From: Rod Fujita [mailto:RFujita@environmentaldefense.org]
Sent: Wednesday, August 03, 2005 12:22 PM
To: gillgage@pacbell.net
Cc: brown@rrassoc.com
Subject: funding ideas for MLPA

Hi Tim and Craig - I think that investment in CA fisheries (in part by the fisheries revolving loan fund authorized by COPA and under development at the coastal conservancy) could help free up money for MPA. I've attached a prospectus for the revolving loan fund that describes how investments could increase the value of seafood through different kinds of processing, and help change the management regime to reduce competition to maximize catch and realign the incentives so that they encourage fishing for increased value (but lower volumes of fish). I've also attached some testimony on the revolving loan fund and a book chapter that describes the basic idea in more detail (but at the global scale).

The result of these kinds of management and processing changes are likely to be more profitable fisheries, which should be required to pay for more of their own management and research costs, freeing up state money that is currently being used for these purposes for non-revenue-generating activities like MPA siting, management, monitoring, etc.

Another possibility would be federal funding, if a national MPA system evolves. I was a member of the federal advisory committee on the national MPA system; our report can be found at www.mpa.gov. We recommended incentives for MPAs and MPA networks to join the federal system, which could include additional funding.

Feel free to call me to discuss these ideas.

<<DOE book chapter final.doc>> <<RLF prospectus rev.doc>> <<RLF OPC testimony 6 10 05 final.doc>>

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The California Ocean Protection Act and Ocean Protection Trust Fund: Sustainable Financing for Ocean Conservation and Management

The California Ocean Protection Act created a $10 million Ocean Protection Trust Fund (OPTF) and authorizes various activities that it can support. Some activities, such as research, monitoring, and coastal habitat acquisition will require grants, as they do not generate revenue.

However, fisheries reform presents an opportunity to leverage the OPTF by allocating a portion to create a **Fisheries Revolving Loan Fund**, authorized under COPA. Fishermen, industry groups, or others could apply to receive funds from the loan program to develop and implement measures likely to result in improved financial and conservation performance. Fishermen remaining in the given fishery would be required to pay back the loan over a multi-year period, and would commit to measures that would ensure management reforms to meet both economic and ecological sustainability criteria.

We consider the Fisheries Revolving Loan Fund a "win-win" for fisheries management.

- California taxpayers would benefit because the fund would be sustainable, allowing investments in fishery after fishery after replenishment from successful projects

- The fishing industry would become more viable financial and able to pay a greater share of management costs

- The fish populations and habitats would benefit, because the loans from this fund would leverage necessary reforms in fishery management to ensure long-term sustainability of fishing practices and harvest levels.

- Fishery managers would have increased flexibility and potentially more funds for research and monitoring (due to cost-sharing with industry), and would have the leverage provided by the loan program to meet management objectives that have eluded them to date due to budget shortfalls.

TESTIMONY OF ENVIRONMENTAL DEFENSE

TO THE OCEAN PROTECTION COUNCIL

Concerning Funding Priorities for Ocean Conservation and Management

June 10, 2005

Provided by Tom Graff, Senior Attorney and Western Regional Director, Environmental Defense

Contact: Rod Fujita or Johanna Thomas, Environmental Defense
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With the passage of the California Ocean Protection Act, the state has an opportunity to address the fundamental obstacles standing in the way of realizing the inspiring vision and goals that you have set for the coast and ocean. California has some of the most progressive laws and policies aimed at creating and maintaining healthy fisheries and ocean ecosystems in the nation, and indeed, in the world. These include the Marine Life Protection Act, the Marine Life Management Act, and now COPA. However, the best intentions have been thwarted by the lack of adequate funding and capacity. Moreover, unless the social and economic drivers of opposition to good management and conservation are overcome, durable solutions will remain elusive and conflict will continue.

Many worthy ocean research, conservation and management projects will require grants, as they cannot generate revenue. However, investments in the state's fisheries tied to changes in management and markets could generate much higher economic returns to the state, while improving their conservation performance. This conclusion is based on dozens of scientific papers, the local knowledge of experienced fishermen, and empirical evidence from hundreds of fisheries, from the San Francisco Bay herring fishery to British Columbia groundfish and Icelandic fisheries. Key reforms leading to fisheries that are successful financially and that protect the environment include time and area restrictions and the designation of access privileges to cooperatives, communities, or individuals as recommended by the U.S Commission on Ocean Policy. Investments in value-added seafood products, such as cold-pasteurized oysters, and the development of new markets that reward the production of seafood in ways to protect the environment, will also be important. All of these investments, and the changes tied to them, need to be carefully tailored to the unique attributes of each fishery.

