



Pathway to Self-Funding
A Case Study on the California Commercial Spiny Lobster Fishery

A 2009 Group Project

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A Case Study on the California Spiny Lobster Commercial Fishery**

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The mission of the Bren School of Environmental Science & Management is to produce professionals with unrivaled training in environmental science and management who will devote their unique skills to the diagnosis, assessment, mitigation, prevention, and remedy of the environmental problems of today and the future. A guiding principal of the School is that the analysis of environmental problems requires quantitative training in more than one discipline and an awareness of the physical, biological, social, political, and economic consequences that arise from scientific or technological decisions.

The Group Project is required of all students in the Master's of Environmental Science and Management (MESM) Program. It is a four-quarter activity in which small groups of students conduct focused, interdisciplinary research on the scientific, management, and policy dimensions of a specific environmental issue. This Final Group Project Report is authored by MESM students and has been reviewed and approved by:

Faculty Advisor – Christopher Costello, PhD

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Abstract

We investigated the economic, social, and political feasibility of developing and implementing a self-funding mechanism known as the “Lobster Stamp” in the California commercial spiny lobster fishery. The Lobster Stamp is an annual fee collected from every California commercial spiny lobster fisherman that will fund various projects of interest and utility to the fishery. The results of our economic model indicate that the fishery could profitably fund Marine Stewardship Council Certification. After ten years, the net benefits of certification ranged from \$912 to \$45,676 per fisherman. We created a survey using the information from our economic model and sent it to all commercial lobster permit holders. We found high support for the Lobster Stamp (65%) and the pursuit of Marine Stewardship Council Sustainability Certification (79%) among fishery respondents. The majority of respondents (58%) were willing to pay \$300 annually for the Lobster Stamp. We then evaluated the legal and political feasibility of implementing self-funding legislation by analyzing existing fishery self-funding legislation and speaking with fishery leaders, California Department of Fish and Game representatives, nongovernmental organization representatives, and fishery lawyers. Our group synthesized the fishery’s concerns and objectives with the results of our cost-benefit analysis, survey analysis, and legal analysis to make final fishery-specific recommendations concerning the legislation of the Lobster Stamp. These recommendations include: setting a \$300 price point, making the stamp mandatory for all permit holders, establishing an advisory committee capable of legally binding decisions, minimizing overhead costs, requiring periodic votes to renew the stamp, and pre-establishing activities eligible for funding.

Executive Summary

In 2008, our client, the California Lobster and Trap Fishermen's Association (CLTFA), voted to pursue the creation of a self-funding mechanism, the "Lobster Stamp." The Lobster Stamp is a method to collect money from California commercial spiny lobster (CCSL) fishermen to use for projects of interest and utility to the fishery. At the same time, CLTFA also discussed pursuing Marine Stewardship Council (MSC) Sustainability Certification, the first step towards obtaining the use of the MSC eco-label. The use of the MSC logo provides market-based incentives for fisheries to fish sustainably. Given the fishery's vote to explore MSC Certification over the summer, we presumed that the CCSL fishery would rank becoming MSC Certified as a high priority for the use of Lobster Stamp funds. Our group project sought to calculate the political and social viability of creating the Lobster Stamp and the economic value of using the initial funds to pursue MSC Sustainability Certification.

The first phase of our project was identifying the costs fisheries bear to undergo MSC Certification assessment. Since the costs of each certification are confidential between the fishery client and the certification company, certification costs are largely unpublished. Anecdotal reports of MSC Certification costs can vary substantially among fisheries, with prices reportedly ranging from \$25,000 to \$500,000. For the purposes of this project, the full cost of MSC assessment is the sum of costs of initial missing data collection and organization, pre-assessment, full assessment, re-assessment five years after certification, and ten years of annual audits. The MSC recently overhauled its assessment methodology and now assesses all fisheries against their new Default Assessment Tree. We compared the CCSL fishery to the Default Assessment Tree to identify the potential gaps in information for this fishery's assessment. We identified the fishery's existing data and found that the fishery does not currently have enough information to pass the full assessment and obtain MSC Sustainability Certification. Our analysis indicates that a stock assessment, a tool used to estimate the abundance and fishing effort of a fished species, is necessary to satisfy these requirements. Including the stock assessment, we estimate the costs of MSC Certification at \$320,000 over ten years.

To fishermen, the general economic benefits of MSC Certification are an enhanced ability to penetrate new markets, a more robust management system, and a price per pound premium, or increased market price. To fishermen, the general economic benefits of MSC Certification are a price per pound premium, an enhanced ability to penetrate new markets, and a more robust management system. To begin our in-depth analysis of the benefits of MSC Sustainability Certification, we performed a literature review and interviews of experts in the area. The bulk of our assessment was deriving reasonable estimates of price premiums based upon empirical evidence.

Our review found a lack of empirical evidence for exact price premiums in MSC certified fisheries, due to a lack of quality fisheries data, the inherent volatility of prices in seafood markets, and the short history of the Marine Stewardship Council. Of the 39 existing MSC certified fisheries, only five were discussed in peer-reviewed literature. Since there

was only a small amount of information on MSC price premiums, we expanded our research to include other eco-labeling certifications and consumer surveys. Based upon our review of existing information on MSC Certified fisheries, consumer surveys of eco-labeled seafood, and other certification schemes, we estimate a 5-10% price premium for the CCSL fishery after MSC Certification. We also quantified the effects of a more robust management system. As a result of the assessment process, it is conceivable that more stringent recreational lobster fishery harvest regulations will be enacted. We estimate these effects could increase yields by up to 3% for the CCSL fishery.

We broke down our cost benefit model into three main sections, based upon three different payment mechanisms for the Lobster Stamp: a \$300 flat fee, a \$0.095/lb fee on landings, and a combination of a \$50 flat fee and a \$0.08/lb fee on landings. The only difference between the plans is how the taxes are distributed among individuals fishing at varying intensities. The results of our analysis indicate that the fishery could profitably fund MSC Certification. After ten years, the net benefits of certification ranged from \$912 to \$45,676 per fishermen. To explore the proportionate impacts of the different payment mechanisms, we developed benefit-cost ratios for fishermen landing lobsters at various scales. The flat fee places a disproportionate burden on those who fish the least. Under a flat fee system, all fishermen have identical costs, but those who fish the most receive the greatest proportion of the benefits. In contrast, the price per pound fee identically distributes the costs and benefits based on each fishing bracket. However, the price per pound fee charges those who fish nothing \$0 and does not account for the option value of fishing an MSC certified fishery in the future. Therefore, we think the most equitable division of costs is the combination \$50 flat fee and \$0.08/lb fee on landings. However, this approach may introduce political and legal obstacles.

To broaden the scope of our project beyond the members of the CLTFA, we sent a survey to all commercial lobster permit holders. The survey was designed to elucidate the fishermen's support for self-funding through a lobster stamp as well as priorities for fishery directed projects, including MSC Certification. A total of 67 fishermen responded to the survey. This number represents a 31% response rate of all 2008-2009 CCSL permit holders. Our survey population deviated from than the actual CCSL permit holder population. While 30% of the CCSL fishery did not report any landings of California spiny lobster, only 5% of our respondents reported no landings. A chi-square test confirmed that our survey population was significantly different than the actual population with regard to landings. Since it is not prudent to extrapolate so few responses to represent a large portion of the actual population, we analyzed the survey based only on active fishermen's responses. Based on this analysis, support for the Lobster Stamp (65%) and MSC Certification (79%) was high. The majority of respondents (58%) were willing to pay \$300 for the lobster stamp. Further questioning showed that 52% of respondents preferred a flat fee payment system versus a per pound landings fee (13%) or a combination of the two (11%), while 19% of respondents did not choose an option and 5% wrote in a response of "none". MSC Certification was the highest ranked fishery project priority. Overall, the results were positive in support of the

Lobster Stamp, a price point of \$300 for a flat fee, and MSC Certification amongst actively landing fishermen.

In order to develop the objectives and legal language for the commercial lobster stamp, our group first communicated with representatives of CLTFA to ensure that we fully understood their priorities and concerns. To further ensure the success of the commercial lobster stamp, we researched other fisheries with self-funding programs. Our group synthesized the fishery's concerns and objectives with the results of our research into self-funding, cost-benefit analysis, and survey analysis to make final recommendations for the fishery. These recommendations include: establishing a \$300 price point, making the stamp mandatory for all permit holders, creating an advisory committee able to make legally binding decisions, minimizing overhead costs, requiring periodic votes for stamp renewal, and legislatively establishing activities eligible for funding.

The final deliverable for our client is a "roadmap" that synthesizes the Lobster Stamp requirements and recommendations with the practical knowledge to pass legislation through the California Legislature. Because the timeline and scope of this project preclude enacting actual Lobster Stamp legislation, this roadmap is intended to instruct the fishery on the most effective means to achieve this goal. The roadmap elevates our project beyond an academic exercise to one that provides tangible and useful results to our client.

Acronym List

AAFA – American Albacore Fishing Association
AB – Assembly Bill
BCR – Benefit cost ratio
CBA – Cost benefit analysis
CBM – Cost benefit model
CCSL – California commercial spiny lobster
CDFA – California Department of Food and Agriculture
CLTFA – California Lobster and Trap Fishermen’s Association
DFG – California Department of Fish and Game
EDF – Environmental Defense Fund
FAM – Fishery assessment methodology
FSC – Forestry Stewardship Council
MLMA – Marine Life Management Act
MPA – Marine Protected Area
MSC – Marine Stewardship Council
MSCV – Value of fishery after MSC Certification
NGO – Non-governmental organization
NR – Non-response
OPC – Ocean Protection Council
RAAC – Recreational Abalone Advisory Committee
RBF – Risk-based framework
RSDA – Regional seafood development organizations
TAC – Total allowable catch
US – United States of America
UK – United Kingdom
WTP – Willingness-to-pay
WWF – World Wildlife Fund

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Equation 10. MSC Logistic Regression

$$Prob(MSC = YES) = \frac{e^{\beta_0 + \beta_1[Age] + \beta_2[CLTFA] + \beta_3[Transferable] + \beta_4[Landings]}}{1 + e^{\beta_0 + \beta_1[Age] + \beta_2[CLTFA] + \beta_3[Transferable] + \beta_4[Landings]}} \dots\dots\dots 32$$

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$$Prob(Stamp = YES) = \frac{e^{0.81 - 0.001[Age] + 0.38[CLTFA] + 0.15[Transferable] + 0.03[Landings]}}{1 + e^{0.81 - 0.001[Age] + 0.38[CLTFA] + 0.15[Transferable] + 0.03[Landings]}} \dots\dots\dots 38$$

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$$Prob(MSC = YES) = \frac{e^{1.19 - 0.008[Age] + 0.27[CLTFA] - 0.13[Transferable] + 0.023[Landings]}}{1 + e^{1.19 - 0.008[Age] + 0.27[CLTFA] - 0.13[Transferable] + 0.023[Landings]}} \dots\dots\dots 41$$

Introduction and Project Significance

We investigated the economic, social, and political feasibility of developing and implementing a self-funding mechanism known as the “Lobster Stamp” in the California commercial spiny lobster (*Panulirus interruptus*, CCSL) fishery. The Lobster Stamp is an annual fee collected from every CCSL permit holder that will fund various fishery projects of interest and utility to the fishery, potentially including Marine Stewardship Council (MSC) Sustainability Certification. By voluntarily initiating self-funding to protect their fishery, these fishermen are taking steps away from traditional top-down management and towards co-management. Fisheries co-management systems involve partnerships combining the knowledge and interests of local fishermen with the legislative, enforcement, and conflict resolution powers of the government (Pomeroy and Berkes 1997).

Our client is the California Lobster and Trap Fishermen’s Association (CLTFA), a voluntary group of California fishermen organized around the goal of keeping their fishery both sustainable and profitable. At meetings held in Dana Point and Santa Barbara in the summer of 2008, CLTFA members voted to explore the potential for self-funding fishery projects in the CCSL fishery through the Lobster Stamp. They considered setting the stamp at a flat fee of \$300 to every permit holder.

CLTFA also discussed pursuing a sustainability certification from the Marine Stewardship Council at their summer meetings. MSC Certification is a reward for environmentally responsible management and practices which can lead to increased recognition and profits for the fishery. While most fisheries would like to obtain certification, the certification is costly, time-consuming, and extremely rigorous (MSC 2005). The fishery must also prove its sustainability. One resource that will be helpful for the MSC Certification process is the CCSL Fishery Overview, updated this summer as a component of our project. This overview includes historic and current available data including management information, California spiny lobster biology, and catch records.

The CCSL fishery is currently managed by the California Department of Fish and Game (DFG) through trap design requirements, seasonal closures, and a restricted access program involving transferable and non-transferable permits (Cascorbi 2004; Culver *et al.* 2006). As outlined in the Marine Life Management Act of 1999 (MLMA), DFG considers the CCSL fishery to be a high priority for development of a fishery management plan. The MLMA required the development of two fishery management plans for nearshore finfish and white seabass fisheries while evaluating and prioritizing which fisheries will require management plans in the future. While California spiny lobster was listed as one of the top ten species or species groups requiring management plans, urchins, California halibut, and nearshore sharks and rays were selected as the top three groups needing management plans (CDFG 2001a).

The MLMA-mandated management plans require the setting of a fishery-specific total allowable catch (TAC). Because of the complex nature of the CCSL fishery, setting an

accurate TAC would be extremely costly and may prove impossible. In small-scale, spatially heterogeneous fisheries like the CCSL fishery, numerous microstocks of California spiny lobster are present. In order to develop a reliable TAC in the CCSL fishery, multiple stock assessments and monitoring of these microstocks would be necessary (Parma *et al.* 2003).

As an alternative to dependence on outside organizations to initiate new management strategies or set research priorities, CLTFA is voluntarily exploring the possibility of self-funding. By self-funding, the fishery can establish and support its own research and management activities and take control of where the fishery is headed in the future. Before taking steps to implement a self-funding mechanism, CLTFA needed to determine whether the entire CCSL fishery would be willing to participate in self-funding and whether self-funding fishery selected projects could be economically profitable.

This group project explored the potential for the entire CCSL fishery to self-fund MSC Certification, while keeping in mind that the fishery could use the money raised through the Lobster Stamp for other self-prescribed fishery goals. First, we assessed the costs and benefits of the MSC Certification process specific to the CCSL fishery. Second, we created a cost-benefit model (CBM) to determine whether the CCSL fishery could profitably self-fund MSC Certification. The CBM evaluated the net benefits per commercial fishing permit of MSC Certification under three self-funding collection mechanisms: a flat fee of \$300, a price per pound fee, and a combination of a smaller flat fee and price per pound fee. Since not every CCSL permit holder is a member of CLTFA, we then surveyed the entire fishery to determine their attitudes toward the lobster stamp and MSC Certification and their preferred fee collection mechanism. Finally, we performed a legal analysis to evaluate the legal and political feasibility of implementing self-funding legislation. We used the results of the CBM, survey, and legal analysis to assemble recommendations for CLTFA to use in developing the legal language for self-funding.

Project Objectives

The objectives of our group project were to provide the California commercial spiny lobster fishery with the tools and knowledge necessary to establish a successful fishery self-funding mechanism. To accomplish our objectives, we answered the following research questions:

1. Can the California commercial spiny lobster fishery profitably self-fund MSC Sustainability Certification?
2. Is self-funding supported by the California commercial spiny lobster fishery?
3. Can successful self-funding legislation be developed?

Answering these research questions provided our client, the California Lobster and Trap Fishermen's Association, with the knowledge needed to move forward with their goals of creating a Commercial Lobster Stamp and pursuing MSC Certification. In addition to answering these questions, we created a set of resource documents to be used by the California commercial spiny lobster fishery. These documents will provide guidance to the fishery as it continues along the path to self-funding, as well as being applicable and useful to other fisheries seeking to achieve self-funding in the future.

Background

California Spiny Lobster Fishery

The CCSL fishery is a small but locally important fishery based in southern California (Cascorbi 2004). This project's client, CLTFA, is an organized group of CCSL fishermen from multiple southern California ports. The CCSL fisheries along the southern coast of California can be described as artisanal, where fishing is done through the use of traps. Artisanal fisheries generally have lower operational costs, catch, and effort exerted than large industrial fisheries. Low costs and ease of entry to artisanal fishing coupled with high unemployment rates can lead to short term increases in fishing efforts and a subsequent reduction in stock levels (Defeo and Castilla 2005). To help alleviate this problem, California placed a moratorium on new lobster permits in 1994. In 1992, there were 351 permits. Following the implementation of a limited entry system, the number of permits had fallen to 251 by 2000. Of these 251, only 120 permits were actively fishing and landing lobster (Culver *et al.* 2006).

California spiny lobster favor rocky underwater habitat and forage on sandy substrate and in beds of surfgrass and eelgrass. These lobsters can produce between 120,000 and 680,000 eggs per year. Females will carry fertilized eggs on their abdomen for about 10 weeks until the eggs hatch into pelagic larvae, which typically occurs around June (CDFG 2001b). Since most breeding of California spiny lobster takes place off the Mexican coast, scientists assumed that the southern California stock is replenished by larvae that are carried north by strong currents (Cobb & Wang 1985). However, Cowen *et al.* (2000) suggest that local production and recruitment of coastal marine species are strongly coupled, creating a more closed system than previously thought. A genetic conductivity study conducted found that populations along the coast of southern California were genetically well mixed, thus indicating that larvae supplied to the Santa Barbara Channel region comes from both local and distant sources (T. Ben-Horin pers. comm.).

Marine Stewardship Council

In 1997, Unilever PLC, one of the world's largest frozen seafood purchasers, and the World Wildlife Fund (WWF), an international conservation organization, jointly formed the MSC to secure the long-term productivity and health of the oceans (Howes 2008). The MSC is the world's leading certification and eco-labeling program for sustainable seafood. It is an independent non-governmental organization that rewards sustainable fishing practices and management. This reward is a certificate stating that the fishery meets a global sustainability standard, the Marine Stewardship Council Sustainability Certification (MSC Certification). This allows the producers of seafood to apply to use the MSC's blue eco-label (Figure 1) that contains the following statement: "This product comes from a fishery which has been certified to the Marine Stewardship Council's environmental standard for a well-managed and sustainable fishery (www.msc.org)" (Howes 2008).



Figure 1. The MSC's blue eco-label (Figure courtesy of Marine Stewardship Council).

Once a fishery makes the voluntary decision to become MSC certified, they contract with a third party certification body that has been accredited by the MSC to perform the assessment. Broadly, this assessment examines the sustainability of the target species stock, fishing techniques, management practices, and ecosystem effects by assessing the fishery's performance against criteria in the MSC Standard.

The MSC Standard

The standards used by MSC were developed to be consistent with the "Guidelines for the Eco-labeling of Fish and Fishery Products from Marine Wild Capture Fisheries" adopted by the United Nations Food and Agriculture Organization in 2005. These guidelines include the need for independent third party assessment using scientific evidence; a transparent process that includes stakeholder input, consultation, and objection procedures; and that the standards be based on the sustainability of the target species, ecosystem, and management practices (Howes 2008).

In short, the MSC standards require that: (1) the long-term sustainability of the fishery's stock is not being sacrificed for short term gains; (2) the fishery is managed in a way that protects and maintains not just its stock but the ecosystem in which its stock resides and on which it depends; and (3) there is an effective management system in place that is in line with both international and national laws and standards that implements (1) and (2) appropriate to the fishery's scale (MSC 2002; MSC 2005).

When a fishery enters assessment, an independent certification body conducts a pre-assessment, the results of which remain completely confidential. This pre-assessment is a brief evaluation of the fishery and the likelihood of its meeting the MSC Standard. There are often considerable changes made to the fishery to improve areas where needed prior to proceeding to the full assessment. A fishery can also decide after the pre-assessment not to enter the full assessment at all and abandon the MSC Certification process. Once a fishery decides to enter full assessment, the process becomes completely transparent and input is solicited from all relevant stakeholders including government agencies, academia, and members of the fishing industry. The certification body uses the MSC's Fishery Certification Methodology to assess the fishery against the MSC Standard

(Howes 2008; D. Averill pers. comm.). Once the assessment against the standard is complete, a draft assessment report is published on the MSC website and opened for stakeholder and public comment. A final report and determination is made based on this external input and the draft assessment report. An objections period is allowed followed by the final decision on certification (Howes 2008).

Prior to 2008, the certification body and stakeholders would develop an assessment tree to set-up performance indicators and scoring guideposts. The performance indicators and scoring guideposts were different for every fishery and were used to assess the fishery against the MSC Standard. However, due to large amounts of criticism concerning inconsistent scoring across fisheries, the MSC has developed a new Fishing Assessment Methodology (FAM). The new FAM has standardized the assessment tree to include 31 performance indicators that are used for every fishery. The new FAM has explicit instructions regarding what each indicator means, which principle it refers to in the MSC Standard, and suggestions for scoring (MSC 2008a). As of July 2008, all fisheries entering assessment will use the new Default Assessment Tree found in Appendix 1 (MSC 2008a; D. Averil pers. comm.).

Cost-Benefit Analysis

Cost-Benefit Analysis

We first assessed the costs and benefits of the MSC Certification process specific to the CCSL fishery. Next, we created a cost-benefit model (CBM) to determine whether the CCSL fishery could profitably self-fund MSC Certification. The CBM evaluated the net benefits of MSC Certification per commercial fishing permit under three self-funding collection mechanisms: a flat fee of \$300, a price per pound fee, and a combination of a smaller flat fee and price per pound fee.

MSC Certification Cost Assessment

Literature Review

A key requirement of the MSC Certification process is that the participating fishery must undergo an assessment which reviews its management and operations and its impacts on the fish population and ecosystem. This assessment is usually carried out by a third-party independent certifier and not the MSC. The associated costs are usually negotiated between the client and the certifier. The MSC does not receive any payment for assessments or certifications, and is not involved in setting the costs associated with the assessment (MSC 2008b). These costs usually include initial assessment, research, audits, and reassessment, if taken as an option. In the past, the certification process has been funded by different institutions. In the case of the Western Australia Rock Lobster fishery, the Western Australia Fisheries Industry Council and the Department of Fisheries of Western Australia both funded the certification process (D. Averill pers. comm.). In contrast, the Maine lobster fishery hopes to be funded by the seafood industry in order to avoid costs to the fishermen (Rappaport 2008). The MSC also provides suggestions on different funds and grants available to fisheries that are interested in undergoing certification, such as the Sustainable Fisheries Fund and Sea Change Investment Fund.

