Options for Financing Coastal and Ocean Conservation in California

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Redefining Progress

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I. The Value of Coastal Protection*

It is fair to say that without access to the coast, the oceans, and the services of the coastal ecosystem, most of California's economy and culture simply could not exist. It is no accident that 86 percent of California's GSP is produced in coastal counties (including counties bordering on our great ocean bays and deltas), nor that the GSP of California is nearly six times that of the combined GSPs of the states immediately inland of California, Nevada and Arizona, though they collectively have a larger land area.

A 2000 study by the National Ocean Economics Program[1] found that the sectors of the economy most directly and immediately tied to the ocean accounted for $42.9 billion (in 2000 dollars), or about 3.2 percent of the Gross State Product, and almost twice that percentage of employment (Table 1). Note that California's economy has grown by more than 18 percent between 2000 and 2006, and that historically these sectors have grown roughly apace with the economy as a whole.

Table 1: Economic value of California's ocean economy in 2000 ($millions).[2]

Sector	Direct GSP	Indirect & Induced	Total
Marine Construction	309	309	618
Living Resources (fish, kelp, etc.)	403	323	706
Minerals	415	291	706
Ship & Boat Building	493	395	888
Tourism & Recreation	12,427	9,941	22,368
Transportation	7,387	10,342	17,729
Total	**21,434**	**21,601**	**43,035**

Moreover, Californian's love of the coast and the oceans is a defining feature of our state character. In 2000, Californians made about 144 million trips to the beach, an average of about four trips for every man woman and child in the state, including inland residents. Survey research shows that a vast majority (88%) of Californians say the condition of the ocean and beaches is personally important to them, and strong majorities also believe that the coastline's condition is very important to the state's quality of life (69%) and economy (61%).

Concerns about the decline in the quality of the coastal environment top the list of environmental concerns, and Californians are willing to protect that environmental quality even at significant economic cost: by strong bipartisan majorities, most Californians support restricting development along the coast, even if it results in less available housing (69%);

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* This report is a product of the Sustainable Economics Program at Redefining Progress. The Sustainable Economics program is dedicated to developing innovative public policies that better harmonize environmental, economic, and social justice goals. Please direct any inquiries to Andrew Hoerner at ahoerner@rprogress.org.

[1] Judith Kildow & Charles S. Colgen, *California's Ocean Economy: Report to the Resources Agency, State of California.* Prepared by the National Ocean Economics Program (July 2005) http://www.resources.ca.gov/press_documents/CA_Ocean_Econ_Report.pdf

[2] Ibid.

protecting wetlands and beach/bay habitats even if it means less commercial activity near the coast (77%); and creating more marine reserves, even if it limits commercial and recreational fishing (75%).[3]

Given the immense importance of the ocean economy and strong public concern for maintaining the coastal environment, it is clear that the state needs stable, long-term sources of funding for ocean conservation. In keeping with the California Ocean Protection Council's vision of preserving and improving the health and utility of our coastal and ocean resources,[4] this report examines options for such funding. We survey the potential of over forty revenue-generating instruments to fund coastal and ocean protection.

Section II of this report will identify substantial unmet needs for coastal protection. The following section will discuss general principles of public finance as they apply to coastal conservation in California. We then turn to a survey of possible instruments in Section IV, assessing the advantages and disadvantages of each. The report concludes with detailed tables outlining current and projected revenues for each instrument.

II. Funding Needs for Coastal and Ocean Protection

The California Ocean Protection Council's Five Year Strategic Plan sets forth bold, specific, and far-reaching targets for maintaining "healthy, resilient, and productive ocean and coastal ecosystems." As part of this vision, the OPC identifies a comprehensive set of goals, actions, and performance measures for managing California's coastal and ocean resources.[5]

Although the objective of the current study was not to comprehensively survey outstanding funding needs for coastal protection, during the course of our work we became aware of numerous outstanding unmet needs that, if met, would advance the goals set forth in the OPC's five year strategic plan. There are substantial unmet funding needs for ocean and coastal protection across most agencies involved with coastal resource management.

A full survey and quantification of these needs is beyond the scope of this study. Indeed, such a survey is one of the unmet needs we have identified. However, to provide context for the detailed survey of revenue-generating instruments in section IV of this report, we briefly list these identified outstanding needs in this section. Here we aim to describe needs identified during conversations with state agency personnel that are consistent with the OPC's strategic plan, not to provide a comprehensive survey of outstanding needs for coastal and ocean protection. Where available, we also cite rough anecdotal estimates of the magnitude of one-time and recurring costs of each need. Most of these are order-of-magnitude ranges, not precise, scientific estimates. Table 2 below summarizes the discussion of the outstanding funding needs.

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[3] Mark Baldassare, Special Survey on Californians & the Environment, Public Policy Institute of California (Nov. 2003) http://www.ppic.org/content/pubs/survey/S_1103MBS.pdf.

[4] California Ocean Protection Council. 2006. A Vision for our Ocean and Coast: Five Year Strategic Plan. http://www.resources.ca.gov/copc/docs/OPC_Strategic_Plan_2006.pdf

[5] California Ocean Protection Council. 2006. A Vision for our Ocean and Coast: Five Year Strategic Plan. http://www.resources.ca.gov/copc/docs/OPC_Strategic_Plan_2006.pdf

In all we identify approximately $824 million in unmet need which we have been able to quantify. This is clearly a lower bound, since there were many needs identified for which we were not able to get dollar estimates for this report (identified in Table 2 with an "NE"). Of these, $520 million are one-time charges and $304 million are recurring annual charges. Annualizing the one-time charges at a five percent real interest rate, this implies that there is an unmet annual revenue need of at least $330 million. In other words, we find that to preserve and maintain the roughly $73 billion[6] that ocean and coastal activities contributes to the Gross State Product (GSP), it is necessary to increase our expenditures on ocean and coastal protection by half a percent of that amount. (Note that the $73 billion of GSP does not include the intangible value of the ocean and coast – the value of the love and esteem that the citizens of California have for a clean and healthy coastal environment. In light of the survey results posted above, this intangible value appears to exceed the GSP contribution by a large ratio. Meeting the needs we have identified is also necessary to preserve this intangible value).

We have classified the identified needs both programmatically and thematically. The identified needs fall into six programmatic areas: contaminant management, management of coastal habitat quality, fisheries management, management of state coastal lands, coastal management plan implementation, and additional needs. Within each of these areas, the needs are further classified into three thematic areas: monitoring, management & operations, and law enforcement.

Estimates in this section for which sources are not cited are from unofficial communications with staff of the relevant agencies.

A. Contaminant Management

Monitoring Needs

- Compile and track all known discharges of contaminants to surface waters in a publicly-accessible, state-wide database. Contaminant discharge data is currently compiled by numerous individual facilities including universities, municipal, and industrial dischargers, and is collected by the regional water boards in some cases.[7] However, this data is not readily available to the public in a state-wide, aggregate format. If it were, comprehensive tracking and management of coastal water quality would be greatly facilitated.

- Closely monitor effluents that are out of compliance with their waste discharge permit requirements, and include this data in the state-wide contaminant discharge database described above. This data would allow enforcement to be targeted specifically to facilities whose pollutant discharges are greater than their permitted levels.

- Track inflows of contaminants from groundwater to surface water, to better understand the role of groundwater contamination in the degradation of coastal water quality.

[6] This is the figure from Table 1 above, adjusted for inflation and economic growth.
[7] Kenneth Schiff, Stephen Weisberg, and Valerie Raco-Rands. 2002. Inventory of ocean monitoring in the Southern California Bight. Environmental Management **29**(6): 871-876.

Management & Operations Needs

- Upgrade ageing sewage infrastructure, particularly combined storm sewer systems and cracking sewage pipes. Combined storm sewer systems collect domestic sewage and rainwater runoff in the same pipes, and under storm conditions, these systems can overflow and directly discharge sewage water into receiving surface water bodies. Resulting bacterial contamination necessitates beach closures to protect human health, which the Ocean Foundation estimates costs up to $300 million per year in California. Human sewage may also contribute to the decline of coral reefs.[8] There is also a need for upkeep and maintenance of existing sewage systems, including treatment of cracks in underground pipes through which contaminated water can enter groundwater and surface waters.

- Implement the Office of Spill Prevention and Response's inland spill pollution program, which is currently not funded. This program would monitor, inspect, and clean up inland spills of oil, hazardous materials, sewage, and sediment discharges. There have been 600 incidents of such spills between January and October 2007, the majority of which were not attended to because of a lack of program funding. This program would also allow tracking of the impact of inland spills on regional and coastal water quality. Thirty positions would be required for an effective inland program analogous to OSPR's marine program, at an annual cost of approximately $20 million, with initial start-up costs of $5 - $10 million, according to the OSPR staff.

Enforcement Needs

- Fully enforce the requirements of waste discharge permits. Additional site inspections are necessary to ensure that the actual quantity of pollutants discharged to surface waters are within the allowed limits of the waste discharge permit. According to the State Water Resources Control Board, current levels of enforcement only allow site inspections of 6-10% of dischargers per year, while the ideal level of enforcement is inspection of 20% of permitted dischargers. The annual cost of an additional 200 positions to implement the discharge monitoring program to this level is estimated to be at least $18.8 million.
[9]

B. Management of Coastal Habitat Quality

Monitoring Needs

- Monitor the status of the network of marine protected areas being implemented along California's coast by the Marine Protected Areas Monitoring Enterprise (MPAME).

- Monitor a comprehensive set of ecosystem indicators to set baselines and track changes in coastal habitat quality. These indicators would include biological and food web indicators, nutrient and bacterial indicators, wetland and kelp indicators, and physical oceanography indicators. Some of this can be accomplished through improvements in the monitoring programs that already exist. The Southern California Coastal Water Research

[8] U.S. Commission on Ocean Policy. 2004. An Ocean Blueprint for the 21st Century Chapter 14: Addressing Coastal Water Pollution. http://www.oceancommission.gov/documents/full_color_rpt/14_chapter14.pdf
[9] Personal Communication. Bud Leland, Office of Spill Prevention and Response. November 1, 2007.

Project (SCCWRP), for example, identifies a need for data coordination and consolidation of metadata that provides indicators to overall coastal habitat quality. Data provided by these ecosystem indicator monitoring programs forms the basis of multi-million dollar management decisions. For example, according to SCCWRP the $600 million dollar decision by the Orange County Sanitary District to employ higher treatment levels was made after an assessment of thirty years of discharge monitoring data.

Management & Operations Needs

- Comprehensively manage the threat to local habitats posed by the introduction of non-indigenous species to California's coastal waters. This includes the need to prevent new introductions; develop technology to treat ballast water; monitor, detect, and respond to new invasions; and control the spread of existing non-indigenous species. The US Commission on Ocean Policy estimated that the costs of invasive species control and management nationally are $31.5 million in the first year and $50 million annually thereafter.[10] Since California's 1100 mile coastline is approximately 9% the total US coast (of 12,375 miles), we assumed that the costs of managing invasive species in California are 9% of the total national costs. Thus, we estimate that the one-time initial setup costs of invasive species management are approximately $2.8 million, and the recurring annual costs are at least $4.4 million. We believe these figures constitute a lower bound because the high level of traffic at California ports poses additional risk of species introduction.

- Remove structural barriers which fragment California's streams and compromise habitat quality along those streams. The State Coastal Conservancy estimates there are more than 2,000 of these barriers and they impede stream and sediment flows, restrict access to stream habitat, impact nutrient cycling, compromise ecosystem values, and restrict the passage of migrating fish. The cost of removing these structural barriers is at least $450 million.

- Support management plans and restoration projects to protect and enhance coastal wetlands, forests, coastal sage scrub and other habitat types that provide important resources for coastal and marine fish, birds and wildlife. Many coastal wetlands have been diked and filled for development or degraded by urban runoff. Coastal lagoons and near-shore waters have been choked with sediment and other pollutants, thereby damaging eelgrass and kelp beds. Coastal forests, including riparian corridors and nearby upland areas, have also been severely impacted by human activities The estimated cost of protecting and restoring wetlands, forests, coastal sage scrub and other coastal habitats is approximately one billion dollars to the level required by the Coastal Management Plan (discussed below), or approximately $200 million per year. (This estimate is for the current five-year planning cycle. We could not get an estimate for needs beyond the end of that cycle).

Enforcement Needs

- Ensure that enforcement measures are adequate to prevent unpermitted pumping that could adversely affect stream and wetland habitats. Additional enforcement may be needed to prevent plastics and other harmful products deposited upstream from reaching

[10] U.S. Commission on Ocean Policy. 2004. An Ocean Blueprint for the 21st Century Chapter 30: Funding Needs and Possible Sources. http://www.oceancommission.gov/documents/full_color_rpt/30_chapter30.pdf

marine environments. With the creation of new marine protected areas, there is a growing need to enforce rules governing ocean fishing and recreation.

C. Coastal Economies/Fisheries Management

Management & Operations Needs

- Develop, implement, and support a comprehensive fisheries management strategy that includes comprehensive monitoring, stock assessment, and control rules for all commercially- and recreationally-important species in California. The State Coastal Conservancy estimates the initial development costs of such a strategy are approximately $60 million, and the recurring annual costs are approximately $10 million, not including the costs of enforcement. In addition, there is some evidence that the maintenance and support activities relating to existing fisheries management plans are underfunded.

- Acquire cutting-edge tools and technology (such as remotely-operated vehicles, underwater video cameras, and submarines) to perform fishery-independent surveys of stock status. New technologies provide new methods of surveying species such as rockfish that are particularly difficult to observe and assess using traditional survey methods. Data collected from fishery-independent surveys are needed to estimate trends in abundance and inform management decisions.

- Study new tools for more efficient industry regulation. Current fisheries regulation provides incentives to over-invest in fishing boats and equipment because firms are racing for a share of a fixed allowable total catch. This over-investment reduces the profit margin of the industry to unsustainable levels and provides incentives to over-fish with equipment that would otherwise be idle. New, creative programs to help the industry return the infrastructure investment to a level consistent with the sustainable fishing take have been initiated at a pilot level. These pilot programs need to be studied in the context of ongoing international negotiations over sustainable catch limits and enforcement. Such programs and related policies, including buyback, entry limits, catch limits, auctioned catch permits, and other regulatory and market-based approaches to achieve efficient and effective reductions in over-investment and over-capacity need ongoing study and, if effective, implementation or expansion.[11] We estimate the study cost at $0.2 to 0.6 million.

Enforcement Needs

- Increase the level of fisheries law enforcement by hiring new wardens and improving compensation and benefits for wardens. The State Coastal Conservancy estimates the cost of increasing fisheries enforcement to adequate levels is approximately $30 - $40 million.

D. Management of State Coastal Lands

Management & Operations Needs

- Comprehensively manage leases granting state coastal lands to cities and harbor districts ("granted lands"). This involves verifying that guidelines for the leases are followed and proposed development on state lands is consistent with the Public Trust mandate. The

[11] See also the discussion of individual transferable quotas below.

State Lands Commission estimates the cost of management of granted lands is $713,000, which covers funding for five positions including one financial specialist and one grant boundary specialist.

- Remove physical structures from state coastal lands, particularly from beaches, that pose risks to public health. The cost of removing hazards is approximately $3 million.

Enforcement Needs

- Five designated positions are needed to monitor and ensure compliance with the terms of leases on state coastal lands that are rented out for various uses, including pipelines, marinas, dredging, wildlife habitat, fiber-optic cables, and power cables serving offshore platforms. Three basic staffers, one civil engineer, and one surveyor are needed to manage leases in a proactive, rather than reactive fashion. The cost of these five positions is approximately $589,000.

E. Enforcing Standards for Coastal Development

New development has many effects on coastal lands, and can have both positive and negative impacts on environmental quality, habitat and ecosystem health, public recreational opportunities, and the commercial use of coastal lands and resources. To assure that new development is broadly consistent with state and national environmental goals and with the public interest more generally, and to assess the necessary investment in related public assets and infrastructure, the primary tool is the Coastal Management Plan (CMP) under the California Coastal Act of 1976, as amended,[12] and the federal Coastal Zone Management Act of 1972, as amended.[13] In addition, there are "Local Coastal Programs" (LCPs) that are essentially local zoning and permitting systems for coastal lands. Although the state has adopted and approved a comprehensive coastal plan, it has not allocated budgetary resources adequate to enable the agencies to actually implement and enforce the CMP and the related Coastal Programs.

Management & Operations Needs

The Coastal Management Plan includes extensive operations to restore, protect, maintain and enhance coastal resources, and to provide access to the shore. The Local Coastal Programs enforce the CMP in most localities except in for certain especially sensitive lands, for which jurisdiction is retained by the Coastal Commission. LCP plans and rules are required by statute to be reviewed by the local jurisdictions and the Coastal Commission and if necessary updated no less frequently than every five years.[14] This review process is seriously behind, with many LCPs having no review for ten years or more. Over this span of time there are substantial changes in the level of development, water quality, threat to species and biodiversity, and habitat fragmentation, such that the original LCP may be so badly outdated that it no longer serves as an effective tool for coastal protection. Moreover, none of these plans has been adequately updated in light of the new science on global warming and sea level rise. At least one million dollars per year, appropriately divided between the

[12] California Public Resources Code §30000 et seq.
[13] Coastal Zone Management Act of 1972, 16 USC 1451-1464, Chapter 33; P.L. 92-583, October 27, 1972; 86 Stat. 1280), as amended.
[14] California Public Resources Code Section 30519.5.

Coastal Commission and the SFBCDC, is required for a rolling review process that will maintain the Coastal LCPs consistently current (and for the parallel review of Federal development plans in California). Additional monies may be required by the local governments for their role in updating the LCPs.

In some cases, the goals of the Plan can only be achieved, or can be achieved most effectively, by the purchase of key plots of land. Examples are to maintain beach access, to prevent ecosystem fragmentation and degradation, and to preserve habitat for threatened and endangered species.. The State Coastal Conservancy estimates that, over the next five years, there are there approximately $200 million/year of currently unfunded acquisition and restoration needs to implement the Coastal management plan as adopted. (See also discussion under Managing Coastal Resources, above).

Enforcement Needs

The principal tool of enforcing the Coastal Management plan is the permitting process. Jurisdiction over permits is split between LCPs, the Coastal Commission, and the San Francisco Bay Conservation and Development Commission (BCDC). For this tool to be effective, it is necessary to enforce the permits, in two senses: first, to make sure that development projects that are required by law to get permits actually do so, and second, to enforce permit conditions in permitted projects. Currently, the resources available for such enforcement are so minimal that it is nearly certain that many violations with serious environmental consequences are occurring. To maintain a current level of enforcement adequate to prevent such violations for the entire coast, at least $4 million per year is needed, appropriately divided between the Coastal Commission and the BCDC. Additional monies may be required by the LCPs as well, from either state or local sources.

F. Additional Needs

Monitoring Needs

- There is a need to comprehensively monitor human uses of the coast and coastal resources, including recreational use. The Ocean Foundation estimates the costs of collecting coastal use data through online surveys should not exceed $1 million every three years.

Management Operations Needs

- There is a need for ongoing maintenance and upkeep of existing infrastructure, programs, and facilities in most state agencies. For example, the National Ocean Economics Project identifies a need to maintain parks and recreation facility infrastructure.

Science Needs:

- All coast and ocean restoration and management activities should be based on sound science. There is a need for additional scientific research and data collection to monitor the health of coastal and ocean resources and to determine the most efficient and scientifically effective means of protecting and restoring damaged ecosystems.

Table 2: Summary of Outstanding Funding Needs Identified Over the Course of this Study			
Programmatic Need	**Thematic Need**	**One-Time Investment Cost**	**Recurring Annual Cost**
Contaminant Management			
Implement inland spill pollution program	Operations	$5 - $10 million	$20 million
Fully enforce waste discharge permit requirements	Enforcement	0	$18.8 million
Track contaminant discharges in a state-wide database	Monitoring	NE	NE
Monitor discharges of out-of-compliance effluents	Monitoring	NE	NE
Monitor groundwater contaminant inflows to coastal water	Monitoring	0	NE
Upgrade ageing sewage infrastructure	Operations	NE	NE
Total, available estimates		$5 to $10 million	$38 million
Management of Coastal Habitat Quality			
Acquire, protect, and/or restore coastal habitat	Operations	0	$200 million
Remove barriers compromising stream habitat quality	Operations	at least $450 million	NE
Marine Protected Areas Monitoring Enterprise	Monitoring	NE	$1.7 - $10.5 million
Comprehensively manage invasive species (control, research)	Operations	$2.8 million	$4.4 million
Monitor comprehensive set of ecosystem indicators	Monitoring	NE	NE
Total, available estimates		At least 443 million	$206 to $215 million
Fisheries Management			
Fully enforce fisheries laws by increasing wardens	Enforcement	0	$30 - $40 million
Develop a comprehensive fisheries management strategy	Operations	$60 million	$10 million
Provide ongoing support to existing management plans	Operations	0	NE
Acquire tools and technology for collecting data on stock status	Operations	NE	NE
Total, available estimates		$60 million	$40-$50 million
Managing Development			
Enforcement of permits and permit conditions	Enforcement	0	$4 million
Review of Local Coastal Programs (LCPs) & Federal planing	Operations	0	$1 million
Local government review of LCPs	Operations	0	NE
Local government enforcement of permits & permit conditions	Enforcement	0	NE
Total, available estimates			$5 million
Management of State Coastal Lands			
Remove structural hazards on state coastal lands	Operations	0	$3 million
Manage leases granting lands to cities and harbor districts	Operations	0	$713,000
Monitor and enforce lease requirements on state coastal lands	Enforcement	0	$542,000
Total, available estimates		0	$4.3 million
Additional Needs			
Monitor human uses of coastal resources	Monitoring	NE	NE
Maintain and upkeep current infrastructure, programs, facilities	Operations	NE	NE
Total, available estimates		0	0
OVERALL TOTAL, available estimates		$518 to $523 million	$294 to $313 million
*NE + No estimate available.			

III. Criteria for Financing Coastal Protection

In choosing a financing source to meet the need for public expenditures to protect the quality of the natural and human environment in ocean and coastal regions, there are two broad types of criteria at play. The first is the set of basic public finance principles for should govern the selection of a particular revenue source – whether from fees, taxes, charges or non-charge sources – out of the broad universe of possible financing options. These principles are positive reasons to select a particular revenue source.

The second class of criteria includes costs, barriers, and constraints to the adoption of particular charges. These are not mere negatives of the basic rationales, but are rather constraints on the adoption of particular sources of revenue that appear desirable from the point of view of the basic rationales. These criteria can in turn be subdivided into two classes, though the line between them is not always clear: feasibility constraints, which determine whether a revenue source can be adopted at all; and countervailing costs, which need to be weighed against the value of the public service provided and the strength of the motivating rationale.