The transition to fisheries that generate more revenue, engage in less conflict, and do more to protect ocean habitats and ecosystems will require strategic investments. The capacity to generate more revenue as a result of management improvements presents an opportunity for creating a sustainable source of financing for fisheries management. Perhaps most importantly, smart investments in fisheries have the capacity to pay back investors, creating the foundation of a revolving fund that can invest in fishery after

fishery. This is a way to greatly leverage an initial relatively small investment by the state that would be aimed at rewarding and helping fisheries willing to transition and at proving the concept to attract private capital. In acknowledgement of this potential, COPA authorizes the creation of a fisheries revolving loan fund, which could leverage the state's seed investment of $2 M into a $20 M loan fund over several years, using public and private sources of capital, so that it could pay its own administrative costs while continuing to invest in fishery after fishery. Mechanisms like this are needed in an area of tight budgetary constraints to match the scale of resources to the scale of ocean management and conservation problems.

We have concluded, based on consultations with financial experts, that the revolving loan fund can best be designed and implemented following a business planning exercise, which would include the development of additional funding sources. We respectfully request that you discuss this revolving loan fund concept at your next meeting, and approve $160,000 for business planning and $2 M in seed capital for the revolving loan fund.

RATIONALITY OR CHAOS?
GLOBAL FISHERIES AT A CROSSROADS
In: Defying Ocean's End, Island Press, 2004

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The depletion of commercially exploited fish populations (*1*) is well documented in the scientific literature, with new studies and perspectives being published at a rapid rate. Economic problems in fisheries, such as extreme economic inefficiency and escalating government subsidies, are also fairly well documented (*2*). However, in spite of a number of fundamental theoretical contributions (*3*), the literature has been less successful in identifying socially and politically practical solutions to these problems.

It is too often overlooked that the interests of commercial fisheries and environmental conservation overlap to a large extent. Long-term profit maximization in commercial fisheries normally implies fish population sizes well in excess of the levels corresponding to the maximum sustainable yield. Compared to the current state of most ocean fisheries this means an increase in the size of the fish populations and a corresponding reduction in fishing fleets and fishing effort[1]. This, of course, is exactly what conservationists would like to see. At the same time, larger fish population sizes maximize long-term profits in the commercial sector. Thus, sensible fisheries management offers the opportunity for mutually beneficial cooperation between environmental and commercial sectors. Both groups have an interest in sustainable management of the oceans' living resources, and the alignment of these interests can simultaneously produce ecological and economic benefits.

In spite of this potential, attempts at fisheries management reform are often blocked by several social, economic and technical factors. These include: (i) inadequate technical

[1] Fisheries are typically managed for maximum sustainable yield (or are depleted), rather than managed for longer-term profit maximization, or maximum economic yield. The latter may result in lower catches, but at a higher value.

and administrative abilities to run a fisheries management system, (ii) lack of funds to finance the transition of the fishery to sustainability, which usually requires temporarily reduced harvests, (iii) the risk perceived by fishermen and other members of the fishing industry of adopting a new and untried fisheries management regime and (iv) lack of understanding of the basic issues involved on the part of many fishermen and managers. These obstacles can be overcome by the appropriate provision of resources in the form of finance and expertise. Moreover, since in many commercial fisheries management reform is capable of generating substantial economic benefits, support of this kind can be repaid in due course plus an appropriate rate of return. Thus, fisheries management reform often constitutes a potentially profitable investment opportunity. There is little doubt that under the right circumstances, e.g. reasonably secure resource use privileges, private investment capital would be attracted to this opportunity.