The costs associated with the certification process vary by fishery depending on the complexity of the fishery, the availability of information and the level of stakeholder involvement. From certifications that have been made thus far, the MSC sets the cost range of certification from \$25,000 to \$500,000 (MSC 2008b).

Methodology

To assess the costs of the MSC Sustainability Certification process, we first developed a thorough understanding of the certification requirements and how other fisheries have met those requirements. In July 2008, to standardize future fishery assessments, the MSC updated its FAM, which now includes the new Default Assessment Tree (Appendix 1). The MSC now requires certification bodies to use the new FAM when assessing fisheries that entered MSC full assessment after July 21, 2008. We evaluated the CCSL fishery against the new Default Assessment Tree to provide CLTFA with an estimate of research costs they may encounter while preparing for full assessment.

Certification costs are confidentially negotiated between the fishery and its independent certifier. To lower the costs of certification, the MSC recommends that a fishery should gather and organize as much information as possible prior to entering full assessment. For the purposes of this project, we calculated the full cost of MSC Certification as the sum of costs of initial missing data collection and organization (research costs), pre-assessment, full assessment, re-assessment five years after certification, and ten years of annual audits.

To begin the cost evaluation of MSC Sustainability Certification, we first examined the CCSL fishery to see if there was any missing data or information that would prohibit completion of the MSC full assessment. To do this, we compared current CCSL fishery data and information to the new Default Assessment Tree (Appendix 1). This comparison did not include other fisheries' assessments, since none of them have been assessed using the new FAM.

To further bolster our cost analysis, and because certification costs are largely unpublished, we directly contacted representatives from several MSC certified fisheries to ask them about their certification costs.

Cost Assessment Results

Our comparison of the CCSL fishery to the MSC Default Assessment Tree (Appendix 1) demonstrated that the fishery sufficiently met the minimum requirements (scoring at least 60 out of 100 points) for two of the MSC's three Sustainability Principles in the default assessment tree. Our approach was modeled on both qualitative and quantitative reviews and inputs used by the MSC. The scoring process we used mimicked the MSC's scoring process to effectively quantify the extent to which each criterion was being met by each fishery.

We found that Principle 1, which assesses the stock status of the fishery, was not satisfactorily met by the CCSL fishery (scoring below 60 points). The CCSL fishery used landings, and catch per unit effort data, collected since 1935, to determine if the fishery was being overfished or if the stock was being depleted. Although the landings have mostly shown increasing trends across time, indicating that the CCSL fishery is "probably sustainable with the current effort," this estimation contains inherent uncertainties (C. Barilotti and T. Karasek pers. comm.). The California Spiny lobster recreational fishery does not record landings, making the commercial fishery's landings record an incomplete estimation of total lobster landings. In addition, permits which are issued each year could be a misleading indicator of effort since not all of the fishermen who are permit holders are active fishermen in this fishery. A majority of the landings are landed by only a small percentage of fishermen. For example, in the 1997-98 season, only 35% of CCSL permit holders landed 75% of the total pounds (C. Barilotti and T. Karasek pers. comm.). Thus, there is potential for effort to significantly increase if those who do not use or underutilize their permits become active again. The potential increase in effort is not factored into the fishery's estimation of its sustainability, and could distort the current understanding of the health of the California Spiny Lobster stock. Thus,

although the fishery believes that it is sustainable based on existing data, there remains a need for specific minimum and target reference points based on a precautionary approach. This requirement can be satisfied by conducting a formal stock assessment which would confirm that the fishery is not being overfished or depleted. We contacted fishery experts and lobster researchers to estimate what the cost of a stock assessment would be for the CCSL fishery (D. Averill pers. comm.). The “standard” cost of a stock assessment, which DFG normally pays for its contracted assessments, is \$70,000 (A. McCall pers. comm.).

Through information gathered from existing literature as well as through conversations with a fishery expert at DFG, we inferred that all of the subcomponents (bycatch, retained species, endangered, threatened and protected species, habitat and ecosystem) under Principle 2 were satisfied to different extents, ranging from the minimum of 60 points to a score of 75 points.

The bycatch of this fishery has been known to be minimal (Cascorbi 2004). In addition, bycatch, which mostly includes the capture of undersized lobsters, is regulated by DFG through minimum size limits. Incidental take of Kelleys’ whelk, octopus, and crab species excluding dungeness crab is legally allowed, but our contact at DFG believes that it is “extremely unlikely” that any of these species are being harmed (K. Barsky pers. comm.). The department also verified that there were no recorded impacts of the fishery on any endangered, threatened, and protected species, nor ecosystem impacts that would be “seriously irreversible” (K. Barsky pers. comm.). The traps used by the fishery were found to have minimal impacts on its habitat, and are required by DFG to have their doors fastened with bare metal crimps. These crimps eventually rust over time and collapse in the ocean, preventing other animals from being trapped (CDFG 2001c).

Principle 3 requires that the fishery has an institutional and operational framework in place which gives the fishery incentive to act in accordance with Principles 1 and 2. Discussions with our contact at DFG revealed that although current management of the CCSL fishery satisfies all the requirements for Principle 3, there remains much room for improvement (K. Barsky pers. comm.). Improvement areas include changing the way the fishery makes decisions, resolves disputes and evaluates its performance. It is difficult to quantify potential costs of such implementations.

Overall, MSC Certification costs can range from \$25,000 to \$500,000, depending on the fishery undergoing the assessment (MSC 2008). Other certified fisheries were contacted to obtain estimates of their costs for undergoing MSC Certification, and specific reasons for variations in their costs informed our estimation of assessment costs. The initial assessment cost for the Oregon Pink Shrimp Fishery was \$80,000, including a certification fee in the range of \$5,000-\$10,000. This certification fee was believed to be on the lower end of the expected price range, due to the familiarity of the certifier with the fishery (B. Pettinger pers. comm.). In contrast, the Alaska Pacific cod and the Gulf of Alaska Pollock fisheries both incurred much higher costs for very different reasons. The former was due to a need for the assessment process to be accelerated (P. Gilliland pers.

comm.) and the latter was due to NGO opposition that arose during formal involvement of stakeholders (J. Gilmore pers. comm.). The Pacific albacore tuna fishery’s initial assessment costs were less than \$100,000 (N. Webster pers. comm.). Initial assessment costs were also below \$100,000 for the Western Australia Rock Lobster fishery. The fishery incurred a total of \$70,000 as its initial assessment cost (D. Averill pers. comm.). Using estimates from the high end of our projected possible costs, the initial assessment cost for the CCSL fishery was estimated at \$100,000 in addition to the research costs, which were estimated at \$70,000. The reassessment cost was calculated as 50% of the initial assessment cost (D. Averill pers. comm.). We estimated annual audit costs based on the estimates from the Oregon Shrimp fishery (\$8,000) and the Western Australia Rock Lobster fishery (ranging between \$10,000 – 15,000) (D. Averill pers. comm.)

We arrived at the following estimates for the CCSL fishery’s costs for MSC Certification:

Type of cost	Amount
Research costs (Stock assessment)	\$70,000
Certification Fee	\$100,000
Post certification: Annual audit	\$10,000/year
Reassessment	\$50,000
<i>Total Cost</i>	<i>\$320,000 over 10 years</i>

Table 1. Summary of MSC Certification Costs

MSC Certification Benefit Assessment

Literature Review

A growing number of “green” consumers are concerned about the environmental impact of their purchases. In 1992, the United Nations Conference on Environment and Development in Rio de Janeiro first identified environmental labeling as a strategy towards reaching ecological conservation goals (Sedjo & Swallow 2002). Environmental labeling, or eco-labels, provides consumers with an assessment of the environmental footprint of the products they purchase. Labeling can be regulated by the government or independently constructed. In either case, the purpose of labeling is to convey information that communicates the environmental criteria in which consumers are interested.

Between 1989 and 1997, recognized eco-labels increased from 12 to 32, and this number is expected to continue growing (Pederson & Neergaard 2006). Proponents of eco-labeling argue that eco-conscious consumers, using a system of environmental labels, will pay a price premium to purchase products that are environmentally friendly. The price premium is an additional increase in the price of a product that environmentally conscious consumers are willing to pay. Organic certified produce and coffee, fair trade coffee, Forestry Stewardship Council (FSC) certification, Dolphin-Safe tuna, and MSC Certification are all examples of eco-labeling. In cases where consumer demand is relatively high, such as fair trade coffee, producers have achieved very high price premiums (58% for fair trade coffee). Additionally, organically certified coffee achieves a

12% price premium (Searle *et al.* 2004). In another study of eco-labels, Nimon & Beghin (1998) found a 33.8% price premium for organic cotton used in the apparel industry. However, a product that is labeled environmentally friendly does not automatically guarantee a price premium for producers (Sedjo & Swallow 2002).

Eco-Labeling in Seafood

Eco-labeling in the seafood industry has primarily stemmed from concerns about the sustainability of seafood harvesting worldwide (Jackson *et al.* 2001). MSC Certification has become the largest and most recognizable sustainability certification of fisheries worldwide. The MSC label conveys information regarding otherwise unobservable environmental impacts on the fisheries' products. The label allows consumers who are concerned about sustainable fisheries, to make informed choices (Roheim 2003). This provides a market incentive for fisheries to certify their fishery, in order to capture the market segment that prefers sustainable seafood.

Methodology

The general benefits of MSC Certification to fishermen are a price per pound premium, increased yields from more robust management, and an enhanced ability to penetrate new markets, as well as social and political benefits. For this project, we quantified the price per pound premium (which is linked to the ability of a fishery to capture and maintain new markets) and increased management yields. We discussed the additional political and social benefits, but they were not quantified in the scope of this project. To begin our analysis of the benefits of MSC Certification, a literature review and interviews of experts in the area were performed.

The bulk of our assessment consisted of deriving reasonable estimates of price premiums based upon empirical evidence. In order to calculate a reasonable estimate for the price premium, we analyzed the reported price premiums of other MSC certified fisheries, consumer surveys on reported preferences for eco-labeled seafood, and additional eco-certifications. While researching MSC certified fisheries, we paid particularly close attention to the two already certified spiny lobster fisheries.

Results

The results of our MSC benefit analysis start with non-MSC eco-labels, move to consumer seafood surveys, and end with a review of the peer-reviewed literature discussing MSC certified fisheries.

Non-MSC Eco-Labels

FSC

The Forest Stewardship Council (FSC) is an internationally recognized, independent environmental certification established to promote the conservation and responsible management of the world's forests. It also served as a model to for the development of the MSC (Gulbrandsen 2008). Similar to the MSC Certification, the FSC aims to use a

market-based approach to solving an international environmental issue. It promotes responsible management through a certification process and use of a trademarked logo that assures consumers of sustainable wood harvest. The FSC also touts price premiums as a benefit of certification (FSC 2009).

There is little empirical evidence for economic benefits to the producers of FSC certified wood, although the number of wood producers has grown dramatically in the last decade (Taylor 2005). A consumer survey of wood products shows that consumers might be willing to pay at least 5% more for certified products (Anderson & Hansen 2004).

Perera *et al.* (2008) conducted a survey of US wood products retailers to assess the most important criteria for retailer wood purchase selection. They found that of the 21 criteria, the top-rated ones were price, quality, and consistency, with eco-labeling/certification ranking last among the 132 retailers surveyed. The most common reasons for choosing to provide certified wood products was company image and certified products being the only product available. Only 7% of retailers chose FSC certified products because they were seeking to increase profit per unit. This suggests that there is little or no price premium associated with FSC certified products. Other studies estimate a 5-10 percent price premium for certified wood products (Gardiner & Viswanathan 2004).

Dolphin Safe Tuna

Approximately 45 years ago, the tuna fishing industry began harvesting with purse-seines. Fishermen located tuna by following pods of dolphins, since dolphins often associate with large yellowfin tuna. The tuna were encircled with the purse seine and hauled onto the boat. In the process, dolphins were often caught in nets and killed. In response to concerns about dolphin mortality, the biggest producers of canned tuna began using a Dolphin-Safe label, regardless of whether or not they adopted any measures to protect dolphins during harvest. This led to Congress passing the Dolphin Protection Consumer Information Act of 1990, which made it illegal to label tuna as Dolphin-Safe unless dolphins were not used to capture tuna for the entire fishing trip. Later, these regulations were relaxed slightly and canned tuna could be labeled Dolphin-Safe simply if no dolphins were killed while fishing.

Teisl *et al.* (2002) found a small (1%) but statistically significant price premium to the Dolphin-Safe Tuna eco-labeling program. The authors conclude that this number may only reflect a partial measure of the price premium. The authors warn that consumers may not respond instantaneously to an eco-label, probably due to the need for information dissemination to consumers. Interestingly, since all tuna sold in the US is labeled Dolphin-Safe, consumers have no choice but to buy tuna labeled Dolphin-Safe (Roheim 2008). Thus, the low price premium reported by Teisl *et al.* (2002) may be an artifact of lack of product differentiation in the canned tuna market.

Consumer Willingness-To-Pay for Eco-Labeled Seafood

The market signal for MSC Certification is strongest in those markets where consumers are aware and concerned about the sustainability of fisheries. Thus, the primary markets for MSC certified products are the US and the European Union. Most consumers prefer an eco-labeled seafood product over a similar but non-labeled product, given that price differences are not too large (Wessells *et al.* 1999; Jaffry *et al.* 2004; Johnston *et al.* 2001; Johnston & Roheim 2006).

In 2003, Seafood Choices Alliance surveyed 1000 US adults on their seafood consumption and knowledge of seafood production (Seafood Choices Alliance 2003). Of those surveyed, 44% said that whether or not a species was overfished was either very important or had a great deal of importance on their seafood purchases. Additionally, 76% of Americans feel they do not have enough information about the seafood available to them and 67% are interested in obtaining more information about the environmental impacts associated with commercial fishing. The most popular choice as a mechanism for obtaining seafood information was a label (66%). Finally, 72% of those surveyed would be more likely to buy seafood labeled “environmentally responsible.”

Similarly, in 2007, Seafood Choices Alliance found 85% of consumers in the UK, Spain, and Germany were concerned about the environmental condition of the ocean. Of those surveyed, 84% would boycott seafood when fishing or farming harms the ocean environment. The average price premium that responding consumers would pay for environmentally friendly fish was 10% (Seafood Choices Alliance 2007).

Given that the majority of the California spiny lobster landed is exported to various countries in Asia, the above studies may not necessarily reflect the market opinion of this fishery’s main consumers. Unfortunately, there are few studies on consumer attitudes towards seafood in Asia. In 2004, the Chinese Certification Committee for Environmental Labeling surveyed Chinese citizens (Macfadyen & Huntington 2007) and found that an increasing number of consumers were aware of eco-labeling. Of the environmental factors respondents cited as purchase influences, most (69%) were for health reasons. Only 21% chose environmental friendly products because of ecological reasons. Surprisingly, 59% of respondents have a similar additional willingness to pay (10%) for environmentally labeled products. However, this increased willingness to pay is mostly for perceived health and safety and not environmental reasons.

In spite of these positive consumer attitude studies, a cautious approach to estimating consumer price premiums for lobster should be taken. There can be a gap between what consumers say they will pay and what they actually will pay (Srinivasan & Bloomquist 2009). Since the above information relies upon consumer surveys and not actual consumer action, there could be an over-estimate of willingness to pay for MSC certified seafood.

In contrast to other labeling programs, such as Dolphin-Safe Tuna, where consumers understand how their choice relates directly to iconic species, MSC Certification relies on

the vague concept of “ecological sustainability.” There is some doubt as to whether consumers will pay more to achieve sustainability (Gardiner & Viswanathan 2004; Jacquet & Pauly 2007). Additionally, there is no seafood-specific information in the markets where California spiny lobster is ultimately consumed. Finally, MSC Certification does not guarantee continued financial benefits. As more and more fisheries become certified, the marginal value of certification decreases with the increased supply of certified product (Kaiser & Edwards-Jones 2006; for a counter argument to this claim, see Roheim 2008).

MSC Certified Fisheries Price Premiums

There is very little direct empirical evidence for the price premium in MSC certified fisheries. The problem lies mainly with poor data collection, the inherent volatility subject to the market prices of fish, and the short time period since the creation of the MSC. These three issues make the price premium for fisheries difficult to discern (Roheim 2008). Below is a discussion of the MSC certified fisheries we found in peer-reviewed literature (with the exception of the American Albacore Fishing Association), with special focus on the two certified spiny lobster fisheries.

American Albacore Fishing Association (AAFA)

In 2007, the AAFA was granted MSC Certification. The AAFA represents fishermen who troll for Albacore tuna using individual hook and lines. After certification, the fishery was oversold for 2008, resulting in a price increase for fishermen from \$1700 per ton to \$2260 per ton (a 33% increase). Attributing this increase mainly to substantial marketing efforts, the fishery was able to enter many new markets and increase the demand for sustainably harvested Albacore Tuna. A secondary benefit was a reduction in the volatility of prices paid to fishermen (N. Webster pers. comm.).

Thames Herring Fishery

Fishermen enjoyed a substantial increase in price from \$3.20/lb. to \$4.80/lb. (a 50% increase) after obtaining MSC Certification (Roheim 2003).

Alaska Salmon Fishery

Alaskan Salmon became the first North American fishery to obtain MSC Certification, soon after the Western Australia Rock Lobster fishery. In an analysis of MSC certified Alaskan salmon, Roheim (2003) concluded that there was little information on the monetary impacts of certification. The Alaskan salmon fishery hoped that MSC Certification would provide a means of differentiation to help recover some of its recent market-share loss to farmed salmon. This may indeed be the case, because after becoming certified, Alaskan salmon was able to break into the MSC-friendly European market, generating \$35 million in new sales (Searle *et al.* 2004).

New Zealand Hoki Fishery

Hoki, or blue grenadier, is heavily fished in the commercial sector and is part of the whitefish market that includes haddock, cod, and pollock. Historically, the price per

pound fishermen receive in the whitefish market has been highly variable. After certification, Unilever committed to buying at least 4,000 tons a year of hoki, which benefited the industry by \$10 million (Roheim 2003). While Roheim (2003) states that it is very difficult to attribute causality in the price of seafood, the price of hoki rose 10% in the year after certification and reduced previously observed price volatilities. This stabilization of hoki's price in the highly volatile whitefish market is a substantial MSC Certification success story. Unfortunately, there is little empirical literature describing an exact price premium for the hoki fishery, since MSC Certification is just one of the many factors that determines the price fishermen receive for their products.

Australian Rock Lobster

The western rock lobster (*Panulirus cygnus*) lives in the waters off southwestern Australia. It is Australia's most lucrative single-species fishery and the largest spiny lobster fishery in the world with seasonal catches averaging 10,700 tons per year (Phillips *et al.* 2003). This value is significantly higher than the CCSL fishery. In many aspects, the Australian Rock Lobster fishery is managed similarly to the CCSL fishery. Seasonal closures to protect spawning individuals have been in place since 1962. The fishery is also managed through a limited entry license system for fishing vessels, escape ports in traps, and size limits. Unlike the CCSL fishery, the Western Australia fishery has trap limits as well as methods to manipulate the number of traps fished in the season to produce the desired levels of effort in one year (Phillips *et al.* 2003). The CCSL fishery has attempted to incorporate trap limits, but currently does not manage the number of traps fished (K. Barsky pers. comm.).

In 2001, the Western Australia Rock Lobster fishery became the first MSC Certified fishery. The fishery identified the European and US markets as those where the MSC label would produce the most benefits. One of the ideas behind obtaining certification was to gain a larger share of the European market than was held by other cold water lobster fisheries. That strategy seems to have been successful, with many countries importing more Western Australia lobster than before the fishery's certification (Phillips *et al.* 2003; Roheim 2003). Additionally, certification gives the fishery some insurance in markets where consumers are concerned about the sustainability of their seafood.

MSC Certification for this fishery has been important in developing information to be used for its own local management purposes. In a program similar to California's MLMA, the Australian government is attempting to meet ecological sustainable development goals across all of its fisheries. The MSC Certification process streamlined information and helped proactively discover the fishery's ecological risk assessments required under governmental management authority. During this process, the fishing industry recognized that environmental groups could be supporters in helping improve the management of fisheries and, likewise, other stakeholders garnered respect for the concern that the fishing industry showed for ensuring ecological sustainability. Finally, the recognition and sense of pride for the fishery should not be discounted. The MSC process has confirmed that the management in place since the 1960s has done a good

job of promoting ecological sustainability in the Australian rock lobster fishery (Phillips *et al.* 2003).

However, there is still little empirical evidence to demonstrate the market principles that MSC is grounded in. The fishery has yet to acknowledge a significant price premium. Phillips *et al.* (2003) argue that the full benefits of MSC have yet to be realized, since there is a lack of consumer knowledge of the MSC Certification (Phillips *et al.* 2003; D. Averill pers. comm.).

Baja Spiny Lobster

The Central Zone of Baja's red rock lobster fishery was successfully certified in 2005. According to the MSC, this was the first community-based, developing world fishery certified. The Baja red rock lobster is the same species as the CCSL (*Panulirus interruptus*), with the Baja fishery in a more southern part of its geographic range. Like the CCSL fishery, most Baja lobster is exported to Asia (Scientific Certification Systems 2004).

The entire Baja lobster fishery is divided into 26 fishing cooperatives. However, the MSC assessment's scope was limited to only 9 of these cooperatives (represented by FEDECOOP), comprising 80% of Baja's total catch (Phillips *et al.* 2008). Like the CCSL fishery, the Baja fishery sets baited wire traps that are fitted with escape ports to fish lobster. The main management regulations are a minimum legal size, prohibiting the take of gravid females, and seasonal closures. The Mexican government grants each cooperative exclusive fishing concessions in twenty-year intervals. This played an important role in the FEDECOOP's decision to undergo MSC assessment.

