Steve	Lake Co. Ag. Dept.	Steveh@co.lake.ca.us	Oak
Hanson, Joel	SMBRC/F	jhanson@waterboards.ca.gov	LB
Horenstein, Julie	DFG	jhorenstein@dfg.ca.gov	Sac Oak LB
Jirik, Andrew	Port of Los Angeles	ajirik@portla.org	LB
Johnson, Doug	Cal-IPC	dwjohnson@cal-ipc.org	Oak
Karkanen, Kristie	Hanson Env./SWC	kkarkanen@hansonenv.com	Oak
Kolipinski, Dr. Mietek	National Park Service	Mietek-kolipinski@nps.gov	Oak
Liu, Marie	Senate Nat. Resources	Marie.liu@sen.ca.gov	Sac
Liu, Qinqin	DFG	qliu@dfg.ca.gov	Sac
Long, Dennis	MBSF	info@mbnmsf.org	Oak
Lynch, Michelle	SWRCB Clean Water Team	smlynch@waterboards.ca.gov	LB
Malamud-Roam, Karl	CCMVCD, AMCA	kmr@ccmvcd.net	Oak
Mannell, S.		sgarmanii@sbc.global.net	Oak

*Mtg. = meeting locations
Sac – Sacramento, August 28, 2006
Oak – Oakland, August 30, 2006
LB – Long Beach – September 1, 2006

2006 California Invasive Species Management Plan Public Meeting Participants

Name	Affiliation	Email	*Mtg.
McDowell, Karen	SFEP	kmcdowell@waterboards.ca.gov	Sac Oak LB
McLain, Susan	Stockton Sailing Club	manager@stocktonsc.org	Sac
Meyer, Clint	Michael Brandman Associates	cmeyer@brandman.com	Sac
Milton, Joe	Dept. of Fish & Game	jmilton@dfg.ca.gov	Sac
Magowan, Cathie	UC Office of the President	Cathie.magowan@ucop.edu	Oak
Noda, Gwen	UCLA	gwennoda@ucle.edu	LB
Noto, Dante	UC Office of the President	Dante.noto@ucop.edu	Oak
Rosales, Ava	CH2M Hill	Ava.rosales@ch2m.com	Oak
Roybal, Cathy	Contra Costa Dept. of Ag	croybal@ag.cccounty.us	Oak
Schnabel, Duane L.	CDFA	dschnabel@cdfa.ca.gov	Sac
Schon, Woody	Sac/Yolo Mosquito & Vector Control	wschon@fightthebite.net	Sac
Simpson, F.		fsimpson@rmc.ca.gov	LB
Sledge, Elaine	On behalf of Nat'l Paint & Coatings Assoc.		Sac
Smith, Larry	USACE		LB
Snyder, Barry	AMEC	Barry.snyder@amec.com	LB
Stephens, David	CA State Lands Commission		Oak
Stransky, Chris	Nautilus	chris@nautilusenvironmental.com	LB
Swanson, Lisa	Matson Navigation	lswanson@matson.com	Oak
Swauger, Troy	DFG	tswauger@dfg.ca.gov	Sac Oak
Sweeney, Caitlin	BCDC	caitlins@bcdc.ca.gov	Oak
Tamanaha, Miwa	SMBRC	mtamanaha@waterboards.ca.gov	LB
Tandoc, Tom	DOI OEPC	Tom.tandoc@gmail.com	Oak
Topel, Jack	SMBRC	jtopel@waterboards.ca.gov	LB
Torbett, Tim	USDA, APHIS	Timothy.J.Torbett@aphis.usda.gov	Oak
Tsuneyoshi, Roy	DBW	rtsuneyoshi@dbwq.ca.gov	Sac
Varghis, Jacob	USCG	Jacob.varghis@uscg.mil	LB
Veloz, MK	Northern California Marine Association	Ncma-gr@comcast.net	Oak
Verity, Rebecca	UC Office of the President	Rebecca.verity@ucop.edu	Sac
Vignolo, John	SJC Mosquito and Vector Control District		Sac
Young, Sara	USCG	Sara.e.young@uscg.mil	Oak

*Mtg. = meeting locations
Sac – Sacramento, August 28, 2006
Oak – Oakland, August 30, 2006
LB – Long Beach – September 1, 2006

2004 Draft Plan Process

The first draft of the AIS management plan included the valuable input of many dedicated individuals with expertise on a wide variety of topics relating to AIS in California and the region. Contributors ranged from local, state and federal agencies, to industry representatives, NGOs and other stakeholders.

Funding for the development of the first draft was provided by the DFG and USFWS. Susan Ellis, the Statewide Invasive Species Coordinator, developed a contract with the University of California, Davis, to develop an Aquatic Invasive Species Plan following the general outline provided by the Aquatic Nuisance Species Task Force. Ted Grosholz was the Principal Investigator for the contract. The deliverables for the contract included facilitated meetings to ensure that agency and stakeholder input was incorporated in the Plan.