Consensus around the need for fisheries reform is building and numerous reform processes are underway, but lack of funding hampers wide-scale change. To provide ongoing resources for fisheries reform, we propose the creation of a Global Fisheries Reform Fund (the Fund), a revolving loan and investment vehicle designed to improve the economic and conservation performance of fisheries. The Fund is an example of a range of institutions that could potentially address the widespread lack of funding for fisheries reform by providing low-interest loans and investment capital aimed at specific fisheries with good potential for economic and environmental improvement. Importantly, the Fund will be structured to recover its outlays with the appropriate return on capital, rather than continuing the tradition of sinking resources into an industry without receiving any return on the investment (e.g., through vessel buybacks without management reform, subsidies, management costs, etc.). Thus, the Fund, with relatively modest initial capital, would be able to sequentially assist in fisheries management reform in a large number of fisheries as the Fund expands.

State of the World's Fisheries: Biological and Economic Problems are Linked

There have been numerous recent reports and studies documenting the status of the world's fisheries and the downfall of many current management schemes. The United Nations Food and Agriculture Organization (FAO) reports that 47% of world's fisheries that have been assessed are fully exploited, 18% are overexploited, and 10% are significantly depleted or recovering (*4*). Furthermore, it has been shown that fisheries are, in general, shifting effort to smaller, lower trophic level fish as populations of larger predatory fish decline (*1*).

Fisheries mismanagement, or often, lack of management, is central to the decline of many ocean resources. From the standpoint of environmentalists, fisheries mismanagement results in a host of ecosystem impacts that extend beyond dangerously low fish populations and include high levels of by-kill (the accidental killing of species that are not targeted by the fishery), impacts on seabirds, sea turtles, and marine mammals, and damage to marine habitats. In fact, the report of the Pew Ocean Commission (*5*) highlights overfishing, habitat alteration due to fishing, and by-kill as among the greatest

threats to ocean ecosystem health. Many of these ecological impacts are direct results of poor management. These ecological impacts are highly publicized and well known, but there are also severe adverse economic effects of poor management. Global fisheries are contributing much less to the economic welfare of both fishermen and the global economy than if fisheries were well managed. Thus, fishermen and nations, no less than environmentalists and marine ecosystems, stand to gain from improved management of fisheries.

The United Nations Food and Agriculture Organization estimates that global marine capture fisheries production is just above 80 million metric tonnes annually (*4*), generating first-hand sale revenues of about US$75 billion per year.[2] But numerous reports (*4, 6, 7*) show that fishing costs substantially exceed revenues, resulting in grossly inefficient fisheries. How can such a high level of economic waste occur? There are two major factors contributing to this deficit, both of which act to reinforce each other: extensive subsidies to the fishing industry and the open-access nature of most fisheries.

Fisheries are usually managed as common property, open-access resources, making them vulnerable to the "tragedy of the commons" as described by Garrett Hardin (*8*). Common property is property held collectively by a group of people. In the case of domestic fish populations, this group of common rights holders is typically an entire nation; when fish populations occur outside national exclusive economic zones, the entire human population is the property holder. The common property arrangement creates competition between fishermen for the available catch, which is limited by nature; because individual shares of the catch are not specified, many fishermen compete to maximize their catch. Under this system, individual fishermen have incentives to catch as much as possible before other fishermen have decimated the populations. To do so, fishermen invest in excessive fishing capital, such as bigger and faster boats, and adjust their fishing practices in socially detrimental ways for example, by fishing under dangerous ocean conditions. Powerful fishing fleets, advanced fish-finding technology, and gear capable of catching large numbers of fish (and damaging ocean habitats) are all logical outcomes of competition for fish in a commons. Additionally, new entrants will seek access to the fishery and expansion of the fishery will occur as long as it is individually profitable (or at least perceived as such). These incentives remain until the populations of fish have been reduced to the level where all profits have disappeared and economic rents[3] are completely dissipated.

The situation described above is referred to as the "race for fish". While the "race for fish" often creates severe economic, biological, and safety problems, traditional fisheries management has generally failed to address this problem. In fact, one of the most common management methods, the imposition of a total allowable catch (TAC), only exacerbates the economic problem. Faced with an overall catch limit (TAC), the

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[2] This value is derived by multiplying the first hand sale value of total capture fisheries production (US$81 billion) by 0.91, the marine proportion of total capture fisheries production (*3*).