The FEDECOOP underwent MSC Certification for three primary reasons. The first was to maintain global competitiveness with the Western Australia Rock Lobster fishery after it became MSC certified in 2000. Second, the FEDECOOP speculated that meeting an international sustainability standard would give them enough political leverage to maintain their high levels of co-management in the fishery. Finally, the FEDECOOP hoped MSC Certification would give the fishery access to new markets in Europe. Phillips *et al.* (2008) state that a price premium was not an important consideration in this decision, since Asian markets are generally less interested in certified lobster.

After certification, there were many inquiries from new markets. However, the FEDECOOP ultimately made no inroads into new markets due to most buyers' desire only to purchase small volumes of the product, logistic hurdles associated with the distribution into new markets, and new buyers' primary interest in lower cost product forms, such as frozen tails (Phillips *et al.* 2008). According to Phillips *et al.* (2008), MSC Certification did not provide the Baja fishery with a price premium or allow much entry into new markets. However, our personal communications with fishery representatives in Baja claim a 7-10% price premium since MSC Certification.

MSC Certification did lead to several community and fishery development projects, grossing over \$21 million. These projects include bringing electricity to rural

developments, modernizing processing plants, upgrading fishing equipment, and constructing new lobster holding facilities. Rather than market benefits, the main benefits to the Baja fishery after certification have been the political and financial support to continue the government concession with strong and sustainable management of the resource (Phillips *et al.* 2008; Lopuch 2008).

Our own contact with scientists and buyers in Baja reported price premiums of 10% and 7%, respectively (C. Costello pers. comm.; C. Guenther pers. comm.). These anecdotal price premiums contradict Phillips *et al.* (2008) and their assertion that the fishery received no price premium or market impacts from certification. However, we report anecdotal evidence on the contrary.

Summary of Price Premiums

There are few quantified market benefits in the literature for any MSC certified fisheries, as demonstrated in our review of MSC and some of its certified fisheries (Nova-Hildesley & Short 2003; Roheim 2008). The ideal basis for an estimated price premium for the CCSL fishery would be the other two lobster fisheries certified under the MSC, but evidence of price premiums we found were either conflicting or non-existent. Although fishing season and total catch varies among the three fisheries, all three fish Spiny Lobsters with similar gear and sell the majority of their catch to Asian markets. The Western Australia Rock Lobster fishery has reported an increased market share in Europe, but no discernible price premium (Roheim 2003). Unfortunately, there is no clear evidence for or against a price premium in either of the two previously certified lobster fisheries.

A review of all certification, eco-labeling, and consumer preference studies analyzed for this project is presented in Table 2. We have found large price premiums for the producers of fair trade and organic certified coffee, organic cotton in the apparel industry, and FSC certification. For Dolphin-Safe Tuna, we have found a much smaller potential price premium. However, we believe the best estimate for a price premium will come from other MSC certified fisheries as well as the previously reported consumer willingness-to-pay surveys specific to seafood products.

Of the MSC certified fisheries in peer-reviewed literature, only Thames Herring and Hoki reported price premiums of 50% and 10%, respectively. The price premium is based on the consumer market demand for sustainable seafood. The MSC only began certifying fisheries in 2001 and only recently has the number of certified fisheries increased significantly. Because of the short time period since the MSC's inception, a lack of consumer education may lead to lower price premiums for MSC Certification. Consumers will not pay a premium for a sustainable product if they do not recognize the product as sustainable. Evidence from the Dolphin-Safe Tuna eco-labeling program supports the idea of a time lag between label development and price premium realization while information is disseminated to the public (Teisl *et al.* 2002). Thus, as more fisheries become certified and consumers increasingly become aware of MSC Certification, it is likely premiums will grow, rather than decrease.

Fishery/Organization	Price Premium
Fair Trade Coffee	48%
Organic Coffee	12%
Organic Cotton	38%
FSC Certification	5-10%
Dolphin-Safe Tuna	1%
Consumer Seafood Surveys	10%
Thames Herring	50%
Alaska Salmon	None Reported
New Zealand Hoki	10%
Western Australia Spiny Lobster	None Reported
Baja Mexico Spiny Lobster	10%; 7%; 0%

Table 2. Summary of fishery, eco-label, or survey studied and their associated price premiums.

Our review of consumer willingness-to-pay studies shows about a 5% to 10% expected price premium for eco-labeled seafood products in the Western world. The willingness-to-pay is probably less in Asia, where CCSL exports much of its catch. However, Asian willingness-to-pay does appear to be increasing recently when compared to past studies.

As a result of this analysis, we estimate that the price premium the CCSL fishery could expect after MSC Certification will range from 5% to 10%. We think these numbers are reasonable and conservative given the reported MSC price premiums, willingness-to-pay numbers, and expected changes in consumer preferences.

Additional Benefits

In addition to the price premium, undergoing the MSC Certification process may result in social, political or management benefits after certification. Individual fishermen may feel social pressure as well as pressure from their buyers to prove that their fishing is certified sustainable since the same product is certified in Baja California, Mexico and Australia. A social benefit of MSC Certification is a sense of pride in being a participant in a fishery that has been certified as sustainable by the world's leading certification and eco-labeling seafood program. This is especially poignant as the world decries worldwide fishery collapse (Pauly *et al.* 1998).

Politically, the CCSL fishery is considered “data-poor” to their regulators, the DFG. Under the MLMA, fisheries are considered data-poor if they do not have a complete stock assessment. Since some believe the CCSL fishery may be targeted soon for a fishery management plan under California's MLMA, a major benefit of certification may be to relieve some of this top-down regulatory pressure by being able to prove they are fishing at sustainable levels. For example, Lopuch (2008) reports that another small-scale

lobster fishery, in Brazil, initiated the certification process with sole intention of lobbying the government for a management plan.

Finally, the MSC assessment process, led by a team of experts across academia, government, and NGOs, may find improvements that could be made to the management of fisheries. If implemented, any improvements made to the management of the fishery could be a benefit if those improvements lead to increased yields in the fishery. Our analysis quantifies this effect as an increase to yields after MSC Certification. In the case of this particular fishery, the improvements could come from improved management of the recreational fishery. There are well-defined data and regulations on the commercial lobster fishery, but no concrete data of the recreational take (Ben-Horin *et al.* 2006). It may very well be possible that part of the MSC Certification assessment process leads to more stringent regulations for the recreational fishery. This in turn could lead to better management in the commercial fishery. The possibility that this better management leads to an increase in commercial lobster yields is the management bonus. For our analysis, we estimated this bonus to be anywhere from a 0–3 percent increase in yields.

Cost-Benefit Model (CBM)

Literature Review

Cost Benefit Analysis (CBA), also referred to as Benefit-Cost Analysis, is a tool that was developed to provide quantitative data to decision makers to better inform policy changes. CBA quantifies and evaluates the total monetary costs and benefits of a project (Kopp *et al.* 1997). One of the reasons for using CBA, according to Pearce *et al.* (2006) is that it provides a model of rationality, especially in the political arena where decisions do not always rely on a rationale based on costs and benefits. Using principles of neoclassical welfare economics as its underlying basis, its application to environmental issues center around the idea of an externality, a “third party detrimental (or beneficial) effect for which no price is exacted” (Pearce *et al.* 2006). CBA was first used in the early 19th century by French engineer Jules Dupuit, who used the approach to calculate the costs and benefits of various public works. More recently, the technique was employed by the Army Corps of Engineers for the U. S. Flood Control Act of 1936 (Chakravarty 1987).

While doing a Cost-Benefit Analysis broadly involves estimating the present values of costs and benefits of a project to calculate the present net benefit value of the project, the underlying economic and philosophical principles of the methods used in estimating costs and benefits have been widely critiqued. The benefits can be estimated either by gathering information on individual preferences through surveys or questionnaires (stated preferences) or by gathering data from the market place (revealed preferences) through a method like contingent-valuation method or travel-cost approach (Kopp *et al.* 1997).

CBA was first designed to guide public policy in the case of very specific local projects. Yet, as Shapiro and Schroeder (2008) state in their review, it has become a “one-size-fits-all technique applied to policy problems as varied as regulating mercury emissions from power plants to the roof strength standard for new automobiles.” The current controversies surrounding CBA have been a consequence of this extended application of CBA to projects with much longer timeframes and larger geographic scope. For example, the process used in estimating the length of a project depends on assessing factors such as technological changes, and shift in demand. Prest and Turvey (1965) claim these factors are vulnerable to a bias; they illustrate the importance of doing a sensitivity analysis in which calculations are repeated for different sets of variables to avoid this bias. According to Cole (2008), a sensitivity analysis shows how varying input parameters changes outcomes and highlights the most sensitive inputs to the model. In his critique of the Stern Review, he argues that the failure to include a sensitivity analysis is a significant omission.

While economics as a field has been undergoing reform with some of its fundamental concepts being redefined, CBA may fail to reflect the same. This technique, although criticized, remains an indispensable tool in the decision-making process. Some of its strengths are its transparency, the single-metric approach to comparing different attributes of a policy, and the template that it provides to filter inefficient projects (Kopp *et al.* 1997; Prest and Turvey 1965).

Methodology

Our cost benefit analysis is a model that weighs the quantified costs and benefits associated with MSC Certification for the CCSL fishery (CBM). The following section describes the assumptions of the model, calculations used, and the results of the model. We report the results for fishery-wide net benefits as well as results for individual fishermen net benefits, based on a series of landings.

Assumptions

To reduce the complexity of the CBM, several assumptions were made. The most conservative (that is, least beneficial) estimates derived were used throughout this model. This ensures that when the CCSL fishery is deciding whether or not to pursue MSC Certification, any error or bias from the analysis underestimates benefits and overestimates costs.

- Annual commercial harvest of California spiny lobster remained constant at 700,000 pounds. The average CCSL landings from published data from 2001–2007 was 759,486 pounds per year (Figure 2, CDFG & Guenther 2008).

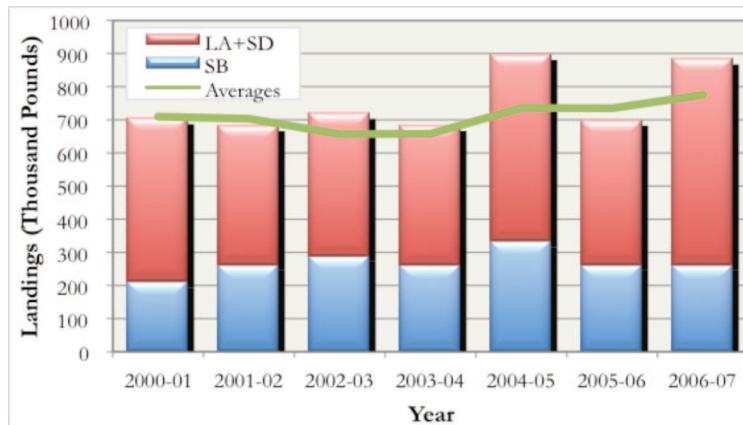


Figure 2. California Lobster Landings by Region and Season from 2001-2007 (Modified from DFG & Guenther 2008).

- Number of permits held constant at 216. While 141 of these permits are transferable and represent a permanent right to fish for that holder, 71 are non-transferable and are retired when that permit holder leaves the fishery. Thus, the number of permits in the fishery will likely decrease over the ten years covered in our model, but our calculations do not account for this.
- The price of lobster held constant at \$11 per pound. Price can vary spatially (by harbor) and temporally (over the course of a season and between seasons). Neither of these effects was included in the CBM.
- The real price of lobster is constant over time.
- Interest on any loans taken out is 0%. The California Fisheries Fund was formed to help fishery associations, seafood businesses, and government agencies fund projects that help fisheries become more stable and profitable.
- Principal on the loan is equal to the cost of the initial assessment for MSC Certification. The annual audits and reassessment will be paid out-of-pocket from Lobster Stamp Revenue. 10 equal annual payments were assumed to cover the initial loan principal.
- Overhead fee held constant at 25%. Since DFG will most likely act as the initial account holder for funds generated by the Lobster Stamp, they will probably take an overhead fee to administer the account. The actual number can range anywhere from 3% to 25% (K. Barsky pers. comm.).

Calculations

The cost-benefit model was broken into three main sections based upon three different fee collection mechanisms for the lobster stamp: a flat fee, a price per pound fee, and a hybrid fee with a combination of a smaller flat fee and a price per pound fee. All plans assume that the fishery is trying to raise exactly the same amount of money over a ten-year period. The only difference between the three plans is how the fees are proportioned between individuals fishing at varying intensities. Additionally, we quantified the amount of time required to collect the required revenue should the fishery decide to pursue MSC Certification without a loan.

Collection Mechanisms

In our scenarios, the fishery wanted to raise a specific amount of money, proposed and accepted by CLTFA during the summer of 2008. This specific quantity was then used to calculate the flat and price per pound fees for the three payment mechanisms using Equations 1–3.

Equation 1. Flat fee calculation. $F = m/f$

F is the fee per individual, m is the desired amount of money to be raised, and f is the number of permits in the fishery.

Equation 2. Price per pound fee calculation. $P = m/l$

P is the price per pound landed fee, m is the desired amount of money to be raised, and l is the total pounds landed. The price per pound fee was calculated using this equation and Excel's Solver function.

Equation 3. Hybrid fee calculation. $n = m - (f * i)$ $H = n/l$

m is the desired amount of money to be raised, f is the number of permits in the fishery, i is the flat fee portion applied to all permit holders, n is remaining portion of desired amount of money to be raised after i is collected from all permit holders. H is the price per pound landed fee, l is the total pounds landed. The hybrid fee was calculated using the above equations and Excel's Solver function.

After developing the fee collection mechanisms, the current value of the fishery was calculated using Equation 4. The current value of the fishery in our model (CV) is the value of the landings of the entire fishery prior to any MSC Certification price per pound premiums. The value of the fishery after MSC Certification (MSCV) was calculated using Equation 5 and incorporates the various quantified benefits according to the seven MSC benefit scenarios described below in Table 3. In addition to total fishery benefits, we used the CBM to evaluate net benefits to the fishery as shown in Equation 6. Further, the net benefits of individual fishermen based on annual pounds landed were calculated using Equation 7. All calculations are based on a ten-year time frame.

Equation 4. Current value calculation. $CV = l * p$

CV is the current value of the fishery, l is the total pounds landed, p is the price of lobster.

Equation 5. Fishery value after MSC Certification. $MSCV_i = l * (1 + b_i) * p * (1 + pp_i)$

$MSCV_i$ is the value of the fishery after MSC Certification according to any given scenario i , l is the total pounds landed, b_i is the management bonus percentage for any given scenario i , p is the price of lobster, pp is the price premium percentage for any given scenario i .

Equation 6. Fishery net benefits after MSC Certification. $NB_i = (MSCV_i - CV) - C$

NB_i is fishery net benefits after MSC Certification according to any given scenario i , $MSCV_i$ is the value of the fishery after MSC Certification according to any given scenario i , CV is the value of the fishery prior to MSC Certification, C is the total cost due to MSC Certification over 10 years.

Equation 7. Individual net benefits at varying fishing intensities. $NB_{if} = l * (1 + b_i) * p * (1 + pp_i)$

Fishing intensities are pounds landed by individual fishermen and were set at 0, 1000, 3000, 6000, 10000, 15000, and 25000 pounds annually. NB_{if} is individual net benefits according to any given scenario i fishing at any given fishing intensity f , l is the total pounds landed, b_i is the management bonus percentage for any given scenario i , p is the price of lobster, pp is the price premium percentage for any given scenario i .

MSC Benefit Scenarios

It was difficult to find a close analogue to the CCSL fishery that was MSC certified and reported a price premium. Because of this, we relied on consumer willingness-to-pay surveys and other certification schemes' reported price premiums in addition to other fisheries' reported price premiums from MSC Certification. Since this wide range of potential price premiums introduces inherent uncertainty, we tested the CBM's sensitivity by evaluating seven different potential scenarios for the fishery after MSC Certification (Table 3). The most conservative scenario estimates a 1% price premium and no management bonus. The most beneficial scenario estimates a 10% price premium increase and a 3% increase in yields from the management bonus.

The price premium would be an additional percentage increase to the current price per pound, representing the additional cost consumers are willing to pay after the CCSL fishery is certified as sustainable. Depending on the scenario, the price premium itself might decrease over time, representing an initial spike in the value of lobster, followed by a gradual decrease in the price premium as other fisheries become certified or the initial exposure of certification wears off. Finally, the management bonus represents a percentage increase in yield that may occur if the MSC Certification process points out steps to more sustainable (and more profitable) management.

	A	B	C	D	E	F	G
Price Premium	1%	5%	5%	10%	10%	10%	10%
Price Premium Decrease	0%	10%	5%	10%	5%	3%	0%
Management Bonus	0%	0%	1%	1%	2%	2%	3%

Table 3. MSC Benefit Scenarios used in the CBM.

Benefit Cost Ratio (BCR)

To quantify how the distribution of costs and benefits varies over our three fee collection mechanisms and seven fishing intensities, we calculated the benefit to cost ratio by using Equation 8.

Equation 8. Benefit Cost Ratio. $BCR = \frac{NB_{if}}{C_{if}}$

BCR is the benefit cost ratio, NB_{if} is the individual fisherman net benefits according to any given scenario i fishing at any given fishing intensity f , C_{if} is the individual fisherman costs according to any given scenario i fishing at any given fishing intensity f .

Results

In all scenarios, the benefits of obtaining MSC Certification are greater than the costs. Per fisherman, the average net benefits range from \$1,829 – \$45,676. The fees (based on generating \$64,800 annually) were a \$300 flat fee, a \$50 initial fee + \$0.08/lb fee or a \$0.095/lb fee on landings. In a year where the fleet lands 700,000 lbs, each of those scenarios generates \$64,800 annually.

Over the ten-year time frame, the fishery generates \$648,000. Our calculations estimate the costs of MSC Certification as \$375,000 over ten years. Our estimates of benefits do not account for the \$273,000 that the fishery would accrue after paying for the costs of MSC Certification. An extra fee would likely add incentive for some fishermen to exit the fishery. However, with the extra money, our analysis of costs and benefits would still be valid even if 91 fishermen exited the fishery. If fewer than 91 fishermen leave, then the fishery will have extra money to finance additional projects during the ten year period.

For the hybrid flat fee and per pound fee, there are many combinations suitable for this analysis. The hybrid approach is attempting to find middle ground between the flat fee and the per pound fee approaches. The per pound fee charges a fishermen proportionate to the amount he fishes. However, the per pound fee fails to account for the option value of fishing in the future. In other words, fishermen who do not fish now are able to capture the benefits of MSC Certification in the future, but would not be contributing to its costs. Given that our flat fee was \$300, the \$50 initial fee is our estimate of this future option value for fishermen.

Since only two MSC certified fisheries have gone through the 5-year reassessment, it was difficult to determine an appropriate timeframe over which to calculate costs and benefits. Since the 5-year reassessment is a large portion of the overall costs, a minimum of 5 years was needed to accurately determine the costs and benefits. Knowing that the 5-year timeframe was our lower bound, we decided a 10-year timeframe was appropriate. Each scenario generates a total of \$648,000 in Lobster Stamp revenue over ten years.

The economic benefits of MSC Certification are the same for every pricing scheme, since all plans assume a 700,000 lb. annual catch and generate the same amount of money. However, the economic benefits do vary across our seven MSC benefit scenarios, as shown in Table 4.

	A	B	C	D	E	F	G
Costs of Certification	\$375,000	\$375,000	\$375,000	\$375,000	\$375,000	\$375,000	\$375,000
Benefits of Certification	\$770,000	\$2,507,588	\$3,890,623	\$5,835,328	\$7,843,040	\$8,414,236	\$10,241,000
Net Benefits of Certification	\$395,000	\$2,132,588	\$3,575,623	\$5,460,328	\$7,468,040	\$8,039,236	\$9,866,000
Net Benefits per License	\$1,829	\$9,873	\$16,276	\$25,279	\$34,574	\$37,219	\$45,676

Table 4. Results of CBM according to our seven different MSC benefit scenarios with annual landings of 700,000 pounds.

It is possible that data from 2000-2007 represents a series of landings above the long-term average for the fishery. We re-analyzed the cost benefit model using the long-term historical landings average of 520,000 pounds (Table 5).

	A	B	C	D	E	F	G
Costs of Certification	\$375,000	\$375,000	\$375,000	\$375,000	\$375,000	\$375,000	\$375,000
Benefits of Certification	\$572,000	\$1,862,780	\$2,890,177	\$4,334,815	\$5,826,258	\$6,250,576	\$7,607,600
Net Benefits of Certification	\$197,000	\$1,487,780	\$2,515,177	\$3,959,815	\$5,451,258	\$5,875,576	\$7,232,600
Net Benefits per License	\$912	\$6,888	\$11,644	\$18,332	\$25,237	\$27,202	\$33,484

Table 5. Results of CBM according to our seven different MSC benefit scenarios with annual landings of 520,000 pounds.

As Table 5 shows, although estimated MSC benefits decrease when annual landings are assumed to be 520,000, each of our seven scenarios still results in positive net benefits from MSC Certification.

If the fishery decides to wait until it has enough money collected to pay for MSC Certification without a loan, it would need to collect and save stamp revenue for three years. It could then pay for an initial assessment in the fourth year without taking out a loan. These calculations were conducted without an interest rate for Lobster Stamp revenue, since a preliminary analysis revealed that only an extraordinarily high interest rate would decrease the time needed to enter MSC Certification.

Benefit Cost Ratio (BCR)

The fee collection plans differ in how the ratios of benefits and costs vary across fishermen landing different amounts. A ratio over 1 indicates a fishing bracket where the total benefits are greater than the total costs. A ratio under 1 indicates a fishing bracket where the total costs are greater than the total benefits. The 0 bracket is not reported,

since there are no benefits associated with fishing 0 pounds. Since the results from Scenario A are the only the scenario where some fishing brackets had BCR ratios under 1, we have only reported the BCR graphs from this scenario (Figure 3). All other scenarios maintain the distribution of benefits and costs between fishing brackets but have equally higher BCRs for every fishing bracket.