In August of 2002, representatives of 14 agencies with a role in managing aquatic invasive species came together to participate in a State AIS Planning Workshop in Davis, CA. Results of that meeting included a draft set of goals and objectives for an AIS Plan and a brief summary of current AIS activities for some of the participating agencies. There was agreement that a state plan could help identify AIS of concern, and provide a framework for how to address AIS prevention, eradication, research, management and education and outreach in a more coordinated and comprehensive fashion.

Additional information for the plan was gathered from other state and federal plans, various websites, published papers, internal agency documents and through personal communication (phone and email).

The Plan's Review Committee (members listed below) commented on a first draft of the plan, which was then distributed to a broader group of Agency reviewers and for public review.

Review Committee for the 2004 Draft Plan

Lars Anderson, United States Department of Agriculture, Agricultural Research Service
Robert Leavitt, California Department of Food and Agriculture
Dale Steele, California Department of Fish and Game
Mark Sytsma, Portland State University
Erin Williams, United States Fish and Wildlife Service

Participation by Other Agencies and Groups

Courtney Albrecht, California Department of Food and Agriculture
Marcia Carlock, California Department of Boating and Waterways
Marina Carzola, California Coastal Commission
Jason Churchill, Lahontan Regional Water Quality Control Board
Nate Dechoretz, California Department of Food and Agriculture
Joseph DiTomaso, University of California, Davis
Maurya Falkner, California State Lands Commission
Connie Ford, State Water Resources Control Board
Joann Furse, California Sea Grant
Eric Gillies, California State Lands Commission
Bob Hoffman, National Marine Fisheries Service
Christina Johnson, California Sea Grant
Jaime Kooser, California Coastal Commission
Steve Lonhart, Monterey Bay National Marine Sanctuary
Karen McDowell, California Sea Grant
Cindy Messer, California Department of Water Resources
Julie Owen, California Department of Boating and Waterways
Bill Paznokas, California Department of Fish and Game
Stephen Phillips, Pacific States Marine Fisheries Commission
Carolyn Pizzo, U.S. Department of Agriculture

Jim Rains, California Department of Food and Agriculture
Steve Schoenig, California Department of Food and Agriculture
Jody Sears, California Department of Water Resources
Linda Sheehan, Pacific Regional Office, The Ocean Conservancy
Basia Trout, Bureau of Reclamation
Tanya Veldhuizen, California Department of Water Resources
Kim Webb, United States Fish and Wildlife Service
Katherine Zaremba, Invasive Spartina Project

2002-2003 Stakeholder Meeting Comments

Incorporating recommendations from a broad array of stakeholders contributes to a better and more responsive AIS plan for the State of California. In an effort to get input on concerns and perspectives regarding AIS during the plan's development, scoping meetings were held to get input from many organizations, businesses, industry representatives and individuals. A northern California stakeholder meeting was held in Sacramento on November 19, 2002. A southern California stakeholder meeting was held on March 20, 2003. Participants provided valuable comments, most of which have been incorporated into the management plan.

Northern California Stakeholder Comments

Invitations were sent to over 200 individuals and included representatives of many industries including the pet, aquarium, and nursery/landscaping trades, live bait and seafood dealers, and ports and marinas. The following individuals attended:

Drew Alden, Growers in Tomales Bay
John Berg, Pacific Merchant Shipping Association
Thomas Confal, IPM Specialist, Bitterroot Restoration, Inc.
John Cruger-Hansen, Harbor Master, City of Antioch
Daniel Garcia, Public Affairs, Marine Aquarists Roundtable of Sacramento
Jeff Hart, President, Habitat Assessment and Restoration Team, Inc.
James Kidder, President, Colombo Bait, Inc.
Karen McDowell, Project Coordinator, West Coast Ballast Outreach Project
James Mills, Vice President and Regional Manager, Westree Marinas
Fleur O'Neill, Policy Education Coordinator, Save Our Shores
John O'Sullivan, Curator of Field Operations, Monterey Bay Aquarium
Roger Phillips, Applied Research Manager, Monterey Bay Aquarium
Kirsten Upson, The Nature Conservancy
M.K. Veloz, Administrative Director, Northern California Marine Association

Mike Fraidenburg of Dynamic Solutions Group of Olympia, Washington facilitated the meeting. Susan Ellis (State Invasive Species Coordinator) explained the different roles and responsibilities of state agencies and current management activities for aquatic invasive species in California. Ted Grosholz (UCD) and Holly Crosson (UCD) discussed the process for the plan's development including future stakeholder and agency meetings as well as the current status of the plan. Mark Sytsma (Portland State University, Portland, Oregon) discussed Oregon's experience with writing a state management plan for aquatic invasive species as well as the uses and limits of state plans. The rest of the meeting was spent listening to concerns and suggestions presented by the stakeholders. Most of the comments could be divided into the categories of Education, Prevention, Best Management Practices, Regulation, State Invasive Species Council and General AIS Management Plan development suggestions.

EDUCATION

- Education about AIS should be a top priority.
- Educational tools should be used instead of legislation and regulations.
- A list of AIS experts should be made available to stakeholders.