Both of these criteria are essential and must be considered. A plausible charge to finance a particular public activity must first be desirable from the perspective of the fundamental rationales, and then shown to be both feasible and to not generate ancillary costs that outweigh those benefits. The next two sections will describe the rationales relevant to selecting a revenue source to finance conservation and the constraints on adopting such sources, respectively.

A. Fundamental Rationales for Selecting Revenue Sources

In identifying possible revenue sources for ocean conservation, we have identified seven rationales that can justify a particular choice of instrument. Of these, the first three are the standard fundamental principles of public finance for allocating the burden of providing public services, principles that should be considered in nearly every case:

- Ability to pay;
- The benefit principle; and
- Polluter pays.

We have also identified particular revenue sources that that may be appropriate to the finance of particular ocean conservation initiatives which do not conform to the standard model of a fee or tax, each with its own rationale and special considerations. These are:

- Sales and rentals of public assets or assets in public trust;
- Profits from public enterprises;
- Insurance or risk sharing charges; and
- Technology transformation levies.

We will discuss these seven rationales in turn, each as they apply to the selection of revenue streams to finance ocean and coastal conservation.

1. Ability to pay

Ability to pay refers to the capacity of the individual charged to pay a fee, charge or tax without undue harm. There are a number of distinct underlying rationales for accepting that fees or charges should be allocated according to ability to pay.[15] There is a broad consensus among philosophical, political, and ethical traditions that the overall system of financing public goods should be progressive or proportional in nature, a principle that was advocated in Adam Smith's 18th century treatise *The Wealth of Nations* and subsequently endorsed across the ideological spectrum, from Milton Friedman's advocacy of a negative income tax (i.e. one that gives the poorest taxpayers a payment rather than a charge) as a replacement for the welfare system in his utopian vision of unfettered markets, *Capitalism and Freedom*, to Karl Marx's demand for an income tax (which did not then exist) during the transition to a worker-controlled economy in *The Communist Manifesto*.

The ability to pay principle is often divided analytically into the horizontal equity principle, which states that those with a similar ability to pay should bear similar burdens for the provision of public goods, and the vertical equity principle, which states that those with a greater ability to pay should pay more than those with a lesser ability to pay. The former can be referred to as the doctrine of *nondiscrimination*, and the latter is sometimes justified as the *principle of equal sacrifice*. These are not mere academic distinctions, but also influential in a wide range of public policy settings, e.g. in allocations of rights and duties by the courts.[16]

Ability to pay is most often measured in terms of annual income or consumption. (Annual consumption equals annual income minus savings plus borrowing, as an accounting identity). However, a variety of refinements or alternatives have been adopted, such as the use of lifetime income or of income adjusted by some non-monetary costs or benefits. Occasionally wealth has also been used as a measure of ability to pay. Charges are said to be *proportional* if they go up proportionally with ability to pay, *progressive* if the tax rate increases with ability to pay(like the U.S. income tax, or the proposed flat tax[17]) and *regressive* if the tax is born disproportionately by those with less ability to pay (like a head tax or most taxes on necessities). One must also specify the unit over which comparisons are to be made. For example, in the U.S. the basic taxable unit for the income tax and for most equity analysis is the household, while the taxable unit under the Canadian income tax is the individual. Similar choices must also be made for business taxation.[18]

A fully specified theory of vertical equity, stating how ability to pay is to be measured (e.g. by household annual income, say, or individual consumption of natural resources) and how charges should rise with ability to pay, contains within it a related theory of horizontal equity. This is because, once we have specified how to measure ability to pay, we can identify those

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[15] See, e.g., Musgrave, A. (1985) "A Brief History of Fiscal Doctrine", in A. Aurbach and M. Feldstein (eds.) *Handbook of Public Economics*, Vol.1, 1-59; Walter J. Blum and Harry Kalven Jr., "The Uneasy Case for Progressive Taxation," *University of Chicago Law Review* 19, no.3 (1952): 417-520.

[16]Richard J. Wood, "Supreme Court Jurisprudence of Tax Fairness," 36 *Seton Hall L. Rev.* 421 (2006).

[17] Although the flat tax has a constant rate on taxed income, and so appears to be proportional, it is still progressive because it continues to exclude income below some fixed amount from taxation. This makes it strongly progressive for low to moderate income, but approximately proportional for higher levels.

[18] The unit of analysis is more complex on the business side, where we have corporations, partnerships, trusts, etc., often owning one another, with a vast range of sizes, and all ultimately owned by individuals. In this setting, the way we define the taxable entity has especially large consequences for the distribution tax burden.

with the same ability to pay. The principle of horizontal equity maintains that every member of such a group should pay the same amount. However, the converse is not true. For example, even if you have determined that ability to pay is most closely related to household annual income, and you believe you know precisely how this income should be measured, this does not tell you how progressive an income tax should be, i.e. what the tax rate should be on people with different income levels.

For financing ocean conservation, the ability to pay principle is particularly important when considering charges to finance governmental services of general public value that neither (1) provide benefits that flow primarily to a few identifiable individuals nor (2) remedy problems caused by a few identifiable individuals. These two situations are typically better governed by the benefit and polluter-pays principle, respectively.

It is also especially important to consider the ability to pay principle when looking at charges likely to fall disproportionately on lower-income families. Many charges levied on consumption fall in this category. More specifically, charges on necessities (and on addictive substances such as alcohol or tobacco) tend to be regressive, while charges on luxury goods and services tend to be progressive. It is an unfortunate truth that the production or consumption of necessities often entails more environmental impact per dollar that the production or consumption of luxuries. A luxury car can easily cost five times what a similarly-sized basic car with a comparable environmental impact costs, and this is true of many kinds of goods. As a result, it is important when examining environmental charges that are large enough to affect people's budgets to examine the potential impact on low- and moderate-income families and offset it where appropriate.

2. The Benefit Principle

The benefit principle states that, to the extent possible, charges should be levied based on the value of the benefit of the government services received. Some have argued that the ability to pay principle is based on the benefit principle, or *vice versa*.[19] When government services provide benefits to particular, identifiable individuals that are greater than the cost of those services, it makes sense to charge the benefitted individuals rather than the population as a whole. This serves principles of both efficiency and fairness.[20] It serves the goal of efficiency because it creates a natural criterion for determining whether a particular government expenditure is worth making, that the net benefit of the government service (i.e. the value of the benefit to the recipient minus total cost of the charge) be positive. It serves the goal of fairness because it allocates the cost of providing a government service between payers in a way that reduces coerced payment and that is intuitively reasonable (and hence legitimizing).

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[19] Some would even argue that the principle of vertical equity is ultimately based on the benefit principle, under the assumption that ability to pay measures the overall benefit from government activities that maintain the status quo. Conversely, one can claim that the benefit principle can be derived from horizontal equity if the value of the service provided is included in the ability to pay measure (e.g. if the value is treated as income when using income as the measure of ability to pay), or regarded as a negative charge. Musgrave, Richard. "Horizontal Equity Once More." *National Tax Journal* 43 (2) (1990): 113-23.

[20] See, e.g., Bittker, Boris. "Equity, Efficiency, and Income Tax Theory: Do Misallocations Drive Out Inequities?" In *The Economics of Taxation*, edited by Henry Aaron and Michael Boskin. Washington, D.C.: The Brookings Institution, 1980.

The benefit principle also embodies useful political knowledge, because it is often possible to recruit support from the charged group for charges that truly meet a benefit test. This is because the charge and benefit together impose no net burden or provide a net benefit. Examples might be charges on the hospitality industry for services that attract enough additional tourism so that the increase in business more than pays for the charge, or charges on recreational fishing to support and rebuild the stocks of game fish (again, provided the value of the increase in fish stock is greater than the charge on net). The benefit principle is especially relevant when looking at programs that benefit identifiable industries, companies, or individuals. Examples might include:

- charges on an industry for programs that will enhance the value of ocean or coastal ecosystem services to that industry;
- property-related charges for programs that enhance the value of coastal property; or
- recreation-related charges for programs that enhance the value of recreation.

3. Polluter Pays

For purposes of this paper, "polluter" is defined broadly as any entity that discharges or disposes of material in water or on land in a manner harmful to the environment. It may also include those who consume or destroy exhaustible or depletable natural resources. Polluters may be businesses, individuals, government agencies or non-profit organizations. The polluter-pays principle states that the social cost of pollution[21] should be born by polluters. This principle, like the benefit principle, is rooted in both equity and efficiency concerns (though in slightly different versions, as discussed below). Polluter-pays charges are necessary for economic efficiency as they send the polluter a signal not to consume a common resource (such as clean air or water) past the point where the pollution causes damage to society greater than the benefit of the polluting activity. As a principle of equity or justice, "polluter pays" asserts that it is better for the costs imposed by pollution, and the costs of reducing or preventing pollution, to be born by the responsible polluter than by innocent non-polluters.

However, it should be observed that, although the basic idea that polluters should pay for the costs they impose on other can be derived from either equity or efficiency, related aspects of environmental policy may differ based on the relative importance of the two rationales for a particular program or charge. For example, they have different implications for the use of the revenue from a charge. In the efficiency framework, it is enough that the polluter pay the real social cost of the last-emitted (or "marginal"[22]) unit of for the charge to produce an efficient outcome. The use of that revenue is largely irrelevant. In the equity framework, it is also often considered necessary for the revenues to be used to prevent future pollution, remediate past pollution, or compensate those injured.

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[21] Here we use "pollution" as a shorthand for every variety of environmentally damaging activity.

[22] Economic theory suggests that efficient markets set the price of all goods and services at the cost of producing the final unit of that good or service. In the case of pollution, it is usually the case that damages increase proportionally or more than proportionally to the level of emissions (as, for instance, when there is a harmless level). Thus, as the level of pollution rises, the harm per ton increases. For the price of pollution to lead to an efficient outcome, it needs to be set equal to the cost of the harm produced by this last ton, which economists call the "marginal" ton.

Also, the two approaches tend to set the charge rate differently. It is frequently easier to measure the cost of prevention, remediation or compensation than the cost of the aggregate social damage from pollution, especially where the latter is diffuse or goes to things that are not priced by any real market, or do not have market prices, such as premature death, species diversity or air clarity. In the equity framework, prevention and compensation is often considered an adequate basis for setting charge, though such a charge may be above or below the marginal social cost, or that that cost may be unknown.

Finally, the two approaches tend to reach different conclusions about the ideal level of pollution. In the efficiency framework, it is usually assumed that the cost of achieving zero pollution is astronomical and excessive, and that polluter-pays charges help firms to make the right tradeoff and produce pollution at the optimal level. In the equity framework, on the other hand, it is often assumed that pollution can and should be lowered to either zero or a harmless level. This is because the equity analysis typically does not allow an economic gain to a polluter to offset the loss it imposes unjustly on innocent others. (By "imposes unjustly on innocent others," we mean that those who bear the cost are not responsible for the loss by wrongful conduct of their own, have not agreed to bear or accept the loss, and have not been fully compensated for the loss).

Despite their differences, the equity and efficiency approaches to polluter-pays are complimentary and each has a role in the public debate on environmental policy. It is often the case that the current pollution are negligible bay either standard and that higher charges would be both efficiency-enhancing and required by justice. It is only when the charge has already been raised to the efficient level that we need to address whether fairness or justice requires that some higher level be met.

4. Public Asset/Public Trust Sales or Rentals

When new revenue is needed to finance a public program, fees or taxes are often considered first. However, sale or rental of a public asset or assets held in public trust can also constitute a substantial revenue source.

Application of our more general principles to such revenues suggests cases where they are especially appropriate:

- Where the asset in question is a coastal resource that is enhanced in value to the users by coastal protection, the benefit principle suggests that a portion of the revenue from the sales or rental go to finance that protection;
- Where an asset is a depletable or exhaustible resource that requires public management and conservation, the polluter-pays principle suggests that the renter or purchaser should pay for that management or conservation;
- Where use of an asset (such as underwater mining or drilling) involves costs or risks either to the coastal environment or to coastal communities, and the value provided does not flow primarily to those communities, the principle of horizontal equity suggests that the a portion of the revenues from that asset sufficient to offset those costs or risks should go to coastal protection or to the provision of goods benefiting coastal communities, respectively.

5. Profits from public enterprises

Like sales and rentals of public assets, the profits from public enterprises are generally used to serve public priorities. The extent to which those profits should be devoted to ocean and coastal protection will vary with a number of factors, including the extent to which the enterprise's welfare is derived from or dependent on coastal resources, the amount and severity of unmet ocean protection needs, and the urgency of other public priorities that have legitimate claims on the same revenue stream.

6. Risk-sharing

Sometimes environmental risks or remediation requirements for rare but costly accidents are greater than can be born by a substantial share of the companies engaged in the business. A good example of this is leaking underground gasoline storage at gas stations. Remediating groundwater contamination from such tanks can involve remediation costs many times the annual income of most gas stations. If adequate provision of private insurance is uncertain, unlikely, or hard to enforce, the risk of inadequate financial capability falls on the general public via an injury to environmental quality or common assets. In such circumstances it is sometimes desirable for public agencies to take on the role of insurer and perhaps of provider of remediation services as well. This can be regarded as an application of the polluter-pays principle in the context of large public risks.

7. Technology transformation/pollution prevention

There are occasions when a leap in technology that would be prohibitively expensive if undertaken by a single firm become feasible when pursued in a coordinated fashion by an industry. Where this leap is supported by the industry or provides a public benefit, and requires public expenditure for activities such as research or enforcement, it may be appropriate to impose a charge on the industry in question or its product to finance policies or services to promote this transformation. This can be justified economically because technology or knowledge is a public good, or because of economies of scale, scope, or networking that are only achievable by coordinated action. This approach has been used by a number of states to finance new technologies that are inherently non-polluting (as opposed to pollution control technologies like filters or waste stream treatment).

B. Constraints, Feasibility Issues and Offsetting Costs

1. Adequacy or scale of revenue potential

A revenue source must be potentially adequate to meet the specified need, either alone or when taken together with other appropriate revenue sources.

2. Administrability/enforcement costs

A fee or charge must be administrable and, where not voluntary in nature, enforceable. Administrability can sometimes be measured by the cost of administration, but there are other concerns as well, such as whether the personnel who will be doing the administration have the requisite training and skills (e.g. don't make accountants run chemical tests or chemists judge compliance with financial accounting standards); whether current personnel can handle the load and if not, whether new people can be brought on board in time; and the complexity and difficulty of the administrative tasks involved. Most of the same concerns also apply to enforcement, with the added caution that it is quite common to place

additional enforcement burdens on already overburdened enforcement agencies with no corresponding increase in resources. Many provisions that would be administrable if adequately enforced are not administrable if no new resources are provided for enforcement.

3. Compliance costs

What administrative costs are to the agencies collecting a fee or charge, compliance costs are to those required to pay, and many of the same concerns apply. Especially for charges that are either small on a per-transaction basis, complex to calculate, or involve the collection of information not currently already being collected for other reasons, compliance costs can be a substantial portion of the total revenue from the charge. This usually indicates that a different charge would be preferable, except in those cases where there is an additional benefit associated with the cost as well, e.g. when a new information-collection system produces information of substantial additional value to the firm or is necessary to protect the public.

4. Competitive burden or benefit/efficiency costs

Many charges deter the activity charged by making it more expensive. This can impose efficiency costs that are additional to the revenue raised and administration and compliance costs. For instance, a charge on labor might discourage the use of labor, resulting in lost jobs and an inefficiently low number of employees relative to capital invested. The value of the public service must be great enough to outweigh these efficiency costs in addition to the cost of the charge and the administrative and compliance costs. Economists call these "deadweight losses." However, it should be noted that, because production of pollution is a harm rather than a benefit, the opposite is generally true of pollution charges at rates up to the marginal social cost:[23] they improve efficiency rather than reducing it.

There is also reason for concern where the magnitude of the charge is sufficiently great to affect the price of the firms' output in industries that face interstate or international competition. In some cases, driving a productive activity from a location where it causes harm to one where it will cause less harm is appropriate, but in others the relocation is simply a burden to the state's economy with no offsetting environmental benefit. This is generally true for relocating activities intensive in global warming pollution, for example, because no true reduction in emissions takes place to offset the in-state economic loss. The optimum solution in such cases is to use border adjustments (for fees or taxes) or consumption-based accounting (for emission permit systems), under which the pollution is considered to be imported or exported along with the product produced, but this is not possible in every case, and other policies may be necessary instead.[24]

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[23] Note that the interaction of pollution charges with other taxes can cause the optimal level to be higher or lower than the optimal rate when the charge is considered in isolation. See, e.g., Bovenberg, A. Lans and Lawrence H. Goulder, 2002. "Environmental Taxation and Regulation," in *Handbook of Public Economics*. A. Auerbach and M. Feldstein eds. New York: North Holland; Parry, Ian W. H., 1998. "The Double Dividend: When You Get It and When You Don't." *National Tax Association Proceedings* 1998:46-51.

[24] See, e.g., the discussion of alternative instruments for offsetting competitive burdens in J. Andrew Hoerner & Frank Muller, "Carbon Taxes for Climate Protection in a Competitive World" in E. Staehelin-Witt and H. Blöchliger, *Ökologisch orientierte Steuerreformen: Die fiskal- und aussenwirtschaftspolitischen Aspekte*, Verlag Paul Haupt, Bern, Switzerland, 1997. (published for Swiss Federal Office for International Economic Affairs). Downloadable from http://www.rprogress.org/publications/1996/swiss_1996.pdf.

5. Political support or opposition

An otherwise appropriate charge may become more or less so because of political support or opposition. As discussed above, the distribution of burdens and benefits from a public program financed by a charge, from any change in the behavior of businesses that the program induces (such as reduced pollution emissions or efficiency losses), and from the charge itself, all not only raise policy concerns but have political implications as well. Addressing the relevant policy concerns through good policy design can and often does produce political as well as policy advantages.

6. Fiscal federalism/appropriate level of collection

When examining fees or charges that will be used primarily by local governments, agencies or authorities to provide services of essentially local value, one should inquire whether the charge should be set, imposed or collected locally, or via some combination of state and local charges. Conversely, when the benefits provided are widely distributed geographically or the primary purpose of a charge is redistributive, it is generally appropriate to impose it at the broadest geographic level feasible. These issues should be examined in accordance with the generally accepted principles of fiscal federalism.[25]

7. Interactions with existing revenue programs

New charges being considered should always be examined for interactions with existing charges, both positive and negative. One example of a positive interaction would be if a new charge uses an existing administrative or record-keeping system in a way that reduces administrative, enforcement, or compliance costs. On the negative side, one must assure that the new charge does not combine with existing charges in such a way as to impose unacceptable deadweight losses or competitive burdens.[26] Other possible interactions should be examined on a case by case basis.

8. Taxes versus fees under the California Constitution

Article XIIIA Section 3 of the California constitution requires that changes in state taxes enacted "for the purpose of increasing revenues" must pass by a two-thirds majority in both houses, and Section 4 imposes a similar requirement on local governments.[27] As a result, any charge that is held to be a tax is more difficult to pass than normal legislation.

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[25] For a review of fiscal federalism principles as they apply at the state level, see, e.g., Sean Nicholson-Crotty, Nick A. Theobald & Dan Wood, Fiscal Federalism and Budgetary Tradeoffs in the American States *Political Research Quarterly*, Vol. 59, No. 2, 313-321 (2006).

[26] Ibid footnote 23 above.

[27] The relevant provisions state:

"**Section 3.** From and after the effective date of this article, any changes in state taxes enacted for the purpose of increasing revenues collected pursuant thereto whether by increased rates or changes in methods of computation must be imposed by an Act passed by not less than two-thirds of all members elected to each of the two houses of the Legislature, except that no new ad valorem taxes on real property, or sales or transaction taxes on the sales of real property may be imposed.

Section 4. Cities, Counties and special districts, by a two-thirds vote of the qualified electors of such district, may impose special taxes on such district, except ad valorem taxes on real property or a transaction tax or sales tax on the sale of real property within such City, County or special district."

However, the Supreme Court of California held in the *Sinclair Paint* case[28] that where a fee is implemented for a purpose that is primarily incidental to the enforcement of laws for the protection of the general welfare under the state's "police power" they shall not be regarded as having the purpose of increasing revenues other than incidentally. The court discusses two types of such "incidental" fees, regulatory fees and permitting fees. A fee is a regulatory fee if it is used to "mitigate the *past, present, or future* adverse impact of the fee payer's operations" [emphasis supplied]. In this case, the fee is deemed to be passed pursuant to the police power, rather than the taxing power, and so not subject to the 2/3 majority rule. To constitute a remediation fee, the revenue must be exclusively used to provide environmental cleanup, and that cleanup must be reasonably related to the basis of the fee. Note that *Sinclair Paint* applies so long as the revenues are devoted to *related* programs, whether those programs are existing or new.

Sinclair Paint also found that if the primary motive in the legislation creating a system of emission permits is to limit pollution emissions, such permitting fees are inherently passed pursuant to the police power rather than the taxing power.[29] When the fee is itself intended to deter a harmful activity, it is based on the police power rather than the taxing power, regardless of how the revenue is spent.[30] Hence an auctioned permit or regulatory fee that is designed to deter the activity charged can constitutionally be adopted by a simple majority vote. This is in contrast to remediation fees, which are regarded as taxes unless there is a close nexus between the fees and the cleanup expenditure.

Emission rights under a permitting system, even when auctioned, are generally held not to be private property, but rather regulatory instruments. For example, the federal auction of the broadcast spectrum has been held to constitute user charge, scored as a negative outlay rather than as tax revenue under budget rules,[31] for purposes of congressional committee jurisdiction,[32] and for the federal constitutional requirement that revenue bills originate in the House of Representatives.

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[28] *Sinclair Paint Company v. State Board of Equalization, 15 Cal.4th* 866 (1997).

[29] The Court found that fees associated with permits that allow operation or emissions are more clearly exercises of the police power than permit fees that are merely used in mitigation or cleanup. " From the viewpoint of general police power authority, we see no reason why statutes or ordinances calling on polluters or producers of contaminating products to help in mitigation or cleanup efforts should be deemed less "regulatory" in nature than the initial permit or licensing programs that allowed them to operate." the *Sinclair Paint* case (*Sinclair Paint Company v. State Board of Equalization, 15 Cal.4th* 866 (1997).

[30] The *Sinclair* Court held that "[I]mposition of "mitigating effects" fees in a substantial amount . . . also "regulates" future conduct by deterring further manufacture, distribution, or sale of dangerous products, and by stimulating research and development efforts to produce safer or alternative products. (Cf. SDG&E, supra, 203 Cal.App.3d at p. 1147, fn. 20 [emissions-based fees provide incentive to use non-pollutant fuels].)"

