Proposed New Invasive Species Recommendation for the California Fish and Wildlife Strategic Vision Project

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This information is being submitted at the request of California Fish and Wildlife Strategic Vision (CFWSV) Stakeholder Advisory Group (SAG) members who participated in the March 8, 2012 CFWSV Statutes and Regulations Workshop.

Potential Statutes and Regulations Recommendation: Add to the California Fish & Game code or the California Public Resources code a definition of "invasive species" and provide explicit enabling authority to protect the state's natural resources from invasive species.

Description: The Department of Food & Agriculture has authority to address invasive species, focusing primarily on species that impact agriculture. The California Natural Resources Agency should likewise have explicit authority to address invasive species that impact natural resources. In particular, the California Department of Fish and Game (DFG) should have enabling authority (not mandating) to address invasive species that impact California's fish, wildlife and plants, the habitats on which they depend, our enjoyment of these natural resources and the economic benefit to communities from recreation and tourism. Without this authority, important invasive species control will not be completed.

Additional program efforts depend on available funding. Sources for such funding in some cases could come from fees charged to beneficiaries or to those whose activities have risk of spreading invasive species. For instance, DFG's current work to prevent the spread of dreissenid mussels is funded by boater fees since recreational boating is the primary vector for spreading these invasive mussels. A recent consultant study conducted for DFG identified multiple fee sources for funding an emergency response fund for aquatic invasive species (see excerpts attached).

Implementation actions include:

- Develop a legal definition of "invasive species" based on existing federal and state definitions.
- Add this definition to the California Fish and Game code or California Public Resources Code with basic enabling authority for DFG to manage invasive species as funding allows.
- Report on potential beneficiaries and risky actors for categories of invasive species and potential mechanisms for assessing fees as appropriate to support management programs to address these invasive species.

Ties to Strategic Vision: Goal 2 (Highly Valued Programs and Quality Services), Objectives 1 (Protect, manage, enhance and restore wildlife resources) and Objective 2 (Help achieve and maintain healthy ecosystems).

Background Information: Invasive species are widely acknowledged to have a major impact on natural resources. DFG's Natural Diversity Database recognizes close to 700 special status species that are impacted by invasive species. In addition to wildlife, invasive species impact water resources, fire management, parks and recreation. The Secretary of Natural Resources Agency worked with the Secretary of Food & Agriculture and other state agency executives to create the interagency Invasive Species Council of California (ISCC). The ISCC has produced the Strategic Framework for Protecting California from Invasive Species.

Final Report

California Aquatic Invasive Species Rapid Response Fund

An Economic Evaluation

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Acronyms

AIS	Aquatic Invasive Species
AISMP	Aquatic Invasive Species Management Plan
AISWG	Aquatic Invasive Species Working Group
BOE	California Board of Equalization
CAAIST	California Agencies Aquatic Invasive Species Team
CAISMP	California Aquatic Invasive Species Management Plan
CDFA	California Department of Food and Agriculture
CDFG	California Department of Fish and Game
CVP	Central Valley Project
DBW	California Department of Boating and Waterways
DMV	California Department of Motor Vehicles
ISCC	Invasive Species Council of California
MDEP	Maine Department of Environmental Protection
MDIFW	Maine Department of Inland Fisheries and Wildlife
MISP	Marine Invasive Species Program
NISC	National Invasive Species Council
OISC	Oregon Invasive Species Council
RRF	Rapid Response Fund
RRP	Rapid Response Plan
SCC	California State Coastal Conservancy

SLC	California State Lands Commission
SWP	California State Water Project
SWRCB	California State Water Resources Control Board
TEU	twenty-foot equivalent unit
VLF	vehicle license fee
WDFW	Washington Department of Fish and Wildlife
WDOA	Washington Department of Agriculture
WDOE	Washington Department of Ecology
WSANS	Washington State Aquatic Nuisance Species Committee

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Executive Summary

This study addresses the economic and institutional aspects of establishing a rapid response fund (RRF) for aquatic invasive species (AIS) in California. It addresses potential sources of funding, the level of funding required, economic benefits, institutional arrangements, and funding criteria.

AIS are an increasingly-serious problem in California as well as in other states and countries. They cause widespread economic damages to fisheries, maritime infrastructure, recreational venues and equipment, water supply systems, and other resources and infrastructure. Non-market impacts—such as impacts on biodiversity and habitats, changes in ecosystem dynamics, and impairment of our ability to manage ecosystems—are also extensive but historically under-estimated because of their non-monetary nature. Efforts to eradicate and control aquatic invasive species in the U.S. have been estimated at up to $9 billion per year.[1]

Rapid response plans have been proposed or developed in several states and for some multi-state or multinational regions. CDFG's Aquatic Invasive Species Management Plan includes a draft rapid response plan, whose goal is to identify steps to minimize AIS' adverse impacts, including actions to eradicate or contain or slow their spread. Though several California agencies already address some AIS concerns or coordinate on specific projects, the plan provides a more comprehensive statewide approach.

As used in this study, rapid response is a functional rather than a temporal concept. The focus is on whether there is a realistic potential for eradication or long-term containment of an AIS rather than on how quickly or how soon after discovery a response is implemented. Eradication or containment of an AIS is much more difficult, and in many cases may be impossible, after it has become established and spread. Early eradication offers the potential for avoiding widespread impacts and/or much higher eradication or control costs in the future. Examples of impacts from AIS that could be avoided include increased operations and maintenance costs for water distribution systems and industrial cooling systems; increased maintenance costs for boats, marina facilities, navigational equipment and other infrastructure; reduced water supplies; greater water treatment costs; and reduced commercial and recreational fishing. Property values can also be affected. Non-market economic impacts of AIS can be substantial, including changes in biodiversity, habitats or food webs; reduced water quality; and reduced recreational, cultural, aesthetic, scientific or educational values.

Numerous factors affect the annual demand for rapid response funding, including the rate of invasion, the fraction of invasions for which response is perceived to be useful or desirable, and the cost of response including eradication efforts. Expenditures per AIS eradication in California have ranged from the thousands to the tens of millions. Based on the historical costs of AIS

[1] Pimentel, David. 2003. Economic and Ecological Costs Associated with Aquatic Invasive Species, pp. 3-5, in K Wakefield and A Faulds (eds.) *Proceedings of the Aquatic Invaders of the Delaware Estuary Symposium*, Malvern, Pennsylvania, May 20, 2003. Cited in California Department of Fish and Game. 2008. Aquatic Invasive Species Management Plan. Sacramento.

eradication efforts in California and the frequency of such attempts, we recommend an initial fund size of $1 - 2 million. The ongoing size of the fund should be set adaptively in response to the number of applications that are judged to be suitable for funding and the costs of the projects.

Potential sources of moneys for an RRF include fees or charges on AIS vectors; fees or charges on resource users and other stakeholders; fees or charges on the general population or appropriations from the State's general fund; and grants from governmental or non-governmental sources. Fees on AIS vectors could include assessments on commercial or recreational vessels, on aquaculture operations, or on sales of imported live aquatic organisms including ornamental plants and animals, bait and seafood. Fees on resource users or other stakeholders could include assessments on recreational vessels, on recreational and commercial fishing and aquaculture, on other water-based recreational activities, and on water deliveries.

Fees set at reasonable levels could annually generate more than $17 million from commercial shipping, more than $11 million from cruise ship passengers, more than $1 million from commercial fishing operations (higher fish landing tax rates), more than $3 million from sport fishing (either from a surcharge on fishing license fees or a higher excise tax on recreational fishing gear), and more than $10 million from water deliveries (surcharges on State Water Project and Central Valley Project deliveries). Such fees would be subject to political, legal, economic and other considerations. General fund appropriation levels are always uncertain, and the potential for supporting an RRF through general fund appropriations appears highly unlikely in the near term due to perennial, large state budget deficits in recent years. For similar reasons, there appears to be little near-term potential to raise general sales and use taxes, or vehicle registration fees, to support an RRF.