[3] Defined as the difference between the price and production cost of the good. For a natural resource, like fisheries, this is often referred to as resource rent or the productive value of the natural resource (long-run profits earned when the property owner limits inputs to an economically efficient level).

incentive of individual fishermen to fish as fast as possible before the TAC is reached is significantly increased. Therefore, the fishery proceeds even more quickly and more wastefully. The results are economically inefficient fisheries in which there is too much capital and effort, deployed over seasons that are artificially shortened, catching fish that are not as valuable, sometimes damaging habitats, and often inadvertently taking seabirds, mammals, small fish, and non-targeted species as unintended victims of this race. Economic distress in turn tends to exacerbate conservation problems, because conservation measures such as marine reserves, bykill controls, and catch reductions are perceived as threats to livelihood rather than as investments in the future. The race for fish is thus responsible for not only many of the environmental problems plaguing the worlds' oceans, but also for the fact that living ocean resources are not generating any net economic surplus, and actually result in a net economic loss. This impoverishes fishermen, as well as the environment.

The other important factor contributing to the substantial global fishery deficit is the high level of subsidies to fisheries. Available estimates place the value of these subsidies between US$15-30 billion (6, 7), or about 20-25% of first sale revenues from world capture fisheries (*6*). In 2001, the World Wildlife Fund published the most comprehensive report to date on global marine fishery subsidies, estimating that subsidies equal at least US$15 billion annually.[4] Subsidies also exacerbate the common property problem described above by artificially supporting the fishery.[5] This encourages even more entrants and greater overcapitalization, and creates further economic inefficiency and environmental destruction.

Analysis shows just how economically inefficient world capture fisheries are, and roughly what the benefits of ending the "race to fish" might be. Recall from above that first-hand sale revenues are approximately US$75 billion (*4*). While some fisheries are already under good management and are profitable, the level of global subsidies suggest an overall net revenue shortfall (or economic loss) of up to US$15 billion. To this loss one must add the substantial costs (*9*) of largely ineffectual fisheries management and research, which can easily be in the neighborhood of US$5 billion annually, generally also financed with public funds. Rough estimates suggest that, if better managed, world fisheries that are worth US$75 billion today could actually generate annual revenues of approximately US$100 billion.[6] Furthermore, eliminating the "race to fish" will not only increase revenues, but will also generate additional rents, or profits, since the capital

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[4] Estimates range from US$11 billion to US$27 billion. Re-examining Subsidies in World Fisheries, a World Bank publication, estimated subsides at US$15-20 billion, or about 20-25% of world capture fisheries first-sale revenues (*5*). In Marine Fisheries and the Law of the Sea, FAO reported that the annual fishery deficit was US$54 billion, and inferred that much of the deficit was due to subsidies (*23*). The WWF report is the most comprehensive to date, but they report that their US$15 billion "guesstimate" may understate that actual value by 100% or more (*6*).

[5] Subsidies artificially raise profits and reduce fishing costs, creating the perception that fishing is profitable even when it is not.

[6] Estimate modified from Wilen, 2003. After rationalization, there are typically changes yield as well as in product quality, marketing, creation of new markets, etc. that lead to revenue increases. Wilen conservatively suggests a 30-35% revenue increase due to these changes. Thirty-three percent of US$75 billion is US$25 billion (*9*). [It has been estimated that the MSY from current fisheries could be close to 100 m mt instead of the current 80 m mt, if fisheries were well managed]

necessary to catch the fish will fall. A conservative estimate suggests that world marine capture fisheries should be generating $US60 billion in profits each year, rather than losing billions of dollars in subsidies and other excess costs (*10*).[7]

This analysis is necessarily incomplete, because it only includes the direct costs of overcapitalization and poor fish quality. It does not include indirect costs that are difficult to calculate, but are most likely very high: the ecosystem values being lost from excessive by-kill, the excess management costs incurred by having to contain the impacts of excessive latent fishing effort, and the value of habitat lost or degraded by fishing in the "race to fish".

The extent of inadequate protection of ecosystem values and underproduction of potential economic surplus differs from fishery to fishery, and between management regimes. Most of the world's fisheries are conducted within the 200-mile Exclusive Economic Zones (EEZs) claimed by coastal nations that include both developed and developing countries. The remainder of global fisheries occurs in the open ocean outside of the legal jurisdiction of any coastal nation. Each of these situations has spawned management structures unique in design, enforcement, and performance, ranging from lack of regulation to area-specific and season-specific closures to complex international agreements. However, many countries have not yet managed to solve the common property problem with regard to their fisheries.