[31] See, e.g., U.S. Office of Management and Budget. *Circular No. A–11: Preparation, Submission, and Execution of the Budget*, (June 2008), Sec. 20, p. 30. http://www.whitehouse.gov/omb/assets/a11_current_year/a_11_2008.pdf. (Updated April 23, 1998). Available from http://www.fas.org/spp/civil/crs/97-218.pdf.

[32] Jurisdiction over bills concerning the auction of broadcast spectrum is concurrent between the commerce and budget committees, but not the tax-writing committees (the Senate Finance Committee and the House Ways and Means Committee). See, e.g., Richard M. Nunno, *Radiofrequency Spectrum Management*, Congressional Research Service Rept. 97-218 (Updated April 23, 1998). Available from http://www.fas.org/spp/civil/crs/97-218.pdf.

Aspects of legislation that could prove helpful in establishing that a proposal that raises some incidental revenue constitutes an emission permit system would include:

- a clear statement of environmental purpose,
- clear, firm reduction targets, and
- a clear permitting mechanism that achieves that reduction.

Note that revenue sources that are not tax-like, such as asset sales or rentals, enterprise profits, fees for using state facilities and the like do not fall within the ambit of Article XIII in any event.

IV. Survey of Provisions

We now turn to a provision-by-provision survey of over 40 options for financing coastal and ocean protection. All or nearly all of these proposed revenue sources could be implemented administratively or, if legislation is needed, could be passed on a simple majority vote. The provisions are classified thematically based on linkages to different environmental or regulatory areas into seven groups: pollution, energy, commercial fisheries, commercial shipping, tourism and recreation, real estate and development, and merchandising.

For each provision we describe the background to the issue, the existing regulatory framework, and current revenues if the charge already exists. We then describe the instrument for generating additional revenues for coastal protection, and estimate the amount of revenue that the instrument may raise where sufficient data is available. Next, we discuss the rationales that justify the existence of the charge, and finally comment on practical concerns, constraints, and feasibility issues. Table 3 summarizes the current revenues (2007) and future potential revenues from each instrument considered. One-time sources are annualized at a five percent real interest rate..

In all, we describe $837 million to $1,189 million in annual revenues. Provisions are sorted by revenue within each category. There are three charges with revenues in excess of $100 million (fees on nutrient discharges that increase oxygen demand in water, royalties on offshore wells and mining, and new oil and gas leases at existing sites), three more with revenues between $50 and $100 (1% of greenhouse gas allowance revenues, outflow of destructively hot cooling water, and a coastal property tax surcharges), and between $10 million and $50 million (fertilizer impact fee, Rigs to Reefs rights fees, hydroelectric impact fees, auctioned fishing quotas, coastal hotel and accommodation fees, cruise ship fees or contributions, scuba diving fees, and fishing license fees),

In some cases there are alternative fees on overlapping activities. In such cases, one would typically not want to put both fees in place without considering the burden on those who fall in the range of overlap. We have generally not accounted for tax interactions (most fees are deductible expenses) which can reduce the revenue from fees by a small amount.

Table 3: Provision-by-Provision Summary of Current Revenues and Potential Annual Future Revenues							Estimated
		Current Revenues		Potential Future Revenues			
Revenue Source	**Agency**	**Rate**	**Base**	**Revenue**	**Rate**	**Base**	**Annual Rev.**
Pollution-Related Revenues							
fees for nutrient & biological oxygen demand discharge	SWRCB			none			$305.8 million
1% of greenhouse gas emission allowance revenues				none	$10 - $20 per ton CO_2		$40 - $80 million
environmental impact fee on sales of fertilizer	CDFA	$0.003 per dollar sold			$0.030 per dollar sold		$30 million
toxic chemical fees	SWRCB			none	$1.93 per pound	3.54 million lbs (2005)	$6.9 million +
household storm water fee				none	$0.50 per household	11.5 million households (2000)	$5.8 million
reforms to existing storm water fee structures	SWRCB			$21 million			$1 million
toxic production, transport, storage fees	OSPR, SLC	$0.05 per barrel		$33 million			limited
fees on air toxics and atmospheric deposition				none			limited
Total, available estimates							$389 to $430 million
Energy-Related Revenues							
royalties and fees offshore wells and mining	SLC	16.67% of oil sales	$1.6 billion sales	$272 million			up to $272 million
new oil and gas leases at existing sites				none			$130 millions +
once-through cooling	SWRCB	$100,000 intake >100mgd		$1.8 million	$50 / million gal. intake	1.58 trillion gallons	$77 million
rigs to reefs rights fees				none			$20-$26 million [annualized at 5%]
hydroelectric impact fees					$0.50 / MWh produced	41 million MWh (2006)	$20 million
underground storage tank spill, leaking pipeline fees	SWRCB	$0.014 per gallon	17 billiion gallons	$237 million			$2 million
oil and gas pipelines and telecomm right-of-way	SLC			$1.87 million			up to $1.87 million
offshore Outer Continental Shelf oil and gas revenue	Res., Count.			$50 million			limited
offshore renewable energy (e.g. wind, wave)	SLC, FERC			none			currently limmitted
Total, available estimates							$250 to $539 million
Commercial Fishing-Related Revenues							
individual transferable fishing quotas				none			$5 to $20 million
fish catch and service levies (landing fees)	DFG	See Fish and Game Code		$1.13 million	5%	$130 million (2006)	$6.5 million
fishing licenses and permits	DFG	Varies based on permit	19,055 licenses (2006)	$3.19 million			$6.4 million if doubled
fines for illegal fishing	DFG, Count.	Rules of Court 4.102		$1.15 million			$1.69 million if doubled
commercial fish business licenses	DFG	Varies based on permit	1422 licenses (2006)	$772,383			$1.5 million if doubled
aquaculture production or licensing charges	DFG			$93,052			$0.19 million if doubled
eco-labeling and certification fees				none			limited
biodiversity and biotech licensing fees				none			limited
Total, available estimates							$21 to $36 million

continued on next page

Table 3 (continued): Provision-by-Provision Summary of Current Revenues and Potential Annual Future Revenues							Estimated
		Current Revenues			Potential Future Revenues		
Revenue Source	**Agency**	**Rate**	**Base**	**Revenue**	**Rate**	**Base**	**Annual Rev. Estimate**
Commercial Shipping-Related Revenues							
water discharge / ballast fees	SLC	$400/qualifying voyage	7226 voyages	$2.83 million	$1000/ voyage	7200 voyages (2005)	$7.2 million
harbor, docking, noise, turbulence, other fees				up to $95,000/vessel			unknown
capacity or tonnage charges				none	$30 / 20-ft container	15 million containers	limited
Total, available estimates							$7.2 million
Tourism-Related Revenues							
coastal hotel and accomodation fees	local			$1.06 billion (local)	$0.50 per hotel room	72 million rooms (2004)	$36 million
cruise ship passenger fees & voluntary contributions	federal	$400/qualifying voyage					$30 million
scuba diving and snorkeling				none	5% of gross expend.	$291 to $620 million	$14.6 to $31 million
recreational fishing license fees	DFG		2,941,094 licenses	$58 million	25% increase	$58 million (2006)	$14.5 million
whale watching				none	5% of direct expend.	$14.11 million	$0.706 million
park and protected area fees	Parks			$70 million			limited
recreational fishing excise taxes		10% of sales value		$14.7 million (2005)			limited
recreational boating and equipment fees	DBW			$200,000			unknown
Total, available estimates							$96 to $112 million
Real Estate & Development-Related Revenues							
Surcharge on coastal region property taxes	local	1.08% assessed value	$2,655 billion	$28.75 billion (local)	0.25% tax increase	$28.75 billion (2005-06)	$72 million
rental on state coastal lands	SLC			$3.5 million			up to $3.5 million
tradable development rights and wetland banking	SCC			none			limited
Total, available estimates							$72 to 76 million
Conservation-Related Merchandising							
Whale Tail license plate	CC		17,200 plates	$5.9 million (2006)			NE
Conservation lotteries				none			NE
Total, available estimates							unknown
OVERALL TOTAL, available estimates						**$837-$1,189 million**	

A. Pollution–Related Revenues

1. Toxic Chemical Fees for Emissions to Water

ESTIMATED REVENUE: $6.9 million; potentially much more

Background and existing regulatory framework

Water quality is degraded by the discharge of toxic chemicals from both point and non-point sources. Point sources of toxic chemical discharges are managed under the federal National Pollutant Discharge Elimination System (NPDES) program, pursuant to the federal Clean Water Act (CWA). The NPDES program is administered by the State Water Resources Control Board (SWRCB) in California. Under this program, NPDES permits specify limits on allowable discharge, and monitoring and reporting requirements. In addition, the state's Porter-Cologne Clean Water Act regulates certain waste discharges not covered by the

federal CWA. Permit fees for waste discharges, including NPDES permit fees, represent a revenue stream to the state on the basis of releases of toxic chemicals to surface water.

Fees for discharges of toxic chemicals are collected by the State Water Resources Control Board under the following seven waste discharge programs: NPDES general permit, NPDES storm water, waste discharge requirements discharge to land, waste discharge requirements land disposal, confined animal facilities, dredge & fill, and agricultural waivers.

The schedules for water quality fees under these seven discharge programs are set by SWRCB, which has legislative authority to set these fees at an appropriate amount to raise the budgeted revenue or expenditure level. Revenues collected from the discharge programs are deposited into the Waste Discharge Permit Fund. These revenues are reported in Table I.A.1 for fiscal year 2005-2006.

Table I.A.1: FY 05-06 revenues and expenditures for programs comprising the Waste Discharge Permit Fund.[33]

Program	Revenue	Expenditures	Difference
NPDES Permit	$14,013,822	$14,178,702	($164,880)
NPDES Storm Water	$21,234,516	$16,498,943	$4,735,573
Waste Discharge Requirements - Discharge to Land	$11,522,968	$14,024,211	($2,501,243)
Waste Discharge Requirements - Land Disposal	$4,784,213	$5,777,715	($993,502)
Confined Animal Facilities	$705,255	$2,095,882	($1,390,627)
Surface Water Ambient Monitoring	$4,733,418	$10,002,741	($5,269,323)
Groundwater Ambient Monitoring and Assessment	$1,521,532	$1,907,307	($385,775)
401 Certified – Dredge and Fill	$3,275,022	$2,775,389	$499,632
Agricultural Waivers	$643,834	$391,139	$252,696
Subtotal	$62,434,579	$67,652,028	($5,217,449)
Fines and Penalty Revenue	$176,200		$176,200
Other	$2,446,207	$496,000	$1,950,207
Total	**$65,056,986**	**$68,148,028**	**($3,091,042)**

Instrument description – Toxic chemicals discharge fee

This instrument would levy a per-pound fee on all discharges of toxic chemicals to surface waters in California, including heavy metals, inorganic chemicals, and petrochemicals, on the basis of the amount of chemical discharged and the relative toxicity of the chemical.

Revenue estimates

Revenue estimates are presented for two alternative fee structures. In the first, inflation-adjusted excise tax rates for the federal Superfund taxes are applied to the total reported pounds of toxic chemicals discharged to California's surface water. In the second, a single fee rate that is adjusted by an index of relative toxicity is applied to the total reported pounds of toxic chemical discharged.

Fee Structure #1 – Superfund excise tax rates are applied to chemical discharges

In the first fee structure, a fee on toxic chemical discharges is modeled after the federal Superfund excise taxes,[34] which assigned each chemical a tax rate from $0.22 to $4.87 per ton in 1995 when collection of the Superfund tax expired.[35] The Superfund tax rate for each chemical varies as a function of its toxicity.

In 1995, a total of $310,135,000 was collected nationally in Superfund environmental excise tax revenues on chemical discharges.[36] In the same year, 219,987,376 pounds of chemicals are reported to have been discharged to surface waters nationally in EPA's Toxics Release

[33] Ibid., State Water Resources Control Board.
[34] Note that, although this charge was designed as a tax at the Federal level, we would anticipate structuring it as a fee under the *Sinclair Paint* doctrine. See Section III.B.8. above on the tax/fee distinction.
[35] Congressional Budget Office. 2007. Budget Options. http://www.cbo.gov/ftpdocs/78xx/doc7821/02-23-BudgetOptions.pdf, pg 333.
[36] Internal Revenue Service. 2007. Table 1 – Environmental Excise Taxes After Credits and Refunds, by Type of Substance, 1995. www.irs.gov/pub/irs-soi/95ex01ts.xls .

Inventory (TRI).[37] Thus, the average national Superfund tax rate in 1995 was approximately $1.41 per pound ($310,135,000/219,987,376 pounds).

A 1995 rate of $1.41 per pound adjusted for inflation to 2007 dollars is $1.93 per pound.[38]

EPA's Toxics Release Inventory reports that a total of 3,563,118 pounds of chemicals were discharged to California's surface waters in 2005, including releases from both point discharges and storm water runoff.[39]

Applying the inflation-adjusted national average tax rate ($1.93 per pound) to reported toxic chemical discharges in California (3,563,118 pounds), we estimate that a fee on discharges of toxic chemicals would raise at least $6.9 million.

This revenue estimate is a lower bound on the total potential revenues from a fee on releases of toxic chemicals for two main reasons: (1) surface water discharge data is only available for about 30% of the chemicals tracked by TRI; and (2) TRI only includes discharge data that was reported, but the reporting rate for discharging facilities is not known and we suspect it could be quite low. Thus, the actual quantity of toxic chemicals discharged to surface waters is likely to be much greater than the reported 3,563,118 pounds.

A more accurate revenue estimate can be calculated by obtaining detailed data on discharge volumes by chemical from each of the nine regional water boards. This discharge data is not readily available in a centralized state-wide database.[40]

Fee Structure #2 – A single fee rate is weighted by an index of relative toxicity
In the second fee structure, a flat rate is levied on each pound of toxic chemical discharged, multiplied by a relative toxicity factor for that compound. Revenue estimates are not presented for this fee structure because an index of relative toxicity for California is not readily available, nor is detailed state-wide data on chemical-by-chemical discharges.

Rationale for charge

California's contaminant discharge monitoring program requires an additional 200 positions to be fully implemented. Current enforcement staffing only allows site inspections of 6-10% of dischargers per year, while approximately 20% of dischargers should be inspected annually to ensure that all dischargers are inspected once in 5 years (which is the period of validity of the discharge permit).[41] Assuming total expenditures of $94,000 per position (estimated from average 2006-2007 expenditures of $144,984,000 on 1542.3 positions at

[37] US EPA Toxics Releases Inventory. 2007. Releases: Chemical Report. http://www.epa.gov/cgi-bin/broker?view=USCH&trilib=TRIQ1&sort=_VIEW_&sort_fmt=1&state=All+states&county=All+counties&chemical=All+chemicals&industry=ALL&year=1995&tab_rpt=1&fld=E3&_service=oiaa&_program=xp_tri.sasmacr.tristart.macro
[38] Bureau of Labor Statistics. 2007. Consumer Price Index. http://www.bls.gov/cpi/
[39] EPA TRI Explorer. 2007. Releases: Chemical Report. http://www.epa.gov/cgi-bin/broker?view=STCH&trilib=TRIQ1&sort=_VIEW_&sort_fmt=1&state=06&county=All+counties&chemical=All+chemicals&industry=ALL&year=2005&tab_rpt=1&OTHDISPD=Y&_service=oiaa&_program=xp_tri.sasmacr.tristart.macro
[40] Personal Communication. Bruce Fujimoto and Dominic Gregorio, State Water Resources Control Board. October 18, 2007.
[41] Personal Communication. Bruce Fujimoto, State Water Resources Control Board. October 18, 2007.

SWRCB[42]), discharge monitoring represents an outstanding funding need of at least $18.8 million.

The per-pound fee on discharges of toxic chemicals is a "polluter pays" fee which would raise enough revenue to fund approximately 73 new positions. If these positions were focused on contaminant discharge monitoring, nearly half the outstanding needs for discharge monitoring would be met. This would result in a greater percentage of waste discharge permitees being inspected each year, and presumably increase the incentive for overall compliance with waste discharge permit limits. Thus, this investment is expected to reduce unauthorized discharges of toxic chemicals to water, thereby improving coastal water quality. Funds might also be used for "Green Chemistry" research to develop safer consumer and industrial products.

Furthermore, if the fees were indexed to an index of relative toxicity for each chemical (fee structure #2), the fee and the corresponding increase in enforcement would provide increased incentive for dischargers of the most toxic pollutants to clean up and reduce their discharges, providing the greatest incremental benefit to coastal water quality.

Practical concerns and discussion

There may be administrative challenges involved with charging a per-pound fee on toxic chemical discharges under the existing regulatory framework. This is because discharges of toxic chemicals are currently regulated under the seven programs comprising the Waste Discharge Permit Fund rather than on a by-chemical basis. The fact that discharge data by chemical and an index of relative toxicity are not readily available in a centralized state-wide database may indicate high administrative costs for this fee.

Compliance and enforcement costs will be directly offset by the fees collected.

Our experience with the federal Superfund taxes (which are no longer collected) should be mined for valuable information on how per-pound fees on toxic chemical discharges could be designed and implemented to best reduce enforcement and compliance costs.

2. Biological Oxygen Demand

ESTIMATED REVENUE: Approximately $300 million from fees for discharge of chemicals that impose oxygen demand to receiving waters; $30 million from fertilizer sales fees

Background and existing regulatory framework

Nutrient pollution is considered one of the "most pervasive and troubling pollution problem[s] currently facing U.S. coastal waters."[43] Excess nutrients encourage biological production in water bodies, which can create oxygen deficits when excess organic matter

[42] California Governor's Budget. 2007-2008. State Water Resources Control Board Budget. http://www.ebudget.ca.gov/pdf/GovernorsBudget/3890/3940.pdf .

[43] U.S. Commission on Ocean Policy. 2004. An Ocean Blueprint for the 21st Century Chapter 14: Addressing Coastal Water Pollution. http://www.oceancommission.gov/documents/full_color_rpt/14_chapter14.pdf , pg 206.

sinks and decomposes, creating low oxygen conditions which eventually suffocate aquatic life. This process is called eutrophication.[44] In California, 5 estuaries (Tomales Bay, San Francisco Bay, Elkhorn Slough, Newport Bay, and Tijuana Estuary) show high levels of eutrophic conditions, including low dissolved oxygen.[45]

Inorganic nutrients such as phosphorus and nitrogen compounds, as well as oxygen demand, are classified as Category 1 pollutants by the US EPA.[46] These nutrients originate from both point sources (wastewater treatment plants, storm water runoff) and non-point sources (agricultural and urban runoff).

Most waste discharge permits in California regulate nutrient discharges from point sources under the NPDES program, according to the SWRCP. However, there is currently no direct fee for discharging nutrients over and above general NPDES waste discharge permit fees. Nutrient discharges from non-point sources are currently unregulated except for some fees assessed by California Department of Food and Agriculture on sales of fertilizer.[47] Fertilizer runoff is one of the major constituents of nutrient pollution in surface waters.

Instrument description – Oxygen demand fee

An oxygen demand fee would be levied on all discharges of phosphorus and nitrogen compounds. This fee could be modeled after revenue proposal REV-52-A in the 2001 Congressional Budget Options, which proposed a fee on water pollutants on the basis of their biological oxygen demand.[48]

Revenue estimates

The 2001 Congressional Budget Options estimate that a fee on water pollutants on the basis of their biological oxygen demand would generate $23.3 billion in added revenues nationally from 2002 through 2011.[49] This estimate is based on a fee of $0.66 per pound of effluent discharged with an average concentration of 22 ppm biological oxygen demand.[50]

Distributing these national revenues among the 50 states on the basis of their contribution to the nation's GDP, we estimate that in a ten year time period similar to 2002 through 2011, California could raise more than $300 million in BOD discharge fees annually:

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[44] National Research Council. 2000. Clean Coastal Waters: Understanding and Reducing the Effects of Nutrient Pollution. Washington, DC: National Academy Press.

[45] Bricker, S.B., C.G. Clement, D.E. Pirhalla, S.P. Orlando, and D.R.G. Farrow. 1999. National Estuarine Eutrophication Assessment: Effects of Nutrient Enrichment in the Nation's Estuaries. http://ian.umces.edu/neea/pdfs/eutro_report.pdf

[46] California Water Boards. 2007. Draft Enforcement Report. http://www.waterboards.ca.gov/legislative/docs/2006/enforcementrpt2006_13385o.pdf , pg 24

[47] AB 2443 Assembly Bill – Bill Analysis. http://info.sen.ca.gov/pub/05-06/bill/asm/ab_2401-2450/ab_2443_cfa_20060918_112627_asm_comm.html

[48] Congressional Budget Office. 2001. Budget Options. http://www.cbo.gov/ftpdocs/27xx/doc2731/ENTIRE-REPORT.PDF

[49] Congressional Budget Office. 2001. Budget Options. http://www.cbo.gov/ftpdocs/27xx/doc2731/ENTIRE-REPORT.PDF

[50] Ibid.

$$\frac{California\,GSP}{US\,GDP} * \$23.3\ billion$$

$$= \frac{\$1.7274\ trillion}{\$13.16\ trillion} * \$23.3\ billion$$

$= \$3.058\ billion$ in total revenues to California for the ten years: from 2002-11.

$3.058 billion in revenues to California over ten years amounts to **$305.8 million** in annual revenues from a per-pound-of-effluent fee on discharges of nutrients and biological oxygen demand. This is also a reasonable estimate for the next ten years because the growth rate of total fertilizer consumption is extremely slow,[51] though it should of course be refined with California-specific fertilizer data.

Rationale for charge

A fee on the discharge of nutrients and oxygen demand follows the "polluter pays" principle, directly charging for pollution by requiring polluters to pay discharge fees for remediation costs. In doing so, it creates a financial incentive for polluters to reduce their nutrient discharges.

Scientific studies linking nutrient discharges to water quality in California's coastal and ocean waters are not as widespread as similar studies in freshwater bodies. Further scientific evidence showing the impact of excess nutrients on coastal ecosystems may be needed to fully justify such a charge. However, the precautionary principle requires that policies be made to protect coastal ecosystems from potentially irreversible harm even in the absence of scientific consensus, and places the burden of proof on polluters to show that their nutrient discharges are *not* detrimental to coastal water quality.

Additionally, we suspect that there are numerous cities and counties that know their treatment systems are illegal but have no sources of funding to update them. A charge on discharge of nutrients could help to finance retrofits of publicly owned treatment systems that are out of compliance. Using the funds for such retrofits is expected to provide a direct, sustained, and substantial benefit to coastal water quality.