We recommend that the RRF be set up as a nonlapsing fund within the California state treasury, with full carryover from year to year of any unused funds; that replenishment accrues continuously from fees or other sources; and that investment of unused funds be managed by the state treasurer's office. Institutional structures for deciding which projects to fund range from keeping decision-making within a single agency to a large, multiple entity panel. The key benefit of a single agency structure is the potential for making quicker decisions on which rapid response proposals to fund, though it could also modestly reduce administrative costs. The benefits of a multiple entity panel include decision-making based on broader knowledge, experience and/or perspectives: broader buy-in by more entities and better support for the program; better co-ordination among entities to assist funded responses; the development of greater AIS rapid response awareness and judgment in multiple agencies; building more stable institutional knowledge and experience for fund decisions; and guarding against agency capture of the fund (i.e. the administering agency awarding most of the funds to its own proposals) or misuse of the fund (awarding funds to projects that address agency priorities other than rapid response).

We recommend that both governmental and non-governmental entities be eligible for RRF funding, and eligible activities include interim containment and eradication efforts, and other activities that support these. Key criteria to be considered in deciding on whether to fund from the RRF should include, but are not limited to the probability of success; the probability of reintroduction; the regional significance of the targeted AIS population; the history of invasion by the AIS and the experience with containment and eradication; the expected ecological side

effects of the eradication effort; and the provision for independent oversight of the eradication effort.

Chapter 6

Funding Sources

Often the funds used for rapid response by state or local agencies are allocated away from ongoing programs or activities, which is a zero-sum game. Agencies involved in rapid response throughout the United States have stated that such efforts should be supported by a separate, dedicated source of funding.

Chapter 5 presents demand projections and rapid response fund sizes needed to address the projected demand under different funding scenarios. These fund sizes range from a recommended minimum of $1-2 million annually to fully fund smaller projects and provide partial or start-up funding for larger projects, up to $7.5-9 million annually to meet the entire projected demand for AIS rapid response projects. This chapter first provides background on key economic principles related to conservation financing (§6.1), and then identifies funding options that could potentially support an RRF at these levels. Discussion below provides for each option a general overview of the funding source, evaluation of its revenue-generating potential, review of some advantages and disadvantages, and identification of important factors warranting further consideration.

This chapter does not make recommendations regarding which funding options should or should not be pursued. Instead, it presents a menu of funding options for further research and discussion among state agencies and lawmakers, including consideration of the regulatory and political viability of different options.

6.1 Principles of Conservation Financing

Like other governmental programs, the burden of costs associated with the conservation of natural resources should be based on such well-accepted concepts as distributional equity and an absence of externalities.[90] In general, these concepts are embraced in several key principles:[91] the ability to pay; the benefit principle; and the "polluter pays" principle. These provide a rationale for the selection of funding mechanisms and of who bears the costs of implementing these activities. However, they do not necessarily consider the barriers and constraints (such as political constraints) associated with specific funding options. All factors should be considered when selecting appropriate revenue sources.

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[90] Distributional equity refers to an allocation of costs among parties in proportion to their respective benefits from the activity being funded. Absence of externalities refers to an allocation of total costs only to the parties responsible for those costs.

[91] These principles were adapted from: Hoerner, J.A. and R. Shrivastava. 2009. *Options for Financing Coastal and Ocean Conservation in California*, prepared for the California Ocean Protection Council by Redefining Progress - The Nature of Economics. Website http://www.opc.ca.gov/webmaster/ftp/project_pages/Fund_Studies/RP_FinancingCoastalConservation_Study.pdf, accessed January 11, 2011.

6.1.1 Ability to Pay

Ability to pay refers to the capacity of the individual (or group) charged to pay a fee, charge, or tax without undue harm. This principle is based on the premise that the financing of public goods should be progressive (or proportional) in nature. The ability to pay principle conforms to both the horizontal and vertical equity principles. The horizontal equity principle states that those with a similar ability to pay should incur similar costs for the protection of public goods. The vertical equity principle states that those with a greater ability to pay should incur higher costs than those with a lesser ability to pay. An example of this is the progressive U.S. tax system, in which people in comparable income brackets are taxed at the same marginal tax rate. Ability to pay is most often measured in terms of annual income or wealth.

In the context of public financing for AIS management in California, the ability to pay principle may be applicable under the premise that the benefits of AIS eradication are pure public goods that are distributed evenly among all residents within the state. In some respects, this is true, e.g. the ecological values associated with preserving native ecosystems and biodiversity. However, in some instances, AIS eradication provides benefits to distinct user groups (e.g., resource users) and/or remedies problems caused by a few identifiable entities or activities (e.g., AIS vectors).[92] In these situations, the allocation of public financing costs may be governed by the benefit and polluter-pays principles, respectively.

6.1.2 Benefit Principle

The benefit principle is founded on the concept that charges should be levied on individuals or groups in accordance with the level (or value) of the benefit realized by the service provided. Thus, when public financing of a particular activity or service provides benefits to specific entities, it is reasonable to charge these entities rather than the general population. This approach is considered to be consistent with the fairness concept because it allocates the cost of providing government services in a manner that provides incentive for payment and reduces coerced payment from entities with no vested interest in the service. Because this principle is intuitively reasonable, it provides legitimacy to potential financing options. It also makes it easier to recruit support from the charged group because that group would realize net benefits from implementation of the activity or service. The benefit principle is especially relevant when the benefit can be easily traced to identifiable individuals, groups or industries, e.g., charges on commercial fisherman for services that would improve the health of fisheries and increase fish landings.

6.1.3 "Polluter Pays" Principle

For this analysis, "polluter" represents AIS vectors, which are defined as the means or agents that transport species from one place to the next. The principle states that the direct and indirect costs and damages of AIS invasions should be charged to the vectors that caused the problem. From an equity standpoint, the polluter pays principle is intuitive in that those responsible for the costs should pay for the costs, rather than those with no role in the activity that causes the impact.

[92] In some cases, the same parties may be both vectors and users of affected resources.

Related considerations involve the magnitude of the charge and how it is used. The charge could theoretically cover all costs associated with AIS invasions, which may include both market costs and non-market costs that are difficult to quantify in the context of environmental services. Alternatively, charges could be set at levels that produce an outcome where benefits exceed costs, but some reduced level of AIS impacts is tolerated. In the equity framework, the use of the revenue is important in that funds could be used to prevent future pollution, remediate past pollution, and/or compensate those adversely affected. Each such consideration has a role in the public debate on environmental and fiscal policy.

6.2 Fees and Other Possible Sources for a Rapid Response Fund

This section discusses the potential sources for an AIS RRF in three categories:

- Fees or charges assessed on AIS vectors, resource users, and stakeholders[93]
- Fees or charges assessed on the general population
- Grant funding

Discussion includes the revenue base associated with each option based on assumptions that represent the potential upper and lower bound on funds. Advantages and disadvantages of various options are also discussed. A summary of funding sources and potential revenues is provided at the end of this section.

Efforts to develop a funding source for the RRF may need to consider the requirements contained in California Proposition 26, passed in 2010. Proposition 26 increases the legislative vote requirement to two-thirds for state levies and charges and for certain taxes currently subject to majority vote, with limited exceptions; and changes the constitution to require voter approval of local levies and charges by either a two-thirds or majority vote, with limited exceptions. These provisions include fees that address adverse impacts on society or the environment caused by the fee-payer's business.

6.2.1 Fees on AIS Vectors, Resource Users, and Stakeholders

The CAISMP identifies vectors that are known or believed to introduce AIS into the state. The polluter pays principle suggests that those activities or entities responsible for the environmental damage should also bear the cost burden, thus translates into fees and charges on distinct AIS vectors. This section considers each main AIS vector independently and discusses potential funding mechanisms specific to each. The AIS vectors considered here include:[94]

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93 There is substantial overlap between AIS vectors and beneficiaries of AIS prevention; therefore, they are presented jointly.

94 There are other AIS vectors that have been identified beyond those listed in this section. The ornamental plant and animal trade, and the live bait and live seafood trades, are potentially important vectors that are currently being studied by the California Ocean Science Trust under a grant from the Ocean Protection Council. Other AIS vectors include aquatic construction, research activities and habitat restoration projects; however, since there appears to be minimal potential for revenue generation from these sources, they were excluded from the analysis.

- Commercial shipping;
- Cruise ships;
- Commercial fishing;
- Aquaculture operations;
- Recreational fishing;
- Recreation watercraft;
- Aquarium trade;
- General recreation activity;
- Water deliveries; and
- Direct transport and other illegal activity.