- AIS information should be available at all bait shops, marinas, boat access areas, etc.
- It may take 20 years, but *all* of the public needs to be educated about AIS (example used was educational programs for dealing with issues such as recycling, littering, etc.).
- The public needs to know why they should care about AIS (i.e., the consequences of invasions).
- The public as well as industry needs to know the economic cost of AIS (cost/benefit analysis).
- Stakeholders are a resource and can help with education, such as public service announcements.
- Multiply educational efforts by identifying what industry sectors can do to help with AIS education and outreach (i.e., using Wal-Mart, Home Depot, PetSmart etc. to educate their customers about AIS).
- A database is needed that focuses on providing information about AIS outreach, education and research-based grants. Information on who is doing what on AIS should also be available and include efforts by NGO's, universities and industry.
- AIS hazards that exist in particular areas need to be identified and publicized before they spread.
- Cross-education between interest groups and government would help understanding of the issues and concerns for both groups.
- Education in the K-12 classroom is important; biologists should go into schools to talk about AIS.
- Aqua-culturists need current information to help avoid AIS introduction problems of the past.
- There should be guidelines developed to help groups "self-police" and educate their constituents.
- Coordination needs to be improved between state, regional and federal groups.
- Identify all educational and technical resources currently available and make them easily accessible.
- Identify where the information gaps are.

PREVENTION (including Early Detection and Rapid Response)

- A Rapid Response program requires extensive coordination but is critical.
- An AIS "hotline" is needed so new sightings can be reported immediately.
- Management of introduction pathways is important for AIS prevention.
- We should have the ethic of not transporting California's AIS elsewhere; include this in the plan.
- The largest percentage of funds should be spent on prevention since it is the most cost-effective.
- Early detection is key to successful AIS eradication and management.
- Each vector/pathway that is identified in the plan should have a lead agency listed as well as a stakeholder group.
- Look into whether funds from anti-terrorism sources could be tapped into (i.e. to address the intentional introduction of a devastating foreign, water-borne organism).

BEST MANAGEMENT PRACTICES (BMPs)

- Each industry should be actively involved in the development of the BMPs that relate to them.
- BMPs can be a tool for industry to understand and meet their obligations.
- Consider using a neutral third party or group (scientific panel) to offer advice and develop recommendations for BMPs instead of leaving development to agencies or industry alone.
- Investigate how "management" of a landscape (or lack thereof) affects the likelihood of invasion.

REGULATION

- The public and industry need to have an understanding of AIS laws and their history before they go into effect.
- We need more education and outreach on laws already passed so the public can abide by them.
- AIS laws and penalties need to be publicized in the DFG regulations right up front.
- Regulatory agencies need to "get on the same page"; inconsistencies confuse the public.
- There should be more opportunity for stakeholder input when new regulations are being written, especially when livelihoods are at stake (*Caulerpa* in southern California was example used).
- A patchwork of regulations makes coordination between state, regional and federal levels difficult.

- Inter-jurisdictional coordination needs improvement to make compliance easier.
- Guidelines need to be developed for meeting NPDES permit requirements.
- A process needs to be developed to authorize within-state transfer of approved live aquatic species.
- Laws, regulations and permits need to be more clear, consistent and effective.
- Enforcement needs to be more vigilant and consistent.
- Stakeholder input should be solicited when permitting procedures are being written.
- New legislation should be written with the help of stakeholders (ballast water example was used).
- Methods for complying with aquaculture regulations need to be clearer.
- Some stakeholders feel like they are working in a vacuum; they need guidelines to help them determine if the right thing is being done.
- Develop a mechanism for mandatory reporting of listed AIS.
- Make sure regulations that affect industry are feasible (shipping example was used).
- Use existing Department of Boating and Waterways (DBW) laws to make AIS introductions illegal.
- Create a single, central clearing house for information on all AIS laws and regulations.

STATE AQUATIC INVASIVE SPECIES COUNCIL (ISC)

- The ISC needs to have broader public representation; consider expanding it to include more stakeholder groups.
- Each industry should decide who will represent them on the ISC.
- The number of industry representatives should be equal to or higher than the number of government representatives on the ISC.
- DBW should not represent all boating interests on the ISC.

GENERAL AIS MANAGEMENT PLAN DEVELOPMENT

- Make the plan short and simple.
- Funding priorities in the plan should be delineated by the ISC or another representative group.
- Work together; don't have government on one side and resource users on the other.
- Stakeholders are interested in practical solutions.
- Use common names in addition to scientific names for AIS to make the plan more user-friendly.
- Limit use of acronyms or fully explain them.
- Prioritization of species within the plan is necessary.
- Develop a system to prioritize aquatic invasive species using the ISC or another representative group.
- Use assigned "Management Classes" as Oregon did rather than prioritizing species.
- Consider using DFA's ABC List of Noxious Weeds as a model.
- Develop a process to determine which method gets used to control or eradicate a species.
- Limit administrative overhead.
- Develop a process to resolve disputes.
- Make sure all groups are represented (include tribes, irrigation districts, bass anglers, boaters, etc.).
- The planning effort should take into account the target species as well as the environment.
- There is a concern that some may try to sidetrack the plan or use the plan to push their own agenda.
- Consider using AIS instead of ANS (the word "invasive" is perhaps better than "nuisance").
- Write into the plan that state and federal agencies coordinate through formal written agreements.
- High profile species should not take over concern for lesser-known problem species.
- Support for current AIS programs should be continued.
- Make sure limited resources go to on-the ground projects rather than getting lost in the bureaucracy.