Practical concerns and discussion

Similar to the fee on discharges of toxic chemicals, administering a fee on oxygen demand may be challenging under the existing regulatory framework, because nutrient discharges are regulated as part of overall waste discharge requirements and are only tracked as discharges under one of the state water board's seven waste discharge permit programs. Since detailed information is required on the nutrient concentrations of waste discharges, administering a per-pound charge on oxygen demand will require major data coordination among the state and regional water boards.

Despite these administrative and data constraints, a fee on discharge of nutrients and oxygen demand is attractive because it raises substantial revenue to solve a real and pressing problem. Further study is recommended on the feasibility of such a charge.

[51] Less than 0.23 percent per year for the 1997-07 period. See http://www.ers.usda.gov/Data/FertilizerUse/.

Instrument description – Excise fee on sales of fertilizer

An excise fee on sales of fertilizer would address non-point nutrient pollution originating from urban and agricultural sources. Existing law provides a farm subsidy which exempts fertilizer sales for farm use from sales tax. It also authorizes the California Department of Food and Agriculture to collect from fertilizer manufacturers $0.002 per dollar of sales to fund the Fertilizer Inspection Program, and $0.001 per dollar of sales to fund the Fertilizer Research and Education Program.[52]

Assembly Bill 2443 (05/06 legislative session) proposed an increase in fertilizer sales taxes to address groundwater contamination.[53] This bill would have:

1. increased the existing fees to $0.010 per dollar of sales to fund research and education relating to the use and handling of commercial and organic fertilizers; and
2. created a $0.030 fee per dollar of sales to ensure access to nitrate-free drinking water.[54]

Revenues from AB 2443 were projected to exceed $30 million.[55]

This bill covered sales of fertilizers to all sectors including household and government consumers. An estimated $240 million is spent annually by households and all levels of government on nitrogenous and phosphatic fertilizers.[56] An additional $0.040 per dollar excise fee on this sector alone would generate $9.6 million in revenues from sales to households and government.

Increased excise fees on sales of fertilizer are particularly easy to collect from an administrative point of view. However, these fees are strongly opposed by associations of agricultural growers and farmers.[57] The bill failed passage in the Assembly Committee on Agriculture.

3. Peetrochemical or Toxic Chemical Production or Transportation Fees

Background and existing regulatory framework

Oil Spill Prevention and Administration Fee

The Oil Spill Prevention and Administration Fee, collected by California Board of Equalization, is charged at a rate of $0.05 per barrel of oil or petroleum products received at a marine terminal or transported through a pipeline through California's waters.[58] This fund generated revenues of $33 million in 2006-2007,[59] and is used to fund ongoing spill

[52] AB 2443 Assembly Bill – Bill Analysis. http://info.sen.ca.gov/pub/05-06/bill/asm/ab_2401-2450/ab_2443_cfa_20060918_112627_asm_comm.html
[53] Ibid.
[54] Ibid.
[55] Ibid.
[56] Data taken from IMPLAN California Social Accounting Matrix.
[57] AB 2443 Assembly Bill – Bill Analysis. http://info.sen.ca.gov/pub/05-06/bill/asm/ab_2401-2450/ab_2443_cfa_20060918_112627_asm_comm.html
[58] California Code of Regulations. Title 14. Division 1(4). Subchapter 2 Oil Spill Prevention and Administration Fee. http://www.dfg.ca.gov/ospr/law/regs/admin_fund.pdf
[59] California Governor's Budget 2007-2008. Schedule 10: Summary of Fund Condition Statements. http://www.ebudget.ca.gov/pdf/BudgetSummary/BS_SCH10.pdf

prevention, preparedness, and administration. Specifically, fees collected under this program are earmarked for the following uses:

- oil spill prevention programs,
- studies leading to improved oil spill prevention and response,
- economic and environmental studies on the effects of oil spills,
- reimbursement of member agencies of the State Interagency Oil Spill Committee as specified,
- implementation of emergency programs to respond to oil spills, and
- response to an imminent threat of a spill.[60]

According to the State Lands Commission, approximately 75% of the revenues from this fund are directed to Department of Fish and Game's Office of Spill Prevention and Response (OSPR), while the remainder funds oil spill prevention programs at State Lands Commission.

The SLC and OSPR describe the DFG and SLC programs as adequately funded as of October 31, 2007. These funds are already earmarked for the above uses, so we do not provide estimates for additional revenues from this fee.

However, there may be additional funding needs in light of the Cosco Busan oil spill that discharged 58,000 gallons into San Francisco Bay on November 7, 2007.[61] In particular, there may be additional funding requirements for a full state investigation into the causes and response to the spill that was directed by Governor Schwarzenegger on November 15.[62] Such an investigation or its findings may justify an increase in the per-barrel fee paid to the Oil Spill Prevention and Administration Fund.

An increase in this fee could also be used to finance real time current monitoring of baseline habitat conditions and natural resource assessments along the California coast. Such baseline assessments would be useful in determining the extent of damages caused by spills when they occur.

Oil Spill Response Trust Fund

The Oil Spill Response Trust Fund was established in 1991. This fund is reserved exclusively for immediate response to oil spills and restoration of affected natural resources. When the fund was initially established, a fee of $0.25 per barrel fee on all crude oil transported through state waters was charged. Once reserves in this fund reached $50 million, further collection of the $0.25 fee per barrel was discontinued and replaced by the $0.05 per barrel Oil Spill Prevention and Administration Fee (described above). Because the Oil Spill Response Trust Fund is reserved exclusively for immediate response to oil spills, it

[60] California Code of Regulations. Title 14. Division 1(4). Subchapter 2 Oil Spill Prevention and Administration Fee. http://www.dfg.ca.gov/ospr/law/regs/admin_fund.pdf

[61] California Department of Fish and Game. November 25, 2007. Cosco Busan Incident Update. http://www.dfg.ca.gov/ospr/spill/incidents/cosco_busan/sf_fact_sheet_17.pdf

[62] San Francisco Sentinel. November 15, 2007. Schwarzenegger Opens State Investigation into San Francisco Oil Spill. http://www.sanfranciscosentinel.com/?p=6923

is not appropriate as a source of additional revenue for coastal and ocean conservation in California.[63]

OSPR was directed to use funds from the Oil Spill Response Trust Fund to finance an expedited response to the November 7th spill in the San Francisco Bay.[64]

Another fund could be established to pay for habitat restoration prior to spills to ensure that there are redundant habitat types and numerous populations of particular species to guard against severe reduction in the case of a major oil spill. These funds could be used for maintaining eel grass habitat, wetland restoration, or even to develop recreational facilities. Some of the funds could be used by regulatory agencies to help in the planning and permitting of these projects.

4. Volume Discharge Fees

CURRENT REVENUE: $21 million in 2005-2006
ESTIMATED FUTURE REVENUE: $6.8 million, minus potentially substantial administration costs

Background and existing regulatory framework

Storm water that runs over man-made impervious surfaces (including housing developments, shopping centers, parking lots, and asphalt) picks up water pollutants including oil, chemicals, heavy metals, and pesticides en route as it travels to coastal water bodies.[65] These pollutants can substantially impact water quality in coastal regions. Thus, storm water discharge is an important source of water pollution in these regions.

Storm water discharges are classified as point discharges and are regulated in California by the State Water Resources Control Board under the storm water program. Under this program, NPDES general discharge permits are required for discharges from industrial, municipal, and construction sources. Revenues from NPDES storm water discharge permits totaled over $21 million in FY 2005-2006, according to the SWRCB.

Fee schedules for each of these storm water permits are specified in the California Code of Regulations Section 2200.[66]

Potential for reform – Existing storm water fee schedules

We present revenue estimates from reforms to the existing fee schedules for municipal, construction, and industrial NPDES storm water discharge permits.

Municipal – Additional Estimated Revenues = $285,000

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[63] DFG Office of Spill Prevention and Response. Frequently Asked Questions about Oil Spills. http://www.dfg.ca.gov/ospr/train/handouts/california_spill_faqs.pdf

[64] San Francisco Sentinel. November 15, 2007. Schwarzenegger Opens State Investigation into San Francisco Oil Spill. http://www.sanfranciscosentinel.com/?p=6923

[65] US Commission on Ocean Policy. 2004. An Ocean Blueprint for the 21st Century. Chapter 14: Addressing Coastal Water Pollution. http://www.oceancommission.gov/documents/full_color_rpt/14_chapter14.pdf

[66] California Code of Regulations Title 23. Division 3. Chapter 9. Waste Discharge Reports and Requirements. Section 2200. Annual Fee Schedules. http://www.swrcb.ca.gov/fees/docs/adoptedfeeschedule.pdf

NPDES storm water fees are assessed on municipal storm water sewer systems on the basis of the population size serviced by the municipality, and are broken down into 10 levels corresponding to 10 population brackets. The highest population bracket in this fee schedule is "greater than or equal to 250,000". The fee required from municipalities with populations greater than 250,000 is $25,000.[67]

However, there were 13 cities in California with populations greater than 250,000 as of January 2007.[68]

Accordingly, we propose that the existing fee schedule be revised. One way to do this is to add additional population brackets above 250,000. We estimate that an additional $285,000 could be raised if three population brackets were added above 250,000 as follows (with possible permit fees listed for each bracket):

Population equal to or greater than 600,000	$60,000
Population between 400,000 and 599,999	$55,000
Population between 250,000 and 399,999	$30,000

Of the 13 municipalities currently paying the maximum storm water discharge fee of $25,000, this revised fee schedule would require 4 cities to now pay $60,000, 4 to now pay $55,000, and 5 to now pay $30,000, for a total of $285,000.

Construction – Additional Estimated Revenues = $250,000
Construction storm water fees are currently assessed per acre of the construction site, to a maximum of 100 acres. We estimate that removing the 100 acre cap may increase fee revenue by up to $250,000.

Industrial – Additional Estimated Revenues = $500,000
Industrial facilities are currently assessed a flat fee of $700 plus an 18.5% surcharge, for a total of $830. We estimate that if this fee were restructured as a function of the impervious area of the facility, permit fee revenues could be increased by up to $500,000. This estimate could be made more precise by obtaining data on the total area of the facility and percentage of impervious areas, which are reported at the time of application for an industrial storm water permit.[69] Such a fee structure would reward industrial activities with the least impact to storm water runoff quality.

Instrument description – Household storm water fee

In addition to the reforms to existing storm water permits described above, we considered levying a $0.50 annual storm water management fee on all households in California. Based

[67] Ibid.
[68] California Department of Finance. 2007. Cities/Counties Ranked by Size, Numeric, and Percent Change. http://www.dof.ca.gov/HTML/DEMOGRAP/ReportsPapers/Estimates/Rankings/CityCounties1-06/RankerText.php
[69] State Water Resources Control Board. Water Quality Order No. 97-03-DWQ Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities. http://www.waterboards.ca.gov/stormwtr/docs/induspmt.pdf

on the 2000 US Census count of 11,502,870 households in California,[70] this fee would raise up to $5.8 million in annual revenues.

Since a household storm water fee would be spread over a very broad base, its rate would be low enough that the charge would be nearly imperceptible to individual households.

The fee may be indexed to the total area of impervious surface at the household, clearly linking the fee to the harm.

However, costs of administering this fee to such a large number of households may be prohibitively high. For example, the costs of mailing, website development and maintenance, monitoring and collections, and recordkeeping may be higher than $0.50 per household. Also, there is no direct link between the existence of a household and the degradation of coastal water quality due to storm water runoff from that household. Finally, households are already indirectly being charged for storm water management via the municipal storm water fees through their property taxes.

5. Charges on Air Toxics Known to Degrade Water Quality

ESTIMATED REVENUE: limited

Atmospheric deposition is the mechanism by which air toxics are transferred to water bodies, leading to a subsequent degradation in water quality. The primary pollutants introduced to inland and coastal waters via atmospheric deposition are mercury, SO_2, and NO_x.

A fee or charge on emissions of air toxics is unlikely to raise sufficient revenues for coastal protection in California because:

1. Mercury, SO_2, and NO_x are primarily generated as by-products of combustion at coal-fired power plants. Since California currently has no coal-fired power plants,[71] ambient air loadings of these toxics may originate from power plants in other states. California has no jurisdiction to charge fees for emissions of air pollutants in other states.

2. It is difficult to show a direct link between air emissions and subsequent damage to water quality and coastal environments, even for air emissions that originate in California, because atmospheric deposition is an indirect source of water pollution. There is not a clear nexus between the harmful activity and the environmental impact. Such a nexus is needed to levy fees or surcharges on emissions.

[70] US Census Bureau. 2007. California State and County QuickFacts. http://quickfacts.census.gov/qfd/states/06000.html

[71] Environmental Leader. 2007. Coal-fired power off-limits to California's utilities. http://www.environmentalleader.com/2007/01/26/coal-fired-power-off-limits-to-california-utilities/

3. The prevailing westerly winds in California flow from west to east[72] and tend to transport air pollutants inland from the California coast rather than towards coastal waters.

6. Revenues from Auctions of Greenhouse Gas Allowances

CURRENT REVENUE: none
ESTIMATED FUTURE REVENUE: $20 – $40 million

Background and existing regulatory framework
California is the first state in the nation to adopt a comprehensive cap on greenhouse gas emissions, the California Global Warming Solutions Act of 2006, sometimes called AB32. The bill authorizes the California Air Resources Board to create a program of tradable emission allowances as a part of an overall plan to enforce that cap. The California Air Resources Board has issued a Scoping Plan under the Act that announces a plan to have the cap cover the vast majority of greenhouse gas emissions from the state, and recommends that most of those emissions be auctioned.

On June 14, 2007, the California Ocean Protection Council (OPC) passed a resolution favoring action to protect California's coastal communities and ocean resources from global warming.

Instrument description and revenue estimates
The proposal is that a small proportion, perhaps one percent, of the total revenues from the auction of greenhouse gas emission allowances be devoted to coastal protection in a mix of fundamental science, monitoring, prevention and adaptation. We estimate that allowances will trade for between $5 and $10 per metric ton of carbon dioxide in the early years of the program. The precise number is still highly uncertain because it varies with details of coverage, offsets allowed, and tradability of allowances with other systems, which have not yet been finalized. At 100 percent coverage of emissions, this would raise approximately $2 - $4 billion per year. However, in the early years of the program coverage is likely to fall well short of 100 percent, and a portion of the allowances may be given away to electric utilities and other large polluters to subsidize their cost of converting to lower-carbon technologies. Finally, the allowance system for the transportation sector is being introduced with a delay. We therefore cut our estimates by 50 percent to allow for these reductions during the phase-in period and other uncertainties. One percent of the adjusted allowance auction revenues, which could be devoted to coastal and ocean protection, is $40-80 million per year. Note that increases in this revenue are highly probable after the first three to six years – nearly certain if the allowances are auctioned and a significant proportion of the total emission reductions are achieved through the allowance system.

Rationale for charge
The impact of climate change on the oceans and coastal communities is still largely unknown but likely to be substantial. Table I.F.1 below lists some of the likely impacts which now appear to be highly probable or nearly certain. The most immediate need is for research and

[72] Western Regional Climate Center. 2007. Climate of California. http://www.wrcc.dri.edu/narratives/CALIFORNIA.htm

assessment of the magnitude and range of possible impacts, the creation of monitoring and early warning systems to measure and forecast those impacts as they occur, and the development of possible policies to prevent or mitigate them. Many more impacts remain possible for which the probability is yet to be properly assessed.

Table I.F.1: Projected Impacts of Climate Change on California Ecosystems	
Projected changes - 21st century	**Examples of Ecological Impacts**
• Warmer summer temperatures; greater ocean stratification, weaker upwelling (very likely)	• Northward species shifts • Lower productivity & food • Exotic species introduced
• Warmer & wetter winters; greater freshwater inflow, coastal flooding (very likely)	• Reduced coastal water quality • Toxic blooms • Human health hazards
• Higher coastal sea level (very likely)	• Intertidal species displaced • Wetlands reduced
• More extreme events; stronger storms, El Nino, hurricanes (likely)	• Greater coastal erosion • Fisheries reduced & displaced • Warm-water fisheries available
• Delayed seasonal cycle; delayed upwelling (likely)	• Delayed spring bloom • Reproduction, migration impacted
Adapted from William W. Fox, Implications of Climate Change on Ocean Living Resources off California, A presentation to the California Council on Science & Technology (Oct. 17, 2007), http://www.ccst.us/meetings/speakers/presentations/2007/October/101707Fox.pdf.	

B. Energy–Related Revenues

1. Oil Spill, Leaking Pipeline, & Leaking Underground Storage Tank (UST) Fees

Instrument description and revenue estimates

There is limited potential for substantial revenues for coastal protection from additional fees on USTs because impacts of leaks on coastal and marine water quality in California have not been monitored or fully demonstrated. Thus, there is currently not a clear nexus between the impacts to coastal water quality from groundwater contamination and leaking USTs.

However, there may be potential to redirect some proportion of unclaimed funds in the Underground Storage Tank Cleanup Fund each year to address coastal and ocean impacts of groundwater contamination from leaking USTs. Doing so would be consistent with the precautionary principle of not waiting for conclusive scientific evidence before enacting policy to mitigate potential harm. If $2 million were set aside from the Fund each year for monitoring the impacts of groundwater contamination on the coastal zone, this would represent only 1% of the total claim amount paid out of the Fund in 2005-2006 ($199

million)[73,74], and 8.7% of the estimated surplus in the Fund ($2 million / ($237 million - $199 million) = 8.7%).

2. Royalties and Fees from Offshore Wells and Mining

CURRENT REVENUE: $272 million in oil & gas royalties from state sovereign lands
ESTIMATED FUTURE REVENUE: up to $272 million

Background and existing regulatory framework

Offshore resources, including subsurface oil and gas within 3 nautical miles of the coast, belong to the state and are managed by the California Coastal Commission[75] and the State Lands Commission. While the Coastal Commission oversees permitting over all offshore oil and gas development in state waters, the State Lands Commission issues development leases to private companies, allowing them to extract offshore oil and gas. There are currently 30 such state-issued leases along the southern California coast. Of these, 18 leases are developed and producing, 9 are developed but non-producing, and 3 are undeveloped.[76]

Royalties of 16 2/3% of the sales value of each barrel removed from California's offshore oil and gas reserves are paid to the state each year, and are verified by the Mineral Resources Management Division of the State Lands Commission, according to the SLC. In 2006-2007, these state royalties amounted to $220 million from leases at the Long Beach Tidelands, and an additional $52 million from leases on other state sovereign lands, for a total of $272 million, according to the SLC.

The total amount collected in sales royalties depends on both the total number of barrels of oil and gas removed and on the market price of these commodities. Although the number of producing leases and total production volume has been declining steadily since 1970, sales royalties have fluctuated from $14 million to $505 million over this period due to variations in the market price of oil.[77] However, declining production means that revenue from sales royalties are ultimately a declining source of revenue in the long-run.

Instrument description

More than 90% of revenues collected by SLC from royalties on sales of offshore oil and gas are currently deposited in the state's General Fund. Since the environmental impacts of offshore oil and gas production are imposed specifically on California's coastal zone, we propose a diversion of some percentage of sales royalties from the General Fund to fund the State's coastal management program

Revenue estimates

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[73] State Water Resources Control Board. 2007. Underground Storage Tank (UST) Cleanup Fund Current Program Statistics. http://www.waterboards.ca.gov/cwphome/ustcf/docs/stats/2007/jun07.pdf
[74] State Water Resources Control Board. 2006. Underground Storage Tank (UST) Cleanup Fund Current Program Statistics. http://www.waterboards.ca.gov/cwphome/ustcf/docs/stats/2006/june06.pdf
[75] California Coastal Commission. 2007. California Coastal Commission: Why it Exists and What it Does. http://www.coastal.ca.gov/publiced/Comm_Brochure.pdf
[76] State Lands Commission. 2007. Offshore Oil and Gas Lease Status Summary. http://www.slc.ca.gov/Reports/CalifOffshoreOil/LeaseStatus.pdf
[77] Ibid.

If all current royalties were diverted to a fund earmarked for ocean and coastal conservation, up to the total amount collected – $272 million in 2006-2007 – could be dedicated to coastal protection. This revenue stream would display considerable variation from year to year depending on the market price of oil and gas. However, if even 4% of total oil and gas royalties were diverted from the General Fund, more than **$10 million** would be made available for coastal protection.

Rationale for dedicating royalties to coastal protection

Although oil and mineral resources within 3 miles of the coast belong to the people of California, extracting these resources imposes considerable environmental burden on the coastal zone. Specifically, oil and gas production results in impacts to coastal wetlands, disruption of bottom-dwelling benthic communities, discharge of toxic pollutants, noise impacts on wildlife, and increased risks of oil spills, among others.[78] Redirecting a small portion of the royalties from sales of oil and gas to the protection of coastal and ocean ecosystems would provide a dedicated revenue stream which would directly benefit affected communities, and would fund remediation, mitigation, and comprehensive management of coastal resources.

An added advantage of dedicating sales royalties to coastal protection is that new charges or fees are not required, so there is no additional financial burden on the industry or end users.

Practical concerns and discussion

California's Public Trust Doctrine requires that uses on Public Trust Lands, including tidelands, must serve statewide public purposes (as opposed to purely local uses),[79] and Section 6217 of the Public Resources Code specifies that revenues from Public Trust Lands will be deposited into the General Fund. Thus, diverting some proportion of revenues from royalties on oil and gas towards coastal protection may require revision of existing legislation.

Diverting revenues from the General Fund will result in reductions in the state-wide budget, and reduced expenditures on other state programs including education and public health.

There may also be additional opportunities for substantial generation of revenue from two controversial proposals favored by the oil industry and some environmentalists. Both involve relaxation of current statutory or regulatory constraints on the industry that some believe would pose little incremental environmental risk.

The first of these, "Rigs to Reefs" rights fees, would charge oil companies a fee for allowing them to leave some portion of the rig structure in place when the sites are decommissioned. It is not clear that removing the deep-water portion of the drilling rigs over exhausted, sealed wells imposes a higher environmental risk than leaving them in place. Moreover, the rigs

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[78] US Commission on Ocean Policy. 2004. An Ocean Blueprint for the 21st Century. Chapter 24: Managing Offshore Energy and other Mineral Resources.
http://www.oceancommission.gov/documents/full_color_rpt/24_chapter24.pdf

[79] Port of San Diego. California Tidelands: Lands Held in Public Trust.
http://www.portofsandiego.org/projects/cvbmp/assets/documents/Understanding%20the%20CA%20Public%20Trust%20Doctrine.pdf

themselves have been shown to provide an enriched marine habitat for some species.[80] As a result, Rigs to Reefs has been widely supported by sports fishing groups and recreational divers. Legislation introduced by State Senator Dede Albert and supported by the industry in 1998 would have required the payment of a one-time fee of $300 to $400 million. Adjusted for inflation, that is equivalent to a permanent annual income stream of about $20 to $26 million dollars,[81] from which should be subtracted any ongoing state expense for maintenance, monitoring, insurance and the like.