Minimizing Impacts, Maximizing Profits

Given that the common property problem and the "race to fish" are the root causes of both environmental problems and poor income generation from the rich resources of the oceans, what are the possible solutions? The most effective solutions revolve around replacing the perverse incentives operating under "race to fish" conditions with incentives aimed at conservation and generating value from the worlds' oceans. As it turns out, there are several tried and true ways to alter incentives. All of these methods closely emulate a private property rights system – but with a major difference. Instead of granting direct property rights to the resource itself, most of these systems are based on the granting of transferable privileges to harvest a certain fraction of the total allowable catch to individuals or groups.[8]

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[7] Based on case studies of the British Columbia halibut and Bering Sea Pollock fisheries, Wilen calculates that following rationalization and elimination of excess inputs, rents (or profits) are approximately 60% of revenues (*9*). Calculation is based on the increased revenue value (US$100 billion) derived above.

[8] There is an important distinction between granting exclusive private property rights and privileges to use a public resource. While there are benefits to granting full property rights, they raise the specter of governments having to compensate rights holders if allowable catches must be reduced for any reason. Since the ocean is common property held in the public trust, the government must retain authority to manage fish populations and fishing activities, free from the threat of a legal compensable takings claim. By granting use privileges instead of property rights in the strict sense, governments retain the ability to manage fisheries while still providing fishermen with strong incentives to maximize the value of their catch and improve their conservation performance.

The granting of harvest privileges can take many forms that can be tailored to specific fisheries, including allocations to groups of fishermen using similar gear types, to fishery cooperatives, to community-based co-management entities, or to individual fishermen. When harvest privileges are held by individuals, they are termed Individual Transferable Quotas, or ITQs (also known as Individual Fishing Quotas, or IFQs).[9] ITQs represent individual percentage shares of scientifically determined allowable catches, thus removing the need to race to catch fish before one's competitors do.

ITQs have been adopted in several hundred fisheries in over 16 countries, and the results have generally been very positive for both conservation and income generation. We believe that having an ITQ changes the focus of fishermen from maximizing one's share of allowable catch (which is uncertain under open or limited access programs) to maximizing the value derived from a secure share of the total allowable catch. Following ITQ implementation, it has been suggested that fishermen in the British Columbia halibut fishery now time their halibut fishing trips according to expected ex-vessel prices (*11*), and Bering Sea Pollock fishermen have altered their fishing to achieve a per unit increase in value (*12*). Freed of the need to compete with other fishermen to catch as many fish as fast as possible, a fisherman can tune his/her operation to maximize profits by fishing at times when market prices for his catch are high or when product quality is high. Fishermen can also reduce costs by trading his/her large boat for a smaller vessel more closely aligned with his/her fish quota. This can result in more income with less investment, and cleaner, less destructive fishing.

In the vast majority of ITQ fisheries that have been established around the world, the "race for fish" has ended, profits have increased, and environmental performance has improved substantially. For example, ITQs transformed the Alaskan and British Columbia halibut fishery from a five day frenzied race, prosecuted by a bloated and overcapitalized fleet, into a much less intense fishery delivering fresh fish nearly continuously throughout the year. In British Columbia, ex-vessel halibut prices[10] rose by 40% following ITQ introduction and total ex-vessel revenues[11] increased by an average of Can$5,8 million per year (*12*). ITQs, introduced in stages from 1976 to 1990 in various Icelandic fisheries, greatly reduced both fishing effort and vessel numbers and transformed a previously loss making industry into a profitable one: In 1988, profits as a percentage of gross revenue for all Icelandic fisheries was –5%, compared to +12% in 2002 (*13*). Similar results apply to the New Zealand fisheries, where ITQs were introduced between 1982-1984, as well as other ITQ fisheries around the world. The value of New Zealand fisheries doubled in real terms between 1990 and 2000, much of which is attributable to having dedicated use privileges in the form of ITQs, as well as gains from trade (*14, 15*)[12]. After its transition to ITQs, the multi-species groundfish

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[9] Individual Quotas (IQs), Individual Fishing Quotas (ITQs), and Individual Transferable Quotas (ITQs) are all similar management structures. IQs assign a specified portion or percentage of the Total Allowable Catch to a fisherman. If the individual quota is tradable or can be sold to others, then it is an ITQ or an IFQ.

