

## STAFF SUMMARY FOR JUNE 10-11, 2015

**7. SPINY LOBSTER FISHERY MANAGEMENT PLAN AND REGULATIONS****Today's Item**Information Action 

Receive Spiny Lobster Fishery Management Plan (FMP) scientific review from California Ocean Science Trust (OST); receive update on FMP and rulemaking timeline; discuss draft regulations and provide direction on options for regulations to include in rulemaking.

**Summary of Previous/Future Actions**

- MRC vetting and recommendation Mar 4, 2015; Marina
- Informational update Apr 8-9, 2015; Santa Rosa
- **Today discuss/direction on regulatory options Jun 10-11, 2015; Mammoth Lakes**
- \*Receive FMP; regulations notice hearing Aug 4-5, 2015; Fortuna
- \*Adopt FMP; discussion/adoption hearing Dec 9-10, 2015; San Diego

**Background**

A Spiny Lobster FMP has been under development since 2012 and is nearing completion. A preliminary public draft FMP was released in Nov 2014, and a scientific review was completed in late May 2015 by a scientific review committee convened by OST (Exhibit 1). FGC is scheduled to receive the FMP after DFW revises the draft based on scientific review findings. Today, OST will present an overview of the scientific review.

Management measures and regulations to implement the Spiny Lobster FMP were developed through DFW's Lobster Advisory Committee (LAC). LAC developed a package of consensus-based regulatory recommendations, clarified and defined through follow-up meetings between DFW and LAC commercial and recreational representatives. At its April 2015 meeting, FGC received a DFW overview of LAC and DFW recommendations (exhibits 2 and 3), and an MRC recommendation (see "Committee" recommendation below). A memo and summary overview of LAC recommendations, select recommendations that DFW does not support, and additional measures proposed by DFW is provided for discussion today (Exhibit 4).

Today, FGC is scheduled to discuss the regulatory recommendations, receive public comment, and provide direction to DFW on the scope of regulatory options to include in a notice of proposed regulatory action and initial statement of reasons for regulatory change. See FGC staff, MRC, and DFW recommendations below. Key considerations for FGC direction are:

- Confirm inclusion of LAC recommendations and additional DFW recommendations.
- Include *or do not include* as options the LAC recommendations not supported by DFW?
- Include *or do not include* any alternatives to DFW or LAC recommendations?

\* A note on timeline: DFW is expected to present a proposed timeline revision necessary to account for project staff redirected to support Refugio oil spill response operations and to adequately address the scientific review findings in the FMP.

**Significant Public Comments**

1. Ace Line Hauler Fishing Products, manufacturer of mechanized hoop pullers, email to

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DFW, concerned about impact of proposed pullers ban on business (Exhibit 5)

2. Package of 58 letters opposing LAC recommendation for commercial trap limits: 10 lobster or general commercial fishermen, 7 restaurant owners or fish buyers, and 41 commenters of unidentified affiliation (see Exhibit 6 for sample letters)
3. Public testimony is anticipated to reintroduce previous proposal concepts to “grandfather in” higher trap limits, although staff has not seen any new specific written proposal

### Recommendation

**FGC staff:** Staff supports DFW recommendations to include LAC changes except for restricting recreational mechanized pullers or for 3-year phase-in commercial trap limit, and to include DFW-identified additions. However, staff recommends that FGC clarify with DFW regarding specific implementation details associated with the LAC waiver to pull another lobster operator permit holder’s traps (e.g., retention of lobsters from serviced traps, and setting of waiver conditions by DFW). Staff also supports MRC recommendation to not include alternate, non-consensus options such as trap limit tiers.

**Committee:** MRC recommends that FGC endorse the LAC consensus recommendations and DFW additional recommendations for proposed regulation options. MRC did not recommend any alternate stakeholder proposals to the LAC recommendations.

**DFW:** 1) Include LAC recommendations except: do not include a) restriction on recreational use of mechanized pullers, nor b) short-term phase-in commercial trap limit provision; and 2) Include DFW’s additional recommendations not addressed by LAC.