The second is licensing fees for allowing additional wells that can be drilled horizontally from existing derricks at sites such as Tranquillon Ridge. The Schwarzenegger administration's May budget update includes revenue of $100 million from this source in FY2009-10, and an average of $129 million per year for 14 years.[82] However, he would need enabling legislation or to overturn the January 2009 decision of the State Lands Commission denying the lease request. Most of the environmental groups that originally supported the deal oppose legislative overturn of the Lands commission decision as a bad precedent.

Though the issue remains controversial, it is possible that the incremental environmental risk from horizontal drilling from an existing derrick may be small. If low environmental impact could be assured from either of these options and a portion of the revenue devoted to coastal conservation, there could new revenue with no new taxes and a net environmental benefit. The SLC estimates revenue opportunities from both of these projects may be on the order of several hundred million each.

Both of these revenue sources derive from rule changes that can probably be defeated by a united environmental movement. As a result, there is an unusual degree of political leverage for insisting that some or all of the revenue be dedicated to financing incremental environmental benefits, possibly shared between clean energy programs and coastal programs. However, they each also impose important environmental risks that must be properly assessed to assure that the additional funding for environmental priorities would not come at too great an environmental price.

6. Surcharge on federal Outer Continental Shelf oil and gas revenue

CURRENT REVENUE: $50 million; $7.4 million of this is only until 2008-2009
ESTIMATED FUTURE REVENUE: limited, decreasing

Background and existing regulatory framework

Offshore resources of the US Outer Continental Shelf (OCS), including subsurface oil and gas resources beyond 3 nautical miles from the coast, are under federal jurisdiction. The US

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[80] See, e.g., Love, M. S., D. Schroeder and M. Nishimoto. 2003. The ecological role of oil and gas platforms and natural outcrops on fishes in southern and central California: a synthesis of information. U. S. Department of the Interior, U. S. Geological Survey, Biological Resources Division, Seattle, Washington. OCS Study MMS 2003-032.

[81] Adjusted for inflation and annualized at a real interest rate of 5%. Calculation of the author.

[82] Highlights Of Governor's Proposed 2009-10 May Revision, Updated with changes proposed by the Governor on May 29, 2009. (JUNE 1, 2009). See, e.g., http://www.co.sanmateo.ca.us/Attachments/SMC/pdfs/Articles/Budget/2009_may_revise_highlights-060209.pdf

federal government issues leases to private companies to develop these resources, and claims a royalty of 1/6th the sales value of oil and gas, as well as bonuses and rents on offshore oil and gas leases.[83] There are currently 79 such federal leases for offshore oil and gas along the southern California coast.[84]

Although the coastal states bear many of the environmental impacts of federal offshore oil and gas activities, they are prohibited from directly charging state taxes on OCS activities by the Outer Continental Shelf Lands Act.[85] Thus, revenue sharing between the coastal states and federal government is the only source of OCS revenues for the states. The exact nature of federal-state revenue sharing, and the amount to be paid to the states by the federal government, has been hotly debated since the 1940s.

California currently receives a portion of federal oil and gas revenues under two revenue sharing programs:

1. Outer Continental Shelf Lands Act Section 8(g) revenues
   Coastal states receive 27% of revenues from OCS leases located between 3 and 6 nautical miles off the coast which were leased after 1978.[86] California received $43 million in 8(g) revenues in fiscal year 2006.[87]

2. Non-8(g) revenues – Coastal Impact Assistance Program
   In 2005, an agreement was reached between the coastal states and the federal government granting 4 years of revenue sharing from "non-8(g) leases" under the Coastal Impact Assistance Program (CIAP). Non-8(g) leases are OCS oil and gas leases situated beyond 6 nautical miles from the coast that were leased before 1978. California is allocated $7.44 million in CIAP funds for fiscal years 2007 and 2008, of which 35% is allocated to coastal counties.[88] CIAP funds are earmarked for protection of coastal areas, mitigation of OCS activities and damages, and implementation of a marine, coastal, or comprehensive conservation management plan.[89]

Additional revenues to California from federal revenue sharing for offshore OCS activities are unlikely because of the long debated history of OCS revenue sharing. However, we recommend the initiation of a process to extend the Coastal Impact Assistance Program beyond fiscal year 2008 to ensure that the current level of funding is maintained in the long term.

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[83] Personal Communication. Doug Anthony, Santa Barbara County. October 25, 2007.
[84] Minerals Management Service. 2007. Pacific OCS Region. http://www.mms.gov/omm/pacific/index.htm
[85] US Commission on Ocean Policy. 2004. An Ocean Blueprint for the 21st Century Chapter 24: Managing Offshore Energy and other Mineral Resources.
http://www.oceancommission.gov/documents/full_color_rpt/24_chapter24.pdf
[86] County of Santa Barbara Planning and Development Energy Division. 2005. Federal offshore oil and gas revenues. www.countyofsb.org/energy/information/fedrevenues.asp
[87] Minerals Management Service Minerals Revenue Management. 2006. Federal Offshore 8(g) Reported Royalty Revenues. http://www.mrm.mms.gov/MRMWebStats/Home.aspx
[88] Minerals Management Service. 2006. Coastal Impact Assistance Program Fiscal Year 2007 and Fiscal Year 2008 Allocations. http://www.mms.gov/offshore/CIAP/PDFs/StateandCPSShareCalculations2006Links.pdf
[89] Minerals Management Service. 2007. Coastal Impact Assistance Program.
http://www.mms.gov/offshore/CIAPmain.htm

7. Oil and Gas Pipelines and Telecommunications Right-of-Way Fees

CURRENT REVENUE: $1.87 million
ESTIMATED FUTURE REVEUE: up to $1.87 million

Background and existing regulatory framework

The California State Lands Commission issues leases granting right-of-way to oil and gas pipelines and fiber-optic cables on state lands. This includes pipelines transporting oil and gas from offshore energy platforms in state and federal waters to the mainland.

Lease rates for right-of-way leases are based on the assessed value of the land, which is determined relative to sales of comparable lands. For example, officials from the SLC describe right-of-way lease rates for pipelines as based on the assessed value of land designated for similar industrial uses.

The current book value of right-of-way leases for oil and gas pipelines is $664,759, and for fiber-optic cables is $1,203,852, according to the SLC.

More than 90% of all revenues collected by the State Lands Commission are currently deposited in the state's General Fund. Officials from the SLC state these funds are not earmarked for coastal protection even though the coastal region bears substantial impacts from right-of-way pipelines.

Instrument description and revenue estimates

There is limited potential to raise additional revenues from existing right-of-way leases because of the methodology used to set lease rates (as described above). However, by diverting right-of-way lease revenues from the General Fund, up to the total amount collected in lease revenues ($1.87 million) could be dedicated to coastal protection.

Rationale for charge

Since right-of-way pipeline leases disrupt the seabed and lands in the coastal region, using these fees to improve the quality of coastal ecosystems ensures that there is a direct link between the charge and the environmental harm caused by the pipelines and cables.

Additionally, revenues from right-of-way leases could finance the removal of large structural hazards on state coastal lands, including jetties and oil platforms that are exposed during storms. The majority of these deteriorated structures are public safety hazards located on beaches, where they impede navigation and recreational uses of the shoreline. The cost of removing these physical hazards is estimated at $3 million by the SLC. If right-of-way lease revenues were dedicated towards removal of these hazards from state beaches, the costs of a comprehensive hazard removal effort could be met within three years. Such a program could also increase the market value of coastal and beach recreation in California.

Practical concerns and discussion

Diverting revenues from the state's General Fund will result in reductions in the state-wide budget and reduced expenditures on other state programs including education and public health.

8. Hydroelectric Power and Stream Barriers

ESTIMATED FUTURE REVENUE: $20 million, possibly increasing

Background

Research by the Ocean Foundation and UCLA found there are more than 800 hydroelectric dams in California and over 2500 other man-made structures including culverts, concrete channels, roads, and low water crossings that fragment streams, resulting in impeded stream and sediment flows, restricted access to stream habitat, and impacts to nutrient cycling. In addition to compromised ecosystem values, one consequence of stream fragmentation is the restriction of passage for migrating fish (Figure II.E.1).[90] Anadromous fish such as salmon and steelhead depend on healthy, passable streams to reach their critical habitat and spawning grounds, which are often located upstream of impassable man-made structures.[91] The full impact of each structure on access to critical habitat depends on its location within the stream: those lower in the watershed have more impact than those nearer the stream's source.

Of the more than 1000 smaller barriers in California's coastal zone, 300 have been identified by officials at the State Coastal Conservancy as high priority candidates for removal to improve passage of migrating fish. The cost of each removal project ranges from $200,000 – $500,000, for a total of $60 – $150 million. Additionally, the cost of removing 3 large dams from the Klamath River are approximately $100 million each, the cost of removing the Matilija Dam from the Ventura River is approximately $50 million, and the cost of removing the San Clemente Dam from the Carmel River is approximately $35 million. Thus, the costs of high-priority removal projects total more than $445 million.

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[90] Pierce, L., et. al. 2005. Bulletin 250 – Fish Passage Improvement: An Element of CALFED's Ecosystem Restoration Program. California Department of Water Resources. Available online: http://www.watershedrestoration.water.ca.gov/fishpassage/docs/b250/B250%20for%20web%20and%20CD/B250.newcombined.pdf

[91] Fish Passage Forum. 2005. Fish Passage Improvement in California Watersheds. State Coastal Conservancy. Available online: http://www.calfish.org/uploads/FPBrochure.pdf

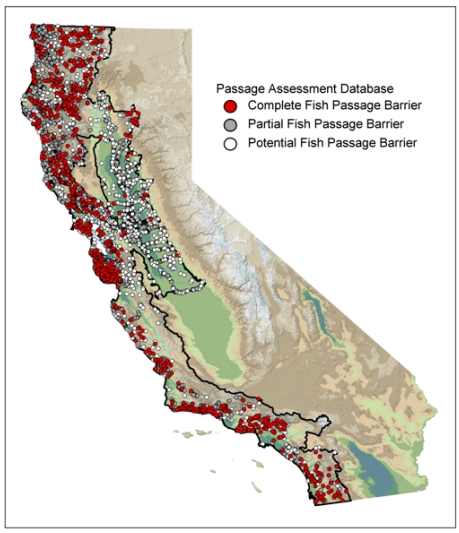

Figure II.E.1: Complete, partial, and potential barriers to fish passage in California's coastal anadromous watersheds.[92]

Instrument description

A mitigating surcharge for improving instream flows and stream habitat, including habitat for fish passage, is proposed. This surcharge would be levied on all hydroelectric power plants whose dams restrict upstream passage of anadromous fish, and would finance the development of a plan for recovery of anadromous fish and improvement of their habitat, to offset the decline created by stream barriers.

Revenue estimates

We derived revenue estimates for two alternative fee structures for the proposed surcharge. In the first, the fee amount is based on the amount of hydroelectric power generated by the plant. In the second, the fee amount is based on two factors: the amount of hydroelectric power generated, and the miles of stream between the dam and the source of the watershed's highest tributary. The fee may also be structured as a per-gallon fee charge, based on the volume of water discharged at the dam.

Fee Structure #1 – Fee is a function of ability to pay

In the first fee structure, a $0.50 fee is levied on each plant per Megawatt-hour of hydroelectric power produced. In this scenario, plants are charged on the basis of their electricity generation, which is assumed to reflect their ability to pay.

The 117 hydroelectric power plants in California generated a total of 40.8 million Megawatt-hours of electricity in 2006.[93] Assuming power generation levels of 2006 are representative of a typical year, this surcharge would raise over $20 million in annual revenues:

$0.50/Megawatt-hour x 40.8 million Megawatt-hours = $20 million

Fee Structure #2 – Fee is a function of ability to pay AND extent of impact

[92] Figure from Calfish.org: http://www.calfish.org/DesktopDefault.aspx?tabId=69.
[93] Energy Information Administration. 2007. Form EIA-906 and EIA-920 Databases. Available online: http://www.eia.doe.gov/cneaf/electricity/page/eia906_920.html.

In the second fee structure, a $0.35 fee is levied per Megawatt-hour of hydroelectric power produced, and additionally, a $30 fee is levied per mile that the plant is located from the stream's source. Charging plants based on their distance from the stream's source ensures that those blocking a greater length of stream habitat (because they are located lower in the watershed) are charged more than those blocking less stream habitat (because they are located higher in the watershed).

For example, a hydroelectric power plant producing 50,000 Megawatt-hours per year located 200 miles from the stream's source would be charged $23,500:

($0.35 x 50,000 MW.h) + ($30 x 200 miles) = $23,500

The total annual revenue generated from this fee structure is $14 million + (117 x average distance of each hydroelectric plant from the stream's source).

Table II.E.1 summarizes estimates of revenues that might be generated from each of the two alternative fee structures.

Table II.E.1: Estimated Revenues from Fish Passage Improvement Surcharge			
Fee Structure	**Rate**	**Base (per year)**	**Annual revenue estimate**
1	$0.50 / Megawatt-hour generated	40.8 million Megawatt-hours	$20 million
2	$0.35 / Megawatt-hour generated + $30 per mile from stream's source	40.8 million Megawatt-hours + average distance from source	$15 million + (117 x average distance from source)

The rates in Table II.E.1 were chosen so that the surcharge would generate approximately $20 million annually. This is the amount needed to remove between 40 and 100 high priority structures, allowing each of the 18 coastal counties to remove between 2 and 5 high-priority structural barriers per year.

Rationale for charge

Additional annual revenues on the order of $20 million would provide a huge boost to the restoration of impeded fish passageways and fish spawning habitat[94], financing the removal of between 40 and 100 high priority structural barriers per year. At this rate, it would take 3 to 8 years to remove the first 300 barriers identified as highest priority by the Fish Passage Forum, representing about 15% of the total removal projects in the state.

This surcharge provides a way for hydroelectric power plants to mitigate their effects on fish passage by financing the removal of barriers elsewhere in the watershed. This creates a direct nexus between those causing the harm and those paying to mitigate it. Both fee structures demonstrate distributional equity, in which payers with the greatest ability to pay are charged the most. The second fee structure also has proportionality between the magnitude of the harm (as measured by the distance of the dam to the source of the highest tributary) and the magnitude of the surcharge.

Removing structural barriers impeding fish passage will provide additional benefits to California's coastal zone: the natural movement of sediments will be improved, preventing potentially costly downstream erosion and subsidence problems.[95]

Practical concerns and discussion

For both fee structures, the amount of revenue collected is a function of the total hydroelectric power produced in California each year. Net generation of hydroelectric power in California increased 89% from 25.5 million Megawatt-hours in 2001 to 48.5 million Megawatt-hours in 2006.[96] If such trends continue, then annual revenues collected by the Stream Habitat Improvement Fund will increase over time as hydroelectric power generation increases. Thus, this fund represents a stable and increase revenue source.

Such a surcharge is likely to be opposed by hydroelectric power plants and by the individual rate payers to whom the surcharge will ultimately be passed. It is likely to be supported by groups supporting the restoration of stream habitat and fish passageways.

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[94] Personal Communication, Michael Bowen, California State Coastal Conservancy, October 3, 2007.
[95] U.S. Commission on Ocean Policy. 2004. An Ocean Blueprint for the 21st Century Chapter 12: Managing Sediment and Shorelines. http://www.oceancommission.gov/documents/full_color_rpt/12_chapter12.pdf
[96] Energy Information Administration. 2007. Form EIA-906 and EIA-920 Databases. http://www.eia.doe.gov/cneaf/electricity/page/eia906_920.html.

Total retail expenditures on electricity in California amounted to $28,669 million in 2004,[97] and are assumed to have increased since then. Assuming that the stream habitat improvement surcharge is ultimately passed on to consumers of electricity, the proposed surcharge of $20 million represents only 0.07% of total retail electricity expenditures in 2004 ($20 million / $28,669 million). This means that if all electricity consumers in the state were equally affected by the surcharge, they would expect an increase of about 0.07% in their energy expenditures. In fact, only those consumers purchasing electricity from the particular utility companies that own hydroelectric plants would be affected by the surcharge, so the increase per rate payer would likely be higher than 0.07%. We recommend that the average increase in costs to the rate payer be evaluated for each electric utility owning hydroelectric facilities.

9. Once-Through Cooling at Coastal Power Plants

Background and existing regulatory framework

There are 18 steam-driven electric power plants located along the coast of California that intake water from oceans and estuaries, run it through industrial once-through cooling systems, and discharge it back to the ocean. These plants are permitted under Section 316(b) of the federal Clean Water Act to collectively intake more than 13 billion gallons of water per day, and have a total generation capacity of 22,006 Megawatts.[98]

The ecological impacts of once-through cooling systems at coastal power plants are substantial, and adversely affect marine ecosystems through three major processes as identified by the State Coastal Conservancy: entrainment, where marine life is sucked into the cooling systems and killed; impingement, where fish and invertebrates are trapped and killed on the intake screens; and thermal impacts, due to water warmed by the cooling system returning to the natural environment.

Total costs of the impacts of once-through cooling on the marine ecosystem and the costs of mitigation are uncertain and difficult to measure, though preliminary cost estimates have been developed for at least 4 plants. For example, these range from $7 million for enhancing biological productivity at Moss Landing to $51.42 million for habitat restoration at San Onofre.[99]

In April 2006, the California Ocean Protection Council and the State Lands Commission issued resolutions urging reductions in entrainment and impingement impacts of once-through cooling systems.[100,101] The State Water Resources Control Board is currently

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[97] Energy Information Administration. 2004. Energy Expenditure Estimates by Source, 2004. http://www.eia.doe.gov/emeu/states/sep_sum/html/pdf/sum_ex_tot.pdf .

[98] California Ocean Protection Council. 2007. California Coastal Power Plants – Cost and Engineering Analysis of Cooling System Retrofits. http://www.resources.ca.gov/copc/OTC.htm .

[99] California Energy Commission. 2005. Issues and Environmental Impacts Associated with Once-Through Cooling at California's Coastal Power Plants. http://www.energy.ca.gov/2005publications/CEC-700-2005-013/CEC-700-2005-013.PDF .

[100] California Ocean Protection Council. 2006. Resolution Regarding the Use of Once-Through Cooling Technologies. http://resources.ca.gov/copc/docs/060418_OTC_resolution_LH2_adopted_2006-4-20.pdf.

developing a statewide policy consistent with these resolutions, requiring coastal power plants to reduce losses from impingement and entrainment. This policy, which is scheduled to be circulated for public comment in the early autumn 2009,[102] may result in certain plants converting their cooling technologies to comply with increasingly stringent standards for once-through cooling systems.

A study commissioned by the California OPC evaluated costs and feasibility of retrofitting once-through cooling systems with wet cooling towers. (Wet cooling towers are a newer technology that alleviates many of the impacts of once-through cooling systems.) This study found that retrofitting the cooling technology is feasible at most sites but infeasible at Redondo Beach, Ormond Beach and El Segundo and problematic at several others.[103] Diablo Canyon and San Onofre are both nuclear power plants, and they have the highest throughput volume (2500 and 2574 million gallons per day)[104] and capacity utilization rate (95.7% and 68.7%)[105] of all the 18 coastal power plants.

Instrument description

A mitigation fee for once-through cooling systems could be imposed. This fee will be imposed on all coastal power plants as long as they continue to cause impingement or entrainment impacts through the intake of ocean or estuarine water.

Revenue estimates

Given that most plants will likely retrofit their cooling technology as a result of the new statewide policy currently under development, this fee would primarily apply to the five power plants at which retrofits of existing technology is infeasible or problematic. We estimate that these five power plants collectively intake more than 1,580,000 million gallons of water per year, which is approximately 80% the total volume of intake annually by all 18 plants.[106] If the mitigation fee for once-through cooling were set at $50 per million gallons of intake, it would raise more than $77 million annually from just these 5 plants.

Total annual throughput from all 18 plants is estimated to be nearly 1,920,000 million gallons;[107] if this total throughput were charged at a rate of $50 per million gallons, $96 million would be raised by the once-through cooling fee.

Rationale for charge

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[101] California State Lands Commission. 2006. Resolution Regarding Once-Through Cooling in California Power Plants.http://www.energy.ca.gov/siting/documents/2006-04-13_SLC_PROPOSED_COOLING.PDF

[102] As announced on the SWRCB website http://www.swrcb.ca.gov/water_issues/programs/npdes/cwa316.shtml, downloaded May 20, 2009.

[103] California Ocean Protection Council. 2007. California Coastal Power Plants – Cost and Engineering Analysis of Cooling System Retrofits. http://www.resources.ca.gov/copc/OTC.htm .

[104] These numbers were derived by multiplying total capacity (design flow) by capacity utilization, using numbers reported by the Ocean Protection Council's Cost and Engineering report at http://www.resources.ca.gov/copc/OTC.htm. They are presented in Table 1 and Table ES-3 of this report.

[105] California Ocean Protection Council. 2007. California Coastal Power Plants – Cost and Engineering Analysis of Cooling System Retrofits. http://www.resources.ca.gov/copc/OTC.htm .

[106] This estimate was derived by multiplying total capacity (design flow) by capacity utilization for each plant, using numbers reported by the Ocean Protection Council's Cost and Engineering report at http://www.resources.ca.gov/copc/OTC.htm. They are presented in Table 1 and Table ES-3 of this report.

[107] Ibid.

A fee on coastal power plants whose intake activities cause impingement and entrainment impacts is a "polluter pays" fee in which the entities causing environmental harm are directly charged. Thus, there is a clear link between the environmental harm and the fee. All funds collected through this fee should be earmarked for habitat restoration or mitigation to reduce the impacts of impingement and entrainment as appropriate.

The fee rate of $50 per million gallons of intake was set so that the fee would raise enough revenues to address costs at the 4 plants for which cost estimates have been developed.[108]

Practical concerns and discussion

If the statewide policy changes which are currently being developed are approved, there will be limited potential for additional revenues from coastal power plants that retrofit their antiquated once-through cooling technologies. However, revenue potential will still exist from plants at which retrofitting is infeasible or problematic, and in the interim while other plants retrofit their cooling technologies. There will also be revenue potential from plants that continue to intake coastal waters for desalination purposes, particularly as the demand for desalinized water grows due to declines in the state's freshwater reserves.

Any fee charged to coastal power plants must be consistent with other state policies concerning these plants. One way to do this is to integrate the once-through cooling fee into the new statewide policy. Doing so would allow coastal power plants to be governed under a single comprehensive policy that sets acceptable standards for impingement and entrainment, and specifies corresponding fees for those power plants that do not comply.