6.2.1.1 Commercial Shipping

Commercial shipping activity at California ports represents one of the primary AIS vectors in the state for marine species in coastal waters, accounting for nearly 80 percent of introductions in North America.[95] These species could become established in coastal ports and estuaries, and prospective eradication efforts could benefit from rapid response funding. There are two primary mechanisms by which commercial shipping poses risks for the spread of AIS – release of ballast water and hull fouling. The filling and discharge of ballast water in commercial vessels facilitates the spread of AIS because water (and aquatic species) from one location are discharged into waters at another location as vessels move from port to port. Hull fouling represents the process by which organisms attach themselves to the hull of a ship during a voyage and transport themselves long distances resulting in the spread of AIS. Funding options related to commercial shipping include allocations or additional fees levied under the existing California Marine Invasive Species Program and/or new fees on the commercial shipping industry based on size or weight of containers.

California Marine Invasive Species Program Fee Allocation. The California Marine Invasive Species Act was enacted in 2003 and established the California Marine Invasive Species Program administered by the California SLC. Under this program, a ballast water management fee was put into effect to regulate the discharge of ballast water from commercial vessels at California ports. The ballast water fee, levied on the number of qualifying voyages, is collected by the California Board of Equalization (BOE) and deposited into the Marine Invasive Species Control Fund created pursuant to Section 71215 of the California Public Resources Code. Revenues from this fund are deposited into the Marine Invasive Species Control Fund to support research and monitoring activities. There are often unused funds that are carried over from year to year. The current fee is $850 per qualifying voyage,[96] which has been in effect since November 2009. The maximum fee that can be levied per the enacting legislation is $1,000 per

[95] California State Lands Commission. 2011. *2011 Biennial Report on the California Marine Invasive Species Program*.

[96] A "qualifying voyage" for purposes of reporting and fee submittal refers to all vessels greater than 300 gross registered tons operating in California waters

voyage.[97] A summary of the Marine Invasive Species Program and associated fee revenues is presented in Table 6-1.

Table 6-1 Summary of Marine Invasive Species Program Fee Revenues

Year	Voyages Billed	Voyages Reported	Total Voyages	Fees Billed	Fees Reported	Total Fees	Payments Received for Period
2005	6,161	1,157	7,318	$2,873,800	$535,200	$3,409,000	$3,374,372
2006	6,247	1,161	7,408	$2,498,800	$464,400	$2,963,200	$2,956,348
2007	5,997	1,199	7,196	$2,398,800	$479,600	$2,878,400	$2,863,459
2008	5,578	1,133	6,711	$2,753,750	$557,825	$3,311,575	$3,273,822
2009	5,023	866	5,889	$3,324,325	$574,100	$3,898,425	$3,856,119
Average (5-Year)	5,801	1,103	6,904	$2,769,895	$522,225	$3,292,120	$3,264,824

Source: California State Lands Commission, 2011

Table 7-1 shows that total charges levied under the MISP were approximately $3.9 million on 5,889 voyages in 2009. Because 2009 data reflect the recent economic downturn in California and include only partial application of the revised fee structure (which started in November 2009), it is more representative to calculate potential fee revenues based on shipping activity over the most recent five-year period between 2005 and 2009 and the new fee of $850 per voyage. On average, there have been about 6,900 qualifying voyages per year since 2005, which would generate approximately $5.9 million in fee revenues annually moving forward.

There are two possible mechanisms to integrate MISP funding into the proposed RRF. First, the MISP Fund could possibly be restructured to allocate a pre-defined percentage of fee revenues to the RRF based on the parallel objectives of both programs and the potential use of the RRF on eradication efforts for marine species. However, it is acknowledged that these revenues are integral to other components of the MISP; therefore, only a small percentage of total program funding could reasonably be allocated to the RRF. For planning purposes, it is assumed that between 10 and 20 percent of ballast water fee revenues could potentially be allocated to the RRF, resulting in about **$587,000 to $1.2 million** in annual funding.

In addition, the MISP fee could be increased up to its maximum permitted level, which is $1,000 per qualifying voyage, with the incremental revenues ($150 per voyage) being allocated to the RRF. This could be implemented in conjunction with or separate from funding allocation from the MISP Fund (based on existing fees) described above. Based on the average number of voyages, an additional **$1.0 million** could be allocated to the RRF.

Current legislation requires that revenues collected from the Marine Invasive Species Control Fee are to be used to implement the MISP. It is not clear whether funding allocations to a

[97] California Public Resources Code Section 71215. Website http://www.leginfo.ca.gov/cgi-bin/waisgate?WAISdocID=90517711061+0+0+0&WAISaction=retrieve, accessed January 11, 2011.

statewide RRF would meet this provision. As a result, legislative changes to the Public Resources Code may be required to allocate a portion of these revenues for invasive species management actions that are outside the scope of the MISP, such as rapid response activities that address both freshwater and marine species. It is likely that the shipping industry would oppose any fee increase, and possibly any change in the use of fees.

Commercial Shipping Capacity or Tonnage Fees. Additional fees and charges may also be levied on the commercial shipping industry based on measures of capacity, such as length of containers or tonnage. The concept of levying fees based on length of shipping containers has already been considered by the California legislature. In 2007, SB 974 (Port Investment Bill) was introduced, which would have implemented a $30 fee per twenty-foot equivalent unit (TEU) shipping container processed at the ports of Los Angeles, Long Beach, and Oakland, with the funds being used for projects improving air quality and port infrastructure.[98] According to an analysis of the bill, it was estimated that the container fee would raise approximately $500 million annually, and up to $1.5 billion annually by 2020 based on projected growth in container volume. The bill was opposed by the shipping industry, but it passed both houses of the legislature before being vetoed by the governor in September 2008. A similar, but more limited, bill could be developed for the purposes of AIS management and eradication. Assuming a more modest $1 to $5 fee per TEU and no growth in container volume, potential contributions to the RRF are an estimated to range between **$17.0 million and $85.0 million** annually. Additional fees could be generated if the fee was expanded to all California ports.

Alternatively, a charge could be levied based on the gross tonnage of commodities shipped through the California port system. There are seven ports in California that are included in the port rankings by cargo volume in 2009 (in descending order of short tons): Long Beach (72,500,221 tons), Los Angeles (58,406,060 tons), Richmond (25,362,626 tons), Oakland (17,405,784 tons), Port Hueneme (1,371,790 tons), Redwood City (907,220 tons), and San Francisco (888,216 tons).[99] In total, approximately 176.8 million tons of commodities were shipped through these seven ports in 2009. The extent of potential revenues for transfer to the RRF is based directly on the proposed unit charge per ton shipped. It is difficult to ascertain the appropriate fee level without more research on commodity values and public outreach to the shipping industry and other stakeholders. For planning purposes, fee levels from $0.10/ton to $1.00/ton were evaluated, which result in revenue estimates ranging from an estimated **$17.7 million to $176.8 million**. This type of fee would require legislative approval, which may be difficult depending on the political and economic climate at the time a bill is proposed.

6.2.1.2 Cruise Ships

Similar to the commercial shipping industry, the risks of AIS introduction are also prevalent with commercial passenger cruise ships, including release of ballast water and hull fouling. There is also the added risk of direct transport of species by passengers visiting foreign ports of call.

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98 Senate Appropriations Committee. 2007. SB 974 Senate Bill – Bill Analysis. Website http://info.sen.ca.gov/pub/07-08/bill/sen/sb_0951-1000/sb_974_cfa_20070514_115807_sen_comm.html, accessed January 11, 2011.

99 American Association of Port Authorities. Port Industry Statistics. Website http://www.aapa-ports.org/Industry/content.cfm?ItemNumber=900&navItemNumber=551, accessed January 11, 2011.

Cruise Ship Passenger Excise Tax. Commercial cruise ships are subject to the $850 per voyage charge levied under the California Marine Invasive Species Program, which targets the cruise line industry. However, there may be opportunities to generate revenue directly from cruise ship passengers via a direct surcharge (or excise tax) on passengers. Such a fee could be levied on a per-passenger basis or alternatively on a percentage of cruise prices.

There is precedent for this type of charge in other regions, specifically a commercial passenger vessel excise tax that is in effect in the State of Alaska. When implemented originally in 2006, the tax in Alaska was $46 per person traveling on a vessel providing overnight accommodations in state marine waters, in addition to a $4 per person ocean ranger fee, for a total cost of $50 per passenger.[100] Recently, Senate Bill 312 was passed by the Alaska legislature that reduced the excise fee to $34.50 per passenger.[101] The tax is paid by the cruise ship operator, which collects the fee from passengers as part of the cost of the cruise ticket. This excise tax is referred to as a "head" tax and has the characteristics of a regressive flat tax.