### Exhibits

1. OST report on Spiny Lobster FMP scientific review, received May 28, 2015
2. LAC and DFW recommendations: commercial lobster regulations, dated Feb 20, 2015
3. LAC and DFW recommendations: recreational lobster regulations, dated Feb 20, 2015
4. DFW memo, received May 29, 2015
5. Ace Line Hauler Fishing Products email to DFW opposing recreational ban of mechanized pullers, forwarded from DFW to FGC on Apr 2, 2015
6. Sample letters opposing LAC trap limit, received May 18, 2015

### Motion/Direction

Moved by \_\_\_\_\_ and seconded by \_\_\_\_\_ that the Commission directs staff to include all LAC recommendations for a draft lobster rulemaking, with the following modifications (check those that apply):

- do not include LAC recommended restriction on recreational use of mechanized pullers
- do not include LAC recommended commercial short-term phase-in trap limit
- include DFW-identified recommendations
- under a waiver, specify that lobsters retrieved from serviced traps may be retained
- under a waiver, specify that DFW may prescribe waiver conditions, including whether traps must be brought back to shore or may be returned to water unbaited and wired open

Final Report of the Scientific Review Committee

**Scientific review of the reference point thresholds  
prescribed in the draft Fishery Management Plan  
for California Spiny Lobster (*Panulirus interruptus*)**



*Convened by the California Ocean Science Trust*

*Supported by the California Ocean Protection Council  
and the California Ocean Science Trust*

**May 2015**



CALIFORNIA  
OCEAN  
SCIENCE  
TRUST

# Review Participants

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## **CALIFORNIA OCEAN SCIENCE TRUST**

California Ocean Science Trust is a boundary organization. We work across traditional boundaries, bringing together governments, scientists, and citizens to build trust and understanding in ocean and coastal science. We are an independent non-profit organization established by the California Ocean Resources Stewardship Act (CORSAs) of 2000 to support managers and policymakers on the U.S. West Coast with sound science, and empower participation in the decisions that are shaping the future of our oceans.

Ocean Science Trust served as the independent appointing agency in alignment with the Procedural Guidelines for the California Department of Fish and Wildlife's Ad Hoc Independent Scientific Advisory Committees. Ocean Science Trust convened the review committee and designed and implemented a scientific review process that promoted objectivity, transparency, and scientific rigor (see Appendix C).

## **SCIENTIFIC REVIEW COMMITTEE**

### **John Field (chair)**

Research Fishery Biologist, Fisheries Ecology Division, Southwest Fisheries Science Center, National Marine Fisheries Service (NOAA)

### **Michel Comeau**

Head of the Lobster Section, Department of Fisheries and Oceans Canada

### **Robert Muller**

Assessment and Modeling, Florida Fish and Wildlife Conservation Commission, Florida Wildlife Research Institute

### **Pete Raimondi**

Chair/Professor, Department of Ecology and Evolutionary Biology, University of California, Santa Cruz

## **CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE**

The Mission of the Department of Fish and Wildlife is to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public.

California Department of Fish and Wildlife staff were engaged throughout the review process. They delivered presentations to the review committee and supplied additional data, information, and feedback to Ocean Science Trust as necessary throughout the review process.

Travis Buck

Tom Mason

Julia Coates

Carlos Mireles

Kai Lampson

Anthony Shiao

The California Department of Fish and Wildlife Marine Region Program Manager, Tom Barnes, was the primary management contact for this review. California Wildlife Foundation was the grant manager for this project.

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**Recommended citation:** Final report of the scientific review committee, scientific review of the reference point thresholds prescribed in the draft Fishery Management Plan for California Spiny Lobster (*Panulirus interruptus*). California Ocean Science Trust, Oakland, CA. May, 2015.

**Cover image:** Ken Curtis

# Background

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Spiny lobster (*Panulirus interruptus*) populations support important commercial and recreational fisheries, and play a key role in the southern California kelp forest ecosystem. Over the last three years, the California Department of Fish and Wildlife (the Department) has developed a draft spiny lobster fishery management plan (FMP) to guide management of these fisheries in accordance with the Marine Life Management Act. An FMP assembles information, analyses, and management options, and serves as the vehicle for the Department to present a coherent package of information, and proposed regulatory and management measures to the California Fish and Game Commission (the Commission). The FMP becomes effective upon adoption by the Commission, following their public process for review and revision. Thus, it is important for the scientific underpinnings of the draft FMP to have undergone independent review prior to submission to the Commission.

The Department is committed to incorporating the best scientific information into management decisions. To this end, the Department approached the Ocean Science Trust to convene experts to conduct an assessment of key scientific and technical components within the FMP and supporting spawning potential ratio (SPR) cable model. Ocean Science Trust, an independent organization that works to advance independent science in management decisions, tailored this review to meet the science needs of the Department, and served as the appointed entity to design and coordinate all aspects of this review.