Our analysis of the feasibility of charging a fee on coastal power plants using once-through cooling may be modified once the new policy is made available.

This charge will impact the ratepayers of utilities owning coastal power plants. To address this, we recommend a thorough analysis of the impacts of this charge on the ratepayer.

3. Licensing Fees for Offshore Renewable Energy (e.g. Wind, Wave)

CURRENT REVENUE: none
ESTIMATED FUTURE REVENUE: unknown, potentially large

Background and existing regulatory framework

Initiatives to harvest offshore renewable energy seek to transform the energy stored in wind, waves, tides, or thermal gradients into usable electricity. According to the State Coastal Conservancy, there are currently no offshore renewable energy facilities in California. Hence, there is presently no state revenue from offshore renewable energy, and future revenue potential is uncertain.

Though in its infancy, the technology to harvest renewable energy from offshore wave and tide energy has already been developed,[109] and there is potential for this energy source to

[108] California Energy Commission. 2005. Issues and Environmental Impacts Associated with Once-Through Cooling at California's Coastal Power Plants. http://www.energy.ca.gov/2005publications/CEC-700-2005-013/CEC-700-2005-013.PDF .

grow considerably over the next several decades. Energy companies such as PG&E and Chevron have recently expressed interest in investigating the potential for harvesting this energy for commercial use. For example, PG&E presented a proposal to study the production of wave energy off the coast of Fort Bragg in Mendocino County in 2007.[110]

The state of California has jurisdiction over waters extending 3 miles out from the coast. According to the State Coastal Conservancy and the SLC, offshore renewable energy facilities will be permitted by the California Coastal Commission, and the State Lands Commission will lease out state lands for renewable energy production in this zone. However, there is some confusion over the legal framework that will govern offshore facilities, and "several state and federal agencies have yet to clarify their positions on the regulatory process for wave energy".[111] For example, PG&E has filed preliminary permit applications for wave energy with the Federal Energy Regulatory Commission (FERC),[112] and Sonoma County is also considering filing an application for wave energy testing with FERC.[113]

Lease payments made to SLC will constitute the bulk of state revenues from offshore renewable energy production under the current regulatory framework. The SLC recommends these lease rates be assessed by SLC and charged by square foot of the project area. The rates will be based on the value of comparable land sales, taking into account any public uses excluded by the project. The actual amount of these lease rates is currently unknown because SLC has not assessed or issued any comparable leases to date.

Instrument description and revenue estimates

Instrument 1: Surcharge on production of offshore renewable energy

An ocean protection surcharge on the production of offshore renewable energy, assessed per kilowatt-hour energy produced, would be collected from all facilities harvesting offshore renewable energy. The rate of this surcharge would be very nominal, such that research and development of new wind, wave, tidal, and thermal technologies were not impeded. We suspect that revenues from this surcharge will become substantial over the next few decades as the proportion of California's total energy portfolio derived from offshore renewable sources grows. We recommend that the ocean protection surcharge be established in the near-term to guarantee that a revenue stream dedicated to coastal protection is available before substantial opposition develops.

Revenues collected from this surcharge would be channeled to mitigation and/or remediation of the environmental impacts of offshore energy production.

Instrument 2: Earmarking lease revenues from offshore renewable energy for coastal conservation

More than 90% of revenues collected by the State Lands Commission, including revenues from leases on state lands, are deposited into the state's General Fund. We recommend that

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[109] Electric Power Research Institute. 2007. Primer: Power from Ocean Waves and Tides. http://www.aidea.org/aea/PDF%20files/OceanRiverEnergy/6-22-2007EPRIprimer.pdf

[110] San Francisco Bay Area Independent Media Center. 2007. PG&E, Wave Energy and the North Coast. http://www.indybay.org/newsitems/2007/10/02/18451392.php

[111] Frank Hartzell, Fort Bragg Advocate. 2007. http://www.advocate-news.com/local/ci_7405181

[112] http://www.indybay.org/newsitems/2007/10/02/18451392.php

[113] Frank Hartzell, Fort Bragg Advocate. 2007. http://www.advocate-news.com/local/ci_7405181

some proportion of lease revenues from offshore renewable energy leases be earmarked for the State's coastal management program in the near-term, so that if offshore renewable energy becomes a substantial energy source in the future, a stream of funds dedicated to coastal protection and mitigation will already have been established.

Rationale for charge

Although renewable energy is often presented as a "clean" alternative to fossil fuels, numerous environmental impacts may be associated with harvesting offshore wave, wind, tidal, or thermal energy. For example, analysis by the State Coastal Conservancy found the harvesting of this energy may result in disruption of marine habitat, impacts to migrating wildlife, acoustic impacts on marine mammals, sediment and coastal impacts, interference with commercial and recreational ocean uses (e.g. fishing, navigation, sailing), and visual impacts.

Revenues collected from the two instruments described above can be used to mitigate or compensate for these environmental impacts, ensuring that the external costs of harvesting energy from the ocean are not overlooked.

C. Commercial Fishing-Related Revenues

1. Individual Transferable Quotas (ITQs)

CURRENT REVENUE: None
ESTIMATED FUTURE REVENUE: Limited

Individual transferable quotas (ITQs) are a market mechanism for assigning exclusive tradable rights to fish to individual fishermen.[114] ITQs are effective because they allow individual fishermen to take ownership of some percentage of the total allowable catch (TAC), thus ending the race to fish that often arises in "derby fisheries" where the resource is managed as common property without individual property rights.[115] Thus it eliminates the current race to catch fish under an aggregate limit, and the incentive to over-invest that has produced substantial excess capacity in the industry and is squeezing the industry's profitability. As a result, the industry under an ITQ system should be more stable and more profitable. Excess ships and equipment could then be profitably sold in other markets.

We recommend that the quotas under an ITQ system be measured by tons of catch of specified species for mobile species. The level of catch allowable can then be adjusted annually based on the current health of the population. For sessile animals and rooted plants permanent, exclusive harvesting rights for a species in a fixed area may be more appropriate.

ITQs have yet to be used to manage access in any of California's commercial fisheries, though they are successfully used to control access in many fisheries around the world (e.g. sablefish and halibut in British Columbia and several fisheries in Iceland and New

[114] Sumalia, Ussif Rashid, Gordon R. Munro, and Jon G. Sutinen. 2007. Recent developments in fisheries economics: An introduction. Land Economics **83**(1): 1-5.
[115] Ibid.

Zealand[116]). Although ITQs are not currently used in California, the State Coastal Conservancy sees several fisheries as good candidates for ITQ management.

ITQs limit the take of fish under quota to a sustainable level. This is necessary for the long-term health of the industry, but nonetheless constitutes a reduction in current supply, which will cause an increase the price to the consumer. The price at which ITQs will trade is therefore equal to the value to the fishing industry of this increase in price. This increase can be substantial – in some fisheries globally it has exceeded the total profit from the industry. Because firms will not bid more than the value of the quota, firms will not pay a price that exceeds this increase. Thus the burden of the quota system will fall mainly on purchasers rather than the industry. However, the price increase is limited by international and interspecies competition in the fish market, which holds down the increase in fish prices and hence the market value of the quotas.

If quotas are allocated based on historic catch levels, they produce monopoly profits for the holders. The authors therefore recommend that auctions be used to allocate ITQs among fishermen (rather than assigning them based on historical landings) to ensure that the distribution of quotas is equitable, transparent, and politics-proof. We also recommend that the auction proceeds be used to support ocean conservation activities that support the continued value and stability of the fish stock and related marine resources. This assures the continued health of the industry and provides a benefit to fish consumers who are ultimately footing the bill.

Based on a review of the quota prices in various markets around the world, and an annual fish catch on the order of $100 million, we estimate that a comprehensive ITQ system could raise $5-10 million per year. Note, however, that this assumes current fish catch and service levies are not increased. If increases such as those discussed in the next section were adopted, the value of any ITQs for the same species would decline by a comparable amount.

Rationale for charge

The primary rationale for ITQs is more efficient regulation of catch to a sustainable level. Auction is justified to prevent windfall profits and to offset the burden on consumers of the price increase.

A secondary benefit of ITQs is to the fishing industry. They provide an incentive for reducing the overcapitalization of the industry, thereby increasing and stabilizing the profitability of the remaining fleet.

Finally, the proceeds of an auction of ITQs provides an especially appropriate revenue source for fisheries management. California's commercial fisheries are currently managed using revenues from only two dedicated sources: (1) landings taxes, and (2) license and permit fees. Total revenues from these two sources amounted to $4.81 million in 2005.[117]

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[116] Dewees, Christopher M. 1998. Effects of individual quota systems on New Zealand and British Columbia fisheries. Ecological Applications **8**(1): S133-S138 Suppl. S.

[117] Department of Fish and Game. Memo: Estimate of Commercial Fishing Costs vs. Revenues. October 6, 2007.

However, the total annual costs of managing the commercial fisheries are estimated at more than $22 million including enforcement, research, management, outreach, and administration,[118] and the costs of the comprehensive fisheries monitoring and management which is needed is far more.

2. Fish Catch and Service Levies (Landings Taxes)

CURRENT REVENUE: $1.13 million in 2005
ESTIMATED FUTURE REVENUE: $6.5 million

Background and existing regulatory framework

Landings taxes are imposed at the dock on licensed fish receivers who receive fish from commercial fishermen, or on the commercial fishermen themselves if the buyers are not licensed.[119] The landings tax rate for each species is listed in the Fish & Game Code Section 8051.[120] These rates became operative on January 1, 1994, and though they were initially based on the economic value of the fishery, this is no longer the case according to DFG. Other than an annual adjustment for inflation introduced in 2005, landings tax rates have been stagnant for 13 years, and are due to be reviewed since the rates are now somewhat arbitrary.[121] However, any changes to the landings tax rates will require legislative action because the tax rates are specified in the Fish & Game Code; the Fish & Game Commission has no authority to change these rates.

Nearly $1.13 million was collected by DFG in 2005 in revenues from landings taxes from all commercial fisheries.[122] The total ex-vessel value of landed fish in that year was $109 million. Thus, landings taxes comprised about 1% of the total ex-vessel value in 2005.[123]

All fees collected by DFG, including landings taxes, have been indexed to inflation each year since 2005, pursuant to the Fish & Game Code section 713.[124]

Revenues from commercial fish landings taxes are one of two sources that fund California's commercial fisheries, the other being fee revenues from sales of licenses, permits, and stamps (discussed in Section III.D of this report).[125]

Instrument description

This instrument would revise the landings tax rates for all commercially-fished species and make them a function of the commercial value of the fishery. One way to do this is to set tax rates each year based on the value of the landings in the previous year; another is to charge a constant rate (say 5%) of the sales value of the landings.

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[118] Ibid.
[119] California Fish & Game Code Section 8041. http://law.onecle.com/california/fish/8041.html
[120] California Fish & Game Code Section 8051. http://law.onecle.com/california/fish/8051.html
[121] Personal Communication. Sam Schuchat, State Coastal Conservancy. September 28, 2007.
[122] Department of Fish and Game. Memo: Estimate of Commercial Fishing Costs vs. Revenues. October 6, 2007.
[123] Ibid.
[124] California Fish and Game Code Section 713. http://law.onecle.com/california/fish/713.html
[125] Department of Fish and Game. Memo: Estimate of Commercial Fishing Costs vs. Revenues. October 6, 2007.

Revenue estimates

If a landings tax rate of 5% the sales value were assessed, this instrument could raise up to **$6.5 million** in revenues for fisheries monitoring and management, based on a total ex-vessel value of $130 million for California's entire commercial fishery in 2006.[126]

Rationale for charge

Commercially-harvested species are common property resources that theoretically belong to the public, yet those who catch and sell these species derive all the benefits of the resource. Landings tax rates that are a function of the value of the catch account for these disproportionate benefits from the common property resource by following the "benefit principle," in which those individuals who benefit from dealing in the most valuable species pay the greatest amount in taxes. In addition, those individuals benefiting the most from high-value landings also have the greatest ability to pay for their use of the resource, because their sales revenues are highest.

Revenues from landings taxes should be used to safeguard the resource from threats posed by commercial harvesting (such as overfishing and habitat degradation) and enhance the quality of California's commercial fisheries. This can be done by investing in management of the commercial fishery. In particular, there is a need for improved monitoring and enforcement of commercial fisheries, and it will take approximately $30–$40 million to fully meet this need, according to the SCC. If revenues from landings taxes increase by $5.4 million ($6.5 – $1.13 million), between 13% and 18% of the total enforcement needs can be met.

2. Eco-labeling and Product Certification Fees

CURRENT REVENUE: None
ESTIMATED FUTURE REVENUE: Limited

Eco-labeling is a way of endorsing consumer products that have been produced or harvested using environmentally sustainable, non-destructive practices.[127] Eco-labeling schemes in fisheries are intended to provide an incentive for producers to ensure that their seafood is sustainable, while creating a simple tool to help consumers choose products that were produced in a sustainable fashion. Eco-labeling schemes are not intended as revenue-generating mechanisms.

None of California's fisheries have been eco-certified to date, although California Chinook salmon and Dungeness crab are currently undergoing assessment for certification by the Marine Stewardship Council (MSC).[128] MSC is an internationally-recognized independent

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[126] California Department of Fish & Game. 2007. Table 15 – Poundage and Value of Landings of Commercial Fish into California by Area – 2006. http://www.dfg.ca.gov/marine/landings06/table15.pdf

[127] Randall M. Peterman. 2002. Ecocertification: An incentive for dealing effectively with uncertainty, risk, and burden of proof in fisheries. Bulletin of Marine Science 70(2): 669-681.

[128] Marine Stewardship Council. 2007. Progress of fisheries undergoing assessment and re-assessment against the MSC standard. http://www.msc.org/assets/docs/Fisheries_chart_5_Nov2007.pdf

non-profit organization that promotes responsible fishing practices by assessing and certifying fisheries that produce sustainable seafood.[129]

Even if several of California's commercial fisheries decided to pursue eco-certification, any fees paid in this process would likely go to MSC because it is already established around the world as the seal of sustainable seafood. Thus, the potential for future state revenues from eco-certification is limited. However, if state-level certification were desired, there may be some unknown potential for state revenues from eco-certification.

3. Commercial Fishing and Fish Business Licenses and Permits

CURRENT REVENUE: $3.19 million in 2006 (plus $770,000 in commercial fish business licenses)
ESTIMATED FUTURE REVENUE: $6.4 million if doubled

Background and existing regulatory framework

All participants in California's commercial fisheries are required to own a commercial fishing license. In addition, DFG requires several species-specific or gear-specific permits to commercially harvest certain species. In some cases, bycatch permits are also required to cover fish caught incidentally. The current fee schedules for these licenses, permits, and stamps are published annually in the California Commercial Fishing Digest, which lists current levels for over 80 fees including non-restrictive permits, transfer fees, limited access and restricted access permits, and late fees.[130]

All fees collected by DFG, including fees for licenses, permits, and stamps, have been indexed to inflation each year since 2005, pursuant to Section 713 of the California Fish & Game Code.[131] However, fee levels for licenses, permits, and stamps are still based on their historic rates, and do not reflect the commercial value of the fishery.

Total sales of commercial fishing licenses, permits, and stamps amounted to $3.19 million in 2006,[132] and sales of commercial fish business licenses were worth $772,383 in the same year.[133]

The Fish & Game Commission has authority to adjust the fee rates for 40 of the 65 different types of commercial licenses, permits, and stamps (not including transfer fees). The remainder are created by statute and require legislative action to be modified. Of the $3.68 million collected in license, permit, and stamp revenues in 2005, nearly $3 million was from fees that are statutorily controlled, amounting to 90% of the total number of licenses, permits, and stamps sold.

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[129] Marine Stewardship Council. 2007. About MSC. http://eng.msc.org/
[130] Department of Fish and Game. 2007 Commercial Fishing Digest: 2007-2008 License, Permit, and Stamp Fees. http://www.dfg.ca.gov/licensing/pdffiles/2007commdigestfees.pdf
[131] California Fish and Game Code Section 713. http://law.onecle.com/california/fish/713.html
[132] Department of Fish and Game. 2007. Commercial fishing licenses and permits Sales reported by license year. http://www.dfg.ca.gov/licensing/pdffiles/cf_sales_10yr.pdf
[133] Department of Fish and Game. 2007. Commercial fish business Sales reported by license year. http://www.dfg.ca.gov/licensing/pdffiles/fb_sales_10yr.pdf

In addition, some species that are harvested in California (including groundfish, sablefish, highly migratory species, and some coastal pelagics) are permitted federally by the National Marine Fisheries Service.[134] Thus, there is no scope to raise additional state revenues from permits for these species.

Revenues from commercial fish licenses, permits, and stamps are one of two sources that fund California's commercial fisheries, the other being landings taxes (discussed in Section III.B of this report).[135]

Instrument description

Current license, permit, and stamp fees need to be adjusted to ensure that they appropriately charge users for the benefits derived from the right to harvest particular species, as well as the potential harms they may cause to the target species and other species. Several variables will factor into an analysis of the appropriate permit fee for each fishery, including the commercial value and number of licenses issued, the costs of management, the ecological status and risks facing the fishery, and jurisdictional issues.

Clearly, such an analysis is beyond the scope of the current report. We do not expect that reforms to commercial license fees will yield substantial additional revenues, although reforms of the current fee structure may help to align fees with the value of each fishery and may offset some of the costs of management.

Revenue estimates and discussion

We estimate an upper bound to the total fee revenues after reform by doubling 2006 fee revenues. If revenues of $3.19 million were doubled by doubling all license, permit, and stamp fees, this would yield a total of $6.4 million.

$6.4 million is considered an upper bound on the potential revenues from licenses and fees after reform because it is unlikely that fees for all commercial licenses and permits can be doubled. Reasons for this include:

- the division of authority regarding permit fees between the Fish & Game Commission and legislature;
- that fact that it may not be appropriate to increase fees uniformly because of the individual characteristics of each fishery;
- the fact that it is unclear why general license fees and species-specific permit fees should be increased by the same amount.

Section 713 of the Fish & Game Code specifies that a fee review should happen at least once every 5 years.[136] Since the last one was implemented in 2005,[137] a fee review will be due

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[134] National Marine Fisheries Service. 2007. Permits – Northwest Regional Office. http://www.nwr.noaa.gov/Permits/Index.cfm

[135] Department of Fish and Game. Memo: Estimate of Commercial Fishing Costs vs. Revenues. October 6, 2007.

[136] California Fish and Game Code Section 713. http://law.onecle.com/california/fish/713.html

[137] The time history of commercial licenses and permits indicates that fees changed for most licenses and permits in 2004 or 2005. Department of Fish and Game. 2007. Commercial Fishing Licenses and Permits Fees by License Year. http://www.dfg.ca.gov/licensing/pdffiles/cf_fees_10yr.pdf

within the next three years. A required fee review may provide the right timing for revising fees for commercial licenses, permits, and stamps.

4. Fines for Illegal Fishing

CURRENT REVENUE: $1.146 million in 2005-2006
ESTIMATED FUTURE REVENUE: $1.686 million if fines are doubled

Background and existing regulatory framework

Penalty and fee schedules for violations of the Fish & Game Code are specified in the California Rules of Court Rule 4.102; Uniform Bail and Penalty Schedules.[138] Fines and penalties are collected by the California State Controller's Office, which disburses 50% of fine revenues to the state and 50% to the counties.

DFG collected approximately $540,000 in Fish & Game violation fine revenues in 2005-2006, and $606,000 in penalties and additional assessments on those fines, for a total of $1,146,000.[139] According to DFG, the total amount charged to offenders was likely much more than $540,000 because: (1) 50% of fine revenues are allocated to the counties; (2) fines assessed in one year are often payable in installments over a number of years; and (3) many offenders are sentenced with diversions (such as community service) rather than fines.

In general, fee rates for Fish & Game offenses are considered too low.[140] For example, total bail ranges from $380 (for numerous offenses) to $57,000 (for unlawful sale or purchase of abalone or unlawful placing of organisms in natural waters).[141] Abalone poaching in particular is rampant in California because of low enforcement rates, and perhaps fines for poaching could be higher.

Instrument description

There are at least three options for increasing revenues from fines for illegal fishing:

1. Increase the number of enforcement wardens, thereby increasing the probability of violators being caught (i.e. the enforcement rate).
2. Increase the dollar amount of the fines per violation.
3. Increase the number of violations that are charged fines rather than given diversions.

Revenue estimates

Total revenues from fines on infractions of the Fish & Game Code can be as high as $1,686,000 if fines are doubled while penalties remain at 2005-2006 levels ($540,000 x 2 + $606,000) (option 2). This represents an effective increase of 47% in total revenues. This estimate assumes that both the current level of enforcement and the number of violations receiving fines rather than diversions remain constant.

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[138] Office of the General Counsel. 2007. Uniform Bail and Penalty Schedules California Rules of Court 4.102. http://www.dfg.ca.gov/enforcement/docs/bail-and-penalties.pdf
[139] California Governor's Budget. 2007-2008. Department of Fish and Game Budget. http://www.ebudget.ca.gov/pdf/GovernorsBudget/3000/3600.pdf
[140] Personal Communication. Sam Schuchat, State Coastal Conservancy. September 28, 2007.
[141] Office of the General Counsel. 2007. Uniform Bail and Penalty Schedules California Rules of Court 4.102. http://www.dfg.ca.gov/enforcement/docs/bail-and-penalties.pdf

Rationale for charge

The use of fines as a penalty for legal infractions ensures that offenders directly pay for their offense. Thus, it is comparable to fines or penalties assessed on other crimes. However, marine fisheries enforcement is severely under-funded and understaffed at DFG, and represents a major need for improving the management of California's marine living resources. For example, the costs of adequate marine enforcement are approximately $16.3 million,[142] and current fine revenues of $1.146 million represent only 7% of these costs. Additionally, there are 70 enforcement positions at DFG with a marine emphasis, yet many of these positions are currently unfilled. Even if all 70 positions were filled, DFG still would not be able to meet its expanding Public Trust mandate, which includes enforcement for numerous unique fisheries and diverse fish populations.[143]

Additional revenues collected from fines on violations of the Fish & Game Code (option 2) should be directed towards increased enforcement in fisheries. These revenues could fund (1) more positions in enforcement, and (2) improved salaries and benefits to existing fisheries wardens, who are under-compensated in relation to the demands of their job and in comparison with similar enforcement officers (e.g. highway patrol officers). Thus, there is a clear nexus between an increase in fines and the use of the revenues for improved enforcement.

Increasing the fine rate per violation should theoretically increase total revenues from fines, assuming that the number of violations remains constant. However, higher penalties should discourage cheaters by raising the stakes if they are caught, eventually leading to a reduction in the number of violations and safeguarding the resource. If this happened, revenues from fines would be expected to eventually decrease.