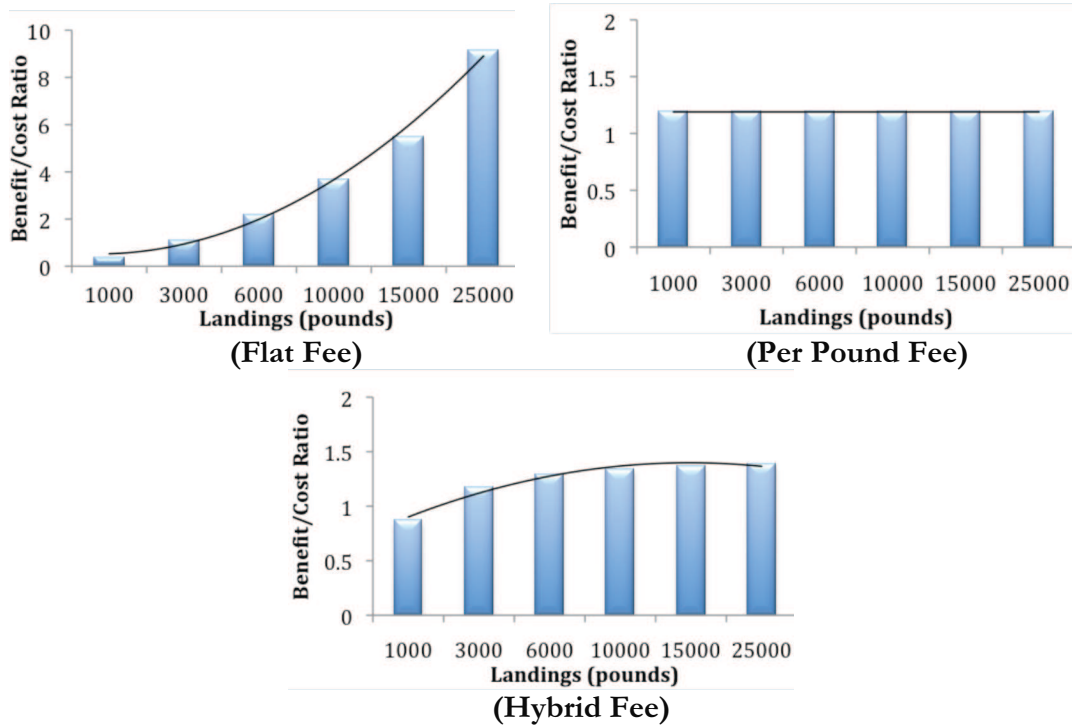


Figure 3. Comparison of CBR for different collection mechanisms.

Intuitively, the flat fee will have the most skewed ratios, as the fishermen who land more pounds will pay a proportionately smaller amount of their income than the fishermen who land smaller amounts. In contrast, the price per pound fee, by definition, will have equal benefit/cost ratios. By the same logic, the combination of an initial fee and price per pound fee will have results that lie somewhere in between the other two structures, depending on how the initial fee is adjusted.

Commercial Fishery Survey

Commercial Fishery Survey

After we found that the fishery could profitably self-fund MSC Certification, we next wanted to see if the fishery would support self-funding. To answer our second research question and broaden the scope of our project beyond our clients, we sent surveys to every commercial lobster permit holder assessing Lobster Stamp support, MSC Certification support, and preferred fee collection mechanism.

Literature Review

Surveys are a commonly used and accepted research tool with broad appeal because they are perceived as a reflection of attitudes, preferences, and opinions of society. Survey research involves requesting self-reported information from people about themselves (Rea and Parker 2005). Survey questions go beyond simply measuring public opinion; they shape and guide responses based on the method in which the issues are framed and the context is set (Zaller and Feldman 1992). Surveys are created to give accurate, reliable and valid answers to important questions (Alreck and Settle 2004). Well-designed surveys generate standardized data that lends itself to quantification and statistical analysis (Rea and Parker 2005). Surveys are becoming a very useful tool for environmental research and come in many forms.

Survey information can be collected through five general methods: mail, web-based, telephone, in-person interviews, and intercept. We used a mail survey. Mail surveys involve the use of a printed questionnaire and can be implemented in a relatively short period of time. Advantages of mail surveys include possible cost savings, respondent convenience, anonymity, and the use of visual aids. Disadvantages of mail surveys include comparatively long response time, lack of interviewer involvement, and incomplete open-ended questions (Rea and Parker 2005).

Methodology

Survey Design

To ensure that our legal recommendations were relevant to and addressed the needs of the entire lobster fishery, we conducted a survey of all 216 commercial lobster permit holders (lobster fishermen). We designed the Commercial Lobster survey to assess the attitudes of the fishermen regarding collection of fees through a commercial Lobster Stamp, contributions to research, priorities concerning fishery directed projects and MSC Certification, and to see if there was any correlation between demographics and attitudes. The survey had 4 main sections: demographics, commercial lobster stamp support, fishery project prioritization and selection, and support for MSC Certification. We used the results from the CBM to create a collection mechanism menu for the MSC section of the survey. This menu shows costs and potential fisherman profits from self-funding MSC Certification based on pounds of lobster landed and the three different funding collection options (Figure 4).

Plan	If you catch...	...you will pay...	...and your annual MSC benefits could be...
A Each fisherman pays a flat fee of \$300	0 lbs/year	\$300/year	\$0/year
	1000 lbs/year	\$300/year	\$110/year – \$1,463/year
	3000 lbs/year	\$300/year	\$330/year – \$4,389/year
	6000 lbs/year	\$300/year	\$660/year – \$8,778/year
	15000 lbs/year	\$300/year	\$1,650/year – \$21,945/year
B Each fisherman pays 9.5 cents per pound	0 lbs/year	\$0/year	\$0/year
	1000 lbs/year	\$81/year	\$110/year – \$1,463/year
	3000 lbs/year	\$244/year	\$330/year – \$4,389/year
	6000 lbs/year	\$488/year	\$660/year – \$8,778/year
	15000 lbs/year	\$1,219/year	\$1,650/year – \$21,945/year
C Each fisherman pays a \$50 flat fee plus 8 cents per pound	0 lbs/year	\$50/year	\$0/year
	1000 lbs/year	\$116/year	\$110/year – \$1,463/year
	3000 lbs/year	\$248/year	\$330/year – \$4,389/year
	6000 lbs/year	\$447/year	\$660/year – \$8,778/year
	15000 lbs/year	\$1,041/year	\$1,650/year – \$21,945/year

Figure 4. MSC Self-Funding Menu. Excerpt from Commercial Lobster Survey.

The timing of Bren School master’s projects necessitated conducting the survey during the commercial California Spiny Lobster fishing season (the first Wednesday in October through the first Wednesday after March 15th). We distributed the survey via mail to all commercial lobster permit holders because the fishermen’s schedules during the fishing season precluded interviews and the complex nature of some of our questions made phone interviews difficult and required visual communication. Mail surveys also decreased the time needed for fishermen to complete the survey and compensated for those who lacked Internet and e-mail access. Most importantly, the DFG, which issues commercial lobster permits and holds all contact information, had privacy concerns. Due to legal constraints, DFG could not release names, addresses or phone numbers of the permit holders. However, they agreed to print mailing labels, which we used to distribute the mail surveys.

Since there is no interaction between the researcher and its subject, mail surveys must be self-contained and perform effectively on their own (Alreck and Settle 2004). Therefore, we exercised careful preparation prior to implementing our survey. This preparation included multiple revisions, a presentation at a CLTFA meeting in Ventura, and a pilot study on Bren School students and local fishermen from multiple ports. Mail surveys have the highest non-response rates of all survey methods (Alreck and Settle 2004). To increase the Commercial Lobster survey response rate, we included a cover letter encouraging lobster fishermen participation, written and signed by CLTFA’s president and a Starbucks gift card in every survey. In addition to the survey mailing, we distributed extra copies of surveys to representatives at various harbors and posted the survey on CLTFA’s website. A copy of the survey and all cover materials can be found on our client’s website: www.cltfa.com.

Survey Analysis

Summary Statistics

We performed all statistical analyses using STATA. To characterize the surveyed population, we completed summary statistics on all questions in the survey including, where relevant, maximum, minimum, mean, standard error. When respondents answered with written responses, this information was categorized and aggregated for reporting. To strengthen our analysis, we also reviewed summary statistics conditional to varying factors that may influence decisions such as CLTFA membership, harbor, landings and permit transferability. To assess correlation between demographic responses, we created a correlation matrix. Strong correlations indicate overlapping variables represent the same factor and do not need to be included in the regression analyses.

Comparison to Actual Population

To determine if our sample population was representative of the actual CCSL fishery population, we compared demographics from our survey to data provided by DFG. We used a chi-square test to compare our harbor, landings, and permit transferability distributions to those provided by DFG from the 2007–2008 fishing season.

Lobster Stamp Support

In addition to asking whether or not respondents support creation of the Lobster Stamp, we asked their willingness to pay for the Lobster Stamp program. We included a paragraph explaining the Lobster Stamp and potential benefits of fishery directed research to facilitate fishermen's understanding.

Logistic Regression with Lobster Stamp Support as the Dependent Variable

We used a logistic regression to investigate demographic factors that potentially affected the respondent's support for Lobster Stamp support. We treated the dependent variable, lobster stamp support, as ordinal (yes/no). We expected respondents' age, CLTFA membership, permit transferability, and annual landings to affect Lobster Stamp support. The logistic regression model is presented as Equation 9 below.

Equation 9. Lobster Stamp Logistic Regression

$$Prob(Stamp = YES) = \frac{e^{\alpha_0 + \alpha_1[Age] + \alpha_2[CLTFA] + \alpha_3[Transferable] + \alpha_4[Landings]}}{1 + e^{\alpha_0 + \alpha_1[Age] + \alpha_2[CLTFA] + \alpha_3[Transferable] + \alpha_4[Landings]}}$$

Stamp is the ordinal dependent variable representing support for the Lobster Stamp program, α_0 is the y-intercept of the model, α_n is the independent variable coefficient estimate, *[Age]* is the stated age of fishermen, *[CLTFA]* is the stated membership of the California Lobster and Trap Fishermen's Association, *[transferable]* is the stated transferability of commercial lobster permit, *[landings]* is the stated value closest to average landing of lobster in pounds

Self-funded Fishery Project Priorities

We asked the fishermen to rank five options (1 = highest through 5 = lowest) for uses of collected funds exclusive of costs (fishery project priorities). To analyze this question,

means for each category were totaled. The lowest mean represented the most preferred industry related project. We also analyzed project priorities by harbor and CLTFA membership to further elucidate the possible reasons why fishermen responded as they did. Additional written fishery project priorities were compiled and added to the original fishery project priorities list.

Marine Stewardship Council Certification and Collection Mechanism Preference

Logistic Regression with MSC Certification Support as the Dependent Variable

We used a logistic regression to investigate demographic factors that potentially affected the respondent's support for the fishery pursuing MSC Certification. We treated the dependent variable, MSC support, as ordinal. We expected respondents' age, CLTFA membership, permit transferability, and annual landings to affect support for MSC Certification. The logistic regression model is presented as Equation 10 below.

Equation 10. MSC Logistic Regression

$$Prob(MSC = YES) = \frac{e^{\beta_0 + \beta_1[Age] + \beta_2[CLTFA] + \beta_3[Transferable] + \beta_4[Landings]}}{1 + e^{\beta_0 + \beta_1[Age] + \beta_2[CLTFA] + \beta_3[Transferable] + \beta_4[Landings]}}$$

MSC is the ordinal dependent variable representing support for the fishery pursuing MSC Certification, β_0 is the y-intercept of the model, β_n is the independent variable coefficient estimate, $[Age]$ is the stated age of fishermen, $[CLTFA]$ is the stated membership of the California Lobster and Trap Fishermen's Association, $[transferable]$ is the stated transferability of commercial lobster permit, $[landings]$ is the stated value closest to average landing of lobster in pounds

Multinomial Logit Model with collection mechanism choice as the Categorical Dependent Variable

In addition to basic statistics, we used a multinomial logit model to investigate how respondents' demographic factors affected their response to collection mechanism choice. We selected a multinomial logit regression because they are used when the dependent variable in question is nominal and consists of more than two categories (Menard 2002). The dependent variable, collection mechanism choice, was treated as categorical (A, B, C).

Survey Results

A total of 67 fishermen responded to the survey. This represents a 31% response rate of all CCSL permit holders of the 2008-2009 season. One response was not included in statistical analyses since important demographic questions were not answered. We used the results of the survey analysis to create a survey summary document for CLTFA (Appendix 3).

Deviation from Actual Population

To evaluate whether or not our responding population is representative of that of the actual CCSL fishery, we compared our demographic responses to demographic information provided by DFG from the 2007–08 season. This comparison showed that our responding population is significantly different than the actual fishery’s population with regards to landings and permit transferability distribution ($p < 0.0001$).

Our respondents were skewed towards active fishermen, while non-landing permit holders were highly underrepresented as shown in Figure 5 ($p < 0.0001$). Only three respondents reported zero annual landings. Since it is not prudent to extrapolate so few responses to represent such a large portion of the actual population, we analyzed the survey based only on active fishermen’s responses (Figure 6). After adjusting the survey results to take into account only the active fishing population, our survey response rate increased from 31% of all lobster permit holders to 41% of active fishermen. Because of this underrepresentation of non-landing permit holders, all results of statistical analyses only reflect the respondents who are a part of the active fishing population.

Another trend we observed in the landings was that survey respondents with annual landings ranging from 0–1000, 1000–3000, and 3000–6000 were under representative when compared to the actual fishery and that survey respondents with annual landings ranging from 6000–15000 and 15000+ were over representative when compared to the actual population (Figure 6).

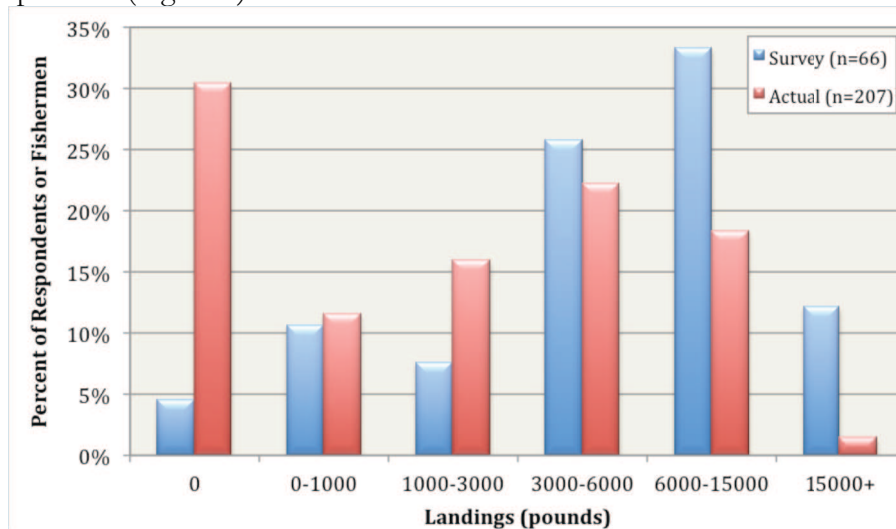


Figure 5. Comparison of survey respondents’ annual landings to DFG data from the 2007-2008 season.

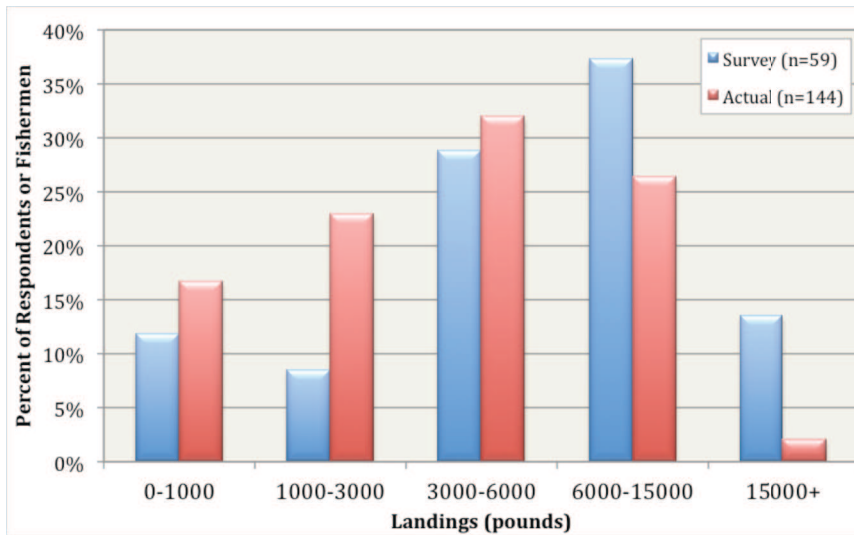


Figure 6. Comparison of survey respondents' annual landings distribution to DFG data from the 2007-2008 season with the non-fishing group removed.

Our survey population also deviated from the actual fishery population with regard to permit transferability as shown in Figure 7 ($p < 0.001$). We found that our survey population was over representative of transferable permit holders (88%) when compared to the actual population (69%).

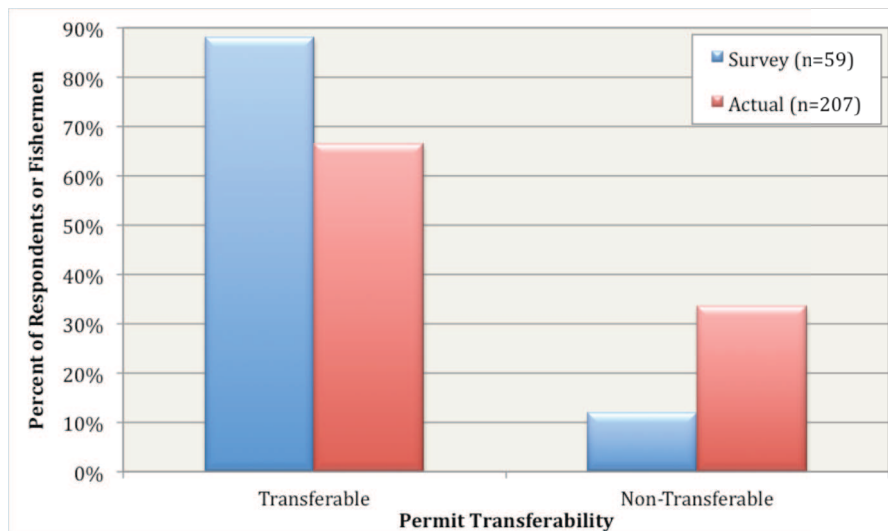


Figure 7. Comparison of active survey respondents' permit transferability to DFG data from the 2007-2008 season.

Demographics

Respondents' average years commercially fishing California spiny lobster was 22 years, but ranged from 1–45 years. The average age of respondents was 51 years, ranging from 28–81 years old. Distributions of years fishing California spiny lobster and average age of respondents is show below in Figure 8. For statistical tests, ages were grouped into the

following categories: 28–39, 40–49, 50–59, and 60 years or older. Responses regarding the number of years respondents plan to commercially fish lobster were highly varied. The average was 20 more years with a range from 0 to “Till I die” or “Till I sell my permit”. Since responses to this question involved both numbers and written responses, we did not include them in additional statistics.

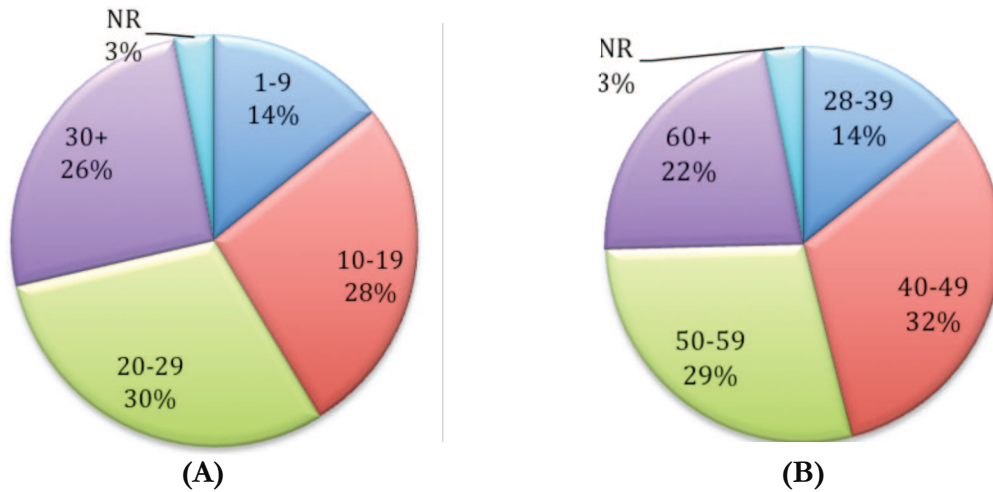


Figure 8. Respondents’ average years commercially fishing California spiny lobster (A, n=64) and age distribution (B, n =63)

Of 63 respondents, 46% of respondents were CLTFA members. Of the 61 responses, 74% stated they would be willing to collect lobster sex and size data for collaborative research.

To mirror CDFG’s statistics, we grouped respondents’ fishing harbors into three main harbors for analysis: Santa Barbara, Los Angeles, and San Diego. The Santa Barbara group includes those fishing out of Oxnard, Santa Barbara and Ventura. The Los Angeles group includes those fishing out of Redondo, Long Beach, Terminal Island, Newport, Dana Point, San Pedro, Los Angeles and Marina Del Rey. The San Diego group includes those fishing out of Mission Bay, San Diego, Point Loma and Oceanside. Respondents’ distribution by the harbor is shown below in Figure 9. Of the 66 total survey respondents, 62 reported their annual California spiny lobster landings. The distribution of reported landings can be seen in Figure 10.