Southern California Stakeholder Comments

Invitations were sent to over 450 individuals and included representatives of local water agencies and irrigation districts, tribes, various industries including the pet, aquarium, aquaculture and nursery/landscaping trades, live bait and seafood dealers, ports, marinas and shippers, and others with an interest in aquatic invasive species. The following individuals attended:

Douglas Ball, Los Angeles Department of Water and Power
Mark Baumann, Live Cargo Reptile and Fish/ San Diego Fish Society
Paul Brown, Project Analyst, Port of San Diego
Thomas Buckowski, Lake Biologist, Lake Mission Viejo Association
Larry Chapp, Vice President, Divisional Merchandise Manager, PETCO
Hugh Cobb, Pacific Coast Bait and Tackle
Tom Gass, Manager, El Pescado Caliente
Chris Graham, Lake Biologist, Lake Mission Viejo Association
Miguel Hernandez, Watermaster, Natural Resources Office, Pauma Band of Mission Indians
Annaliese Hettinger, The Diving Locker
Steve Lonhart, Monterey Bay National Marine Sanctuary
Marshall Meyers, Executive Vice President, Pet Industry Joint Advisory Council
Craig Parsons, Live Fish, Reptile, Bird and Small Animal Buyer, PETCO
Russell Moll, Director, California Sea Grant/ Scripps Institute of Oceanography (SIO)
Anandra Ranasinghe, Southern California Coastal Water Research Project
Freda Reid, San Dieguito Lagoon Committee and Research Associate (SIO)
Andi Shluker, The Nature Conservancy of Hawaii
Ed Smith, General Manager, Palo Verde Irrigation District

Mike Fraidenburg of Dynamic Solutions Group (DSG) of Olympia, Washington facilitated the meeting. Ted Grosholz (UCD) discussed the ecological and economic costs of aquatic invasive species and introduced the goals and purpose of the meeting. Susan Ellis (State Invasive Species Coordinator) explained the different roles and responsibilities of state agencies and current management activities for aquatic invasive species in California, and provided an update on the formation of the California Aquatic Invasive Species Council. Mark Sytsma (Portland State University, Portland, Oregon) discussed Oregon's experience with writing a state management plan for aquatic invasive species as well as the uses and limits of state plans. Holly Crosson (UCD) discussed the process for the California plan's development and progress on the plan thus far. The rest of the meeting was spent discussing concerns and suggestions presented by the stakeholders. Most of the comments could be divided into the categories of Education, Prevention, Best Management Practices, Regulation and General AIS Management Plan development. Below is a summary of specific comments made under each of these categories.

EDUCATION

- A comprehensive strategy for AIS Education and Outreach should be developed.
- Education should be used instead of new legislation and regulation.
- More AIS information needs to reach the public, retail stores, industry, schools, etc.
- Prioritize educational efforts based on risk associated with a given pathway.
- Piggyback onto current Agency educational programs.
- Consider "green labeling" to help consumers make the right choice; peer pressure will encourage appropriate behavior/decisions of others.
- Educational efforts need to take into account the multi-cultural nature of CA (signs, etc. need to be published in other appropriate languages besides English).
- Marketing experts should be used to get a single, common AIS message out across the region.
- The AIS message has to touch people personally (an impact on the quality of life or the pocketbook).
- Educational materials should be tailored to specific industry sectors (aquaculture, boaters, bait shops, pet/aquarium retailers, etc.).

- The public as well as industry needs to know the economic cost of AIS (pay now or pay more later).
- Stakeholders are a resource and can help with educational efforts (i.e., using Recreational Fisherman's Alliance, American Sportfishing Association, Diving or Tropical Fish Clubs, etc.).
- Multiply educational efforts by identifying what industry sectors can do to help with AIS education and outreach; partner with pet/aquarium and other industries.
- Develop better ways to get the AIS message out, for instance, don't just have a booth at trade shows but work directly with promoters of shows (example – Fred Hall Show).
- Publish articles in Western Outdoor News and similar magazines.
- Train people to use the AIS "Traveling Trunk" and have them take it "on the road".
- A comprehensive AIS species list should be developed and publicized with appropriate contacts listed for experts associated with each species.
- There should be guidelines developed to help groups "self-regulate" and educate their constituents.

PREVENTION (including Early Detection and Rapid Response)

- An AIS Prevention Program is key to success but is not foolproof.
- AIS Screening and Risk Assessment Programs should not be overly simplistic or arbitrary. They need to be based on the best available information and sound science.
- Volunteers can be an important piece in monitoring efforts for early detection of AIS.
- Training volunteers takes a lot of organization and keeping them motivated over the long term can be challenging
- Interaction with Watershed Councils is important.
- An AIS "hotline" is needed so new sightings can be reported immediately.
- Determine the economic consequences of pathway prevention.
- Look into funds available through "homeland security".