[10] Ex-vessel prices are prices paid to fishermen for seafood products right off the boat.

[11] Ex-vessel revenues are revenues obtained from the sale of seafood products right off the boat.

[12] Value is the market capitalization (quota price*TAC), which summarizes gains from trade and ownership (*14*).

fishery off British Columbia, Canada, improved compliance with catch limits and virtually eliminated bykill and unaccounted fish mortality (*12*). This fishery also substantially improved its economic performance. Ex-vessel prices increased by US$0.32 per pound for Pacific Ocean Perch and US$0.37 per pound for lingcod and the landed value of the total catch increased by $13 million (*12*).

ITQs generally result in improved environmental performance, with respect to compliance with total allowable catch levels, bykill reduction, and other measures. Rather than opposing conservation measures and complaining about the lack of adequate research, ITQ holders in some ITQ fisheries have actually invested in conservation, research, and management[13] (*13*). Fisheries become profitable and able to thrive, even without indirect government subsidies. Increased profitability may reduce opposition to conservation measures, because under an ITQ regime they may be perceived as investments in the future of the fishery, producing a flow of increased benefits to the ITQ holder. Also as a result of increased profitability, ITQ fisheries are often able to pay management costs formerly paid by the government. For example, New Zealand fisheries achieve almost full cost recovery and now pay annual fees that cover nearly all management and research costs (*15*).

In a number of countries, institutions analogous to ITQs have evolved. These systems often involve the allocation of exclusive privileges (i.e., privileges that are revocable by the government and not subject to compensation) to use marine resources within a specific coastal zone to groups, rather than individuals (e.g. Mexican fishery cooperatives and European Union producer organizations). Coastal communities, fishing cooperatives, or fishermen's unions are also often granted management responsibilities -- including the authority to set, enforce and implement rules to ensure sustainability. These innovations reduce the "race to fish" driven by both local unrestrained fishing effort and poaching by fishermen who are not members of local communities. Cooperatives, community-based management systems, and other institutions promise some of the same benefits seen with ITQ systems, including not only less damage to valuable, rare, or unique components of ecosystems, but also fisheries that maximize economic values and contributions to economic development in settings where income generation opportunities are scarce. In fact, traditional marine tenure systems may have operated in similar ways (*16*).

Despite strong evidence that secure access to a guaranteed share of sustainable catch cures many of the environmental and economic ills present in modern fisheries, progress toward adopting these measures has been disappointingly slow. In some countries, there is a deeply-felt concern about the allocation of exclusive use of resources that have traditionally been open to everyone. These sentiments must be balanced against the economic, biological and environmental gains of dedicating use privileges. Other more specific concerns focus on the potential difference between individual and collective economic gains or losses, the potential for economic windfalls resulting from the sale of

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[13] For example, in New Zealand, quota shareholders have asked for voluntary reductions in TAC to improve population status and have funded consultants to carry out research related to population assessments, enhancement programs, bathymetric surveys, etc.

harvest privileges, the possibility of excessive levels of industry consolidation, and, related to all this, perceived inequitable distribution of harvest privileges. However, both theory and experience shows that it is possible to design programs in such a way to adequately address these concerns. For example, Alaskan fishermen insisted on a requirement that ITQ holders be on board the vessel to prevent a fishery dominated by "absentee landlords". They also implemented a cap on the maximum amount of ITQ that an individual or firm can accumulate (one percent of the allowable catch) to prevent a large change from a fleet dominated by small businesses to one dominated by large firms. In *Sharing the Fish*, the National Academy of Sciences recommended ways to allocate ITQs more fairly and to address other concerns (*13*). But fear of change and deeply held concerns, coupled with a lack of funding for education, consensus building, and implementation, continue to block the road to a more rational way of managing precious marine resources. This applies especially to less developed countries which, in addition to the above, face the difficulties of limited alternative employment opportunities, inadequate financial resources, and in many cases, the lack of administrative and fisheries management capacity and infrastructure.