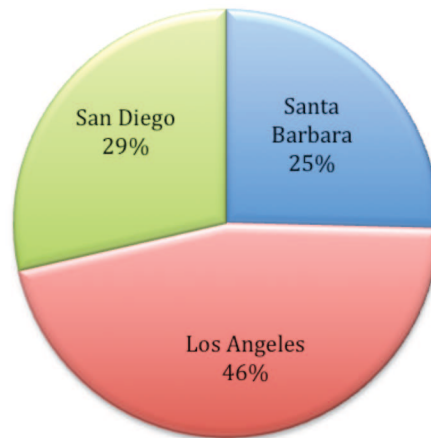


Figure 9. Respondents' fishing harbor distribution (n=63)

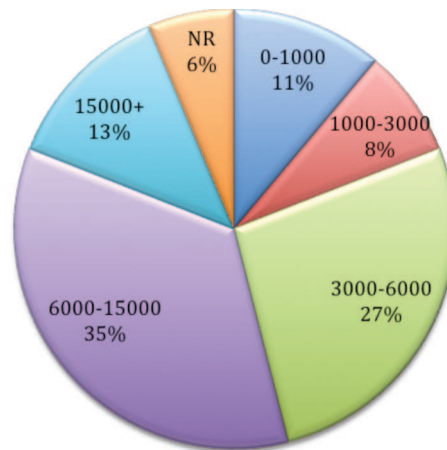


Figure 10. Respondents' reported annual landings in pounds. (n=63)

The correlation matrix (Table 6) showed that age was highly correlated with the number of years respondents reported holding a lobster permit (0.7). Because of this strong correlation, age was used in further analyses as a representative proxy for age and permit years. The correlation matrix also showed that Lobster Stamp support and willingness to pay \$300 for the Lobster Stamp were highly correlated (0.75).

	Permit Years	CLTFA	Age	Trans. Permit	Landings	Stamp Yes	WTP 300 Yes	Max. WTP	MSC Yes
Permit Years	1.000								
CLTFA	0.0877	1.000							
Age	0.7014	-0.1284	1.000						
Trans Permit	0.0804	0.3536	-0.2798	1.000					
Landings	0.1305	0.4881	-0.1596	0.5916	1.000				
Stamp Yes	-0.0903	0.6124	-0.2574	0.4330	0.4758	1.000			
WTP 300 Yes	-0.0410	0.5181	-0.2325	0.3565	0.3866	0.7546	1.000		
Max WTP	0.0018	0.6337	-0.1266	0.3495	0.4167	0.6147	0.6479	1.000	
MSC Yes	-0.0171	0.3536	-0.2798	0.0278	0.1972	0.5774	0.4951	0.3746	1.000

Table 6. Correlation table. *Permit years* is the number of respondents' years fishing, *CLTFA* is membership in CLTFA, *Age* is respondents' age, *Trans Permit* is permit transferability, *Landings* is respondents' reported landings, *Stamp Yes* is a yes vote for the Lobster Stamp, *WTP Yes* is respondents' willingness-to-pay \$300 for the Lobster Stamp, *Max WTP* is respondents' maximum willingness-to-pay for the Lobster Stamp, *MSC Yes* is a yes vote to pursue MSC Certification.

Lobster Stamp Support

Summary Statistics

Of the 63 respondents who were active fishermen 65% support the Lobster Stamp (Figure 11). 58% of respondents would be willing to pay \$300 for the Lobster Stamp. The average reported maximum willingness to pay for the Lobster Stamp was \$288, including 11 responses for \$300, although responses ranged from as little as \$0 to a maximum of \$1000.

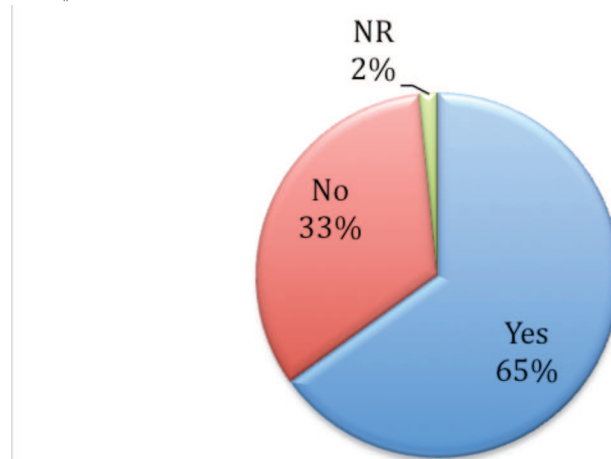


Figure 11. Respondents' Lobster Stamp support distribution (n=62, 1 non-response)

Respondents' written comments on why they would be willing to pay a given amount were aggregated and are reported below. Respondents who support the Lobster Stamp listed the following reasons for support in the following categories:

- need to stop poachers
- need to stop part-time fishermen
- want fishery representation
- want a proportional tax on the fishery

Respondents not supporting the Lobster Stamp listed the following reasons for opposing the stamp in the following categories:

- permit is non-transferable
- do not want to pay more than they already pay to fish
- do not want any more regulation
- do not believe the stamp is worth it

Logistic Regression with Lobster Stamp Support as the Dependent Variable

After running the model from Equation 9, the logistic regression equation predicting Lobster Stamp support was:

Equation 11. Lobster Stamp Logistic Regression with results

$$Prob(Stamp = YES) = \frac{e^{0.81-0.001[Age]+0.38[CLTFA]+0.15[Transferable]+0.03[Landings]}}{1 + e^{0.81-0.001[Age]+0.38[CLTFA]+0.15[Transferable]+0.03[Landings]}}$$

We included only 59 respondents in this regression; this represents all respondents that reported answers for all variables used in the regression (Lobster Stamp support, age, CLTFA membership, permit transferability, and landings). We found that permit transferability and reported landings were not significant. The regression was highly significant ($p < 0.001$) and showed the following factors for predicting Lobster Stamp support:

- Increasing age has a small but significant negative impact on support of lobster stamp ($p = 0.043$)
- CLTFA membership has a significant positive impact on lobster stamp support ($p = 0.003$).

Additional Lobster Stamp Support Analysis

We next examined whether respondents supporting the Lobster Stamp differed based on CLTFA membership or permit transferability. We found that respondents who were CLTFA members differed significantly from respondents that were non-members ($p = 0.02$). CLTFA member respondents were more likely to support the Lobster Stamp than non-member respondents (Figure 12). We also found that respondents who possessed transferable permits were not significantly different from respondents who did not have a transferable permit ($p = 0.13$).

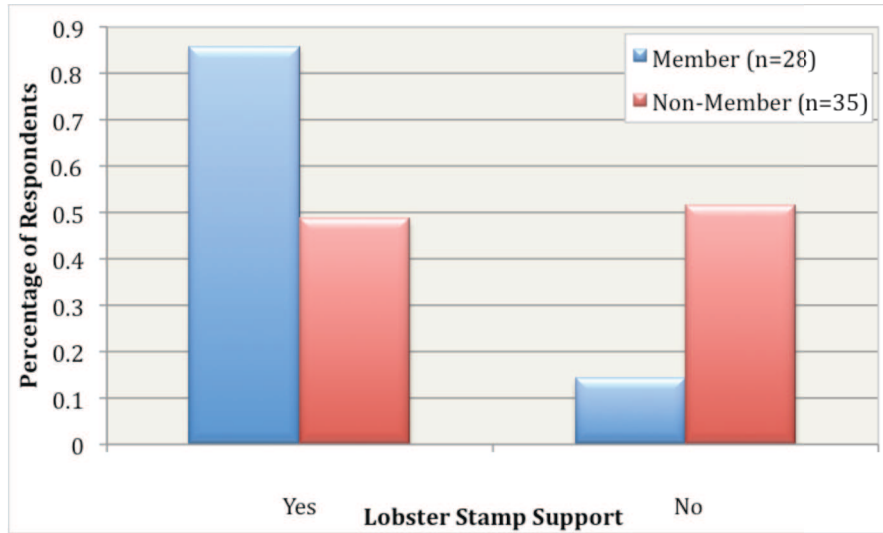


Figure 12. Respondents’ support and non-support for Lobster Stamp compared to CLTFA membership (n=63)

Self-funded Fishery Project Priorities

Fifty-eight fishermen prioritized the pre-populated list of self-funded project priorities and we ranked them from highest to lowest priority (Table 7). When we evaluated self-funded fishery project priorities based on respondents’ harbor (Table 8), we found MSC Certification was the highest project priority for respondents from Los Angeles and Santa Barbara, while permit buyback was the highest priority for respondents from San Diego. Marine Protected Area (MPA) monitoring was the lowest priority for respondents from Los Angeles and San Diego but was the second highest priority for Santa Barbara.

Rank	Fishery Priorities
1	MSC Certification (2.43 ± 1.45)
2	Permit Buyback (2.65 ± 1.48)
3	Legal Advocate/Lobbyist (2.67 ± 1.35)
4	Impacts of Recreational Lobster Fishing (3.03 ± 1.31)
5	Marine Protected Area Monitoring (3.67 ± 1.45)

Table 7. Self-funded fishery project priorities (mean ± standard deviation).

Rank	Los Angeles	San Diego	Santa Barbara
1	MSC Certification	Permit Buyback	MSC Certification
2	Lobbyist	Lobbyist	MPA Monitoring
3	Permit Buyback	Recreational Lobster	Permit Buyback
4	Recreational Lobster	MSC	Lobbyist
5	MPA Monitoring	MPA Monitoring	Recreational Lobster

Table 8. Self-funded fishery project priorities by harbor.

When we evaluated self-funded fishery project priorities based on whether or not respondents belonged to CLTFA (Table 9), we found that MSC Certification was the highest priority for respondents who were CLTFA members, while respondents who were non-CLTFA members listed permit buyback as their highest priority. Hiring a lobbyist was the second highest priority for both respondent groupings while MPA monitoring was the lowest priority.

Rank	CLTFA	Non-CLTFA
1	MSC	Permit Buyback
2	Lobbyist	Lobbyist
3	Recreational Lobster	MSC
4	Permit Buyback	Recreational Lobster
5	MPA Monitoring	MPA Monitoring

Table 9. Self-funded fishery project priorities by CLTFA membership

In addition to ranking the above five fishery priorities, respondents were asked to add in any additional fishery project priorities they wanted to include. We aggregated these responses and listed them below:

- Impacts of hoop nets, especially the new design
- Price fixing by buyers
- Wider migration studies
- Fishery Management Plan for lobster
- Keep NGOs out of stakeholder/permit status
- Adjusting size limits
- Impacts of purse seiners and dragnets
- Trap limits

Marine Stewardship Council Certification

Marine Stewardship Council Certification Summary Statistics

When asked if they support the CCSL fishery pursuing MSC Certification, 78% of respondents said yes (Figure 13). Further, when asked if they would support the use of the Lobster Stamp funds to pay for MSC Certification, 75% of respondents said yes (n=59). With marginal significance, respondents who are CLTFA members were more likely to support MSC Certification when compared to respondents who are not-CLTFA members (p=0.06).

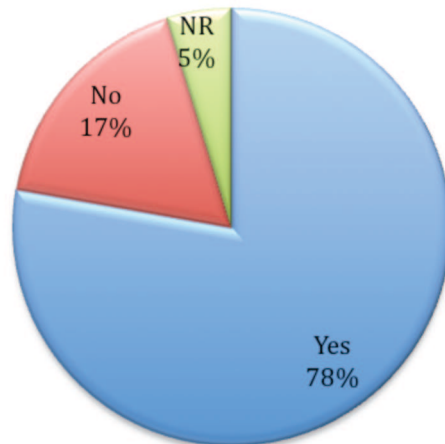


Figure 13. Respondents' MSC Certification support distribution (n=60, 3 non-responses)

Logistic Regression with MSC Certification as the Dependent Variable

After running the model from Equation 10, we found the regression predicting MSC Certification support was:

Equation 12. MSC Logistic Regression with results

$$Prob(MSC = YES) = \frac{e^{1.19 - 0.008[Age] + 0.27[CLTFA] - 0.13[Transferable] + 0.023[Landings]}}{1 + e^{1.19 - 0.008[Age] + 0.27[CLTFA] - 0.13[Transferable] + 0.023[Landings]}}$$

We included only 56 respondents in this regression; this represents all respondents that reported answers for all variables used in the regression (Lobster Stamp support, age, CLTFA membership, permit transferability, and landings). We found that permit transferability and reported landings were not significant. The regression was significant ($p=0.02$) and showed the following factors for predicting MSC Certification support:

- CLTFA membership has a significant positive impact on MSC Certification support ($p=0.013$).
- Increasing age has a small but marginally significant impact on MSC Certification support ($p=0.069$).

Collection Mechanism Menu Choice

Three payment collection mechanisms were explained in the survey (Figure 4): a flat fee of \$300, a \$0.095 per pound fee, and a \$50 flat fee paired with a \$0.08 per pound hybrid fee. When asked to select a preferred payment collection mechanism for the Lobster Stamp, 52% of respondents chose the flat fee, 13% chose the per pound fee, 11% chose the hybrid fee, 19% did not answer the question and 5% said “None” (Figure 14). The “None” category was created for respondents who wrote in the space provided that they did not want any of the collection mechanisms. When asked to rate level of support for each plan, the most frequent response for the flat fee was “support” while the most frequent responses for the per pound and hybrid fees were “less inclined to support.” This is consistent with the preferred plan findings.

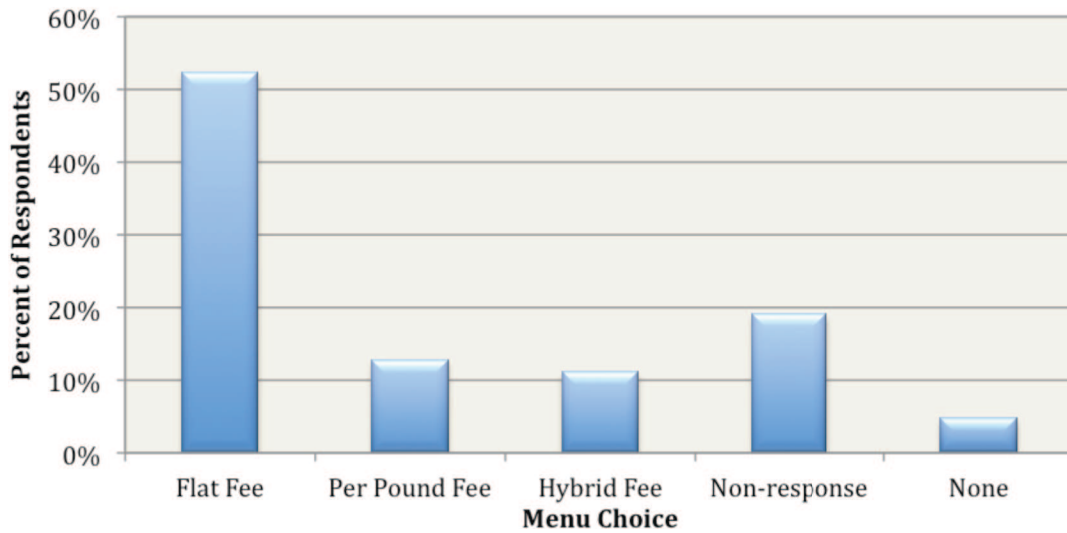


Figure 14. Respondents’ preferred payment collection mechanism. *Flat fee* is an annual fee of \$300, *Per Pound Fee* is \$0.095 per pound fee, *Hybrid Fee* is a \$50 flat fee paired with an \$0.08 per pound fee, *NR* is non-response, *None* represents respondents who wrote in “None”. (n=63)

Further analysis of collection mechanism preference showed that the higher a respondents’ reported annual landings were, the more likely they were to select the flat fee; all respondents who reported annually landing more than 15,000 pounds selected the flat fee. Conversely, those landing smaller amounts preferred the per pound or hybrid fee (Figure 15). But, we had a disproportionate amount of high-liners reply to this survey. So the apparent majority selection of the \$300 flat fee mechanism is likely due to the overrepresentation of fishermen with high reported landings responding to our survey and NOT majority fishery opinion.

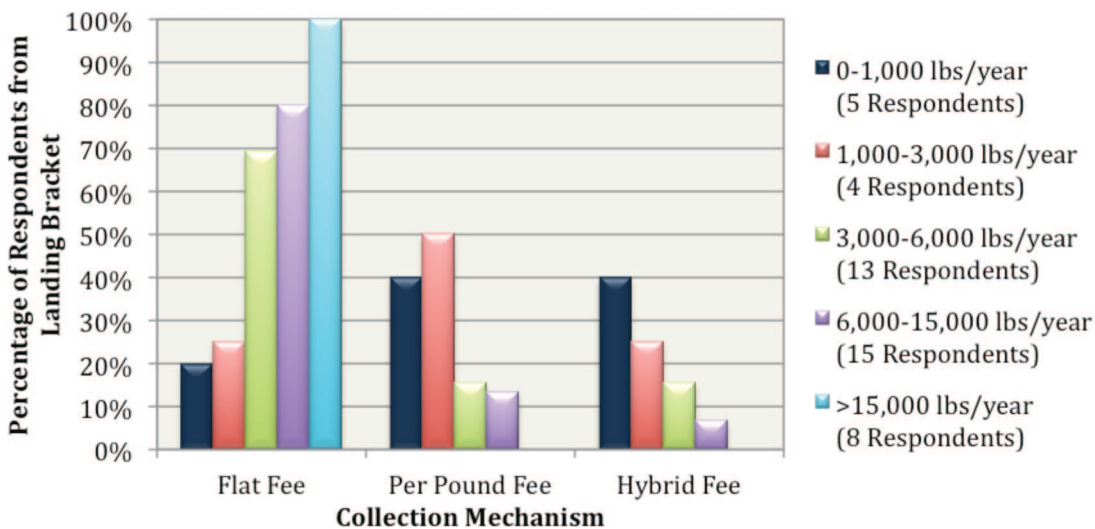


Figure 15. Summary of Fee Mechanism Choice by landing bracket. *Flat fee* is an annual fee of \$300, *Per Pound Fee* is \$0.095 per pound fee, *Hybrid Fee* is a \$50 flat fee paired with an \$0.08 per pound fee

Multinomial Logit Model with Collection Mechanism Menu as the Dependent Variable

Of the 48 respondents who answered the question about menu choice, only 10 did not support the Lobster Stamp. Thus, the logit is primarily explaining the attitudes towards collection mechanism of respondents who support the Lobster Stamp. We set the \$300 flat fee as the base outcome for our logit. The only significant finding the multinomial logit model found was that increased landings had a negative impact of respondents' choice of the hybrid fee (C) over the flat fee (Table 10). This is consistent with the trend observed in Figure 15 above.

Plan	Factor	Coefficient	SE	Significance
B	Age	0.045	0.044	
	CLTFA	-1.44	1.06	0.172
	Transferability	0.507	1.74	
	Landings	-0.844	0.549	0.124
	Constant	-0.815	3	
C	Age	-0.009	0.048	
	CLTFA	-1.84	1.31	0.158
	Transferability	1.25	1.9	
	Landings	-1.47	0.684	0.032**
	Constant	2.91	3.2	

Table 10. Multinomial logit model output (n=45). *Plan B* is the \$0.095 per pound fee, *Plan C* is the \$50 flat and \$0.08 per pound hybrid fee.

Legal Analysis

Legal Analysis

Once we determined through our CBM that the CCSL fishery could profitably self-fund MSC Sustainability Certification and found from our survey results that fishery members support self-funding, we next sought to explore the legal viability of the commercial Lobster Stamp. To determine the potential for successful self-funding legislation, we did independent research and contacted leaders, DFG, NGOs and fishery lawyers.

Literature Review

CLTFA is interested in pursuing the legislation of a commercial lobster stamp in order to provide funds for fishery-enhancing activities. This stamp will be purchased annually with the commercial lobster fishing permit. As part of our literature review, we researched other fisheries raising funds in similar manners.

Alaska's HB 419, passed in 2004, allows for the creation of twelve Regional Seafood Development Organizations (RSDAs). Fishermen in each of twelve state-designated regions in Alaska can form an RSDA and vote to fund them through self-taxing their catches. The collected funds, which can range from 0.5-2% of the total catch, is then sent to the Alaska Department of Revenue and appropriated back to the RSDAs (Southeast Alaska Rainforest WILD 2008). Examples of Alaskan RSDAs include the Copper River/Prince William Sound Marketing Association, which voted in 2005 to collect a 1% tax from catches by the drift gillnet salmon fleet and uses the funds for product promotion and consumer education about the region's salmon. The Association is managed by a Board of Directors made up of members of the fishing fleet (Copper River/PWS Marketing Association 2008).

The Alaskan Bristol Bay Regional Seafood Development Association, established in 2006, also collects a 1% tax, or "harvest assessment." These funds are used for product promotion and consumer education, as well as researching methods to reduce fisher costs (BB-RSDA 2008). The Bristol Bay RSDA is composed of commercial driftnet permit holders and is managed by a board of directors elected from the permit holders. The Board treasurer is responsible for the funds, and an independent accountant conducts an annual audit (BB-RSDA 2008).

The main purpose of the Alaskan RSDAs is to improve fishermen revenues. While funds can be used for marketing and consumer education, they have also been used for infrastructure benefiting the entire fishery. For example, facilities for loading and freezing salmon can improve fish quality and product shipping opportunities. The Bristol Bay RSDA invested in ice in boat holds to chill salmon, which led to increased fish quality and therefore increased revenues (Welch 2008).

In California, the California Salmon Council has been collecting money for a Salmon Stamp since 1979, when a \$30 stamp was introduced for fishermen to increase freshwater production of salmon. Commercial fishermen bought the stamp along with their commercial fishing license, and the money was matched by state funds. When the

program proved successful, leading to increased salmon production and increased profits for salmon fishermen, the Pacific States Marine Fisheries Commission, which had sponsored the original 1979 salmon stamp legislation, returned to the legislature to request an expansion of the program to promote salmon and habitat restoration (Commercial Salmon Stamp 2008). In 1982, the stamp fee was increased to an \$85 base fee plus \$12.50 per fisherman for each 250,000 pounds landed by the fishery, with a maximum fee of \$260 yearly. The commercial passenger fishing fleet joined the salmon stamp program in 1987. The program, by law, is reauthorized every five years, ensuring that the funds will be collected only with the support and approval of the commercial fishing and commercial passenger fishing salmon industries (CDFG 2008).