In addition to improving enforcement of Fish & Game Code violations, increased investment in fisheries wardens would provide several additional benefits because the wardens could serve a monitoring role in addition to an enforcement role. In this capacity, fisheries wardens would effectively become round-the-clock watchdogs on the ocean. This would allow more rapid identification and response to poaching events, pollution and spill events, introductions of invasive species, and monitoring of trends and variability in fisheries catches (providing an additional source of fishery-independent data to be used for management).[144]

Practical concerns and discussion

Fee schedules for Fish & Game violations should be compared with the fine levels for the same offenses in other states, particularly in Oregon, Washington, and Alaska.

Although an increase in fines for illegal fishing may be relatively straightforward to implement, it is unlikely that doing so would raise substantial additional revenues.

5. Aquaculture Production or Licensing Charges

[142] Personal Communication. Nancy Foley, Department of Fish and Game. October 16, 2007.
[143] Ibid.
[144] Ibid.

CURRENT REVENUE: $93,052 in 2006
ESTIMATED FUTURE REVENUE: $0.19 million if doubled

Total revenues from aquaculture licensing fees amounted to $93,052 in 2006.[145] The fee rates for aquaculture licenses are very low and do not reflect the complete ecological footprint of aquaculture. However, given the current scale of the industry, even if aquaculture license fees were greatly increased, total revenues would still be modest. Thus, it is unlikely that aquaculture has the potential to raise substantial revenues for fisheries management or coastal conservation in California.

Prospects for future revenues from aquaculture are uncertain. Although California is not currently known as an aquaculture state, growth in the industry over the next two decades could increase the revenue base from aquaculture in the future.

8. Biodiversity and Biotech Licensing or Development Fees

CURRENT REVENUE: None
ESTIMATED FUTURE REVENUE: Unknown

Biotechnology license fees grant the rights of living organisms to companies who wish to prospect for unique proteins or DNA for the development of biotechnology. California does not currently issue licenses for the development of biotechnology from marine biodiversity, nor does it have any revenues from such fees.

Future potential of California's biotechnology prospecting industry is unknown.

D. Commercial Shipping-Related Revenues

1. Harbor, Docking, Freight, Intermodal-Transport, Noise, Turbulence, and Propeller-Related Fees and Charges

CURRENT REVENUE: High; potentially in the $100,000 range per vessel
ESTIMATED INCREMENTAL FUTURE REVENUE: Unknown, limited

The fees assessed on commercial vessels coming to port in California are substantial.[146] For example, the average container vessel making its first port call at the Port of Oakland paid almost $95,000 in total fees in 1998, including port fees, pilotage fees, ship agent fees, ballast water fees, and longshoreman fees, according to the SLC. The total fees assessed on any vessel depend on the vessel type, cargo, the port, the agreements between companies, and various local, state, and federal requirements, and different agencies receive widely varying amounts of these fees.

Given the fees already facing the commercial shipping industry, and their strong lobby groups, approval of additional fees on this user group for coastal protection is difficult.

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[145] Department of Fish and Game. 2007. Special permits: Sales reported by license year. http://www.dfg.ca.gov/licensing/pdffiles/sp_sales_10yr.pdf
[146] Personal Communication. Norman Fassler-Katz, Office of Senator Lowenthal. October 17, 2007.

Thus, we consider future revenue potential limited unless we can identify aspects of shoreline and coastal protection that the industry desires. For example, one of the infrastructural bottlenecks to shipping is the environmental burden of diesel-powered electric generation while at dock in non-attainment areas. Suitable electrical hookups, and a requirement to use them, might enable a considerable expansion of shipping, and so could lead to industry support. The key is to unlocking this revenue source is to use the revenue to provide goods and services that the industry values, or that will allow it more beneficial approaches to complying with existing laws that will otherwise impose even higher costs.

2. Commercial Shipping and Aquatic Invasive Species (AIS)

CURRENT REVENUE: $2.83 million (2005)
ESTIMATED FUTURE REVENUE: up to $7.2 million

Background and existing regulatory framework

Aquatic invasive species (AIS) are introduced to California's inland and coastal waters where they establish reproducing populations, often displacing and endangering native species while creating millions of dollars of damage to human uses of coastal waters, including impacts to commercial, agricultural, and recreational activities.[147] Once invasive species become established, they are nearly impossible to eradicate and can wreak havoc on local ecosystems. Thus, staff at the SCC identify prevention as the best way to control the threat of invasive species.[148]

AIS are introduced to coastal waters in California via at least seven different vectors: fouling of commercial ships, ballast water on commercial ships, aquarium introductions, the live bait trade, recreational boating, intentional introductions, and construction or restoration projects.[149] However, commercial shipping is the most important vector of nonindigenous introductions in coastal waters, accounting for up to 80% of introductions in North America.[150] AIS can be introduced by commercial ships via two mechanisms: (1) being released from a ship's ballast water, or (2) clinging onto and fouling the ship's exterior body. Different methods are used to control each of these two vectors.

Numerous state agencies share the responsibility of managing aquatic invasive species in California, including the State Lands Commission, Department of Fish and Game, Department of Boating and Waterways, and State Water Resources Control Board. The Ballast Water Program at SLC is responsible for controlling invasive species introductions from commercial shipping. Additionally, DFG, the State Coastal Conservancy, and the San Francisco Estuary Project have partnered to develop an Aquatic Invasive Species Management Plan for California, which is currently in the draft stage.[151]

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[147] California Department of Fish and Game. 2006. California Aquatic Invasive Management Plan. http://sfep.abag.ca.gov/pdf/AISmgmtplan.pdf
[148] Personal Communication. Abe Doherty, State Coastal Conservancy. September 28, 2007.
[149] Ibid.
[150] California State Lands Commission. 2007. 2007 Biennial Report on the California Marine Invasive Species Program. http://www.slc.ca.gov/Spec_Pub/MFD/Ballast_Water/Documents/2007FinalBiennialReport.pdf
[151] California Department of Fish and Game. 2006. California Aquatic Invasive Management Plan. http://sfep.abag.ca.gov/pdf/AISmgmtplan.pdf

Section 71215 of California's Public Resources Code establishes the Marine Invasive Species Control Fund, and caps this fee to a maximum of $1000 per qualifying voyage.[152] The fee is currently set at $400 per qualifying voyage. All vessels greater than 300 gross registered tons that arrive at a California port after operating outside California waters are considered "qualifying voyages" and are subject to this fee.[153] This fee is administered by the Ballast Water Program at SLC and is collected by the California Board of Equalization.

Table IV.B.1 shows that fees of $2.8 million were billed under the Marine Invasive Species Control Fee in 2005, and $3.3 million were collected in total revenues (the difference is due to penalty assessments).

Table IV.B.1: Summary of Marine Invasive Species Fee Program.[154]

Period of Activity	Voyages Billed	Voyages Reported (Note 1)	Total Voyages	Fees Billed	Fees Reported (Note 1)	Total Fees	Payments Received for Period (Note 2)
2000	5871		5871	2735534		2735534	2723981
2001	5263	510	5773	2105200	204000	2309200	2306992
2002	4608	921	5529	1378400	277200	1655600	1639458
2003	4668	1013	5681	933600	202600	1136200	1133732
2004	5699	1123	6822	2752200	535100	3287300	3248625
2005	6070	1156	7226	2830700	534700	3365400	3326187
Through August 2006	4200	768	4968	1680000	307200	1987200	1961363
TOTAL	**36379**	**5491**	**41870**	**$14,415,634**	**$2,060,800**	**$16,476,434**	**$16,340,338**

NOTES: Note 1: Returns are due at the end of the month following the period of activity.
Note 2: As a result of penalties and accrued interest for any one period, actual cash received may exceed amount originally billed.

The Technical Advisory Committee met on October 2, 2007 and discussed increasing the fee from $400 to $700 per qualifying voyage. This fee increase will meet the additional funding needs of the Marine Invasive Species Program at SLC.[155]

Instrument description

This instrument would set the Marine Invasive Species Control Fee at its maximum permissible level, which is $1000 per qualifying voyage.

Revenue estimates

Assuming 7200 qualifying voyages annually, a maximum of **$7.2 million** can be collected if the fee is set to its maximum level.

Rationale for the charge

Although the current fee level meets existing needs of the existing Ballast Water Program at SLC, there are outstanding funding needs for controlling aquatic invasive species in California. Some of these are: research and development of ballast water treatment technologies, the development of performance standards for acceptable treatment levels

[152] California Public Resources Code Section 71215. http://www.leginfo.ca.gov/cgi-bin/displaycode?section=prc&group=71001-72000&file=71215
[153] California State Lands Commission. 2007. 2007 Biennial Report on the California Marine Invasive Species Program. http://www.slc.ca.gov/Spec_Pub/MFD/Ballast_Water/Documents/2007FinalBiennialReport.pdf
[154] Ibid. pg. 42.
[155] Personal Communication. Maurya Falkner, State Lands Commission. October 19, 2007.

required by ballast technologies, and invasive species monitoring, assessment, control, and research as proposed by the Aquatic Invasive Species Management Plan. Additional fees collected from the Marine Invasive Species Control Fee could be used to fund some of these activities.

Practical concerns and discussion

Current legislation requires that fee revenues collected from the Marine Invasive Species Control Fee are to be used "solely to carry out this division",[156] which is the Ballast Water Program at SLC. Thus, legislative changes to the Public Resources Code would be required to spend some of these revenues on invasive species management actions that are outside the scope of the Ballast Water Program, such as general invasive species monitoring, control, and research.

Existing fee revenues can only be spent on program expenditures as specified in the Governor's budget. Any additional expenditures will have to be approved by a budget change proposal and/or legislative revisions before they can be implemented. Changes to the budget must be justified on the basis of program costs, number of voyages billed, and compliance rates.

Any fee increase is likely to be opposed by the shipping industry. However, the majority of coastal invasive species are introduced through commercial shipping, so an increase in fees on this sector would be consistent with the "polluter pays" principle.

Although a tiered fee structure would ensure that those vessels posing a greater risk of invasion are charged more than vessels posing less risk, industry has lobbied for all vessels to be charged the same rate.

3. Capacity or Tonnage Charges

CURRENT REVENUE: None
ESTIMATED FUTURE REVENUE: $528 million

In February 2007, Senator Alan Lowenthal introduced SB 974, the Port Investment Bill, which would levy a $30 fee per twenty-foot equivalent shipping container processed at the ports of Los Angeles, Long Beach, and Oakland (which are the first, second, and fourth largest ports in the US).[157] It is estimated that the container fee would raise $528 million annually to reduce air pollution and improve port infrastructure.[158] At the request of industry, the bill included the following three strictures: (1) that revenues be kept in a special fund and not be used for purposes other than improving air quality and port infrastructure; (2) that revenue collection should be project-specific; and (3) that industry should have a say in which projects are carried out.

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[156] California Public Resources Code Section 71215. http://www.leginfo.ca.gov/cgi-bin/displaycode?section=prc&group=71001-72000&file=71215

[157] Senate Appropriations Committee. 2007. SB 974 Senate Bill – Bill Analysis. http://info.sen.ca.gov/pub/07-08/bill/sen/sb_0951-1000/sb_974_cfa_20070514_115807_sen_comm.html

[158] Office of Senator Lowenthal. 2007. Lowenthal introduces Port Investment Bill. http://dist27.casen.govoffice.com/vertical/Sites/%7B1FA4E4FF-6592-4C73-B509-0BBDD48984CA%7D/uploads/%7BFBF6B352-7278-4898-97E7-C43B995E4C52%7D.PDF

This bill was ultimately opposed by the shipping industry though it contained measures the industry supported[159]. It passed both houses of the legislature, to be vetoed by the governor in September 2008. The veto message criticized details but not the overall goal, leaving open the possibility that he could sign a similar bill with some fine-tuning.

E. Recreation-Related Revenues

1. Recreational Activity Fees

CURRENT REVENUE: None
ESTIMATED FUTURE REVENUE: $15.25 to $32 million in fees on whale watching and diving alone

Background and existing regulatory framework

70% of California's population lives in the state's 20 coastal counties,[160] and recreational use of California's coastal zone, including beach use, is high. At least 70% of all Californians visit the coast at least once per year,[161] and conservative estimates of the total number of beach days in California are at least 150 million.[162]

A variety of opportunities exist for raising revenues for protection of coastal quality from recreational users of the coast, including charging user fees and collecting voluntary contributions. In particular, there are many coastal user groups that do not pay for their use of the ocean, and these groups could be targeted.[163]

For example, the following is a partial list of groups that do not generally pay license or user fees for their use of California's coastal recreational resources: wildlife watchers (including bird and whale watchers), joggers, hikers, swimmers, bikers, rollerbladers, surfers, shoppers, and diners. Recreational boaters and recreational anglers are two user groups that already pay substantial user fees.

Instrument description

A variety of instruments could be targeted to raise revenues for coastal protection from recreational users of the coast. Instruments that target all user groups are:

1. Parking fees for access to parks and beaches.
2. Voluntary contributions from recreational users.
3. Fees on retail businesses located within one mile of the coast.

Instruments that target specific user groups are:

4. Per activity fees on direct expenditures for a certain activity (e.g. whale watching)
5. Excise taxes on recreational equipment (e.g. diving equipment)

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[159] Personal Communication. Normal Fassler-Katz, Office of Senator Lowenthal. October 17, 2007.
[160] California State Association of Counties. 2007. California County Population Updated 2006. http://www.csac.counties.org/default.asp?id=399
[161] Pendleton, Linwood, and Judith Kildow. 2006. The non-market value of beach recreation in California. http://linwoodp.bol.ucla.edu/cabeaches.pdf
[162] Ibid.
[163] Personal Communication. Linwood Pendleton, The Ocean Foundation & UCLA. November 19, 2007.

6. Fees on non-durable recreational equipment (e.g. bait for angling, air fill on diving tanks)

Revenue estimates

We estimated revenues from fees on direct expenditures relating to whale watching and diving.

Hoyt (2001) reports that direct expenditures on boat-based whale watching tours were $14.11 million in 1999, and that there were 762,700 boat-based whale watchers in that year.[164] If a 5% fee were assessed on the sale of each whale watching trip, we estimate that revenues of at least $700,000 could be raised ($14.11 million x 5% = $705,500). Assuming that these fees were spread evenly across all boat-based whale watchers, this represents a fee of less than $1 per whale watcher.

Pendleton and Rooke estimate that the annual expenditures on scuba diving in California could have ranged from $138 million to $276 million in 2000, and the annual value of snorkeling could have ranged from $153 million to $344 million in the same year.[165] Thus, total expenditures on scuba diving and snorkeling could have ranged from $291 million to $620 million in 2000. If a 5% recreational use fee were assessed on all scuba diving and snorkeling expenditures (including equipment and diving tours), between $14.55 million and $31 million could be raised in revenues.

These estimates suggest that there may be substantial potential for raising revenues for coastal protection from recreational users that are not currently paying user fees.

Rationale for charge

The maximum fee that can be charged for any recreational activity is the value of that activity per user day. These values can be estimated using travel cost or contingent valuation methods.[166]

Fees on recreational uses of the coastal zone represent a "user pays – user benefits" fee in which those people benefiting from the common property resource (the coast) pay for it.

There is a pressing need for monitoring human use patterns in the coastal zone, and a small percentage of revenues raised from recreational activity can fund such monitoring programs. For example, online surveys of users along the coast could be conducted for $1 million every three years.

Revenues from recreational activity should also be directed towards improving water quality in the coastal zone, because the public health cost of gastroenteritis from recreation in

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[164] Erich Hoyt. 2001. Whale Watching 2001: Worldwide Tourism Numbers, Expenditures, and Expanding Socioeconomic Benefits. International Fund for Animal Welfare. http://www.ifaw.org/ifaw/dfiles/file_106.pdf, page 15.

[165] Linwood Pendleton and Jaime Rooke. 2006. Understanding the potential economic impact of SCUBA diving and snorkeling: California. http://linwoodp.bol.ucla.edu/dive.pdf

[166] Ibid.

contaminated coastal waters ranges from $21 to $50 million dollars.[167] This problem can be addressed by upgrading ageing sewage infrastructure across the state, at a total cost of approximately $300 million per year.[168]

Practical concerns and discussion

Recreational users of the ocean who participate in activities involving considerable expense (e.g. whale watching, diving, boating, surfing) likely have both the ability and the willingness to pay a nominal amount for coastal protection. These users, as well as those participating in low-cost activities (e.g. swimming, jogging, people watching) may also be inclined to make voluntary contributions for this purpose. Fees and contributions from recreational activity represent a publicly visible source of revenues.

3. Recreational Fishing License Fees

CURRENT REVENUE: $58 million (2006)
ESTIMATED INCREMENTAL FUTURE REVENUE: $14.5 million

Background and existing regulatory framework

Sport fishing is a major recreational activity in California, with total expenditures (including equipment, licenses, membership dues, magazines and books, transportation, lodging, and food) worth over $2 billion in 2001.[169] Marine angling is growing in popularity as new gear and vessel innovations are introduced,[170] and national participation in marine angling grew by 7% from 2000 to 2005.[171]

Although the total number of recreational fishing licenses sold in California has decreased since 2000 to 2.9 million in 2006,[172] revenues from license sales have increased over the same period (to $58 million in 2006).[173] This is because fees for recreational fishing licenses have increased annually.[174]

All fees collected by DFG, including fees for recreational fishing, have been indexed to inflation each year since 2005, pursuant to the Fish & Game Code section 713.[175]

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[167] Suzan Given, Linwood Pendleton, and Alexandria Boehm. Regional public health cost estimates of contaminated coastal waters: A case study of gastroenteritis at Southern California beaches. http://linwoodp.bol.ucla.edu/illness.pdf

[168] Personal Communication. Linwood Pendleton, The Ocean Foundation & UCLA. November 19, 2007.

[169] U.S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau. 2001. 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, Table 16. http://www.census.gov/prod/2002pubs/fhw01-ca.pdf

[170] Personal Communication. Linwood Pendleton, The Ocean Foundation & UCLA. November 19, 2007.

[171] Linwood Pendleton and Jaime Rooke. 2007. Using the Literature to Value Coastal Uses – Recreational Saltwater Angling in California. Coastal Ocean Values Center. http://www.coastalvalues.org/work/working-papers/COVC20071.pdf

[172] Department of Fish and Game. 2007. Sport fishing: Items reported by license year. http://www.dfg.ca.gov/licensing/pdffiles/sf_items_10yr.pdf

[173] Department of Fish and Game. 2007. Sport fishing: Sales reported by license year. http://www.dfg.ca.gov/licensing/pdffiles/sf_sales_10yr.pdf

[174] Department of Fish and Game. 2007. Sport fishing: Fees by license year. http://www.dfg.ca.gov/licensing/pdffiles/sf_fees_10yr.pdf

[175] California Fish and Game Code Section 713. http://law.onecle.com/california/fish/713.html

Sales of recreational fishing licenses ($58 million) are worth almost 20 times as much as sales of commercial fishing licenses ($3.19 million), because the number of participants in the recreational fishery is more than 150 times the number of participants in the commercial fishery.

Instrument descriptions and revenue estimates

A 25% increase in recreational license fees would yield an additional $14.5 million in revenues.

To ensure distributional equity, such an increase in fees could be accompanied by the addition of a low-income qualification for the reduced fee sport fishing license. The revenue implications of low-income sport fishing fees are currently unknown.

Rationale for charge

Recreational fishing license fees can be an example of a "user pays – user benefits" fee, provided that revenues collected are directly used to improve recreational fishing conditions in the state.

The average licensing fee per item is low ($19.76),[176] and there is evidence that recreational fishermen are willing to pay more for the benefits they derive from recreational fishing as long as those payments are directed back towards improving California's recreational fisheries.[177] This, coupled with the fact that recreational fisheries are worth a lot, makes further exploration of charges on recreational fisheries worthwhile.

Practical concerns and discussion

We recommend a prior exploratory procedure with the recreational fishing community to evaluate their needs and the feasibility of an increase in license fees to simultaneously meet those needs and serve environmental goals. There will probably need to be some allocation of money between coastal and inland conservation programs.

2. Recreational Fishing Excise Taxes

CURRENT REVENUE: $14.7 million in 2005
ESTIMATED FUTURE REVENUE: limited

Background and existing regulatory framework

There is a federal excise tax of 10% on sales of sport fishing equipment by the manufacturer, including rods, poles, reels, lines, spears, tackle, supplies and accessories, tackle boxes, and electronic outboard boat motors.[178] Revenues from this tax are deposited into the federal Aquatic Resources Trust Fund (commonly known as the Wallop-Breaux Fund), and have ranged from $97.5 million to $103.3 million annually from 1999 through 2005.[179] These

[176] $19.76 = $58,119,999 in revenues / 2,941,036 items sold.
[177] Personal Communication. Sam Schuchat, State Coastal Conservancy. November 7, 2007.
[178] Internal Revenue Service. 2007. Publication 510: Excise Taxes for 2007. http://www.irs.gov/pub/irs-pdf/p510.pdf
[179] Laine, Melissa. 2007. What's New in Federal Excise Taxation, Fiscal Years 1992-2006. Internal Revenue Service. http://www.irs.gov/pub/irs-soi/06excise.pdf

funds are used in part to fund the Sport Fish Restoration Program, which allocates funding to state agencies for land acquisition, development, research, operations and maintenance, sport fish population management, and program coordination. California received between $12 million and $14.7 million in funding from this account from FY 2000 through FY 2005.[180] The amount allocated to each state is based 60% on the number of licensed anglers in the state and 40% on the state's total land and water area.[181]

The excise tax on recreational fishing is an example of a "user pays – user benefits" program, because recreational anglers pay slightly more for their equipment, and enjoy the resulting benefits from improved recreational angling conditions.

Revenue potential

There is **limited potential** for additional state funding from excise taxes on recreational fishing equipment, because any additional funding will have to come via federal transfer payments through the Sport Fish Restoration Program unless the state imposes a parallel charge. Since the amount of federal payments is derived in part by the number of recreational anglers registered in the state, any instrument that increased the number of recreational fishing registrations should theoretically increase the amount of federal payments through the Sport Fish Restoration Program.

It is interesting to note that while total expenditures on sport fishing equipment in California were $459,202,000 in 2001,[182] payments to the state from the Sport Fish Restoration Program were $12 million in the same year.[183] Assuming that 10% of expenditures was paid in federal excise taxes ($45.9 million), the state received only 26% of the total amount paid in excise taxes on sport fishing equipment. This would suggest that California is may not be effectively securing federal Sport Fish Restoration payments. We suggest that the Ocean Protection Council / State Coastal Conservancy review California's claims to the Sport Fish Restoration program and investigate opportunities for funding a portion of California's sport fishing program through these funds.