A similar excise tax can be levied on cruise passengers embarking from ports in California with the funds allocated to the RRF. The magnitude of the excise tax in Alaska can be used as a proxy to estimate revenues generated by a similar measure in California. For this study, a maximum charge of up to $50 per passenger is considered. In total, there were 1.1 million cruise ship passengers that embarked from California in 2009.[102] This number is down slightly from approximately 1.3 million in 2007 and 1.2 million in 2008. Based on a tax ranging between $10 and $50 per passenger, total estimated revenues would be between **$11.1 million and $55.6 million** annually.

Alternatively, the charge could be levied as a percentage of cruise ship ticket prices. Assuming the average cost of a cruise is approximately $1,000, this tax rate could range between 1.0 percent and 5.0 percent of cruise prices to yield equivalent revenues presented above. The benefit to this approach is that it would make the fee progressive in that higher income passengers that tend to purchase higher-priced fares would generally incur a proportionally higher share of the costs.

Voluntary Donations by Cruise Ship Passengers. There may also be opportunity to implement a system of voluntary donations by cruise ship passengers. Such a program may facilitate the development of a "greener" (or more environmentally-friendly) cruise experience and operator, which could lend itself to additional marketing opportunities. A voluntary contribution program has been successful in Baja California for adventure travelers serviced by Lindblad Expeditions, with donations geared toward conservation purposes.[103] Over a three-year period (2003/04 to

[100] Alaska Department of Revenue. Commercial Vessel Passenger Excise Tax. Website www.legis.state.ak.us/basis/get_documents.asp?session=26&docid=181, accessed January 11, 2011.

[101] Alaska State Legislature. Bill History/Action for 26th Legislature, Bill SB312, Vessel Passenger Tax. Website http://www.legis.state.ak.us/basis/get_bill.asp?session=26&bill=SB%20312, accessed January 11, 2011.

[102] Cruise Lines International Association. 2010 CLIA Cruise Market Overview, Statistical Cruise Industry Data Through 2009. Website http://www2.cruising.org/Press/overview2010/, accessed January 11, 2011.

[103] Environmental Finance Center, University of Maryland. Partnership for the Delaware Estuary Financing Feasibility Study. Website http://www.efc.umd.edu/pdf/PDE.pdf, accessed January 11, 2011.

2005/06), the average donation was approximately $62 per passenger with a participation rate of 24 percent. For this analysis, more conservative assumptions were considered – a participation rate of 10 percent and a range of donation values from $10 to $60 per passenger. Based on these assumptions, the potential revenue generated by a voluntary donation program on cruise ship passengers is an estimated **$1.1 million to $6.7 million annually**. However, because this would be a voluntary program, there is significant uncertainty with this funding source, and it may be better utilized as a supplemental source of revenues.

6.2.1.3 Commercial Fishing

Commercial fishing poses a threat as an AIS vector primarily through hull fouling of vessels located in harbors, docks and berths during the off season. AIS can also be transported via commercial fishing gear, such as fishing lines, tackle, buoys, traps, and nets. There is a lack of regulatory authority on commercial fishing vessels as the State of California has no authority on vessels under 300 gross register tons in size.[104] Potential opportunities to generate revenues for the RRF include increases in fish landing taxes; commercial fish business license fees; and commercial fishing license, registration, stamp and permit fees. These are the three primary sources that fund the regulation and oversight of the commercial fishing industry in California.

Fish Landing Taxes. The CDFG implements a commercial fish landings tax system pursuant to California Fish and Game Code Sections 8040-8070.[105] Landings taxes are imposed on licensed fish receivers who receive fish from commercial fishermen or on the commercial fishermen themselves if the buyers are not licensed. The landing tax rate schedule is based on the number of pounds of individual fish species harvested, rather than on the value of the landings. The tax rates are adjusted for inflation annually pursuant to the Fish and Game Code Section 713.[106] The Fish and Game Code also outlines the purposes for which the funds will be used.

Commercial fish landing taxes have generated significant revenue for fisheries management. In 2005, CDFG collected approximately $1.13 million in revenue from landings taxes from all commercial fisheries.[107] During this same period, the total ex-vessel value of fish landings was $108.3 million.[108] Based on these figures, the effective tax rate (as a percentage of fish landing value) is roughly 1.04 percent. On average, the total value of commercial fish landings has been $124.5 million annually between 2005 and 2009, generating an estimated $1.3 million annually (assuming the same effective tax rate presented above).

An increase in fish landing tax rates could generate additional revenue that could be transferred into the RRF. An increase in tax rates can be implemented using the existing system (i.e., tax per

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104 California Department of Fish and Game. 2008. California Aquatic Species Management Plan.

105 California Legislative Council. Official California Legislative Information. Website http://www.leginfo.ca.gov/cgi-bin/waisgate?WAISdocID=06932514196+0+0+0&WAISaction=retrieve, accessed January 11, 2011.

106 Ibid.

107 Hoerner and Shrivastava, 2009, op. cit.

108 California Department of Fish and Game, Poundage and Value of Landings of Commercial Fish by Area, 2005, from the CFIS system, Tables 15 and 15a.

pound of fish landing), or the system can be revised to base the tax rates on the commercial value of the fishery. For planning purposes, potential tax rates of between 2 percent and 5 percent of the total value of fish landings were evaluated. Under this option, approximately **$1.2 million to $4.9 million** in incremental tax revenues (above the baseline levels) could be allocated for the purpose of AIS rapid response activities. However, any changes to the landings tax rates or structure will require legislative action because the tax rates are specified in the Fish and Game Code, and the Fish and Game Commission has no authority to change these rates.

Commercial Fish Business License Fees. Section 8030 of the Fish and Game Code requires any person who engages in any business for profit involving fish to obtain a commercial fish business license.[109] The various types of licenses include: Fish Importer's License, Fish Processor's License, Sport-Caught Fish Exchange Permit, Fish Receiver's License, Marine Aquaria Receivers License, Fish Business License (Multifunction), Fish Wholesaler License, Fisherman's Retail License, and Live Fresh Water Bait License. A complete description of these licenses required is presented in the *2011 Commercial Fish Business License Information Guide* published by DFG.[110] Revenues generated by commercial fish business licenses have averaged approximately $798,000 annually over the five-year period from 2005 to 2009. For this study, potential license fee increases ranging from 5 percent to 25 percent were evaluated. Using these parameters, approximately **$40,000 to $200,000** in additional licensing revenues could be allocated to the RRF. Implementation of this funding mechanism would require legislative approval.

There are two specific vectors noted in the CAISMP that are directly or indirectly subject to commercial fish business license fees – the live bait industry and seafood industry. Fees on the live bait industry are implemented directly as part of Live Fresh Water Bait licenses, and are especially relevant to AIS due to the potential for species transport in bait packing material. Indirectly, the seafood industry is subject to increased costs from most commercial fishing license fees. Instead of a broad increase in fees for all license types, it may be preferable to focus potential fee increases on specific types of licenses such as these.

Commercial Fish License, Registration, Stamp and Permit Fees. CDFG issues licenses and registrations for all commercial fishermen, fishing vessels, and passenger fishing boats in California. In addition, CDFG requires several species-specific or gear-specific permits for certain commercial fishing activities, as well as by-catch permits for some fish caught incidentally. Sections 7850-7858 of the Fish and Game Code outline the commercial fishing regulations applicable in California.[111] An overview of applicable regulations and current fee schedules is also published annually by CDFG in the *Digest of California Commercial Fishing*

[109] California Legislative Council, op. cit

[110] California Department of Fish and Game. 2011 Commercial Fish Business License, Information Guide. Website http://www.dfg.ca.gov/licensing/pdffiles/Guide2011.pdf, accessed January 14, 2011.

[111] California Legislative Council. Official California Legislative Information. Website http://www.leginfo.ca.gov/cgi-bin/displaycode?section=fgc&group=07001-08000&file=7850-7858, accessed January 14, 2011.