The purpose of the Salmon Stamp is to “put as many fish as possible on the deck per dollar spent.” This is achieved through increased salmon production, restoration of salmon populations and habitat, and education (Commercial Salmon Stamp 2008).

Also in California, fees from purchase of the abalone report card, introduced at \$15.00 in 1997 and today purchased for \$19.70, goes to the Abalone Restoration and Preservation Account, which funds research and management of abalone and abalone habitat, compliance with abalone-related statutes and regulations, direction for abalone and abalone habitat management volunteers, and abalone awareness and education. The abalone report card differs from the salmon stamp and Alaskan RSDAs in that it is required to be purchased with a sport fishing license by recreational abalone fishers, not commercial fishermen. Use of the funds is nominally managed by the Recreational Abalone Advisory Committee (RAAC), appointed by the Director of Fish and Game, which meets once per year and makes recommendations to the director concerning how the money should be spent (CDFG 2008). However, in practice, the RAAC has historically had limited control over the Recreational Abalone Management Program funds, acting essentially as a letter-writing committee with little real influence on fund expenditure (C. Voss pers. comm.).

The California Sea Urchin Commission, created in 2004, goes a step farther towards true fishery/government co-management. The commission is composed of ten elected commissioners, one appointed public member, and non-voting governmental stakeholders. Commission members vote on a tax not to exceed \$0.03/lb landed. The funds are used for product quality, conservation, policy and management, scientific research, marketing, and education. The tax is divided equally between urchin divers and processors, and is paid quarterly using Fish and Game landing tax procedures, with the processor deducting the tax from money paid by the diver and acting as a trustee until the commission is paid (CA Sea Urchin Commission 2008).

Though collection amounts and methods vary, the use of a base fee with incremental increases based on catch is not unprecedented. A committee or board of directors to determine use of the funds was present in all fisheries studied, and should probably be incorporated in the California Spiny Lobster stamp funds. Collection of funds by the state’s Department of Fish and Game is also common. Important issues to be addressed

in the California commercial lobster stamp legislation include ensuring that the fishery or elected representatives thereof, and not DFG, control how the money is spent; ensuring that excessive amounts of overhead charges are taken by DFG; and resolving whether the stamp should be established in perpetuity or whether fishery support should be reassessed at established intervals.

Methodology

In order to develop the objectives and legal language for the Commercial Lobster Stamp, our group first communicated with representatives of CLTFA to ensure that we fully understood their priorities and concerns. To further ensure the success of the commercial lobster stamp, we researched other fisheries with self-funding programs and compiled details of their self-funding programs for comparison. This research included consultations with fishery leaders as well as evaluating their legislation. We compared five fisheries with self-funding programs in Alaska and California: the California Sea Urchin Commission, Bristol Bay Regional Seafood Development Association, Copper River/Prince William Sound Marketing Association, California Salmon Council, and the California Recreational Abalone Management Program. We described each fishery's fee collection method, fee amount, payees, management procedures, and special notes as applicable. From our research, we determined which components of other fisheries' systems worked and might serve as a model for the commercial lobster stamp. Additionally, we identified any hindrances created by the legal language in other fisheries' stamp programs that should be avoided in the creation of the Lobster Stamp.

In addition to the above research, DFG Marine Region representatives, fisheries lawyers, and NGOs were contacted to discern the best way to turn the Lobster Stamp into a political and legal reality. Discussions with DFG focused on political and logistic constraints, as well as the pros and cons of collecting Lobster Stamp funds through DFG. Additionally, the political pathway to convert the Lobster Stamp language into a law was assembled. Discussions with fisheries lawyers and NGOs focused on potential legal challenges the Lobster Stamp may face, as well as specific legal phrases and clauses that should be included in the language recommendations.

We used the results from our research into self-funding fisheries, communications with external contacts, and legal language from other stamp programs to identify common and/or relevant practices that will be of use to the lobster fishery. This took the form of two deliverables: a detailed outline of Lobster Stamp Requirements and Recommendations for CLTFA (Appendix 4) and a Political Road Map detailing the steps CLTFA and its legal advisors will need to take to create a clear course for the fishery and its representatives to follow (Appendix 5). These deliverables will allow CLTFA and its representatives to ensure the fishery's needs and desires are met and that mistakes made in the past by other self-funding bodies will not be duplicated here.

Results

The results of our research into fishery self-funding programs provided insight into issues the CCSL fishery should consider in creating their own self-funding program. All five of the fisheries we researched have a committee or board of directors to determine how the collected fees should be spent. These committees generally consist of fishery representatives elected by the fishery, often with regional representation. For example, the California Sea Urchin Commission includes five divers representing San Diego, Los Angeles or Orange, Ventura, Santa Barbara, and Sonoma or Mendocino County (CA Food & Ag. Code Section 79040). The committees may also include governmental stakeholders or members of the public, who may or may not have voting rights.

However, not all of these committees have the authority needed to ensure their recommendations are implemented. In 1997, California's Recreational Abalone Management Program created a recreational abalone stamp and the RAAC to "make recommendations to the [DFG] director regarding abalone resource management" (CA Fish & Game Code Section 7400). Although intended to play a large part in determining how the fees from the abalone stamp were spent, this committee had no legal authority to decide how the funds were spent, and became, in effect, a "letter-writing committee" (C. Voss pers. comm.).

Not all of the self-funding regimes we studied were established in perpetuity. The Salmon Stamp expires every five years and then must be reauthorized, so that funds do not continue to be collected if they are no longer needed (CA Fish & Game Code Section 7863). Members of the California Sea Urchin Commission also vote to renew the commission every five years (K. Barsky pers. comm.).

Fee collection methods also varied among fisheries. The two Alaskan Regional Seafood Development Associations we studied collect a 1% marketing tax from its payees, while the California Sea Urchin Commission votes on a self-assessment, or tax, not to exceed \$0.03/lb. landed (CA Fish & Game Code Section 79120). The Recreational Abalone Stamp is sold to all recreational abalone divers annually for a flat fee of \$18.65 (CA Fish & Game Code Section 7149.8). The Commercial Salmon Stamp currently costs \$85.00 and is purchased by all commercial salmon vessel operators and crewmembers annually. However, if the total fishery's catch exceeds 3 million pounds, an additional \$12.50 for each additional \$250,000 pounds landed is added to the stamp fee. The stamp fee is legislated not to exceed \$260.00 (CA Fish & Game Code Section 7860c). Regardless of the fishery's catch and increases in the stamp fee, every stamp holder pays the same amount.

The research into other self-funded fisheries was combined with the results from our fishery survey to create the Lobster Stamp Requirements document (Appendix 4). This document will serve as a resource for the fishery as it moves towards self-funding. The Lobster Stamp Requirements document addresses the fishery's preliminary concerns that the fishery retain control of the funds and reduce the amount of overhead taken by DFG, as well as ensuring that all permit holders will be required to pay. In addition, the

Lobster Stamp Requirements document includes important components of a stamp bill that we identified through our research. The document also incorporates examples of existing legal examples from existing fishery self-funding laws on which to model the Lobster Stamp language.

Discussion

Cost Benefit Model

The results of the CBM indicate that even the most conservative benefits result in overall net benefits to the fishery. These positive net benefits do not incorporate the social and political benefits that were not quantified as part of this project. Including these supplementary benefits would only increase the positive net benefit to the fishery. Including the 520,000-pound landing analysis simulates a string of years with smaller than anticipated fishery-wide landings. Even with these reduced landings, our most conservative scenario of benefits still results in positive net benefits.

However, it is ill advised for a fishery to expect price premiums after simply undergoing certification. There is no guarantee that premiums will occur. Since most lobsters landed by the CCSL fishery are sold to Asia, it is especially pertinent in this case. Historically, Asian customers have been less willing to pay premiums for environmentally sustainable goods, but there is some evidence this is beginning to change (Macfadyen and Huntington 2007). Becoming MSC certified could be an important step to maintaining the CCSL fishery's current market share in Asia, where its main competitors (Australia and Baja, Mexico) are already certified. This can be thought of as the avoidance of a future price discount (K. Roheim pers. comm.). Still, it is unclear whether these markets would pay a premium to the CCSL fishery.

However, it is clear that if the fishery is proactive in accessing new markets, they will have a much better chance at achieving substantial price premiums (N. Webster pers. comm.). The AAFA is a perfect example. The AAFA began extensive talks between the buyers/processors and fishermen. Contributing to the excitement were articles in the New York Times and National Geographic. As a result, the fishery was oversold the year after certification and received a 33% premium.

In order to substantially increase the market benefits of MSC Certification, the CCSL fishery should be actively engaged in finding new markets. Perhaps the greatest opportunity is in Southern California. There is a noticeable absence of California spiny lobster in any major grocery chain in Southern California. Outside of specialty fish markets, it is almost impossible to find the lobsters harvested in the ocean only miles away. Instead, consumers find Maine, Australian, and Brazilian lobsters. Southern California is an ideal place for CLTFA to exploit new markets as the average consumer may be more willing to pay for sustainably harvested seafood and may be particularly interested in locally sustainably harvested seafood.

The benefit/cost ratios described in the results show that in the most conservative estimates of benefits, some fishermen might lose. For fishermen who land no lobsters during the season, the flat fee and hybrid approach will always result in negative net benefits. Only through the price per pound fee will fishermen landing nothing be charged nothing. However, even those who currently fish nothing may benefit from

MSC Certification through the fishery becoming more valuable in the future. Permit holders not currently fishing may choose to fish in the future given price premiums and management benefits from MSC Certification. Taking this into account, we recommend the hybrid \$50 flat fee and \$0.08 per pound fee. This fee mechanism avoids the free-rider problem by charging those who are not currently fishing for the option value to fish at an MSC certified fishery in the future. But, unlike the flat fee mechanism, the hybrid fee distributes the majority of the costs to those who fish the most. However, this approach may not be politically and/or legally tractable.

Commercial Fishery Survey

Survey respondents who are CLTFA members had a greater proportion of support for the Lobster Stamp (Equation 11 and Figure 12) and MSC Certification (Equation 12) than non-member respondents. Several factors may explain these differences. The survey's report of the prior vote of support for the Lobster Stamp by CLTFA members may have influenced CLTFA members to vote with the organization. Discussions of the Lobster Stamp and MSC Certification ideas at CLTFA meetings may have increased CLTFA members' understanding of, and therefore support for, the proposals. Finally, CLTFA members' current contributions of money to the fishery through membership dues demonstrate that they are already interested in pooling their funds to improve the fishery.

Active fishermen, those reporting landing lobster, had much higher survey response rates than inactive fishermen (Figure 5). The skew in the responses towards active fishermen, combined with their support of MSC Certification and the Lobster Stamp, support the theory that long-term ownership in a fishery promotes improved stewardship of the resource.

Survey respondents ranked MSC Certification as their highest self-funded fishery project priority. This finding is consistent with the high support found for the fishery's pursuing MSC Certification. Overall, survey respondents ranked MPA monitoring as the lowest self-funded fishery priority. However, we found large differences between fishery project priorities separated by harbor. Respondents from Los Angeles and San Diego ranked MPA monitoring as their lowest priority, while Santa Barbara respondents ranked it as their second highest priority. MPA monitoring could be a higher priority for the Santa Barbara fishermen since they have been involved in MPA implementation at the Channel Islands and realize the importance of science in informing decisions. Although respondents from Los Angeles and Santa Barbara ranked MSC Certification as their highest project priority, San Diego respondents ranked permit buyback as their highest priority. Non-CLTFA member respondents also ranked permit buyback as their highest priority. Respondents could be interested in permit buyback as a method of reducing the number of total fishermen in the fishery, as well as buying out inactive permits. Both CLTFA members and non-member respondents, as well as respondents from Los Angeles and San Diego, ranked hiring a legal advocate as their second highest priority. These respondents could recognize the need for representation, especially during the Lobster Stamp and Marine Life Protection Act processes.

The \$300 flat fee was the most preferred collection mechanism menu choice. As noted in the cost benefit model, this method does not distribute the costs proportionally. Our multinomial logit model (Table 10) showed that increasing landings makes a respondent more likely to select the \$300 flat fee. The responses to this question were biased towards higher landing respondents. When further analyzing the menu choices by landing bracket (Figure 15), we found a clear pattern confirming the multinomial logit results. The \$300 flat fee was the lowest cost and therefore most popular choice among fishermen landing 3000 or more pounds, compared to a \$0.095 per pound landing fee or a \$50 flat fee plus a \$0.08 per pound fee. There was large non-response (21%) to this question. There were also three respondents who wrote in “none” as a menu choice, all of whom voted “no” in support of the lobster stamp. Based on these findings, support for the \$300 flat fee system should be used with caution since it is only representative of the higher landing respondents.

Respondents shared concerns regarding self-funding as well as MSC Certification. Some respondents felt overly burdened by the existing fees, felt more fees might put them out of business, or felt that any more fees were unnecessary. A few respondents were willing to pay up to \$1000 for the lobster stamp, mainly as an attempt to force the non-active fishermen out of the fishery. Some respondents strongly opposed paying for MSC Certification, asserting that the CCSL fishery’s sustainability already has a long history of data to support it. Respondents also expressed concerns about funds being collected through the DFG. Some respondents offered suggestions for future management, including introducing trap limits and basing a fee structure off the number of traps used.

The majority support for the Lobster Stamp and for the \$300 flat fee payment mechanism from our survey respondents will be an important supplement to the Lobster Stamp legislation. However, recognizing the dynamics and differences in opinions of the fishery is imperative in characterizing the fishery.

Legal Analysis

By evaluating existing fishery self-funding programs, we determined what issues faced by other fisheries should be addressed in the formation of the Lobster Stamp. We also addressed the fishery’s preliminary concerns, expressed to us by CLTFA members at the beginning of our project. Our solutions to these potential issues and fishery-identified concerns were compiled into the Lobster Stamp Requirements Document.

CLTFA expressly requested that we identify strategies they can follow to reduce overhead costs and maximize the amount of control the fishery has over how the funds are spent. One option we considered while researching a self-funding mechanism for the CCSL fishery was the creation of a California Commercial Spiny Lobster Commission. In California, commissions are formed under the Marketing Branch of the California Department of Food and Agriculture (CDFA) as marketing programs independent of DFG. Commissions are voted into existence by fishery members and are legally empowered to establish regulations and self-funding programs that must be followed by

the entire fishery (CDFA 2008a; CDFA 2008b). This would allow the CCSL fishery to hold the funds from their self-funding program and directly control fund expenditures, and would completely eliminate overhead costs taken by an outside agency.

However, our analysis suggests that the CCSL fishery is not currently in a position to form a successful fishery commission. Compared to the California sea urchin fishery, which has successfully created a commission, the lobster fishery encompasses both a larger spatial area and a greater number of members. In addition, the fishery is currently divided between fishermen with transferable permits and those with non-transferable permits. These regional differences and different types of permits held by fishermen translate to very different priorities amongst individual fishermen. The creation of a commission would require buy-in from all members of the fishery, which may prove very difficult to achieve if common goals and priorities could not be agreed upon by everyone. Further evidence that the lobster fishery is not currently prepared to form a commission is the fact that CLTFA is currently only able to collect annual dues from about 20 members. Until fishery members can be relied upon to consistently pay annual fees in the interest of improving the fishery, an easily enforced legal obligation that all fishery members pay for the Lobster Stamp when purchasing their permit will be required.

Though a commission is not currently a feasible option for the fishery, the creation of a California Commercial Spiny Lobster Commission may be an appealing option in the future, as the number of permit holders decrease and the fishery's priorities become more closely aligned. In the absence of a commission, the fishery will likely have to have DFG collect the Lobster Stamp fees to ensure that all members of the fishery contribute to the fund.

Our discussions with DFG and research of other fisheries yielded language on which to model the overhead collection in the stamp bill. A set overhead percentage of the Lobster Stamp funds collected through DFG can be named in the legislation. Alternatively, the legislation could dictate that DFG return a check for the funds directly back to the fishery without taking any money in overhead, rather than holding onto the money until it is used by the fishery. However, this second option is not greatly supported by DFG, and would also require the fishery to find a reliable treasurer to manage the funds. Although support by DFG is not strictly required in order to pass legislation, DFG does have an opportunity to comment on potential legislation affecting its operations, and these comments may influence whether the bill is passed (K. Barsky pers. comm.).

A primary concern to the fishery is to maintain control over how the money is spent. The fishery's priorities of some possible activities were examined through our survey. We discussed several of these activities with DFG to glean what range of activities would be possible if DFG were to collect the money. For example, one of the fishery projects discussed was the fishery hiring a lobbyist to represent their interests. If DFG holds the funds, the funds would technically be "state money." California law places many

restrictions on activities for which state funds can be used, including a condition that this money cannot be used to hire a lobbyist (K. Barsky pers. comm.). We determined that an advisory committee with authority to make binding decisions would ensure that the fishery controls how the money is spent, within the legal restrictions applicable if DFG holds the funds.

To help the fishery ensure they have spending control, the Lobster Stamp funds could be held by the Ocean Protection Council (OPC). OPC is a governmental organization established in 2004 to support California's Ocean Protection Act. The OPC's legislated duties include "coordinat[ing] activities of state agencies that are related to the protection and conservation of coastal waters and ocean ecosystems..." (COPA Section 3561(a)(1)) and "contract[ing] with the California Ocean Science Trust and other nonprofit organizations, ocean science institutes, academic institutions, or others..." (COPA section 31615(4)) to accomplish their overall goals of improving ocean protection and organizing more effective use of public funds (COPA Section 33505). OPC has been identified as an organization willing to hold the Lobster Stamp funds in a trust account not subject to appropriations, as funds held by DFG may be. Under this arrangement, DFG would collect the Lobster Stamp Funds and pass them directly to OPC to enter into the Lobster Stamp Trust Account. This would minimize the amount of overhead costs to DFG (H. McGonigal pers. comm.). Combined with an advisory committee to represent fishermen's interests, this would ensure that the funds would be available to the fishery to use when and for what purpose they are needed.

From our discussions with DFG, we determined that an annual flat fee of \$300 per fisherman would be the simplest to administer and therefore would result in the lowest overhead costs from DFG. Our preliminary survey results also suggest that this fee structure will receive the widest amount of support from the active fishing population.

The Lobster Stamp Requirements document also includes legal language relevant to the issues we identified as important to manage in the stamp bill. For requirements within the document that have legal precedent, sample legal language has been inserted for use in the Lobster Stamp legislation. This legal language is taken from existing fishery self-funding legislation and provides examples on which to model the Lobster Stamp bill language.

In addition to the Lobster Stamp Requirements, we also created the "Pathway to the Lobster Stamp" (Appendix 5), detailing the process we followed and the next steps for the fishery to take to move the lobster stamp through legislation. This document will not only be a useful resource for the CCSL fishery, but could also be helpful to other fisheries planning to establish their own self-funding mechanisms.

The Pathway to the Lobster Stamp begins with the creation of the Lobster Stamp Requirements document, and moves through our discussions with fisheries lawyers, NGOs, DFG, and representatives of other fisheries to determine the legal and political viability of the stamp. We also identified members of the California State Assembly

representing regions where lobster fishing takes place and who are sympathetic towards the fishery's cause whom the fishery can approach to sponsor the bill. These include Pedro Nava of Assembly District 35 (Santa Barbara and Ventura Counties) and Jared Huffman of District 6 (Marin and Sonoma Counties).

The Lobster Stamp Requirements document, examples of legal language, results from our survey and cost-benefit model, as well as the Pathway to the Lobster Stamp itself, are important components of our project. These documents will be important resources for the fishery as it moves towards self-funding, and transform our project from an academic exercise to one that provides a tangible and useful result to our client. Creating these documents is an important step in the Pathway to the Lobster Stamp, and represents the end of our project's involvement in the Lobster Stamp creation process.

Project Limitations

Cost Benefit Model

The MSC cost assessment was inhibited by recent changes MSC has implemented for fishery assessments. Since the new FAM applies only to fisheries entering assessment after July 21, 2008, there are currently no fisheries that have been certified under this methodology. Since the assessment process is now more consistent, the new FAM could lead to a reduction in assessment costs.

The new Risk-based Framework (RBF) was created to allow data-poor fisheries to be assessed under the new FAM. It allows for a more qualitative approach to fill the gap for data-limited components of a fishery (MSC 2009). According to conversations with the MSC, the lobster fishery will likely use the RBF should they decide to undergo full assessment for MSC Certification (D. Averill pers. comm.). The RBF was not introduced until February 2009, so we were unable to study its effects on the fishery's MSC Certification costs. This could result in a drastic reduction in the cost of MSC Certification since the RBF allows for a fishery to obtain MSC Certification without performing a stock assessment (D. Averill pers. comm.).

For the cost-benefit model to produce workable results in the scope of this project, we had to make simplifying assumptions about the number of permits and price of lobster remaining constant throughout the ten-year period. In reality, the number of permits will almost assuredly go down regardless of whether or not the Lobster Stamp is implemented, though the introduction of the Lobster Stamp may increase the number of fishermen leaving the fishery in the near future. Faced with the requirement to pay an additional fee without receiving any benefits, fishermen who are inactive may choose to leave the fishery instead of paying the additional fee, contributing to a significant reduction in the amount of permits soon after the lobster stamp is enacted. This analysis did not predict this effect nor account for it in its calculations. The price of lobster could have a significant effect on our calculations as well. Data was not available at the time of analysis to increase the resolution of our cost-benefit model by including a temporally and spatially dynamic value of lobster.

Commercial Fishery Survey

It is important to view our survey results with caution because they represent only 31% of the fishery and are skewed towards active fishermen. In addition, our survey respondents were not representative of the actual population with regards to average annual landings and permit transferability (Figure 5 and Figure 7). Because of this, it was necessary to be cautious in our interpretation of the apparent majority of support for the Lobster Stamp, MSC Certification and the \$300 flat fee payment mechanism. The results of our survey could be strengthened through two modifications: weighting and controlling for standard error. Weighting would adjust the responses to better fit the actual population. The responses from underrepresented groups, such as non-transferable permit holders, would have increased weight versus respondents who help transferable permits.