5. Cruise Ship Passenger Fees and Voluntary Contributions

CURRENT REVENUE: $400 per qualifying voyage
ESTIMATED FUTURE REVENUE: up to $30 million

Background and existing regulatory framework

As California's cruise ship industry has grown over the last two decades, so have the environmental impacts of cruise ships, many of which are substantial and direct. For example, cruise ships result in the generation of vast quantities of solid waste, graywater,

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[180] US Fish and Wildlife Service. 2005. Sport Fish Restoration Apportionment History. http://federalaid.fws.gov/apport/SFRAhistory.pdf

[181] Congressional Research Service. 2005. The Aquatic Resources Trust Fund. http://www.whprp.org/NLE/CRSreports/05apr/RS22060.pdf

[182] U.S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau. 2001. 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, Table 16. http://www.census.gov/prod/2002pubs/fhw01-ca.pdf

[183] US Fish and Wildlife Service. 2005. Sport Fish Restoration Apportionment History. http://federalaid.fws.gov/apport/SFRAhistory.pdf

sewage, air pollution, and oil and chemical effluent.[184, 185] They also act as vectors for the transportation and introduction of invasive species.[186] These impacts become cumulative when cruise ships repeatedly visit the same environmentally-sensitive locations.[187]

In California, cruise ships are regulated by AB 121 and AB 906, which prohibit the dumping of sewage, sewage sludge, oil bilge water, graywater, and hazardous waste into state waters.[188] Cruise ships are also subject to the $400 marine invasive species control fee.[189]

Instrument description and revenue estimates

We present revenue estimates for three possible instruments to collect funds from cruise ship passengers and cruise lines: (1) an ocean protection surcharge levied per passenger; (2) voluntary ocean protection donations made by cruise passengers; and (3) matching donations made by cruise lines.

Mandatory ocean protection surcharge

1,141,452 total cruise passengers traveled on the 24 member lines of the Cruise Lines International Association in California in 2005.[190] If a mandatory ocean protection surcharge of 2% were levied on each passenger, we estimate that the ocean protection surcharge could generate well over $20 million in revenues (assuming an average cruise price of $1000 per passenger and at least 1 million passengers):

1 million passengers x $1000/passenger x 2% surcharge = $20 million

Voluntary contributions by cruise passengers

Lindbald Expeditions has collected an average donation from cruise passengers for environmental protection of $61.53 since 2004, with a participation rate of 24%.[191] If similar programs were established for guests to make voluntary contributions on cruise lines visiting California ports, we estimate that there may be potential for collecting at least $5 million from such contributions, assuming an average donation of $50 per passenger and a 10% participation rate:

1 million passengers x $50/passenger x 10% participation = $5 million

Corporate matching donations

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[184] Terry Davies and Sarah Cahill. 2000. Environmental implications of the tourism industry. Resources for the Future. http://www.rff.org/Documents/RFF-DP-00-14.pdf

[185] State Environmental Resource Center. Issue: Cruise Ship Pollution. http://www.serconline.org/cruiseShipPollution.html

[186] Terry Davies and Sarah Cahill. 2000. Environmental implications of the tourism industry. Resources for the Future. http://www.rff.org/Documents/RFF-DP-00-14.pdf

[187] U.S. Commission on Ocean Policy. 2004. An Ocean Blueprint for the 21st Century Chapter 16: Limiting Vessel Pollution and Improving Vessel Safety. http://www.oceancommission.gov/documents/full_color_rpt/16_chapter16.pdf

[188] State Environmental Resource Center. Issue: Cruise Ship Pollution. http://www.serconline.org/cruiseShipPollution.html

[189] Personal Communication. Maurya Falker, State Lands Commission. October 17, 2007.

[190] Cruise Lines International Association. 2006. The 2006 Overview. http://www.cruising.org/press/overview%202006/2006OV.pdf, page 29

[191] Environmental Finance Center, University of Maryland. Partnership for the Delaware Estuary Financing Feasibility Study. http://www.efc.umd.edu/pdf/PDE.pdf

If each cruise line matched its' passengers' donations dollar-for-dollar, there may be potential for an additional $5 million in revenues.

If all three instruments were implemented simultaneously, there may be potential for up to $30 million in revenues for coastal and ocean protection in California.

Rationale for charge

Cruise lines that develop voluntary contribution and matching programs may be able to create the image of a "greener" cruise experience, thus generating additional marketing opportunities. There may be additional opportunities to develop contests among cruise lines in which those collecting the most in passenger donations and providing the most in matching funds would be eligible for a prize.

The core target market for cruise vacations in North America is passengers aged 25 and older, from households earning $40,000 and up.[192] Over half of the passengers are college educated.[193] Thus, the cruise market (a) is wealthy and has the ability to pay for coastal protection, and (b) is educated and may have awareness of coastal environmental issues. Thus, cruise ship passengers are a good user group to collect fees from.

Cruise lines may theoretically benefit from improvements to ocean and coastal quality if these improvements increase passenger satisfaction with the cruise, resulting in repeat business and better referrals.[194]

Practical concerns and discussion

Cruise lines would need strong incentives for implementing voluntary contribution and matching programs, especially if they have to bear the costs of administering them. These could be provided by showing that the benefits of improved coastal quality (greater passenger satisfaction and more passengers) are greater than the costs of administering the programs. An alternative incentive might be the reduction of mandatory surcharges on cruise lines that collect a certain amount in voluntary contributions and matching funds.

6. Recreational Boating and Equipment Taxes and Fees

CURRENT REVENUE: $200,000 (2005-2006)
ESTIMATED FUTURE REVENUE: Unknown

There are 4 million motorized and 2 million non-motorized recreational boaters in California. Eighty to eighty-five percent of recreational boats are small (less than 26 feet) and remain inland. The larger boats use diesel or sail. There are about 50,000 larger boats, which aren't registered and pay additional taxes to the Coastguard.[195]

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[192] Cruise Lines International Association. 2006. The 2006 Overview. http://www.cruising.org/press/overview%202006/2006OV.pdf
[193] Ibid.
[194] Environmental Finance Center, University of Maryland. Partnership for the Delaware Estuary Financing Feasibility Study. http://www.efc.umd.edu/pdf/PDE.pdf
[195] Personal Communication. Harold Flood, Department of Boating and Waterways. September 6, 2007.

A key component of the Department of Boating and Waterways' budget comes from motorized boaters, who pay a gas tax at the pump. This tax raises $45-50 million, $27 million of which is appropriated to California State Parks.[196] Additionally, $11 million is collected in revenues from boat registration fees. Thirty-five to forty percent of registration fees are retained by the Department of Motor Vehicles; the remainder is used for law enforcement at DBW.[197] There were revenues of $200,000 to the Harbors and Watercraft Revolving Fund in 2005-2006.[198]

Recreational boating and its infrastructure have numerous environmental impacts including damaging habitat, spreading invasive species, impeding the natural flow of sediments, and blocking construction of the California Coastal Trail.[199] Thus, an environmental protection fee levied on recreational boaters could be justified on the basis of their environmental impact. Potential revenues from such a fee are currently unknown.

Due to the large number of fees currently assessed on boaters, it is unlikely that they will accept additional fees for coastal and ocean protection, though it would be possible to pursue an exploratory negotiation similar to the one suggested on fishing licenses above with representatives of the recreational boating community.

3. Coastal Hotel and Accommodation Surcharge

CURRENT REVENUE: $1.06 billion at local level
ESTIMATED FUTURE REVENUE: $36 million

Background and existing regulatory framework

Section 7280 of California's Revenue and Taxation Code authorizes cities and counties to "levy a tax on the privilege of occupying a room or rooms… in a hotel, inn, tourist home or house, motel, or other lodging…"[200] These taxes are known as "transient occupancy taxes" (TOT). The mean TOT rate across 405 Californian cities in 2004-2005 was 9.3%, and the revenue collected from cities in that year was $1.06 billion.[201] The tax code does not require any specific use of TOT funds, and each city or county uses these funds at its discretion to finance activities within the city or county. For example, TOT revenues in Sonoma County are used to fund advertising and promotional activities.[202]

In 2005, California Senator Joe Simitian introduced SB 956, a bill which would have levied a $1 surcharge per night per room on all charges for transient occupancy in the 20 coastal and

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196 Personal Communication. David Johnson, Department of Boating and Waterways. September 6, 2007.
197 Personal Communication. Harold Flood, Department of Boating and Waterways. September 6, 2007.
198 California Governor's Budget 2007-2008. Schedule 8 – Comparative Statement of Revenues. http://www.ebudget.ca.gov/pdf/BudgetSummary/BS_SCH8.pdf
199 Personal Communication. Neal Fishman, State Coastal Conservancy. September 10, 2007.
200 California Revenue and Taxation Code Section 7280. http://www.legaltips.org/california/california_revenue_and_taxation_code/7280-7283.aspx
201 California Local Government Finance Almanac. 2007. Transient Occupancy Tax Rates – California Cities. http://www.californiacityfinance.com/TOT05PUB.xls
202 County of Sonoma. 2007. County of Sonoma Transient Occupancy Tax. http://www.sonoma-county.org/tax/tot/index.htm

Bay Area counties.[203] The bill was designed to provide a long-term, stable source of funding for coastal and ocean protection to agencies including DFG, the Coastal Commission, the Travel and Tourism Commission, and the San Francisco Bay Conservation and Development Commission. However, it met with opposition from tourism industry associations including the California Hotel and Lodging Association and the California Lodging Industry Association and was not passed. SB 956 has been inactive since January 2006.[204]

Major industry concerns were that (1) of all the businesses that depend on coastal tourism, the hospitality industry was being disproportionately burdened; (2) residents living in close proximity to the ocean derive benefits from healthy coastal ecosystems and should pay for coastal protection; (3) the hotel industry is already subject to general transient occupancy taxes; and (4) California is the only state in the US in which tourism is funded entirely from assessments on the tourism industry.[205]

Instrument description and revenue estimates

We estimate that up to **$36 million** could be generated from a $0.50 surcharge on every hotel room per night in the 20 coastal and Bay Area counties. This is based on our estimate of approximately 72.2 million nights of room rentals in the coastal and Bay Area counties (which was derived using the TOT rates and revenues for each city in the coastal zone,[206] and an average daily room rate in the US of $112.90.[207])

Rationale for charge

A surcharge on coastal hotel rooms ensures that visitors to the coastal zone pay for the benefits they derive from its quality and integrity. Thus, this is a "user pays – user benefits" surcharge. For example, the tourism value of the coastal zone can be increased by using revenues from the hotel accommodation surcharge to build and maintain the California Coastal Trail, to finance beach nourishment and replenishment, to implement sanitation programs ensuring water quality and reducing the number of beach closures, and to improve coastal views by removing hazardous structures. The regulatory programs of the Coastal Commission and BCDC ensure that a range of such coastal resources are maintained. Thus, this surcharge may be justified on the basis of the benefit principle.

Practical concerns and discussion

Given strong industry opposition to SB 956, before proceeding with another attempt to levy a surcharge on hotel rooms in the coastal zone to fund coastal and ocean protection, some effort to address the concerns of the industry should be undertaken.

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[203] Senate Committee on Natural Resources and Water. 2005. SB956 Senate Bill – Bill Analysis. http://www.leginfo.ca.gov/pub/05-06/bill/sen/sb_0951-1000/sb_956_cfa_20050429_112647_sen_comm.html

[204] SB 956 Assembly Bill – Status. 2006. http://www.leginfo.ca.gov/pub/05-06/bill/sen/sb_0951-1000/sb_956_bill_20060131_status.html

[205] Senate Committee on Natural Resources and Water. 2005. SB956 Senate Bill – Bill Analysis. http://www.leginfo.ca.gov/pub/05-06/bill/sen/sb_0951-1000/sb_956_cfa_20050429_112647_sen_comm.html

[206] California Local Government Finance Almanac. 2007. Transient Occupancy Tax Rates – California Cities. http://www.californiacityfinance.com/TOT05PUB.xls

[207] PKF Consulting. 2006. Trends in the Hotel Industry USA Edition – 2006. http://www.pkfc.com/samples/ATsample.pdf

The proposed level of the surcharge ($0.50) is nominal, and represents only a 0.44% increase in the price of the room rate to the customer (from $112.90 to $113.40). Tourist and business travelers staying in hotel rooms will likely be relatively price inelastic to such a nominal price increase, and may even have some positive feelings arising from this portion of the bill. We suggest that the OPC commission a study to identify the marine and coastal protection measures of greatest benefit to the hospitality industry and undertake an analysis to see if a package could be assembled that promotes tourism to a sufficient extent to offset the likely effects of the charge on industry revenues. Another possibility is to create a voluntary program with an attractive seal that participating hotels could use on their doors, literature, and website, identifying them as supporters of coastal conservation.

F. Real Estate and Development-Related Revenues

1. Rental of State Coastal Lands

CURRENT REVENUE: $3.5 million
ESTIMATED FUTURE REVEUE: up to $3.5 million

Background and existing regulatory framework

The California State Lands Commission issues leases for various industrial, commercial, and other uses on publicly-owned state lands. 3768 such leases are currently outstanding, and are designated for uses including pipelines, oil platforms, marinas, dredging operations, power cables, and wildlife habitat.[208] Lease rates are based on the assessed value of the land, which is determined relative to sales of comparable lands. Total rents due are equal to the lease rate multiplied by the square footage of land being leased.[209]

The current book value of all leases on state coastal lands is $3,491,306.[210]

More than 90% of all revenues collected by SLC for leases on coastal lands are deposited in the state's General Fund because these revenues are derived from public property. Hence, these funds are not earmarked for coastal protection even though the impacts of any development on state coastal lands will be felt in the coastal region. [211]

Instrument description and revenue estimates

There is limited potential to raise additional revenues from existing leases on state coastal lands because of the methodology used to set lease rates (as described above). This is because the appraisal process takes into account the fact that property values are higher nearer the coast, so lease rates in the coastal zone are automatically set at a premium. However, by diverting lease revenues from the General Fund, up to the total amount collected (**$3.5 million**) could be dedicated to coastal protection.

Rationale for charge

[208] Personal Communication. Barbara Dugal and Colin Connor, State Lands Commission. October 25, 2007.
[209] Ibid.
[210] Personal Communication. Colin Connor, State Lands Commission. November 9, 2007.
[211] Personal Communication. Paul Thayer, State Lands Commission. October 1, 2007.

The impacts of industrial, commercial, or other development on state coastal lands will be felt in the coastal zone. Thus, it makes sense that some of the revenues collected from leases on state coastal lands be used to mitigate detrimental effects or improve management of state lands in the coastal zone. For example, there is a need for proactive compliance and monitoring to ensure that leasees comply with the terms of their lease. The costs of adequate regulatory enforcement are approximately $353,000 for three dedicated positions.[212]

Practical concerns and discussion

Diverting revenues from the state's General Fund will result in reductions in the state-wide budget and reduced expenditures on other state programs including education and public health.

2. Surcharge on Coastal Region Property Taxes

CURRENT REVENUE: $29 billion to local agencies
ESTIMATED INCREMENTAL FUTURE REVEUE: $72 million

Background and existing regulatory framework

Property taxes are exclusively collected and distributed at the local level, and are a primary source of revenue for California's counties, cities, schools, and special districts. In 2005-2006, 17% of property tax revenues were allocated to counties, 10% to cities, 55% to school districts and community colleges, and 18% to special districts.[213] Total property tax revenue in California was $38.34 billion in 2005-2006.[214]

Instrument description and revenue estimates

This instrument would impose a 0.25% surcharge on the property tax rate of each of the 20 coastal and Bay Area counties. Revenues from the surcharge would be earmarked for protection and management of coastal resources in California.

By applying the average 2005-06 tax rate in the 20 coastal and Bay Area counties (1.08%) to the total assessed value of land in those 20 counties ($2,656 billion), we estimate that total property tax revenues from the coastal counties was $28.75 billion in 2005-06.[215]

A 0.25% increase in property tax payments would raise additional revenues of $72 million:
$28.75 billion x 0.0025 = $72 million

Rationale for charge

Owners of property in the coastal region enjoy numerous benefits from their proximity to the ocean. Since coastal property has a premium value, a surcharge on property taxes in the

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[212] Personal Communication. Barbara Dugal and Colin Connor, State Lands Commission. October 25, 2007.
[213] California Board of Equalization. 2006 Property Taxes. http://www.boe.ca.gov/annual/pdf/2006/3-property06.pdf
[214] California Board of Equalization. 2007. Table 4 - Summary of Assessed Values of Property Subject to Local General Property Taxes and Average Tax Rates, 1996-97 to 2006-07. http://www.boe.ca.gov/annual/pdf/2006/table4_06.pdf
[215] California Board of Equalization. 2006. Table 14 – 2005-06 General Property Tax Levies as Compiled for Computation of the Average Tax Rate. http://www.boe.ca.gov/annual/pdf/2006/table14_06.pdf

coastal region, to be used for coastal protection and management, is justified. An increase to the rate payer of 0.25% is nominal.

Furthermore, hedonic analyses have shown that as coastal environmental quality (including water quality, access to the beach, and views) increases, so does the value of coastal property.[216] We urge comprehensive further analyses of the link between coastal environmental quality and the value of coastal property because these will form the basis for many public policy arguments in favor of investing in coastal protection.

Furthermore, coastal property owners may be in favor of a property tax surcharge for coastal and ocean protection if the resulting improvements in coastal quality substantially increased the value of their property.

Practical concerns and discussion

Since property taxes are already collected as a source of local revenue, the regulatory and administrative framework for assessing and collecting them is already in place. Thus, this surcharge is especially cheap to administer and collect. Due to restrictions set forth in California Constitution Article XIII. Section 3, such a surcharge may need to be passed by super-majority or by initiative, unless it can be justified as a remediation fee under Sinclair Paint.

2. Transferable Development Credits and Wetland Banking

CURRENT REVENUE: None
ESTIMATED FUTURE REVEUE: Short-term – Limited; Long term – Potentially large

California's coastal and regional conservancies have been involved with purchasing the development rights from owners of parcels of land with high conservation value and selling them to landowners of less ecologically sensitive properties. This process shifts development from areas where it may be environmentally damaging to areas that can absorb additional development, by offering a monetary reward in exchange for the development rights. Land owners requiring more development rights on their properties can then purchase these rights from the conservancy. Thus the conservancy acts as a broker and a clearinghouse in the transactions. Transferable development credit schemes have been used in Big Sur, San Luis Obispo, and the Santa Monica Mountains.[217]

There is currently **limited** potential for additional state revenues from transferable development credits, because they are not currently designed as a revenue-generating instrument.[218] However, given the widespread bipartisan voter support for limiting coastal development to protect the coastal environment, we urge that a study of the possibility of a comprehensive auctioned development credit system be commenced, with revenues to be divided between coastal protection and public infrastructure in coastal regions. We observe that such a system would greatly increase the value of already-developed coastal property

[216] Personal Communication. Linwood Pendleton, The Ocean Foundation & UCLA. November 19, 2007.
[217] Personal Communication. Prentiss Williams, State Coastal Conservancy. September 7, 2007.
[218] Ibid.

and so has a surprisingly substantial potential support base among existing property-holders in the region.

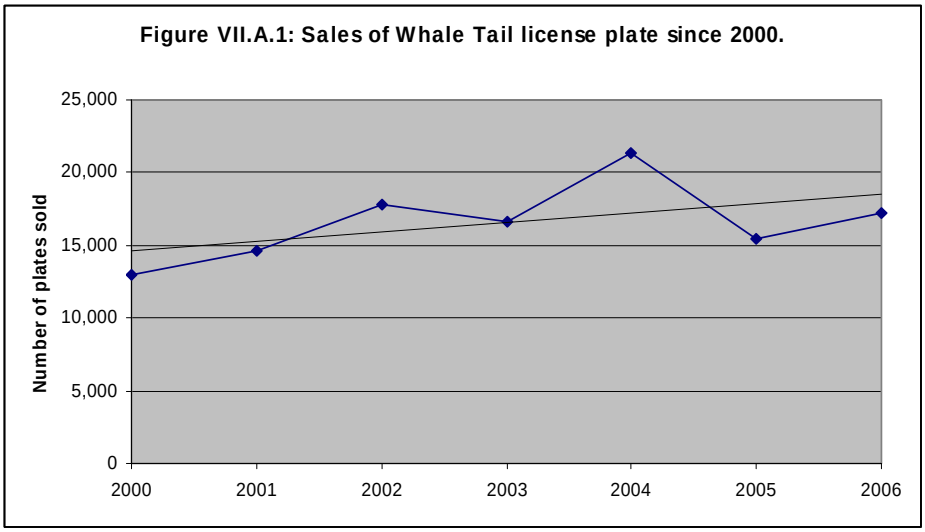
G. Conservation-Related Merchandising and State Enterprises

1. "Whale Tail" Specialty License Plate

CURRENT REVENUE: $5.9 million in 2006

The California Coastal Commission issues a specialty motor vehicle license plate depicting a diving whale as a means to finance coastal and ocean protection programs in the state. Proceeds from sales of this plate are used to award grants for coastal environmental education, beach cleanup, restoration, and other coastal environmental projects.[219] On average, approximately 16,500 Whale Tail plates are sold annually, and Figure VII.A.1 shows that sales have generally shown an increasing trend between 2000 and 2006.

Figure VII.A.1: Sales of Whale Tail license plate since 2000.



* The data shown in this figure was taken from annual reports of the Whale Tail Grants program, which are available at http://www.coastal.ca.gov/publiced/plate/plgrant.html .

Fees from sales and renewals of the Whale Tail license plate contributed $1.7 million to the California Beach and Coastal Enhancement Account and $4.2 million to the Environmental License Plate Fund in 2006.[220]

2. 2. Conservation Lotteries

CURRENT REVENUE: None
ESTIMATED FUTURE REVENUE: Unknown

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[219] California Coastal Commission. 2007. Whale Tail License Plate. http://www.coastal.ca.gov/publiced/plate/platefaq.html

[220] California Coastal Commission. 2006 and 2005 Annual Reports of the Whale Tail Grants Porgram. http://documents.coastal.ca.gov/reports/2007/2/F3.5a-2-2007.pdf ; http://documents.coastal.ca.gov/reports/2006/2/W25a-2-2006.pdf .

Although there is no direct link between lottery revenues and conservation, several jurisdictions, including the U.K., the Netherlands, and Oregon have successfully used lotteries to raise money for conservation.[221] There may be potential for California to fund part of its coastal protection programs through similar lotteries.

[221] Barry Spergel and Melissa Moye. 2004. Financing Marine Conservation: A Menu of Options. Center for Conservation Finance, World Wildlife Fund.
http://www.worldwildlife.org/conservationfinance/pubs/fmc.pdf