## REVIEW SCOPE

Ocean Science Trust, in consideration of the management request, worked with the Department to develop a scope of review focusing on the scientific and technical underpinnings of the FMP and supporting materials. Thus, this was not a comprehensive review of the FMP, or the proposed approach to management contained therein. Rather, the central question of this review was:

*Given the Department of Fish and Wildlife's available data streams and analysis techniques, are the technical components, models, and supporting documents that underpin the FMP scientifically sound and reasonable?*

The review focused on the following components:

1. The three proposed reference point thresholds (i.e., catch, catch per unit effort (CPUE), and spawning potential ratio) that will serve as signals for when changes within the fishery may warrant management responses;
2. The underlying science that informed the decision to manage the fishery as a single stock;
3. The comprehensiveness of the data supporting the estimate of spiny lobster habitat contained within marine protected areas;
4. Estimates of stock productivity and its ability to support fishing (i.e., calculations for the lobster growth curves adopted in the Parrish Model for setting the spawning potential ratio threshold); and
5. The spawning potential ratio (SPR) model as presented in "DRAFT Report on the Cable-CDFW 1.0 Model and the Calculation of Spawning Potential Ratio" (cable model), including model assumptions, calculations, interpretation, and application of the model results in setting the SPR reference point threshold.

In addition to these specific sections of the FMP, reviewers were asked to identify priority research and monitoring gaps associated with the scientific and technical components of the FMP. Reviewers also provided recommendations for ways to work more closely with the academic community to collect and maintain the most up-to-date essential fishery information (EFI).

## SUMMARY OF THE REVIEW PROCESS

This review took place from October 2014 – May 2015. Ocean Science Trust implemented a scientific review process<sup>1</sup> that sought to promote objectivity, transparency, candor, efficiency, and scientific rigor. A multidisciplinary, four-member review committee was assembled, representing international expertise in fisheries science and management, marine ecology, stock assessment, and modeling. Reviewer names remained anonymous until completion of this review to encourage candid feedback. Ocean Science Trust facilitated constructive interactions between reviewers and the Department through a series of remote meetings, where Department staff provided reviewers with the management context, presented an overview of the scientific and technical elements under review, and were available to answer reviewer’s questions. In addition, Ocean Science Trust convened reviewers independently to allow the review committee to candidly discuss the review materials and conduct their assessment. Ocean Science Trust worked with the review committee to assemble and synthesize their written and verbal responses to guiding questions, as well as discussion from remote meetings into this final report. This report is publicly available on the Ocean Science Trust [website](#)<sup>2</sup>.

## PROJECT MATERIALS UNDER REVIEW

The following materials were provided by the Department to the review committee for scientific and technical review:

- Draft Spiny Lobster Fishery Management Plan, For Technical Review, 11/4/2014<sup>3</sup>
- Draft Report on the Cable-CDFW 1.0 Model and the Calculation of Spawning Potential Ratio
- Draft Spawning Potential Ratio Cable-CDFW 1.0 Model

Additional data and information were provided by the Department at the request of the review committee to assist with their assessment throughout the review process.

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<sup>1</sup> Available at <http://bit.ly/1Fd9A6X>

<sup>2</sup> Available at <http://bit.ly/1Fd9zA3>

<sup>3</sup> Draft available on the Department of Fish and Wildlife website at <http://bit.ly/1Fda254>





# Review and Recommendations

Foremost, the review committee valued the opportunity to provide independent scientific recommendations for consideration in management of the California spiny lobster fisheries. They acknowledged the extensive time and resources that went into the development of the FMP and supporting model by both the Department, the Lobster Advisory Committee, stakeholders, and outside experts, including modeler Dr. Richard Parrish. Reviewers appreciated the Department staff's constructive engagement throughout the course of the review, as well as their willingness to thoughtfully consider recommendations from this report. The Department produced an FMP that is user-friendly and readable by broad audiences, is well referenced, and incorporates the effects of no-take marine protected areas for the first time in a state-managed fishery. Reviewers noted that the FMP would complement the fairly robust management measures already in place.

This assessment is organized around the key focal points identified in the scope of review. These recommendations aim to improve the science supporting the proposed reference point thresholds prescribed in the draft FMP. Where possible, insight is provided on the implications of each recommendation.

The main recommendations concern the spawning potential ratio (SPR) cable model, several of which would need to be addressed before this model can provide a sound scientific basis for decision-making. Additional scientific guidance and considerations are included that would produce a more scientifically robust FMP, as well as longer-term recommendations, data and research needs that would strengthen the science contained within the model and FMP and its ability to inform management as new information and analyses become available.