Although our analyses showed non-significant differences between transferable and non-transferable permit holders, and their support for the Lobster Stamp, this lack of confidence does not mean the trend is not there. Because we were sampling from a finite small population, our analyses were very sensitive to changes in our sample size. For this analysis, we only had eight respondents holding non-transferable permits. However, this lack of confidence does not mean the trend is not there. For this analysis, we only had eight respondents with non-transferable permits. To better understand attitudes of the fishery as a whole, a new survey should be developed to obtain a more representative sample of all CCSL permit holders.

Additional improvements that we could have made to the survey include randomizing the order of survey questions, conducting personal interviews to explain difficult questions, and performing the survey outside of the fishing season. Some respondents raised concerns regarding the order of survey questions, especially those asking about Lobster Stamp support and MSC support. Randomizing the order of these questions would have allowed us to control for any influence these questions may have had on responses. The complex nature of the survey question regarding payment mechanism choice may have confused some respondents. Personal interviews could have eliminated ambiguity regarding the question. This may have resulted in a higher response rate and/or different responses. Finally, sending the survey outside of the commercial lobster-fishing season could have increased the amount of time available to fishermen to complete the survey, thereby increasing the response rate.

Some respondents may have selected MSC Certification as their top priority among self-funded fishery projects because we phrased the question as “select your priorities regardless of cost.” The costs were not explained until a later section of the survey. Explaining these costs earlier in the survey may have modified the respondents’ choices of self-funded fishery project priorities. Respondents chose permit buyback as the second most popular fishery project priority. We theorize that CLTFA President John Guth’s mention of permit buyback in the letter of support distributed with the survey may have contributed to the popularity of this selection.

After survey results were distributed to the fishery, a fisherman contacted us and said that a number of fishermen in his harbor, including himself, were disappointed when they saw the results. This was because they thought a non-response to our survey would count as a no vote towards the lobster stamp. This shows that some fishermen perceived our survey as ballots rather than opinion finding devices. For them, their non-response does not indicate they do not care about the issue, they just think that automatically counts as a "no" vote. This should be considered in future attempts to involve fishermen in research.

Legal Analysis

Researching fishery self-funding programs carried certain limitations. We chose to focus our research on fishery self-funding programs fairly similar to the program that the lobster fishery is interested in pursuing. For example, we did not research the lobster cooperatives used by lobster fishermen in Baja California, because these cooperatives are very community-based and do not provide a model applicable to the CCSL fishery's idea for a Lobster Stamp. This focus, combined with language barriers, severely limited the number of fisheries available for us to compare in researching existing self-funding programs.

Even among the fisheries we studied, none provided an exact model for the fishery to follow. The CCSL fishery encompasses a large spatial area and diversity among members' priorities that make self-organizing difficult. The fairly large quantity of money required to accomplish proposed goals such as MSC Sustainability Certification makes the Lobster Stamp a less agreeable proposal for fishery members than less expensive stamps such as the \$18.65 Recreational Abalone Stamp. The wide range of activities the fishery is interested in funding is most closely compared to the California Sea Urchin Commission, but as discussed above, the commission does not provide a good model for the CCSL fishery to follow at this time. This set of unique requirements made it difficult to translate other self-funding programs into a cohesive model for the CCSL fishery to follow.

Recommendations

Research into other fisheries produced recommendations to the CCSL fishery, which we incorporated into the Lobster Stamp Requirements. Our recommendations include the creation of an advisory committee or board of directors elected by the fishery to determine how the funds should be used. This committee should be composed of fishery members and may also include non-fishermen, such as scientists and/or agency representatives, as voting or non-voting members of the committee.

In order to ensure that the lobster fishery has real power to control how the stamp funds are spent, the legal language for the lobster stamp should specify that the Lobster Stamp committee's recommendations are legally binding. We also identified issues for the fishery to make decisions about prior to drafting the final committee legislation for the Lobster Stamp. These include the number of committee members, the lengths of their terms, and how members should be elected to fairly represent the fishery. We

recommend that the committee includes regional representation of permit holders, as well as representation of both transferable and nontransferable permit holders and permit holders ranging from those who do not fish at all to those landing over 15,000 pounds per year. Inclusive representation of the fishery's diverse interests is vital to ensure fairness in determining Lobster Stamp funding priorities.

In addition to the creation of an advisory committee, we also recommend that the stamp bill legislation include a set expiration period, so that the fishery may renew or revise the stamp periodically. Based on the California Salmon Stamp, which expires and must be renewed every five years, this will ensure that the fishery does not continue to collect money if it loses support in the future.

Based on our legal analysis results, we also recommend that a \$300 flat fee be collected annually by DFG from each permit holder. Collection by DFG will guarantee payment by all permit holders, and collection of a flat fee will reduce the amount of overhead that DFG requires and maximize the probability that the Lobster Stamp legislation will pass.

In order for the fishery to retain maximum possible control over how the stamp funds are spent, we recommend including a range of possible allowable activities in the legislation. We also recommend the fishery legislate that DFG transfer the Lobster Stamp funds directly to OPC, which will hold the funds in a trust account, minimize overhead costs and maximize fishery access to and control of the funds.

The remainder of the Pathway to the Lobster Stamp, after our group's research and recommendations concerning the Lobster Stamp Requirements, consists of our recommendations on the fishery's next steps. We recommend that the fishery align with a group or individual familiar with the legislative process to assist with writing the bill and moving it through the state assembly, and that the fishery votes on the final legal language through a second mail survey or regional meetings. The fishery and its allies will then contact the assembly members we identified in order to find a sponsor or co-sponsors for the bill. These assembly members will then move the bill through Congress and the Lobster Stamp will be adopted as law.

The MSC Sustainability Certification does not guarantee economic benefits to fishermen; it only creates the possibility of benefits. Should the fishery choose to undergo MSC Certification, it should bear in mind the significance of being proactive and reaching out to new markets overseas and domestically. One of the ways the CCSL fishery can increase the probability of benefits is to talk with buyers, processors, and retail chains about chain of custody certification. Chain of custody certification allows the fishery's products to bear the MSC logo at the point of consumer purchase. This allows environmentally minded consumers to shop for seafood products bearing the MSC logo. To increase the likelihood of the economic benefits discussed in this project, we recommend the fishery actively pursue new markets and a chain of custody certification where appropriate.

Conclusion

Through our research, we established that implementing a self-funding mechanism in the CCSL fishery is economically, socially, and politically feasible. Our CBA demonstrated that not only could the fishery self-fund MSC Certification, but that this project would lead to net profits for the fishery. Our fishery survey results suggested that the majority of active fishermen support the Lobster Stamp and use of the collected funds for MSC Certification. Our legal analysis discovered existing legislation on which to model the stamp language and established the legal and political feasibility of Lobster Stamp legislation. Representatives from the Environmental Defense Fund have introduced legislation to create the Lobster Stamp. On February 25, 2009, Assembly Member Saldana introduced bill number AB571, which will require purchase of a Commercial Lobster Stamp with every commercial lobster permit. Revisions are ongoing and CCSL fishery representatives will be using the Lobster Stamp Requirements and Recommendations document we created to ensure that the final version of the bill addresses the potential issues we identified and successfully achieves the fishery's goals.

While the Pathway to the Lobster Stamp includes details specific to the CCSL fishery, the general procedure outlined in this project is applicable to similar fisheries wishing to develop self-funding. These fisheries would require a relatively localized geographical scale and management body, and would require leaders able to identify and pursue projects of interest to the majority of the fishery. It is important to first review the fishery's needs and goals. This includes an evaluation of the fishery's organization, its political climate, projects for which fishery members would like to use the funding, and the price point and method for funding. After evaluating the fishery, a careful financial and legal analysis is necessary to ensure the fishery's goals could be met by the price point of the collection mechanism and that both the projects and collection mechanisms are legally feasible. The final steps of the Pathway to the Lobster Stamp ensure that legislation will be enacted, but that the fishery will be involved in approving final language before it is adopted as law. One of the most important lessons to take from this project is that the fishery must be collaboratively involved throughout the process to ensure equity and self-funding success.

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Appendices

Appendix 1

Default Assessment Tree

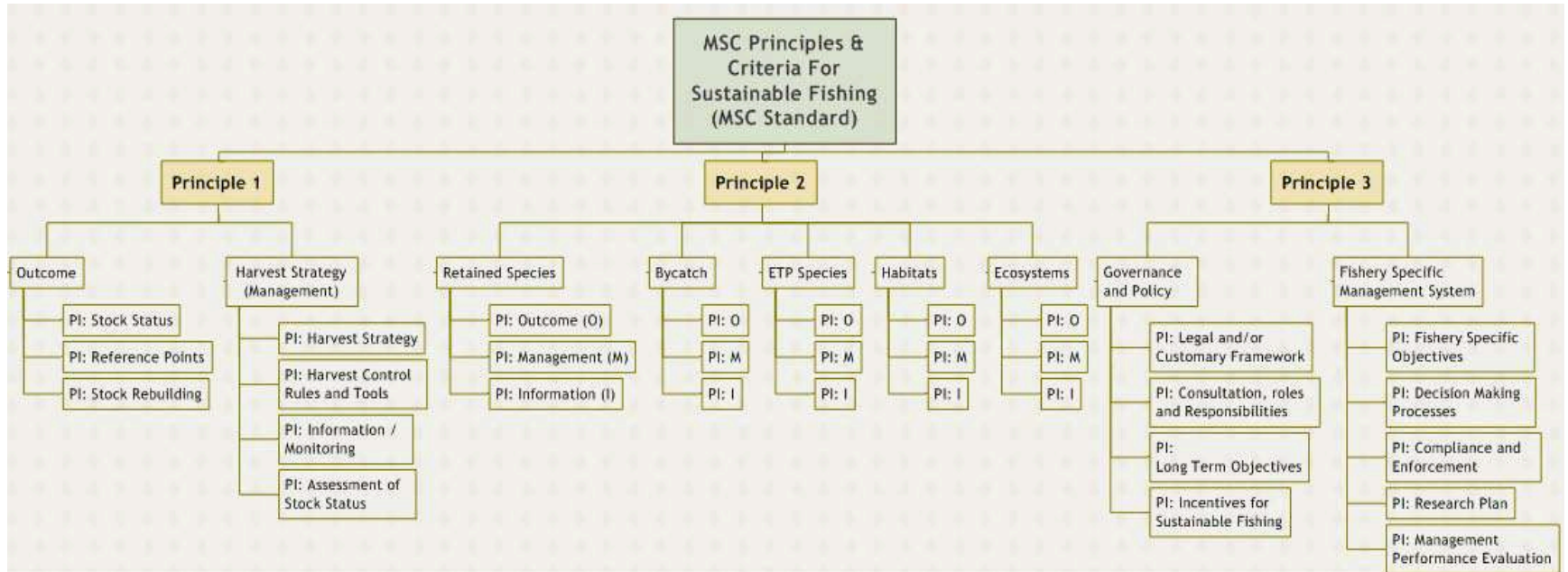


Figure 16. MSC's new Default Assessment Tree (D. Averill pers. comm.)

Appendix 2

Commercial Lobster Fishermen Survey

Dear commercial lobster permit holder,

Let us buy you a cup of coffee!

We are Master's students at the Bren School at UC Santa Barbara. Under the leadership of John Guth and Chris Miller, we are working for the California Lobster & Trap Fishermen's Association (CLTFA) to identify ways that we may assist the fishery. In the summer of 2008, an opportunity presented itself when CLTFA members at meetings in Dana Point and Santa Barbara voted to explore methods of self-fundraising for fishery research. The money would be used for projects relevant to the fishery. In partnership with CLTFA, we are investigating the commercial lobster fishery's options for self-fundraising.

While you are enjoying a cup of coffee on us, we would appreciate you taking 10 minutes to complete our survey. Your participation is vital to ensure our project captures perspectives of the entire fishery. The more input we receive from you, the more accurate and useful our recommendations will be to the fishery.





Since we are trying to reach the entire commercial lobster fishing community, surveys are being sent to every permit holder. Please note the survey responses will be completely anonymous and returned directly to us. Individual responses will not be shared. Any reports or presentations referencing these responses will report only aggregated results.

A copy of the survey is also available through Talib Wahab, John Law, and on CLTFA's website (www.cltfa.com).

If you have any questions or concerns regarding this survey please call us at 805 893-5524 or email us at southcoast@bren.ucsb.edu.

Your participation is greatly appreciated. Please mail responses by **January 23rd, 2009**.

Sincerely,

Lauren  Theresa 
 

Lauren, Phil, Theresa, Samantha, and Uthra
South Coast Group Project
2400 Bren Hall
Bren School of Environmental Science & Management
University of California, Santa Barbara
Santa Barbara, CA 93106-5131

Commercial Lobster Fishermen Survey

To all lobster permit holders and fishermen:

This survey is important, please fill it out and return it as soon as possible. I'm sure you are all aware of the current MPA process that is going on at this time, and the possible impacts it may bring to our fishery. There are other issues in our near future that have the potential to affect us adversely. A fishery management plan for lobster is being discussed and we need to be involved in it. Such things as quotas, allocations, IFQ's, TFQ's, etc. are all being talked about by others outside the fishery. It is important that we step forward and come up with a plan and direction that the fishery participants want. Our association has met several times to discuss these goals and strategies and we hope you will take the time to join in. The lobster stamp idea mentioned in the survey will insure that everyone participates financially other than just a few to achieve future goal or even a buy down of permits. It is an expense whatever the amount, that we need to endure in order to go forward to protect our fishery.

John Guth



President, CLTFA

Commercial Lobster Fishermen Survey

This survey was designed to assess the viewpoints of all commercial lobster fishermen in southern California regarding self-funding fisheries research. The results of this survey will be an important supplement to the recommendations made by our Master's thesis Group Project to the lobster fishery. Your participation is voluntary and will remain completely anonymous.

1. How many years have you held a commercial lobster fishing permit? _____
2. What harbor do you fish out of? _____
3. Are you a member of CLTFA? Yes No
4. What year were you born? _____
5. How many more years do you plan to commercially fish lobster? _____
6. Is your permit transferable? Yes No
7. Which value most closely represents your average annual landings of lobster in pounds? Please circle your response
 - a. 0 – 1,000
 - b. 1,000 – 3,000
 - c. 3,000 – 6,000
 - d. 6,000 – 15,000
 - e. More than 15,000

Lobster Stamp

In the summer of 2008, California Lobster and Trap Fishermen's Association (CLTFA) members met in Dana Point and Santa Barbara and voted to explore a method of self-fundraising for spiny lobster projects known as a "Commercial Lobster Stamp." This stamp would be purchased annually with your commercial fishing permit. Potential benefits of self-funded fishery projects include increases in lobster yield, increased price/pound, and scientific data to inform management. These funds would be collected by the Department of Fish and Game (DFG) and placed into a Commercial Lobster Account to be used solely for the commercial lobster fishery. Recognizing that CLTFA membership is not necessarily representative of the entire fishery, we would like to gain a broader perspective of what the fishery, as a whole, would support.

8. Do you support the idea of the lobster stamp as described above? Yes No
9. At the Dana Point meeting this summer, CLTFA members agreed they would be willing to pay an annual flat fee of \$300 in addition to your purchase of the commercial lobster operator permit. Would you support a \$300 fee applied annually to each permit?
 Yes No

What is the maximum price you would set the lobster stamp at (and still be willing to pay yourself)? Why?

(continued on next page)

Commercial Lobster Fishermen Survey

Self-Funded Fishery Research Projects

10. Please rank the following options for uses of funds collected through the Commercial Lobster Stamp from 1 to 5, with 1 being your highest priority (exclusive of cost).
- a. ____ Impacts of recreational lobster fishery
 - b. ____ Marine Protected Area monitoring
 - c. ____ Permit buyback
 - d. ____ Legal advocate/Lobbyist
 - e. ____ Marine Stewardship Council Sustainability Certification

11. Are there any other industry related topics you would like to see added to the list? If yes, please write below.

12. Interest has been expressed in participating in collaborative research. Would you be willing to collect lobster sex and size data from a few of your traps (2–5 traps per week)?
- Yes No

Marine Stewardship Council Sustainability Certification

The Marine Stewardship Council (MSC) is an international non-profit organization that certifies fisheries as sustainable. This certification rewards sustainable fisheries where environmental impact is minimized and effective management is in place. Benefits of certification include potential price per pound premiums and yield increases. Two other lobster fisheries are currently MSC Certified: Western Australia rock lobster and portions of the Baja red rock lobster fisheries.

13. Do you support the idea of your fishery pursuing MSC Certification? Yes No
14. At the Dana Point and Santa Barbara meetings this summer, CLTFA discussed allocating portions of the Commercial Lobster Account toward obtaining MSC Certification. Would you support the use of the Commercial Lobster Account to pursue MSC certification? Yes No

(continued on next page)

Commercial Lobster Fishermen Survey

Marine Stewardship Council Sustainability Certification (continued)

Our group has worked on estimating the potential costs and benefits of applying for MSC certification. By analyzing previously surveyed fisheries, talking with MSC experts, and speaking with experts in the California Spiny Lobster fishery, our group has conservatively estimated the costs of certification as totaling around \$568,750. This is the highest reasonable estimate we constructed. Potentially, the costs could be significantly lower. This figure includes pre-assessment, assessment, data collection, annual audits, the first five-year reassessment, and an additional 25% for account overhead costs from DFG.

We determined the benefits of MSC certification by looking at data from previously certified fisheries. Fisheries have reported price per pound increases after certification ranging from 1% – 50%. We estimated the benefits conservatively and report values that represent a 1% to 10% increase in price. This range is reflected in the estimates for individual MSC benefits in the last column of the table below.

All three Lobster Stamp options produce \$660,000 of revenue for the fishery, assuming annual total landings are the same among the options. The distribution of lobster stamp fees among fishermen is the only difference between the options.

Please review the table below:

Plan	If you catch...	...you will pay...	...and your annual MSC benefits could be...
A Each fisherman pays a flat fee of \$300	0 lbs/year	\$300/year	\$0/year
	1000 lbs/year	\$300/year	\$110/year – \$1,463/year
	3000 lbs/year	\$300/year	\$330/year – \$4,389/year
	6000 lbs/year	\$300/year	\$660/year – \$8,778/year
	15000 lbs/year	\$300/year	\$1,650/year – \$21,945/year
B Each fisherman pays 9.5 cents per pound	0 lbs/year	\$0/year	\$0/year
	1000 lbs/year	\$81/year	\$110/year – \$1,463/year
	3000 lbs/year	\$244/year	\$330/year – \$4,389/year
	6000 lbs/year	\$488/year	\$660/year – \$8,778/year
	15000 lbs/year	\$1,219/year	\$1,650/year – \$21,945/year
C Each fisherman pays a \$50 flat fee plus 8 cents per pound	0 lbs/year	\$50/year	\$0/year
	1000 lbs/year	\$116/year	\$110/year – \$1,463/year
	3000 lbs/year	\$248/year	\$330/year – \$4,389/year
	6000 lbs/year	\$447/year	\$660/year – \$8,778/year
	15000 lbs/year	\$1,041/year	\$1,650/year – \$21,945/year

15. What is your opinion of Plan A?
 Strongly Support Support Less inclined to support Would not support
16. What is your opinion of Plan B?
 Strongly Support Support Less inclined to support Would not support
17. What is your opinion of Plan C?
 Strongly Support Support Less inclined to support Would not support
18. What is your preferred plan? A B C

(continued on next page)

Commercial Lobster Fishermen Survey

Thank you for completing our survey. You may use this page to provide additional written comments, or if you have questions or comments you would like to voice, you can also call us at 805 893-5524.

Please mail your response to the address below by **January 23rd, 2009**. For your convenience, we have enclosed a self-addressed, postage paid envelope. Your feedback is very valuable.

South Coast Group Project
2400 Bren Hall
University of California, Santa Barbara
Santa Barbara, CA 93106-5131

Appendix 3

Survey Results for CLTFA



COMMERCIAL LOBSTER FISHERY SURVEY 2009

A Supplement to the Southcoast Master's Thesis Group Project

More information and copies of this document can be found at <http://fiesta.bren.ucsb.edu/~southcoast/>
 Please contact us at southcoast@bren.ucsb.edu if you have any questions about our project or this material.

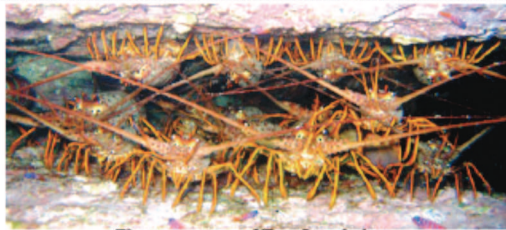


Photo courtesy of Dan Scanderbeg

In January 2009, we sent mail surveys to all commercial lobster permit holders. This survey was part of a Donald Bren School of Environmental Science & Management Master's Thesis Group Project. Our goal was to assess the viewpoints of all commercial lobster permit holders in Southern California regarding self-funding through a lobster stamp, self-funded fishery research project priorities, and Marine Stewardship Council (MSC) Certification.

	Respondent Characterization	1
	Marine Stewardship Council Certification Support	2
	Participation in Collaborative Research	2
	Lobster Stamp Support	3
	Self-funded Fishery Project Priorities	4

Deviation from Actual Population

Survey respondents were largely active fishermen and non-landing permit holders were highly underrepresented (Figure 1). Since it is not reasonable to characterize the opinions of the non-fishing community based on so few responses, we analyzed the survey based only on active fishermen's responses. Our survey population also deviated from the actual fishing population with regard to representation of transferable permit holders vs non-transferable permit holders. 88% of respondents held transferable permits where the actual distribution of transferable permits is 69% of commercial lobster operator permits issued in 2008 (Figure 2).