BEST MANAGEMENT PRACTICES (BMPs)

- Develop guidelines for acceptable, humane and environmentally safe ways to deal with unwanted aquatic organisms (whether it be proper disposal, returning the organism to the retailer, or being "adopted" by someone else).
- Industry and individuals need to accept a degree of economic liability and responsibility for their actions regarding AIS introduction and spread.
- Create industry standards to regulate and penalize the bad actors.
- Each industry should be actively involved in the development of their own BMP's. Weak industry initiative yields weak BMPs.
- Industry documentation is needed to support accountability.
- Determine if BMPs should be regulatory.
- Develop BMPs for Bass Tournaments.
- BMPs need to maintain some flexibility and an acknowledgement that "one size does not fit all".
- BMPs can help achieve buy-in, create institutional memory, give an outsider a way to monitor activities and are already an accepted process in industry (similar to ISO example).

REGULATION

- Enforce the laws and regulations we already have, rather than pass new ones.
- Provide positive incentives to encourage self-regulation.
- Provide better information about what AIS laws are currently in place and how to comply with them.
- A few bad apples are causing regulatory problems for all involved.
- Determine more effective ways to catch violators of current laws, including interstate transport.
- Improve current regulations. Piranhas and snakeheads were used as examples of species that are regulated but still are imported and released. We should learn from these experiences and attempt to prevent similar situations.

GENERAL AIS MANAGEMENT PLAN DEVELOPMENT

- Coordinate with the National Marine Sanctuaries on Plan development.
- Work with California Sea Grant to achieve success in plan implementation, especially with education and outreach strategies and actions.
- Be creative with funding and partnerships.
- Leverage resources by doubling up on surveys, inspections, etc. that are already being done.
- Continually evaluate and update the plan and make sure the plan's goals are being realized (develop a scorecard).
- Make sure the functioning of the California Aquatic Invasive Species Council is evaluated so it does not outlive its useful purpose. If changes are needed to make the council more effective, they should be able to be promoted through other agencies and the general public.
- Take steps to minimize the loss of dollars through overhead.
- Do not set the stage for failure by creating a timeline that cannot be met.
- Involve economists if possible (can a dollar figure be put on habitat/resources?).
- Make it clear who will determine priorities in the plan and what gets funded.
- Incorporate Watershed Councils in the planning effort.
- Make the relationship between the plan and AIS policy clear.
- Determine how plan implementers will interact with on-the-ground managers.
- Write the plan so that it facilitates funding for implementation. The plan should be user-friendly.
- Plans should promote accountability so that managers have an incentive to perform and meet commitments.

APPENDIX F: EXECUTIVE SUMMARY OF *BIOLOGICAL INVASIONS: RECOMMENDATIONS FOR U.S. POLICY AND MANAGEMENT*

Position Paper of the Ecological Society of America

Biological Invasions: Recommendations for U.S. Policy and Management

David M. Lodge, Susan L. Williams, Hugh MacIsaac, Keith Hayes, Brian Leung, Sarah Reichard, Richard N. Mack, Peter B. Moyle, Maggie Smith, David A. Andow, James T. Carlton and Anthony McMichael, 2006

Executive Summary

The spread of nonindigenous (non-native) species introduced into the United States is a significant and growing national problem, costing taxpayers hundreds of billions of dollars in environmental degradation, lost agricultural productivity, increased health problems and expensive prevention and eradication efforts. Some nonindigenous species are introduced intentionally and are highly valued by humans, e.g., agriculture, aquaculture, and ornamental species. Many other species are introduced as by-products of human activity, especially through the increasing global transportation of humans and commercial goods. A subset of introduced species spread widely, become abundant and cause harm. The definition of "harm" is a function of human values, which often differ in different regions and may change temporally. Nevertheless, harm is often unambiguous and the species from elsewhere that causes harm are referred to as invasive nonindigenous species. They are the focus of policy and management concern because of their serious and complex contributions to diseases of plants, animals and humans; reductions in native species; changes in ecosystem function; and financial losses.

Well known examples of invasive nonindigenous species include the vine kudzu (*Pueraria lobata*) in the southeastern U.S., cheat grass (*Bromus tectorum*) in the western U.S., and zebra mussel (*Dreissena polymorpha*) in the central U.S. More recent arrivals with large net negative impacts on the environment, agriculture, forestry, industry and human health include West Nile virus, the seaweed *Caulerpa* (*Caulerpa taxifolia*), Asian long-horn beetle (*Anoplophora glabripennis*), emerald ash borer beetle (*Agrilus planipennis*), sudden oak death (*Phytophthora ramorum*), monkeypox virus, and the SARS virus. Without management, the populations of these species grow and spread such that damages accelerate over time. In contrast to many other forms of pollution, such widespread invasions become irreversible because the technology often does not exist to selectively eradicate species. Relative to the economic and ecological costs of other forms of environmental pollution, the costs of nonindigenous species are therefore of particular concern because they are likely to be borne over very long time frames.