The Global Fisheries Reform Fund: Investing in Conservation and Sustainable Fisheries

If fisheries are to be transformed on a scale that will make a difference for the world oceans, a catalyst for change is needed— one that can overcome the obstacles that currently hinder the designation of use privileges. We propose the establishment of the Global Fisheries Reform Fund (The Fund), a revolving loan and investment vehicle focused on rationalizing world fisheries, as an example of one kind of institution that can address this need. The Fund would target candidate "win-win" fisheries that simultaneously promise high financial returns and environmental benefits from rationalization (the transition to a system of designated use privileges). The Fund would be a streamlined, independent institution that can take investments from a variety of sources--including bilateral, aid, and governmental organizations, as well as private foundations and individuals—without being beholden to a partner with alternate goals and values.

In order to be successful, the Fund must have three core attributes: research expertise in fisheries; sensitivity to social, cultural and ecological impacts of implementation of use privileges; and the ability to raise funds and remain financially solvent. In general, the Fund would work to connect available capital with appropriate candidate fisheries in the form of a loan or other instrument, and then monitor the investment to ensure that the fishery meets the loan requirements. The Fund could be organized in a variety of ways. A non-profit (either 501c-3 or 501c-4) organization with a governing board of experts and a commitment to a triple bottom line -- measuring success in achieving economic, environmental and social benefits -- may provide the right kind of institution to carry out the mission of the Fund. The organization could have two distinct divisions that would work together to achieve fisheries reform: The research and accountability team would identify candidate fisheries, provide the biological and political expertise necessary to carry out the reform, and follow through with the fisheries to monitor and analyze

success and ensure compliance with the loan conditions; while the investment team would provide financial expertise, structure the loan and/or financial instruments, recruit and interface with potential investors, negotiate transactions and manage investments. The board would be responsible for holding the Fund accountable to the triple bottom line.

With all divisions working together, the Fund would first identify candidate fisheries, analyze the ecological and economic potential of reform, and create a process for carrying out a transition to rights-based management system, including the structure of an appropriate financial instrument such as a loan or bond. The Fund will then approach investors, targeting those with a commitment to social and environmental investments, and raise money to fund the reform process. All of the investment will be directed at reforming the fishery, for example as a direct application to reducing excess fishing capacity or funding the work of the experts employed or retained by the Fund.

The Fund could support education, analysis, and deliberative processes to help each fishery realize its economic and biological potential through the dedication of use privileges. The relationship between the Fund and the fisheries management entity (e.g., a fishery cooperative or other management institution) could take the form of a contract setting forth the terms of a loan, bond, or other instrument. Various conditions on the instrument could be negotiated, including conservation measures. Following ITQ implementation, the fishery would be responsible for paying back the loan, with interest, or providing the promised rate of return. The Fund would assess a fee as a percentage of the increased revenues enjoyed by fishermen following ITQ implementation, with the exact structure depending upon the specific cultural and political context of each fishery. Therefore, some of the enhanced revenue stream resulting from ITQ implementation would be retained by the fishermen, some would be paid to the Fund to cover operating expenses, and some would be used to replenish the Fund and pay back investors, thereby achieving self-sustaining fisheries reform. Importantly, the financial instrument would be structured to achieve a desired rate of return for the investors, similar to a more traditional instrument. Following payback from a specific fishery, investors may choose to keep their money in the Fund, thereby reinvesting in the next fishery reform candidate, or they can exit the Fund with a return.

The Fund would seek to work with fisheries of all sorts, from both developed and developing countries. Importantly, the specific attributes of loans made by the Fund would be malleable enough to accommodate differences in fishing history and socio-political structure in each fishery. The specific method of rationalization would depend on the fishery -- taking into account each fishery's unique biological, social and political context -- and could range from ITQs to fishing cooperatives to area-specific use privileges. For example, a subsistence fishery would likely require a different approach than a commercial fishery to achieve environmental and economic benefits. In addition, the Fund could finance viable business plans to add value to fishery products such as the creation of cooperatives made up of harvesters, processors, and retailers who all abide by sustainable seafood criteria.