Laws and Licensing Requirements.[112] All fees collected by CDFG, including those for licenses, registrations permits, and stamps, have been indexed to inflation each year since 2005, pursuant to Section 713 of the Fish and Game Code.

Conceptually, commercial fishing fees should be set at levels that appropriately charge users for the benefits derived from the right to harvest particular species, as well as management costs and potential environmental damages, such as transport of AIS. As such, an increase in commercial fishing fees may be well justified as a funding source for the RRF. Revenues collected from the sale of commercial fishing licenses, permits, registrations and stamps have averaged $3.5 million annually from 2005-2009. Assuming an across-the-board increase in fees of 5 percent to 25 percent, an additional **$173,000 to $863,000** in commercial fishing revenues could be made available to the RRF.

With so many sources of commercial fishing fees in place, it is difficult to determine the relative ease of implementing proposed fee increases. The Fish and Game Commission has authority to adjust fees for 40 of the 65 different types of commercial licenses, permits, and stamps (not including transfer fees).[113] Other fees have been created by statute and would require legislative action to be modified. It has been estimated that approximately 90 percent of fee revenues associated with commercial fishing are statutorily controlled,[114] thereby requiring legislative approval. Additionally, any type of fee adjustment would need to consider other factors such as the nexus between license type and AIS risk.

6.2.1.4 Aquaculture Operations

Aquaculture has been a growing industry in California and is expected to continue growth into the future as more limits are imposed on wild fish harvests.[115] Aquaculture operations have been identified as vectors of AIS introductions in the state due primarily to shellfish seed import, abalone culture, shellfish waste, finfish culture, and genetic dilution.[116] Accordingly, it may be equitable to levy additional charges on the aquaculture industry to fund rapid response activities for AIS. The primary mechanism would be through an increase in aquaculture licensing fees administered by CDFG.

Aquaculture License Fees. Total revenues from aquaculture licensing fees have averaged $101,000 annually between 2005 and 2009, with fees steadily increasing over this period. Current fees include registration of new aquaculture operations ($716 per year); renewal of registration for existing operations ($362.25 per year); a surcharge on operations with at least $25,000 in gross sales annually ($539.25 per year); and late fee for registrations received after April 1 ($65.66 per year). Potential for revenue generation from an increase in aquaculture licensing fees is modest because of the limited revenue base. Based on existing revenues, an

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[112] California Department of Fish and Game. 2011 Commercial Fish Business License, Information Guide. Website http://www.dfg.ca.gov/licensing/pdffiles/Guide2011.pdf, accessed January 14, 2011.

[113] Hoerner and Shrivastava, 2009 op, cit.

[114] Hoerner and Shrivastava, 2009, op. cit.

[115] California Department of Fish and Game. 2008. California Aquatic Invasive Species Management Plan.

[116] Ibid.

increase in fees from 5 percent to 25 percent could generate about **$5,000 to $25,000** annually to be allocated to the RRF. While this amount is relatively small, continued growth in this industry could increase the revenue base from aquaculture in the future; however, it could not serve as a stand-alone funding source for the RRF.

6.2.1.5 Recreational Fishing

Sport fishing is a major recreational activity in California and serves as a significant driver of economic activity, particularly in local economies with high-value recreational fisheries. However, recreational fishing can also serve as a vector for AIS. First, the use and accidental release of invertebrates and other live bait while fishing can result in AIS introductions. Another concern is the introduction of organisms that are unintentionally brought in with the packing material used to transport bait. Further, recreational fishing gear can carry AIS from one waterbody to another. Two potential funding sources related to recreational fishing include a surcharge on fishing license fees and an excise tax on recreational fishing equipment.

Recreation Fishing License Fees. Although the total number of recreational fishing licenses sold in California has decreased in recent years (approximately 1.18 million resident fishing licenses in 2009[117]), revenues from license sales have been increasing. In 2009, revenues from recreation fishing licenses and stamps totaled about $65.3 million, up from $54.5 million in 2005.[118] Over this period, recreation fishing licensing revenues have averaged $60.8 million annually. Increased revenues are attributed to the rise in licensing fees collected by CDFG, which have been indexed to inflation each year since 2005.

A surcharge could potentially be added to recreation fishing license fees to fund the RRF. A surcharge of 5 to 25 percent is considered here. A five percent licensing surcharge would yield about **$3.0 million** per year, and at 25 percent, nearly **$15.2 million** would be generated annually. Using the current resident fishing license as an example, the license fee would increase from $43.46 per year to $45.63-$54.33 per year, resulting in a surcharge of $2.17 to $10.87 per license. If these incremental revenues are used for the purpose of AIS eradication and thereby result in improvements to recreational fisheries in the state, recreational anglers could benefit directly from this funding option; this conforms to the "benefit" principle presented above. Further, estimates of consumer surplus value for recreational fishing suggest that anglers may be willing to pay more for the opportunity to fish, particularly with enhancements to the quality of fisheries in the state. Public outreach efforts could be pursued to ascertain the willingness of anglers to pay this fee, while acknowledging the potential environmental and fishery benefits.

Recreation Fishing Excise Tax. In addition to fees on the opportunity to participate in recreational fishing activity (i.e., license fees), revenues can be generated by an excise tax on recreational fishing equipment and gear. There already is a federal excise tax of 10 percent on sales of sport fishing equipment by the manufacturer, including, but not limited to, rod and poles, reels, tackle, and other fishing supplies and accessories. A three percent excise tax is also levied

[117] California Department of Fish and Game. DFG Sport Fishing License Sales Statistics. Website http://www.dfg.ca.gov/licensing/pdffiles/sf_items_10yr.pdf, accessed January 11, 2011.

[118] Ibid.

on tackle boxes and electronic outboard boat motors.[119] Revenues from this tax are deposited into the federal Aquatic Resources Trust Fund (commonly known as the Wallop-Breaux Fund), and are used in part to fund the Sport Fish Restoration Program, which provides funds to state agencies for land acquisition, development, research, operations and maintenance, and sport fish population management.[120] It is unlikely that additional revenues could be directed to individual states because funding allocations are based on the number of the number of licensed anglers in the state and the state's total land and water area.

However, there may be an opportunity to establish a comparable excise tax at the state level to fund the RRF. Total expenditures on sport fishing equipment in California were nearly $327 million in 2006.[121] Assuming a state-level excise tax on the sale of recreational fishing equipment was implemented at a rate between 1 and 10 percent, approximately **$3.3 million to $32.7 million** in new revenues could be generated and allocated to address AIS in the state.

6.2.1.6 Recreational Watercraft

Similar to commercial vessels, recreational watercraft, including boats, jet-skis and wave-runners, are significant vectors for AIS. The primary mechanisms for AIS transport are hull fouling and discharge of bilge pump water. In addition, AIS can be transported on trailers used to move watercraft from location to location. Seaplanes have also been identified as a potential vector, but the extent of seaplane activity in California is relatively limited and therefore excluded from the analysis. Potential sources of revenue from recreational watercraft users include registration fees, excise taxes, launch ramp fees, and boater education fees.

Boat & Trailer Registration Fees. Recreational watercraft and trailers must be registered within the State of California. Registration fees on watercraft are levied on a biennial basis and vary depending whether it is a new registration or renewal; the biennial renewal rate is $20. Trailer registrations are based on a service fee of $10 every 5 years. Registration fees are collected by the California Department of Motor Vehicles (DMV), which allocates a portion of revenues to the DBW, while retaining some revenues internally. Direct estimates of registration fees collected by DMV are not readily available; therefore, for this study, estimates have been made based on the number of boats registered in the state and registration fee levels. Between 2005 and 2009, an average of 900,500 pleasure boats was registered annually in California.[122] If it is conservatively assumed that all registrations are renewals at an effective annual rate of $10 per year,[123] existing revenue from boat registrations is about $9 million per year. Taking into account

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119 Internal Revenue Service. 2007. Publication 510: Excise Taxes for 2007. Website www.irs.gov/pub/irspdf/p510.pdf, accessed January 11, 2011.

120 Congressional Research Service, Library of Congress. April 6, 2005. The Aquatic Resources Trust Fund. Website http://www.policyarchive.org/handle/10207/bitstreams/4061.pdf, accessed January 8, 2011.

121 U.S. Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau. 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. Website http://wsfrprograms.fws.gov/Subpages/NationalSurvey/nat_survey2006_final.pdf, accessed January 8, 2011.