Despite the great diversity of invasive species and their impacts, an identified group of pathways transport species, and a common set of biological processes – introduction, establishment, spread, and impact – operate in all invasions. Policy and management solutions become clearer when these common pathways and processes are recognized. Nevertheless the possible management responses diminish as any invasion progresses. Prevention is possible only before a species arrives or at the point of entry. Thereafter, a narrow window of opportunity for eradication exists before some species spread so widely that it is impossible or infeasible to locate and kill all populations. Once a species is too widespread for eradication, only three management options remain: controlling populations in selected locations; active mitigation of impacts; or simply bearing the cost of the changes caused by the invader. U.S. policy, often by default, has largely adopted the last option, i.e., acceptance of often irreversible environmental and economic damage.

The only study to attempt a nationwide estimate of the economic costs to the U.S. of nonindigenous species concluded that annual costs exceed $120 billion (Pimentel et al. 2005), which

we regard as an underestimate because the majority of invasive species were not included in the study. Even this underestimate equates to costs of $1,100 per U.S. household per year, costs that will continue to grow unless prevention and management of invasive species improves. Yet, the U.S. has allowed invasions to continue and damages to increase.

A more cost-effective approach would include greater investments in prevention and other active management steps, including early detection, eradication and control. Recent scientific advances in our understanding of biological invasions make it clear that more effective options exist for these threats. Here, on behalf of the Ecological Society of America, we make six recommendations for government action that, if implemented, would substantially reduce the current and future damages to the U.S. from invasive species. We include proposals for cost-effective government actions that will address these problems with the understanding that other measures are important to complement governmental responses. Key challenges that require urgent government action include prevention, detection, eradication and control of harmful non-native species, and the coordination of these efforts at the state, federal and international levels. Table 1 summarizes the major recommendations, data and techniques for implementation, and proposed lead organizations.

Prevention

Recommendation 1. Use a combination of existing and new technologies, education strategies, industry codes of conduct, and government oversight to prevent introductions from pathways that already are well known to be major sources of nonindigenous species, and to monitor other pathways into the United States to better assess the degree of risk they pose.

Recommendation 2. Screen live organisms proposed for importation into the U.S. for environmental, economic and human health risk before a decision is made to allow entry. Risk analysis tools should be repeatable, transparent, supported by current scientific findings and applied to all pathways, across all agency jurisdictions.

Early Detection, Eradication and Control

Recommendation 3. Use new technology to improve active surveillance of invasive species to increase the success of rapid response and eradication efforts, in cooperation with existing web-based information networks in universities, herbaria, museums and state agencies.

Recommendation 4. Make legal authority and emergency funding available for eradication and control to proceed rapidly once a newly established potentially invasive species is detected. Current legal mechanisms and funding for responses to agricultural pests and parasites, and to human pathogens, should be extended to all potentially invasive species in all habitats, and employed commensurate with the threat.

Recommendation 5. Provide on-going funding and incentives for slowing the spread of established invasive species on public and private lands, in cooperation with the states and tribal governing bodies.

Establishing a National Center for Invasive Species Management

Recommendation 6. Expand existing authority of the National Invasive Species Council (NISC), including the establishment of a National Center for Invasive Species Management under NISC, to better coordinate policies among government agencies and with other countries. Current U.S. examples of intergovernmental cooperation include the National Interagency Fire Center and the Center for Disease Control and Prevention. Unless these or conceptually similar recommendations are adopted, the rate of damages to our environment, economy and health caused by invasive species will accelerate. These damages are spread across many stakeholders, and no strong, nationwide group has emerged to encourage industries that are pathways of introduction to reduce the threat. Hence the federal government must assume greater leadership to coordinate efforts by all

levels of government. We recognize that the problem is complex and interdisciplinary, includes many pathways, a tremendous diversity of organisms that are invasive, and the vulnerability of all terrestrial, marine and freshwater ecosystems. Despite this complexity, and the consequent overlapping and sometimes conflicting state, federal and international policies involved, the six recommendations described in this paper provide sound guidance for the future. Recent scientific and interdisciplinary advances provide a strong basis for rapid implementation of these cost-effective solutions.

APPENDIX G: LIST OF REGULATED SPECIES IN CALIFORNIA

Aquatic invasive species are regulated by a number of state and federal regulations. The aquatic plant and animal species restricted in California, and the regulations that apply to each, are listed below.

ANIMALS

In California, the animal species considered detrimental to native wildlife, state agriculture or public health and safety are listed in California Administrative Code Title 14, Section 671. Importation, transportation and possession of the restricted animals on this list are unlawful except under permit issued by the California Department of Fish and Game. Animal species restricted by the federal government are considered "injurious wildlife" and named in the Lacey Act (50 CFR 16.11-16.15). The U.S. Fish and Wildlife Service has responsibility for regulating the live importation or shipment of these animals.

California's list of Restricted Animals
http://www.dfg.ca.gov/licensing/pdffiles/fg1518.pdf
Click on the following link: "Search for a Specific Regulatory Section"
Title: 14
Section: 671

Injurious Wildlife Species List (PDF)
U.S. Fish and Wildlife Service
http://www.invasivespeciesinfo.gov/laws/main.shtml

PLANTS

Certain aquatic invasive plants are listed as Noxious Weed Species in Title 3, Section 4500 of the California Administrative Code. Their eradication, control, and containment are regulated by the California Department of Food and Agriculture (DFA). Each species has been given a "pest rating" based on the economic risks it poses to the state. In addition, Division 3, Chapter 3.5, Section 2300 of the California Fish and Game Code restricts all species of the marine alga genus *Caulerpa*. Federally restricted invasive plants are listed in Noxious Weed Act P.L. 93-629.