Fisheries that have serious economic and conservation problems but show potential for economic recovery through use privilege designation could be chosen for investment. Such fisheries could include those in fragile tropical systems with unique ecosystems and species of global interest from a conservation perspective. However, because fisheries management infrastructure in many developing countries may lack the capacity to administer complex programs like ITQs, or prove incapable of generating sufficient returns to satisfy investors, the Fund could take different approaches. One approach may include the provision of loans to fishery or area cooperatives (which would then assign use privileges) or grants to develop capacity for community-based management (CBM) in selected coastal zones. Community-based management has proven effective in various countries, including the Philippines, Samoa, and Fiji (*16, 17, 18*). Opportunities to generate joint economic development benefits and conservation benefits would be targeted, but specific options for reforming fisheries would be generated by communities and supported by the Fund. In addition to reforming the fishery, the Fund could support alternative employment activities, as well as sustained resource management by communities, including enforcement of fishery regulations, marine reserves, and subsistence fishing.

The groundfish fishery off the West Coast of the United States is characteristic of many developed country fisheries and can be considered as a case study for rationalization by the Fund. The fishery has been declared a federal fishery disaster; we suggest that biological decline and economic collapse were due primarily to the lack of designated use privileges leading to "race to fish" conditions and depletion of the target population and non-target populations. The fishery is not economically efficient and lost 49% of its value from 1995 to 2001[14] (*19*). In addition, environmental problems include excessive by-kill of non-targeted fish species, degraded habitat, and associated accidental killing of marine birds and mammals. Obstacles to rationalization have included fear of excessive fleet consolidation, fear of inequitable initial ITQ allocation, and concern about windfall profits resulting from a give-away of exclusive privileges to use a public trust resource.

Application of external funding by philanthropic foundations to support education and research on ITQs has contributed to the development of a new process to rationalize the fishery, and the federal government has provided funds to buy out about half the productive capacity of the trawl fleet with a $10 million grant and $36 million loan. Even with these efforts, the fishery is still in danger due to the lack of dedicated use privileges, and a major constraint to rationalization is a lack of funds to support and encourage change (*20*). Investment by the Fund could finance ITQ program development, analysis, stakeholder processes, administration, observers, and enforcement, and could be conditioned on a commitment to improved environmental performance standards such as sustainable (shrinking) caps on bykill, habitat damage performance standards for all gear types, and marine reserves (to reduce the externalities in terms of ecological damage imposed by the fishery on society). The Fund would leverage investment for the fishery from a variety of sources interested in improving both economic and conservation performance in fisheries, including local governments, private investors, and conservation funders.

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[14] Based on ex-vessel revenues from PacFIN data (*18*).

We anticipate that the changes resulting from the application of monies from the Fund would not only improve the environmental performance of the fishery, but also enhance revenues and the profitability of the fishery. The revitalized fishery could then pay back the loan and eventually share most or all of the cost of program administration, enforcement, and scientific research. Substantial cost sharing is typical of many ITQ fisheries (*13*). This coordinated collaboration of different interests would simultaneously tackle the four major problems in this fishery: any excess capitalization remaining after the federal buyout, lack of secure use privileges, lack of incentives for stewardship under "race for fish" conditions, and the need to protect habitats and reduce by-kill. Other promising candidates for reform may include Gulf of Mexico fisheries, the Gulf of California shrimp fishery (*21*) and the West African continental shelf fishery (*22*).

In summary, fisheries worldwide are economically inefficient and in biological decline. Numerous entities have recognized this and are independently attempting to address both the symptoms and causes of global depletion of the world's fisheries. Some countries, such as New Zealand, Iceland, Australia, and Canada have successfully reformed some of their fisheries through designating use privileges in the form of ITQs, and governments in other countries are cautiously experimenting with various types of rationalization. In many cases, fishermen themselves are designing and promoting innovative new methods of removing "race to fish" incentives (*23*)[15]. In addition, conservation interests are seeking and developing innovative ways to halt destructive fishing methods, and to set aside unique and fragile marine ecosystems from extractive practices. We believe that large gains are possible by joining forces, coordinating and leveraging experiences and funding. A Global Fisheries Reform Fund offers a model to coordinate these various institutions into a unified and practical effort to tackle the challenges of fisheries management. Given the current environment of uncoordinated actions and lack of sustainable funding for fisheries reform, the Global Fisheries Reform Fund holds promise for helping to achieve the Pew Commission's vision of a healthy ocean (*5*), providing sustainable funding for simultaneously improving the economic vitality of fisheries and their environmental performance.

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