122 California Department of Boating and Waterways. Vessel Registration Reports. Website http://www.dbw.ca.gov/Reports/VesselReg.aspx, accessed January 9, 2011.

123 Biennial registration rate of $20 divided by 2 = $10/year

other types of boats subject to registration requirements, out-of-state fees and new applications (subject to higher fees), this figure is likely higher. Trailer registrations are estimated to generate an additional $1.8 million, assuming each boat has a trailer.

An increase in boat and trailer registration fees may be another option for generating revenues for the RRF. An increase in fees from 5 to 25 percent would result in boat registration renewal costs increasing from $20 to between $21 and $25 biennially, and would yield approximately $450,000 to $2.3 million in additional revenues per year. Similarly, boat trailer registration costs would increase from $10 to between $10.50 and $12.50 every 5 years, resulting in about $90,000 to $450,000 annually in incremental revenues. Collectively, boat and trailer registration fees could generate between **$540,000 and $2.7 million** for a dedicated RRF. Higher surcharges, such as those levied in other states (see below), would yield even higher revenues.

Due to the strong relationship between boating activity and transport of AIS, this funding option would likely garner support. In addition, there is precedent for boating fees to be used for AIS management in other states. For example, Minnesota implements a $5 surcharge on all watercraft registered to fund their invasive species program. Other states assess similar types of fees, including Colorado, Oregon, Washington, and Idaho.

Excise Tax on Recreational Watercraft. Similar to the excise tax on recreation equipment, a state excise tax on recreation watercraft sales could also generate revenues to address AIS in the state. In 2009, it is estimated that total annual expenditures for new powerboats, motors, trailers and accessories was $417 million in California.[124] Assuming a tax rate of 1 to 10 percent, a new excise tax of recreational watercraft could generate revenues of **$4.2 million to $41.7 million** annually.

Alternatively, the watercraft excise tax could be levied on the fair market value of non-commercial boats in California. Because the revenue base would be on all watercraft (not just new sales), the revenue potential is high. Such an excise tax is in effect in the State of Washington, where the assessment rate is 0.005 of the fair market value, with a minimum fee of $5.00; this tax is in lieu of the property tax. However, in California, all aircraft, vessels, boats, and personal watercraft are assessable as personal property and are subject to local property tax; therefore, the viability of assessing watercraft owners with an additional tax or transferring local tax revenue to the state is low.

Launch Ramp Fee Surcharge. Many boat launch facilities throughout California are subject to a launch fee. Conceptually, a surcharge could be added to the standard launch fees to generate revenues for the RRF. However, boat launch facilities across the state are managed by an array of public agencies, as well as private entities. As such, it would be difficult to implement and collect a uniform surcharge on all facilities. It may be possible that a surcharge could be limited to state agencies that manage boat launch areas, such as California State Parks. Data are not readily available to estimate current boat launch revenues across the state, and therefore, the

[124] National Marine Manufacturers Association. 2009 Statistical Abstract. Website http://www.discoverboating.com/info/pressrelease.aspx?id=17836, accessed January 7, 2011.

potential revenue stream for the RRF is unknown. In addition, many boat launches are not staffed and are free.

Boater Education Fee. In California, a license is not required to operate a boat, nor is a boating safety course, although a free California Boating Safety Course is offered by DBW. (Some states do require boaters to be licensed or to have taken a boating safety course.) An option to generate revenues for DBW, as well as the RRF, is to charge a nominal fee to take the boater safety course, which could be expanded to include information of AIS prevention and management. The revenue-generating potential of this option is difficult to estimate because such a requirement is not currently in place and the extent and scope of this type of program and associated revenues are unknown.

6.2.1.7 General Recreation Activity

It is also acknowledged that a wide range of water-based recreational activities, other than fishing and boating, could facilitate the introduction and spread of AIS, including, but not limited to swimming, windsurfing, parasailing, scuba diving, and waterfowl hunting. The primary mechanism in the transport of AIS associated with these activities is via movement of recreation gear. Potential options for generating revenues from general types of recreational activities include the following:

- Parking fees at recreation areas;
- Voluntary contributions from recreationists;
- Fees on retail businesses located near developed recreation areas;
- Recreation activity surcharges (for activities subject to existing charges); and
- Excise taxes on recreational equipment (other than fishing and boating, described above).

Due to the expansive list of recreation activities and funding possibilities, as well as the limited correlation of these general recreation uses with AIS introductions, estimates of potential revenue generation using these funding mechanisms have not been developed. The theoretical limit on the extent of these types of fees and charges is the economic (or consumer surplus) value of that recreational activity. Such economic values have been estimated for many different types of recreation activity.[125]

6.2.1.8 Water Deliveries

Substantial quantities of water are transported across the state to meet the needs of agricultural and M&I users. Two primary water conveyance systems are used to transport water in California –SWP and CVP – with a capacity of approximately 4 million acre-feet (AF) and 7 million AF per year, respectively.[126] These two systems facilitate movement of water from the Sacramento-San Joaquin River Delta in northern California to agricultural and municipal and industrial

[125] Loomis, John. 2005. Updated outdoor recreation use values on national forests and other public lands. General Technical Report PNW-GTR-658. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 26 p.

[126] California Department of Fish and Game. 2008. California Aquatic Invasive Species Management Plan.

interests in the San Joaquin Valley and M&I customers in Southern California, as well as other parts of the state. There are inherent risks for the spread of AIS with these water conveyance systems both within the state and out-of-state. In fact, there have been documented instances where AIS have been transported in these systems, e.g., the yellowfin goby. There are factors that limit the spread of AIS in these systems, including drinking water treatment processes for M&I deliveries and ground application of water for agricultural deliveries. However, the connectivity across the extensive network of canals, ditches, and other conveyance infrastructure make the SWP and CVP facilities important potential AIS vectors in the state.

In addition, the spread of AIS in these systems can result in substantial economic impacts to water customers. Many water contractors and agencies currently monitor for invasive species in their local conveyance systems, resulting in higher operating costs. In addition, certain AIS, like quagga mussels, have the potential to clog up water diversions and impair hydropower generation, resulting in lost production value and associated economic activity. In the case of a widespread invasion of particularly harmful AIS, there is also potential for temporary limits on water deliveries that could cause substantial economic impacts across the state.

SWP & CVP Water Deliver Surcharge. A surcharge on SWP and CVP water deliveries could be used to generate revenues for the RRF. The surcharge could be levied as a flat-rate fee on each unit of water deliveries or as a percentage charge on the cost of water paid by water contractors. For example, a $1 surcharge on every AF of water delivered to SWP and CVP contractors would yield approximately $8.7 million annually based on the average quantity for water deliveries by SWP (3.8 million AF, between 2007-2010) and CVP (4.9 million AF, between 2006-2010).[127] However, a flat-rate charge may cause inequities to the two sets of customers of these systems because they are subject to substantially different water charges. Water contactors served by the SWP pay on average approximately $256 per AF, while CVP contactors pay about $12.55 per AF based on historical water charges and payments. Therefore, it may be more equitable to levy the surcharge as a percentage of unit water costs. Assuming a 1 to 10 percent surcharge, SWP water costs could increase between $2.56 and $25.61 per AF and would result in approximately $9.7 million to $97.5 million in added revenues. For CVP contractors, water costs would increase by about $0.13 to $1.25 per AF, resulting in revenues of between $616,000 and $6.2 million. The combined revenue potential for water delivery surcharges ranges from **$10.4 million to $103.6 million**.

6.2.1.9 Direct Transporters and Other Illegal Activity

There is also the potential for accidental or deliberate release of AIS into aquatic environments by humans. The direct transport of AIS into the state is illegal, as is non-compliance with regulations aimed at preventing the introduction and spread of AIS in California, such as mandatory boat inspections.