CDFA Weed List
http://www.cdfa.ca.gov/phpps/ipc/encycloweedia/pdfs/noxiousweed_ratings.pdf

Federal Noxious Weed List (PDF)
http://www.aphis.usda.gov/ppq/weeds/weedlist2006.pdf

Appendix G
State and/or Federal Regulated Aquatic Invasive Animals

Scientific Name	Common Name	Group	Habitat	Regulated By
Mustelidae (Family)	All species except *Amblonyx cinerea*, Oriental small-clawed otter, *Aonyx capensis,* African clawless otter*, Pteronura brasiliensis,* giant otter and all species of genus *Lutra,* river otters.	Mammals	F	CA
Amiidae (Family)	bowfins	Fish	F	CA
Anguilla (Genus)	freshwater eels	Fish	F	CA
Aplodinotus grunniens (Species)	freshwater drum	Fish	F	CA
Astyanax fasciatus (Species)	banded tetra	Fish	F/B	CA
Belonesox belizanus (Species)	pike killifish	Fish	F	CA
Carcharhinus (Genus)	freshwater sharks	Fish	F	CA
Cetopsidae (Family)	whalelike catfishes	Fish	F	CA
Channidae (Family)	snakeheads	Fish	F	CA, US
Clariidae (Family)	labyrinth catfishes	Fish	F	CA*,US
Ctenopharyngodon idella (Species)	grass carp (permits may be issued for possession of triploid grass carp)	Fish	F	CA
Cyprinodon variegatus (Species)	sheepshead minnow	Fish	F/B	CA
Dorosoma cepedianum (Species)	gizzard shad	Fish	F	CA
Esocidae (Family)	pikes	Fish	F	CA
Heteropneustidae (Family)	airsac catfishes	Fish	F	CA
Hoplias malabaricus (Species)	tiger fish	Fish	F/B	CA
Hypophthalmichthys molitrix (Species)	silver carp	Fish	F	CA
Hypophthalmichthys nobilis (Species)	bighead carp	Fish	F	CA
Ictiobus (Genus)	buffalo suckers	Fish	F/M	CA
Lepisosteidae (Family)	gars	Fish	F	CA
Leuciscus idus (Species)	Ide	Fish	F	CA
Morone americana (Species)	white perch	Fish	F	CA
Morone chrysops (Species)	white bass	Fish	F	CA
Perca flavescens (Species)	yellow perch	Fish	F	CA
Potamotrygonidae (Family)	river stingrays	Fish	F/M	CA
Petromyzontidae (Family)	lampreys - all nonnative species	Fish	F/M	CA
Salmo salar (Species)	Atlantic salmon - restricted in the Smith River watershed	Fish	F/M	CA

* Only members of the Clarias, Dinotopterus, and Heterobranchus genera are prohibited by Title 14 section 671

Key

B	Brackish	CA	CDFG Restricted Species, Title 14, Section 671
F	Freshwater	US	USFW Lacey Act 50 CFR 16.11-16.15
M	Marine		

Appendix G
State and/or Federal Regulated Aquatic Invasive Animals

Scientific Name	Common Name	Group	Habitat	Regulated By
Salmonidae (Family)	live or dead uneviscerated salmonid fish, live fertilized eggs, or gametes of salmonids are prohibited unless accompanied by a certification that the ensures they are free of *Onocorhynchus masou* virus and the viruses causing viral hemorrhagic septicemia and infectious hematopoietic necrosis, and meet the conditions in 50 CFR 16.13	Fish	F/M	US
Serrasalmus (Genus)	piranhas (including genera Pygocentrus and Pygopristis, and invalid genera Serrasalmo, Taddyella, Rooseveltiella)	Fish	F	CA
Stizostedion vitreum (Species)	walleye	Fish	F	CA
Tilapia aurea (Species)	blue tilapia	Fish	F/M/B	CA
Tilapia nilotica (Species)	Nile tilapia	Fish	F/M/B	CA
Tilapia sparrmani (Species)	banded tilapia	Fish	F/M/B	CA
Tilapia zillii (Species)	redbelly tilapia (permits may be issued to a person or agency for importation, transportation, or possession in the counties of San Bernardino, Los Angeles, Orange, Riverside, San Diego, and Imperial)	Fish	F/M/B	CA
Trichomycteridae (Family)	parasitic catfishes	Fish	F	CA
Ambystoma (Genus)	tiger salamanders	Amphibian	F	CA
Bufonidae (Family)	toads (including *Bufo marinus,* cane toad, giant toad or marine toad; and invalid species, *Bufo paracnemis,* Cururu toad, and *Bufo horribilis,* other large toads from Mexico and Central and South America)	Amphibian	F/M	CA
Xenopus (Genus)	clawed frog	Amphibian	F	CA
Crocodilia (Order)	crocodiles, caimans, alligators and gavials	Reptile	F/M	CA
Chelydridae (Family)	snapping turtles	Reptile	F	CA
Cambaridae (Family)	crayfish - all species except *Procambarus clarkii* and *Orconectes virilis*	Invertebrate	F/M	CA
Eriocheir (Genus)	crabs	Invertebrate	F/M	CA, US
Dreissena (Genus)	zebra and quagga mussels	Invertebrate	F	CA, US **
Potamopyrgus antipodarum (Species)	New Zealand mudsnail	Invertebrate	M	CA
Transgenic Aquatic Animals	Freshwater and marine fishes, invertebrates, crustaceans, mollusks, amphibians and reptiles		F/M	CA