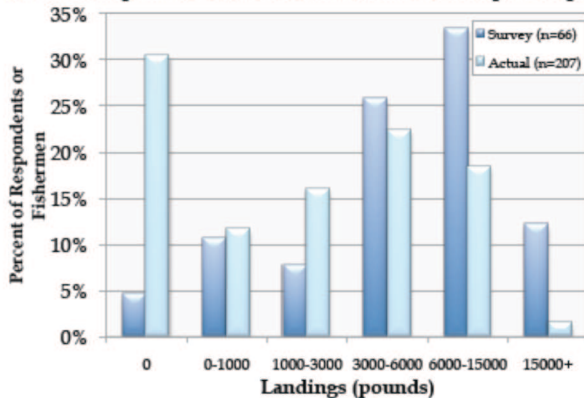


Figure 1. Distribution of landings among lobster permit holders. Survey respondents were largely active fishermen with most (34%) reporting average landings of 6-15000 lbs whereas DFG landings receipts from the 2007-08 season report 18% of permit holders landing in this range.

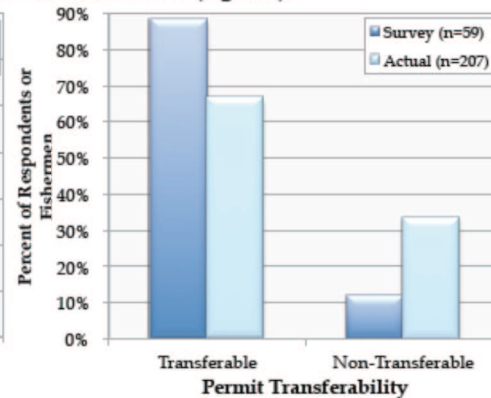


Figure 2. Comparison of active survey respondents' permit transferability to DFG data from the 2007-2008 season.

Respondent Characterization

We received 67 responses to our survey representing a 31% response rate. Our “active” respondents represent 42% of permits landing lobster from the 2007-08 season. Respondents plan to commercially fish lobster for an average of 19 years with a range from 0 to till I sell my permit.

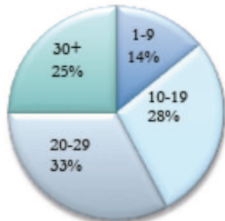


Figure 3. Respondents' reported average years commercially fishing. Average: 22 years. Range: 1-45 years

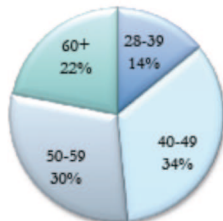


Figure 4. Respondents reported age. Average: 51 years. Range: 28-81 years

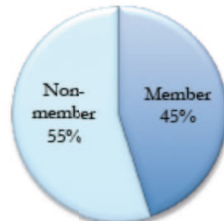


Figure 5. Percent respondents reporting CLTFA membership.

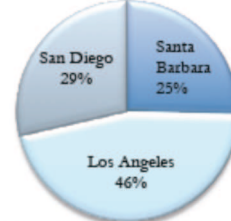


Figure 6. Harbor distribution

Participation in Collaborative Research

We described collaborative research as collecting lobster sex and size data from a few traps every week. 48 respondents (76%) stated they would be willing to collect information from their traps (Figure 7). When we grouped responses by harbor, there was still majority support for participation in collaborative research ranging from 72% support to 81% support (Figure 8).

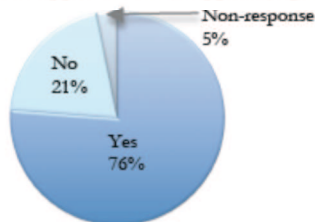


Figure 7. Respondents' willingness to participate in collaborative research (n=63).

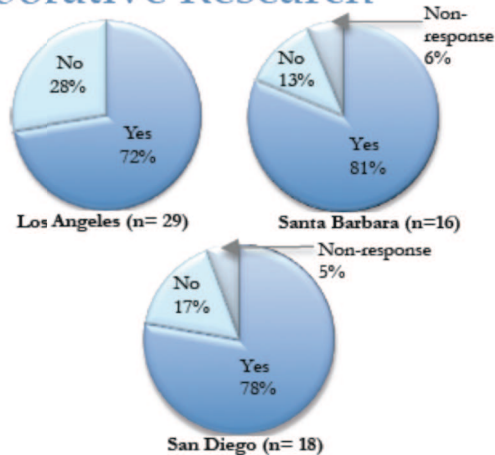


Figure 8. Respondents' willingness to participate in collaborative research grouped by harbor.

Marine Stewardship Council Certification

The Marine Stewardship Council (MSC) is the world's leading certification and eco-labeling program for sustainable seafood. It is an independent non-governmental organization that rewards sustainable fishing practices and management.

When asked if they wanted the fishery to pursue MSC Certification, 70% of the 62 respondents voted yes (Figure 9). 75% of respondents support the fishery using collected funds to support MSC certification

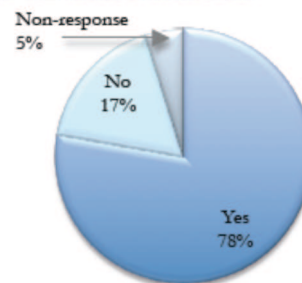


Figure 9. Respondents' MSC support

Lobster Stamp Support

66% of “active” respondents support the lobster stamp (Figure 10). 58% of respondents would be willing to pay \$300 for the lobster stamp. The average reported maximum willingness to pay for the lobster stamp was \$288, although responses ranged from as little as \$0 to a maximum of \$1000. Respondents who were CLTFA members were significantly more likely to support the lobster stamp than non-members (Figure 11).

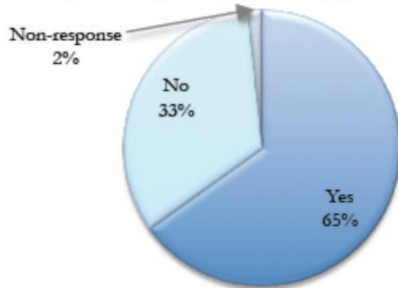


Figure 10. Respondents' lobster stamp support

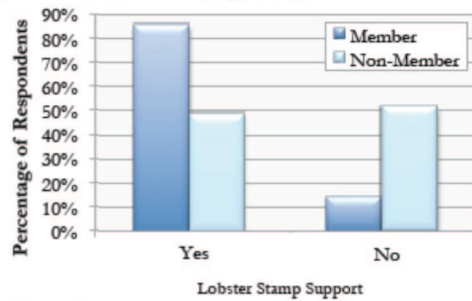


Figure 11 Respondents' support and non-support for the lobster stamp compared to CLTFA membership (n= 28, 35)

Respondent's reasons for lobster stamp support:

- need to stop poachers
- need to stop part-time fishermen
- want fishery representation
- want a proportional tax on the fishery

Respondent's reason for lobster stamp non-support:

- permit is non-transferable
- already pay enough to fish
- do not want any more regulation
- do not believe the stamp is worth it

Plan	If you catch...	...and you will pay...	...and your annual MSC benefits could be...
A Each fisherman pays a flat fee of \$300	0 lbs/year	\$300/year	\$0/year
	1000 lbs/year	\$300/year	\$110/year – \$1,463/year
	3000 lbs/year	\$300/year	\$330/year – \$4,389/year
	6000 lbs/year	\$300/year	\$660/year – \$8,778/year
	15000 lbs/year	\$300/year	\$1,650/year – \$21,945/year
B Each fisherman pays 9.5 cents per pound	0 lbs/year	\$0/year	\$0/year
	1000 lbs/year	\$81/year	\$110/year – \$1,463/year
	3000 lbs/year	\$244/year	\$330/year – \$4,389/year
	6000 lbs/year	\$488/year	\$660/year – \$8,778/year
	15000 lbs/year	\$1,219/year	\$1,650/year – \$21,945/year
C Each fisherman pays a \$50 flat fee plus 8 cents per pound	0 lbs/year	\$50/year	\$0/year
	1000 lbs/year	\$116/year	\$110/year – \$1,463/year
	3000 lbs/year	\$246/year	\$330/year – \$4,389/year
	6000 lbs/year	\$447/year	\$660/year – \$8,778/year
	15000 lbs/year	\$1,041/year	\$1,650/year – \$21,945/year

Table 1. MSC Self-Funding Menu. Excerpt from survey

46 respondents selected their preferred payment collection method (Table 1). There was a majority support for Plan A, a \$300 flat fee to be applied annually when purchasing a lobster permit. Plan C, a flat fee combined with a per pound fee, was last (Figure 12). We found that landings played an important role in determining menu choice. There is a trend when you look at menu choice by landings that the more a fishermen lands, the more likely they are to pick Plan A (Table 2). However, as demonstrated by Table 2, our menu selection result is a heavily biased opinion of those that land a large amount and would benefit the most from Plan A.



Figure 12. Respondents' preferred payment collection mechanism

Plan	Landings						Total
	0	0-1000	1000-3000	3000-6000	6000-15000	15000+	
A	0	1	1	9	12	8	31
B	0	2	2	2	2	0	8
C	7	2	1	2	1	0	7
Total	1	5	4	13	15	8	46

Table 2. Summary of fee mechanism choice by landing bracket

Self-funded Fishery Research Project Priorities

58 fishermen (92% of responding active fishermen) responded to the question on self-funded fishery projects. Their responses were summarized into a list of project priorities (Table 3). Project priorities were also explored by CLTFA membership (Table 4) and by harbor (Table 5). Priorities differed highly across region and membership

Rank	Fishery Priorities
1	MSC certification
2	Permit buyback
3	Legal advocate/Lobbyist
4	Impacts of recreational lobster fishing
5	Marine Protected Area monitoring

Table 3. Self-funded fishery project priorities

Rank	CLTFA	Non-CLTFA
1	MSC	Permit buyback
2	Lobbyist	Lobbyist
3	Recreational lobster	MSC
4	Permit buyback	Recreational lobster
5	MPA monitoring	MPA monitoring

Table 4. Self-funded fishery project priorities by CLTFA membership

Rank	Los Angeles	San Diego	Santa Barbara
1	MSC Certification	Permit buyback	MSC Certification
2	Lobbyist	Lobbyist	MPA monitoring
3	Permit buyback	Recreational lobster	Permit buyback
4	Recreational lobster	MSC	Lobbyist
5	MPA monitoring	MPA monitoring	Recreational lobster

Table 5. Self-funded fishery project priorities by harbor

Additional Project Priority Responses

- Price fixing by buyers
- Wider migration studies
- Adjusting size limits
- Fishery Management Plan for lobster
- Keep NGOs out of stakeholder/permit status
- Impacts of purse seiners and dragnets
- Trap limits

Survey Summary

- Results only describe attitudes of actively landing fishermen and are slightly biased towards transferable permit holders
- Majority support for:
 - participation in collaborative research
 - the lobster stamp from active fishermen respondents
 - the lobster stamp from respondents holding transferable permits
 - \$300 flat fee collection method
 - the fishery pursuing MSC certification from the active fishermen respondents
 - the fishery using collected funds to pursue MSC certification
- Majority of respondents would be willing to pay \$300 for the lobsters stamp
- The more a fishermen lands, the more likely they are to support plan A, the flat fee
- Marine Stewardship Council certification was listed as the highest self-funded fishery priority from active fishermen respondents
- Permit buyback was a high priority for self-funded fishery projects
- There were strong differences in responses across region, level of fishery participation, and CLTFA membership status

Appendix 4

Lobster Stamp Requirements and Recommendations for CLTFA

Based on our research and discussions with relevant parties, we have compiled a list of requirements that we recommend be written into the Lobster Stamp legislation. These requirements will ensure that the fishery's concerns and interests are addressed and protected under the new legislation. In addition, we have included examples of legal language on which to model the Lobster Stamp legislation. The requirements are as follows:

The stamp should be mandatory, purchased annually when renewing commercial lobster permits. This will ensure that the entire fishery contributes to the stamp funds. Making purchase of the stamp from DFG at the time of buying the lobster permit will make enforcement of payment easy.

Model Legislation:

Salmon Stamps; Application and Fee: Cal Fish & Game Code Section 7860.a

“Except as provided in subdivision (f) or (g), no person who is 18 years of age or more and less than 70 years of age, on or before April 1 of the current license year, shall take salmon for commercial purposes or be on board a vessel on which salmon are taken for commercial purposes while salmon are being taken or transported unless that person has a commercial fishing salmon stamp issued pursuant to this section affixed to his or her commercial fishing license.”

A committee or board of directors should be established to determine how the funds will be spent. This committee will be elected by and made up of fishery members. The committee will vote on activities on which the stamp funds shall be used.

Our recommendations concerning the committee are as follows:

- The Committee's recommendations should be binding – the money should be used only for the projects or activities recommended by the Committee, and the Governor or Legislature should not have the ability to appropriate the funds for other uses.
- Appropriation of the stamp funds to the Committee for use on their recommended activities should be required without approval by the Legislature, regardless of budget year.
- The fishermen representatives on the committee should be elected directly by the fishery.
- The Committee should consist largely, if not entirely, of fishermen, and should include alternates to attend meetings if the fishermen committee members are unavailable.
- The Committee should include at least one representative and alternate from each county in the CCSL fishery (Santa Barbara, Ventura, Los Angeles, Dana Point, and San Diego) in order to ensure that the entire range of the fishery is represented. We suggest that fishermen from each port elect one or two representatives from their port to sit on the committee.

- Though it may be helpful to include non-fishermen, such as the OPC Secretary or scientists, in the committee to discuss how the funds can be effectively spent, we recommend that any non-fishermen on the committee be included in a nonvoting role.
- Given the limited number of permit holders qualified and interested in serving on the committee, there should be no term limit for fishery representatives on the committee.
- The committee should meet at least once per year, or more frequently as required.

Model Legislation

These examples of legislation concerning existing advisory committees provide good examples of committee membership. The Commercial Salmon Trollers Advisory Committee is composed of one DFG member and five representatives of the commercial salmon fishery, each with an alternate. The Recreational Abalone Advisory Committee (RAAC) consists of six representatives of the recreational abalone fishery, one DFG member, and two scientists not associated with DFG. We recommend modeling the membership of the Lobster Stamp Committee on these examples. However, neither of these committees are perfect models for the Lobster Stamp Committee, and our recommendations above should be taken into account if the committee is modeled on existing committees.

Commercial Salmon Trollers Advisory Committee: Cal Fish & Game Code Section 7862

“A Commercial Salmon Trollers Advisory Committee shall be established consisting of six members selected by the director. One member shall be chosen from the personnel of the department. Four persons shall be selected, with alternates, from a list submitted by a fishermen's organization deemed to represent the commercial salmon fishermen of California. One member shall be selected, with an alternate, from lists submitted by individual commercial passenger fishing boat operators or by organizations deemed to represent the commercial passenger fishing boat operators of California...”

Recreational Abalone Advisory Committee (RAAC): DFG Code Section 7400

“(a) The director shall appoint a Recreational Abalone Advisory Committee consisting of nine members who shall serve without compensation. The members of the advisory committee shall be selected as follows: (1) Six members who are not officers or employees of the department. The six members shall be residents of California and meet the following requirements: (A) Two members shall reside north of the southern boundary line of Marin County and a line extending due east from the easternmost point of Marin County located in San Pablo Bay. The two members shall be selected from nominations submitted by the Northern California Shellfish Assessment Program or by individuals or organizations that actively participate in the recreational abalone fishery, except that not more than one of the members selected shall be an active or former commercial abalone diver or involved in commercial seafood processing or marketing. (B) Two members shall reside south of the

southern boundary line of Marin County and a line extending due east from the easternmost point of Marin County located in San Pablo Bay and north of the boundary between Santa Barbara and San Luis Obispo Counties and a line extending due east from the easternmost point in that boundary line... (C) Two members shall reside south of the boundary between Santa Barbara and San Luis Obispo Counties and a line extending due east from the easternmost point in that boundary line... (2) One member shall represent the department in enforcement activities and shall be selected from personnel in the Wildlife Protection Division. (3) Two members shall be marine scientists who are or have been involved in abalone research at universities, state universities, or in state or federal programs. Not more than one of the persons shall be an officer or employee of the department..”

The legislation will include a range of acceptable activities for which the funds may be used.

From our survey, we have determined that some activities of interest to fishermen include Marine Stewardship Council Sustainability Certification, buyback and retirement of transferable lobster permits, and hiring a fishery advocate. The fishery should specify some of the activities on which the funds can be spent, and specify that the funds may not be incorporated into the DFG or OPC general fund or used for any activities not recommended by the committee, regardless of budget year.

Model Legislation

Fees from Abalone Stamp to Restoration & Preservation Account: Cal Fish & Game Code Section 7149.9.a.1-3

“7149.9. (a) Fees received by the department pursuant to Section 7149.8 shall be deposited in the Abalone Restoration and Preservation Account within the Fish and Game Preservation Fund, which is hereby created. Notwithstanding Section 13340 of the Government Code, the moneys in the account are continuously appropriated, without regard to fiscal year, to the department to be used only for the Recreational Abalone Management Program. For the purposes of this article, ‘program’ means the Recreational Abalone Management Program. The program shall include the following...”

The percentage of collected funds taken in overhead charges by the collection agency should be minimized.

The percentage of collected funds taken for overhead or administrative costs can be specified in the legislation. To minimize the administrative costs to the Department of Fish and Game, we recommend that the Department remand the funds to the Ocean Protection Council, which will then act as a trustee of the funds until required for use by the fishery.

Model Legislation

Fees from Abalone Stamp to Restoration & Preservation Account: Cal Fish & Game Code Section 7149.9.c

(c) The department shall maintain internal accounts that ensure that the fees received pursuant to Section 7149.8 are disbursed for the purposes of subdivision (a). Not

more than 20 percent of the fees received pursuant to Section 7149.8 shall be used for administration by the department.

The quantity of money collected from each individual should be specified.

From our survey results and CBA and to maximize ease of collection, we recommend a \$300 flat fee collected annually from every commercial lobster permit holder.

Model Legislation

Salmon Stamps; Application and Fee: Cal Fish & Game Code Section 7860.c

Except as provided in subdivision (b) of Section 7852.3 and this subdivision, the department shall issue a commercial fishing salmon stamp upon application therefore and payment of the fee of eighty-five dollars (\$85). For any commercial salmon season preceded by a commercial salmon season in which the commercial troll salmon landings in this state equal or exceed 3,000,000 pounds dressed weight, as determined by the department, the fee shall be increased by twelve dollars and fifty cents (\$12.50) for every 250,000 pounds over 3,000,000 pounds of dressed weight landings, except that the total fees as adjusted shall not exceed two hundred sixty dollars (\$260).

The stamp should expire periodically and require renewal by the fishery.

This will ensure that funds do not continually be collected if support for the lobster stamp and interest in funding fishery projects decreases in the future. We recommend an expiration period of five years, based on the California Salmon Stamp.

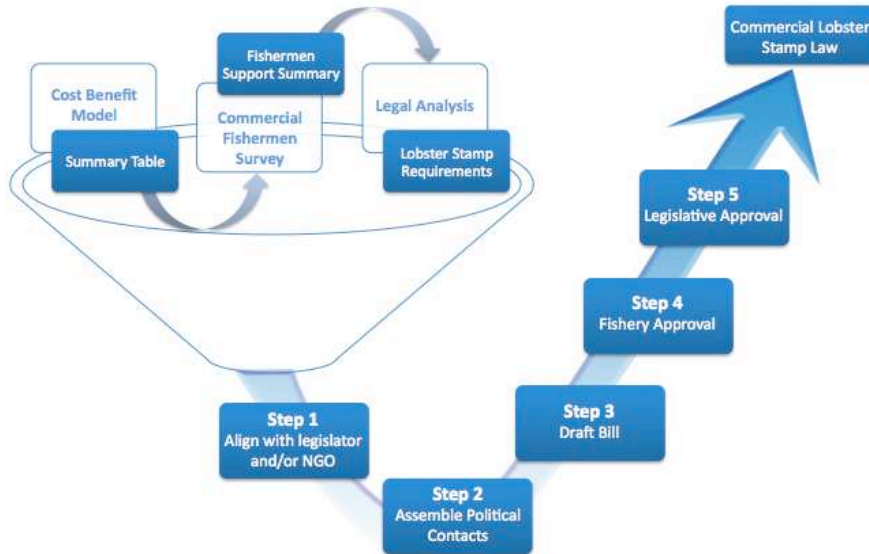
Model Legislation

Salmon Stamp: Cal Fish & Game Code Section 7863

7863. This article shall remain in effect only until January 1, 2012, and as of that date is repealed, unless a later enacted statute that is enacted before January 1, 2012, deletes or extends that date.

Appendix 5

Pathway to the Commercial Lobster Stamp



The Commercial Lobster Stamp Pathway illustrates our group's work on the Commercial Lobster Stamp and the next steps the fishery should take. The results from our cost benefit model, survey, and legal analysis all contributed to creating the Lobster Stamp Requirements document for the fishery. This document serves as a guide for the fishery to creating successful legislation as they continue on the path towards turning the Lobster Stamp into law. Below are the steps towards the Lobster Stamp that we recommend the fishery should take. Although these steps fall beyond our involvement with the project, they follow from our research and work on the Lobster Stamp.

- 1) **Align with legislator and/or NGO:** The fishery has already aligned with the Environmental Defense Fund (EDF), and a placeholder bill has been submitted to the state assembly.
- 2) **Assemble Political Contacts:** EDF is in contact with members of the state legislature who can assist the fishery in supporting the bill. We also compiled a list of suggested assembly members likely to support the Lobster Stamp for the fishery to contact. These include John Laird, Jared Huffman, and Pedro Nava.
- 3) **Draft Bill:** The fishery can use our Lobster Stamp Requirements and suggested political contacts to ensure that the bill language avoids potential concerns and that the legislation accomplishes the fishery's goals.
- 4) **Fishery Approval:** Next, we recommend fishery approval of the edited legislation. Leaders of CLTFA can request feedback from the entire fishery through a mail survey or at regional meetings.
- 5) **Legislative Approval:** Finally, the fishery will be ready to seek legislative approval and creation of the Commercial Lobster Stamp.