Fines & Penalties related to AIS. The use of fines as a penalty for legal infractions serves as deterrent to illegal activity, such as AIS transport. Conceptually, there should be a correlation

[127] California Department of Water Resources. 2008. Bulletin 132-07: Management of the California State Water Project (Table B-5B); and U. S. Department of Interior, Bureau of Reclamation, Central Valley Operations Office, Report of Operations Monthly Delivery Tables (Table 21).

between the level of the fine and the degree of the infraction, such that offenders directly pay for their actions. Violations of applicable AIS regulations are subject to fines and penalties as outlined the Fish and Game Code Sections 12000-12026 and California Rules of Court Rule 4.102.[128] Fines and penalties are collected by the California State Controller's Office, which disburses 50 percent of fine revenues to the state and 50 percent to the counties in which the infractions were committed. As presented in the 2011-12 California State Budget, approximately $2.13 million in fines and additional penalties and assessments is accounted for in the various funds administered by CDFG.[129]

Data on the amount of revenue generated by fines and additional penalties and assessments attributed directly to AIS-related infractions are not readily available. However, it can be argued that the fine and penalty structure for AIS-related infraction is too low, particularly in light of the potential ecological and economic damages that AIS may cause. As a result, there may be opportunities to increase the penalty levels for AIS-related violations in Fish and Game Code Sections 12000-12026 to generate additional revenue for the RRF (assuming the number of violations remains constant). However, it could be argued that higher fines would serve as a greater deterrent to illegal activity resulting in a reduction in the number of violations, and thus revenues. If this were the case, revenues would decline, but the overall objective of AIS prevention would be reinforced. Overall, it is difficult to estimate the revenue potential of this funding option.

6.2.2 Taxes and Charges on the General Population

Successful management and eradication of AIS in California would help protect and conserve natural resources and related economic activity throughout the state. The protection of the ecological and economic values of the state can be considered a public benefit, and many of the ecological features that are threatened by AIS are considered public goods (i.e., public trust resources) that provide value to society as a whole. Therefore, it may be appropriate to levy taxes and charges on the general population to generate revenues for an AIS RRF.

Because the RRF would be a state fund, it would need to be funded by taxes and charges that provide revenue at the state level. For example, property tax assessments would not be a viable funding option because property tax revenues are allocated to local cities and counties. Therefore, the discussion presented in this section considers the following options:

- General fund;
- Sales and use tax;
- Vehicle registration and license fees;
- Motor vehicle fuel tax; and

[128] Judicial Council of California, Administrative Office of the Courts. January 2009. Uniform Bail and Penalty Schedules. Website http://www.courtinfo.ca.gov/reference/documents/2009_jcbail.pdf, accessed January 9, 2011.

[129] California Governor. California State Budget, 2011-2012, 3600 Department of Fish and Game. Website http://www.ebudget.ca.gov/StateAgencyBudgets/3000/3600/department.html, accessed January 9, 2011.

- Bond financing

General Fund Appropriations. If a separate AIS RRF were established, the state legislature could elect to allocate money directly from the state general fund into the RRF as a direct appropriation. Alternatively, CDFG (or another state agency) could include RRF funding requirements in its annual budget, which in part is funded by general fund revenues. In essence, this funding option would be analogous to emergency funding periodically sought for AIS invasions, such as the funding for the quagga mussel response at Lake Mead. y having the RRF established, however, the funds could be in place at the time a new species is discovered resulting in time and cost savings. Such a strategy is endorsed as part of California Agricultural Vision, which states that "The State Board should work with the state's Invasive Species Council, the California Invasive Species Advisory committee and the National Invasive Species Council to assure that, in formulating its final Strategic Framework for Protecting California from Invasive Species, it develops a comprehensive strategy supported by an adequate and stable source of funding. At a minimum, the strategy should evaluate the possibility of dedicating a percentage of the state's general fund to invasive species."[130] The drawback to this source is that funding levels would be potentially subject to substantially large variations from year to year. Also, because of the ongoing state budget deficit, obtaining funds directly from the general fund may prove difficult. However, this option can be written into the legislation establishing the RRF, which would provide the flexibility to use general funds in the future.

General fund revenues have been used for AIS in other states. The invasive species fund established by the Idaho Invasive Species Act of 2008 is an example of this type of funding. In that case, the fund was established in the state treasury and "receives such appropriations as deemed necessary by the governor and the legislature to accomplish the goals" of the Act. [131] Other examples of direct funding include the Idaho Legislature providing funding for Eurasian watermilfoil control and the Utah Legislature appropriating $2.5 million general funds, of which $1.4 million is ongoing, to allow the Utah Division of Wildlife Resources to conduct an AIS program.

Sales and Use Taxes. Sales and use taxes at the retail level represent a significant source of revenue at the state and local level. The total statewide base sales and use tax rate is 8.25 percent; of this, 6.0 percent goes to the state general fund, a combined 1.25 percent goes to various funds administered at the state level,[132] and 1.0 percent goes to local counties.[133] In 2006-2007, the

[130] American Farmland Trust. December 2010. California Agricultural Vision: Strategies for Sustainability. Report to the California Department of Food and Agriculture and the State Board of Food and Agriculture. Website http://www.cdfa.ca.gov/agvision/docs/Ag_Vision_Final_Report_Dec_2010.pdf, accessed March 1, 2011.

[131] The invasive species fund established by the Idaho Invasive Species Act of 2008 is an example of this type of funding. In that case, the fund was established in the state treasury and "receives such appropriations as deemed necessary by the governor and the legislature to accomplish the goals" of the Act. Website http://www.legislature.idaho.gov/idstat/Title22/T22CH19SECT22-1911.htm, accessed March 1, 2011.

[132] Includes: 0.25% for State's Fiscal Recovery Fund (to pay off Economic Recovery Bonds (2004)); 0.50% for Local Public Safety Fund to support local criminal justice activities; and 0.50% for Local Revenue Fund to support local health and social services programs.

[133] Includes: 0.25% for county transportation funds and 0.75% for city and county operations.

state realized approximately $53.3 billion in sales and use tax revenues,[134] which accrued primarily to the general fund. The potential use of general fund appropriations for the RRF is outlined above. However, an incremental increase to the sales and use tax rate could be implemented specifically to generate revenues for the RRF. For the purposes of an AIS RRF, the incremental tax increase would need to be relatively small to correlate to target funding levels. For this analysis, potential sales tax increases of 0.0025 percent to 0.025 percent were evaluated. Based on these rates, approximately **$17.0 million to $169.6 million** could be generated on an annual basis to fund the RRF.

Vehicle Registration and License Fees. An increase in vehicle registration and license fees represents another approach to charge AIS costs to the broader public. Vehicle registration and license fees are collected annually by DMV from residents that own motor vehicles in the state. Although distinct, the two fees are collected jointly as part of registration fees due annually. The current vehicle registration fee is $34 per year.[135] The vehicle license fee (VLF) was established by the Legislature in 1935 in lieu of a property tax on vehicles. The VLF assessment is based upon the market value of the vehicle as determined by the DMV, and has been assessed at a rate of 1 percent annually since 1999. Prior to 1999, the assessment rate was 0.65 percent. The portion of the rate in excess of 0.65 percent is deposited into the state general fund; the incremental increase to generate revenues accruing to the general fund is set to expire in 2011.[136]

Registration and VLF fees represent an important source of revenue for state government. Between 2003 and 2007, annual registration fee revenues have averaged $2.5 billion and VLF revenues have averaged $2.1 billion.[137] One or both of these fees could be increased to fund the RRF. The incremental fee increase could take the form of percentage or flat fee surcharge to the existing fee structure. If registration fees were increased by 1.0 to 10.0 percent (i.e., from $34 to $34.34-$37.40 per year), approximately $9.6 million to $95.5 million could be generated annually. A comparable percentage increase in VLF fees would result in an effective assessment rate of 1.01 to 1.10 percent and would generate about $21.4 million to $213.7 million per year.

Alternatively, a flat-fee surcharge could be added to each vehicle registered in California. The average number of vehicle registrations in California between 2003 and 2007 is nearly 28.1 million.[138] A surcharge of $1 to $10 applied to annual vehicle registrations is estimated to generate approximately **$28.1 million to $280.8 million** per year. This funding option is similar to California Proposition 21 in the 2010 election, which was rejected by voters. This measure would have established an $18 annual state vehicle license surcharge and would have provided

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134 California Department of Finance, Economic Research Unit. 2009. 2008 California Statistical Abstract. Website http://www.dof.ca.gov/html/fs_data/stat-abs/statistical_abstract.php, accessed January 15, 2011.

135 California Department of Motor Vehicles. Vehicle Registration and Vessel Fees. Website http://dmv.ca.gov/vr/fees/reg_fees.htm, accessed January 15, 2011.