** Only the species Dreissena polymorpha is prohibited by the Lacey Act

Key

B	Brackish	CA	CDFG Restricted Species, Title 14, Section 671
F	Freshwater	US	USFW Lacey Act 50 CFR 16.11-16.15
M	Marine		

Appendix G
State and/or Federal Regulated Aquatic Invasive Animals

Scientific Name	Common Name	Habitat	Applicable Regulations/Pest Rating
Alternanthera philoxeroides	alligatorweed	F	A
Arundo donax	giant reed	W/U/R	B
Azolla pinnata	mosquito fern, water velvet	F	US
Cabomba caroliniana	fanwort	F	Q
Caulerpa taxifolia	Caulerpa	M	US, DFG
Caulerpa cupressoides	Caulerpa	M	DFG
Caulerpa mexicana	Caulerpa	M	DFG
Caulerpa sertulariodes	Caulerpa	M	DFG
Caulerpa floridana	Caulerpa	M	DFG
Caulerpa ashmeadii	Caulerpa	M	DFG
Caulerpa racemosa	Caulerpa	M	DFG
Caulerpa verticillata	Caulerpa	M	DFG
Caulerpa scapelliformis	Caulerpa	M	DFG
Eichhornia azurea	anchored water hyacinth	F	US
Hydrilla verticillata	hydrilla	F	US, A
Hygrophila polysperma	Miramar weed	F	US
Ipomoea aquatica	Chinese water spinach	F	US
Lagarosiphon major	oxygen weed	F	US
Limnobium spongia	spongeplant	F	Q
Limnophila indica	ambulia	F	Q
Limnophila sessiliflora	ambulia	F	US, Q
Lythrum salicaria	purple loosestrife	W/U	B
Melaleuca quinquenervia	broadleaf paper-bark tree	W	US
Monochoria hastata	monochoria	F	US
Monochoria vaginalis	heartshape false pickerelweed	F	US
Nymphaea mexicana	banana water lily	F	B
Ottelia alismoides	duck lettuce	F	US
Pistia stratiotes	water lettuce	F	B
Polygonum amphibium	swamp smartweed	F	C
Polygonum cuspidatum	Japanese knotweed	W/U/R	B
Sagittaria sagittifolia	arrowhead	F	US
Salvinia auriculata	salvinia	F	US, A
Salvinia biloba	salvinia	F	US, A*
Salvinia herzogii	herzog salvinia	F	US, A*
Salvinia molesta	giant salvinia	F	US, A*
Sparganium erectum	exotic bur-reed	F	US
Tamarix chinensis	Chinese tamarisk	U/R	B
Tamarix gallica	French tamarisk	U/R	B
Tamarix parviflora	smallflower tamarisk	U/R	B
Tamarix ramosissima	salt cedar	U/R	B

*DFA considers these species a synonym of Salvinia auriculata

Appendix G
State and/or Federal Regulated Aquatic Invasive Animals

Key for State and/or Federally Regulated Aquatic Invasive Plants

DFG	Regulated by CDFG Division 3, Chapter 3.5, Section 2300
F	Freshwater
M	Marine
R	Riparian
SM	Saltmarsh
U	Upland
US	**Regulated by the Federal Noxious Weed Act, P.L. 93-629.** For more details, see the discussion of the Noxious Weed Act in the subsection titled "Other Federal Authorities" in Appendix B of the California Aquatic Invasive Species Management Plan..
W	Wetland

Noxious Weed Ratings per California Department of Food and Agriculture Plant Industry Policy Letter 89-2, May 1, 1989. http://www.cdfa.ca.gov/cdfa/pendingregs/docs/PlantPestRatings.pdf

A	An organism of known economic importance subject to enforced action involving eradication, containment, rejection, or other holding action at the state-county level. Quarantine interceptions to be rejected or treated at any point in the state.
B	An organism of known economic importance subject to eradication, containment, control or other holding action at the discretion of the commissioner. OR an organism of known economic importance subject to state holding action and eradication only when found in a nursery.
C	An organism subject to state endorsed holding action and eradication only when found in a nursery; action to retard spread outside of nurseries at the discretion of the commissioner; reject only when found in a cropseed for planting or at the discretion of the commissioner.
Q	An organism requiring a temporary "A" action pending determination of a permanent rating. It is suspected to be of economic importance, but its status is uncertain because of incomplete identification or inadequate information.
D	Organisms determined to be of little or no economic importance