This FMP is the first instance where state fisheries managers in California are employing a technical model (aside from a formal stock assessment) to inform the development of a harvest control rule. As such, reviewers thought it valuable to close the review with some insight into how scientific models are scoped, considered, and reviewed as FMPs are developed for other state fisheries in the future.

## 1. EVALUATION OF THE PROPOSED REFERENCE POINT THRESHOLDS

Three proposed quantitative reference points and associated thresholds – spawning potential ratio, catch, and catch per unit effort (CPUE) – are meant to serve as metrics to assess the state of the lobster fishery and stock. The FMP states that whenever a stock reaches a threshold reference point, resource managers must investigate the cause and potentially provide a response. The Department has to review the catch, catch per unit effort, and update the spawning potential ratio on an annual basis. This process is designed to monitor the fishery and its stock in order to prevent any of the metrics from reaching a threshold.

Below are the scientific review committee's recommendations for each reference point. For sections 1.1 (SPR) and 1.2 (catch, CPUE), recommendations are divided into those that reviewers suggest the Department address before adopting the FMP, and those that are longer-term considerations, which can be addressed after adoption of the FMP.

## 1.1 Spawning Potential Ratio (SPR) Cable Model and the SPR Reference Point

Much of the review focused on the SPR cable model, since it is the main measure of the spiny lobster spawning biomass structure and the only biological reference point in the FMP (i.e., it integrates information and assumptions about lobster growth, reproduction, and mortality). The model, starting with 1,000 recruits, calculates an equilibrium SPR value – a ratio of the number of eggs produced by the fished population over the number of eggs produced by the unfished population. Being an equilibrium model, it does not track cohorts or size trends over time, but does provide relative abundance estimates for the fixed number of recruits. Therefore, this SPR estimate is used to estimate an annual fishing mortality rate specific to a given year’s observed mean size, with no temporal connection among the annual estimates. The FMP advises that when the  $SPR_{CURRENT}$  falls below the “stable and productive” reference period between 2000-2010 ( $SPR_{THRESHOLD}$ , based on the average SPR value during this period), the Department is required to investigate the underlying cause and potentially provide a management response for the Commission to consider. The model also evaluates the effects that marine protected areas (MPAs) may have on the calculated SPR value of the lobster stock.

During the course of the review, reviewers were provided with three iterations of the SPR model. The model was originally developed by Dr. Richard Parrish, and underwent further development and revisions by the Department. The final version (referred to here as the cable model) is the version intended for use in the management of the fishery, and was the main focus of this assessment. The cable model includes the following revisions from the previous iterations:

1. a new growth model (i.e., changing the model from a von Bertalanffy growth model to a newly developed model)
2. changes to initial time step (i.e., size, age, season)

The draft FMP provided to reviewers for their work was developed based on the original model and did not reflect these revisions. The reviewers were instructed to assume that the draft FMP would be revised to reflect the most recent cable model. Additionally, following initial technical discussions between Department staff and the reviewers, the Department agreed to remove a prescribed value for the SPR threshold in order to allow for the ability to continually improve the model without amending the FMP.

### 1.1.1 Key Recommendations for Securing a Management-Ready SPR Model

Reviewers agreed that the cable model requires essential revisions before it can provide a scientific basis for management of the lobster fishery, but that these revisions are likely achievable before the FMP is adopted. In the longer term, more substantive data collection and research initiatives to better inform a model comparable to the current model, or an alternative modeling approach, are identified as priorities. Below are the key recommendations for securing a management-ready SPR model, organized around thematic areas.

#### Growth Model

- ***Rely on the von Bertalanffy growth modeling methods until the newly developed growth model can be robustly validated.***

The primary revision to the SPR model by the Department was the replacement of a von Bertalanffy growth model, with a new set of Gaussian 4-parameter growth curves that were developed by Department staff. These were based on raw data from three tag-recapture studies in order to estimate male and female lobster growth rates. Growth curves are central to determining a stock’s ability to replenish itself. Reviewers acknowledged the inherent difficulties in obtaining reliable growth rates for crustaceans, such as lobsters, that grow through molting. Though von Bertalanffy growth models are widely used and accepted, they represent a generic growth response; the Department examined multiple growth models in an attempt to employ an alternative that better represented the growth of *P. interruptus*.