136 California Department of Motor Vehicles. Revenue and Taxation Code Section 10752. Website http://dmv.ca.gov/pubs/vctop/appndxa/revtax/rvtax10752.htm, accessed January 15, 2011.

137 California Department of Finance, Economic Research Unit, 2009, op. cit.

138 California Highway Patrol. Statewide Integrated Traffic Records System (SWITRS), 2008 Annual Report of Fatal and Injury Motor Vehicle Traffic Collisions. Website http://www.chp.ca.gov/switrs/, accessed January 15, 2011.

free admission to all state parks to surcharged vehicles. The surcharge revenues would have been deposited in a new trust fund called the *State Parks and Wildlife Conservation Trust Fund*, with use of the fund restricted to state parks and wildlife conservation. The $18 surcharge would have generated about $500 million in revenues annually for the trust fund, with savings to the general fund and other special funds up to $200 million annually. Based on recent election results, this funding option may prove difficult to implement.

Motor Vehicle Fuel Taxes. In California, motor vehicle fuel is taxed at both the federal and state level. The federal excise tax on fuel is $0.18 per gallon. The state fuel tax is $0.353 per gallon, which was increased in 2010 from $0.18 per gallon in conjunction with a decrease in the sales tax on fuel.[139] On average, approximately 15.3 billion gallons of fuel are sold in California every year.[140] Prior to the tax increase, state fuel tax revenues averaged approximately $3.4 billion per year (based on 2005-6 and 2006-7 data).[141] With the recent increase, fuel tax revenues are expected to be substantially higher.

A surcharge to the state fuel tax could generate substantial revenue for the RRF. It is estimated that a relatively modest surcharge of 0.1 cents to 1 cent ($0.001-$0.01) per gallon of fuel would generate about **$15.3 million to $153.4 million** in new fuel tax revenues on an annual basis.

Bond Financing. California has used bond financing extensively as a funding tool for conservation in the past. A sample of recent bond financing programs implemented by the California Resources Agency includes:[142]

- Proposition 1E - The Disaster Preparedness and Flood Protection Bond Act of 2006;
- Proposition 12 - Safe Neighborhood Parks, Clean Water, Clean Air, and Coastal Protection Bond Act of 2000;
- Proposition 13 - Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Bond Act;
- Proposition 40 - California Clean Water, Clean Air, Safe Neighborhood Parks, and Coastal Protection Act of 2002;
- Proposition 50 - Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002; and
- Proposition 84 - Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006.

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139 California Board of Equalization. Fuel Taxes Division – Tax Rates. Website http://www.boe.ca.gov/sptaxprog/spftdrates.htm, accessed January 15, 2011.

140 California Board of Equalization. Net Taxable Gasoline Gallons. Website http://www.boe.ca.gov/sptaxprog/reports/MVF_10_Year_Report.pdf, accessed January 15, 2011.

141 California Department of Finance, Economic Research Unit, 2009, op. cit.

142 California Natural Resources Agency. Resources Agency Bonds Program. Website http://resources.ca.gov/bonds.html, accessed January 12, 2011.

Most of the conservation-based bond measures passed in California are used to fund large-scale regional programs and projects. For example, bond funding outlined under Proposition 84 totals nearly $5.4 billion spread over eight broad project areas, including water quality; flood control and subventions; statewide water planning and design; protection of rivers, lakes and streams; forest and wildlife conservation; protections of beaches, bays and coastal waters; state parks and natural education facilities; and sustainable communities/climate change. It is unlikely that the AIS RRF would be large enough to require bond financing on its own, and further, it would require voter approval. However, there may be opportunities for grant funding for the RRF from these larger bond measures for the distinct purpose of early response and eradication of AIS in the state. No revenue estimates have been developed for this study, however.

6.2.3 Grant Funding & Contributions

The RRF could also seek additional funding through grant programs at the state and federal level as outlined in Strategy 1C1 in the CAISMP. In fact, federal law[143] enables state governors to request federal assistance for up to 75 percent of the cost incurred to implement state aquatic invasive species management plans. Because rapid response planning and funding are clearly goals of the California plan, these federal grant monies may be a viable source of funding for the RRF. Alternatively, state-funded monies from an RRF could be used as a source of matching funds for other federal grant programs (see Strategy 1C of the CAISMP).

However, grant funding represents "soft" money that cannot serve as a reliable funding option, and using state grants to fund the RRF is a zero-sum game for California. Further, the pursuit of grant funds may be inefficient, requiring the diversion of staff time to grant solicitation rather than RRF management. To effectively pursue grant funding, the RRF administrative structure may need to include a funding development specialist to track and apply for available grant opportunities (see Strategy 1C5). Because the probability of securing grant funding is unknown, potential grant revenues for the RRF are unknown.

6.3 Summary of Funding Options

There is a wide range of potential funding sources for an AIS RRF (Table 6-2), each with its own advantages and disadvantages. Identifying the most viable options is a complex process. Funding options that are tied directly to entities that are either AIS vectors or beneficiaries of AIS control might be most acceptable. Adoption of new or increased fees or taxes should consider the ability to pay so that financial burdens are not excessive.

143 The Nonindigenous Aquatic Nuisance Prevention and Control Act (1990).

Table 6-2 Summary of Potential Funding Sources for AIS RRF

Source	Responsible Entity	Funding Estimate		Notes
		Low	High	
CA Marine Invasive Species Program – Fund Allocation	Shipping Industry	$587,000	$1,174,000	10%-20% allocation of existing fee revenues
CA Marine Invasive Species Program – Ballast Water Fee Increase	Shipping Industry	$345,000	$1,036,000	Increase in fee from $850 to $900-$1,000 per voyage
Port Capacity Charge – Per 20-foot Equivalent Container	Shipping Industry	$17,000,000	$85,000,000	$1-$5 charge per 20-foot equivalent container; at southern California ports only
Port Capacity Charge – Per Gross Tonnage	Shipping Industry	$17,684,000	$176,842,000	$0.10-$1.00/ton charge
Cruise Passenger Excise Tax	Cruise Passengers	$11,119,000	$55,594,000	$10-$50/passenger charge
Cruise Passenger Voluntary Donations	Cruise Passengers	$1,112,000	$6,671,000	$10-$60/passenger donation and 10% participation rate
Commercial Fishing Landings Tax	Fishing Industry	$1,191,000	$4,926,000	Increase in tax rate on fish land values from approx. 1% to 2-5%
Commercial Fish Business License Fee	Fishing Industry	$40,000	$200,000	5-25% increase in fees
Commercial Fishing License and Permit Fees	Fishing Industry	$173,000	$863,000	5-25% increase in fees
Aquaculture License Fees	Aquaculture Industry	$5,000	$25,000	5-25% increase in fees
Recreation Fishing License Fees	Anglers	$3,038,000	$15,190,000	5-25% increase in fees
Recreational Fishing Equipment Excise Tax	Anglers	$3,270,000	$32,698,000	New excise tax at rate of 1-10%
Recreation Watercraft and Trailer Registration Fee	Boaters	$540,000	$2,701,000	5-25% increase in fees
Recreational Watercraft Excise Tax	Boaters	$4,170,000	$41,700,000	New excise tax at rate of 1-10%
Boat Launch Ramp Fees	Boaters	*Unknown*	*Unknown*	Data not available to estimate
Boater Education Fee	Boaters	*Unknown*	*Unknown*	Data not available to estimate

		Funding Estimate		
General Recreation Activity – Various Fees and Charges	Varies	*Unknown*	*Unknown*	Not estimated
CVP/SWP Water Delivery Surcharge	Water Contractors	$10,363,000	$103,631,000	Surcharge of 1-10% on existing water rates
Direct Transport and Other Fines and Penalties	Varies	*Unknown*	*Unknown*	Data not available to estimate
General Fund - Direct Appropriations	Public	*Unknown*	*Unknown*	Not estimated
Sales Tax Revenues	Public	$16,957,000	$169,575,000	Sales tax rate increase of 0.0025% to 0.025%
Motor Vehicle Registration or Vehicle License Fees	Public	$28,085,000	$280,845,000	$1-$10 surcharge on vehicle registrations
State Fuel Tax	Public	$15,335,000	$153,353,000	0.1 - 1 cent surcharge
Conservation Bonds	Public	*Unknown*	*Unknown*	Not estimated
Grant Funding	Public	*Unknown*	*Unknown*	Not estimated

Chapter 8

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