The reviewer's main concern with the current SPR cable model is with the application of the new Gaussian growth curves. While reviewers recognized that the Gaussian 4-parameter curves may better fit the data, they had concerns that these growth models have not been subject to rigorous scientific discussion. The results of the Gaussian curves are not consistent with the existing literature regarding the growth patterns of lobsters in similar ecosystems, and lead to potentially unrealistic SPR model behavior and results. In particular, they lead to growth rate estimates that are very slow such that mature individuals can reproduce many times prior to being vulnerable to full fishing mortality. Slow growth rates in this particular SPR model implementation translate into lower harvest rates and a reduced impact of fishing on population reproductive output; the slower you make growth, the lower the estimated relative exploitation rate is in the SPR model. This is contrary to what is typically understood about growth rates and stock productivity. The fact that this model estimates a "snapshot" of relative exploitation rate in a given year with assumed constant recruitment, rather than tracking exploitation and cohort strength (and potential feedback to recruitment) over time contributes to this somewhat counter-intuitive result, but the unusually slow growth is the primary driver. The net effect of the Gaussian growth model as applied in SPR cable model is that fishing mortality of most legal lobsters has a reduced impact on the estimated SPR, relative to SPR estimation based on the von Bertalanffy growth model.

These Gaussian growth curves are not necessarily incorrect – in fact, they may well be a more accurate representation of lobster growth – and should be improved with additional research. Reviewers commend the Department for making strides to move beyond the standard growth model. Further studies showing that the approach has some precedent with crustaceans and more investigation of the underlying data is necessary before the Gaussian growth model can be applied with confidence. If and when an alternative growth model is considered to be sufficiently developed to incorporate into the SPR model, the Department should consider whether that model is consistent with growth models of lobsters in other (similar) ecosystems, and ensure that sensitivity analyses are conducted to evaluate the effects of any new growth relationships on SPR model performance.

**von Bertalanffy growth expands the resolution of the SPR model compared to the Gaussian growth curves**

With current understanding, the von Bertalanffy growth model is more appropriate for a relative metric of exploitation as it is more responsive to changes in exploitation, produces results that are comparable to methods used elsewhere for similar fisheries, and expands the resolution of the SPR model (see Appendix A for further analyses conducted by reviewers). Thus, reviewers recommend that the Department rely on the more standard and widely used von Bertalanffy growth modeling methods, until the newer Gaussian curves can be robustly validated.

Longer-term considerations are included in section 1.1.2, including the need to routinely collect length or other size compositional data (length or weight distributions) and information on actual selectivity and maturity curves, which would provide the basis for a more robust SPR model (e.g., more accurate estimates of fishing mortality). Reviewers recognized that there is inherent variability in the growth data at small sizes using the available tag-recapture studies, and provide some recommendations that may increase comfort with new Gaussian growth curves based on these data.

- **Use SPR with caution at high exploitation rates.**

It is also important to note that the SPR cable model (with either growth model applied, although the problem is exacerbated at slower growth rates) becomes uninformative at very high exploitation rates (Appendix A). This is partially a result of the confounding of the maturity and selectivity curves described below. This constraint should be recognized explicitly in the SPR model documentation and the FMP, and the Department should be cautious when interpreting results at high exploitation rates.

- **Reconsider some of the tag-recapture data that were removed from the growth models.**

The growth models are based on a limited data set, from which some outliers and negative values were removed (per Department presentation to review committee). Juveniles can often show high growth rates in short timeframes, thus some of the data identified and removed might actually be informative. In addition, the Department should consider making the “negative growth” data points zero instead of removing them from the analyses if they are believed to be measurement error. Reconsidering how these data points are treated may reduce variability at small lobster sizes and lead to more accurate estimates of growth.

## Model Functionality

- **Update the vulnerability relationship.**

In the cable model, the vulnerability function has precisely the same coefficients as maturity. If this is a true coincidence, it should be explained. However, recent data on female lobsters from Hovel et al. (2015) and Kay (2011) indicate that female lobsters may be reproductive at smaller sizes than previously thought. The Department should verify, and if appropriate, update this function in the cable model. In addition, the current function in the cable model is for the commercial fishery that uses traps. Traps have an upper limit based on the throat size of the trap while there is no upper limit in the recreational fishery. Therefore, there should be a separate vulnerability relationship for the recreational fishery in any future model that can account for recreational catch.

- **Revisit the natural mortality function.**

The natural mortality function assumes that natural mortality decreases as lobsters grow; however within the current cable model, a minimum rate occurs at an age of 17.92 years and then the rate increases again. This pattern of senescence is unusual, and the Department should provide additional references or data to support the assumption that older, larger lobsters experience higher natural mortality. If the proportion of ‘plastered females’ (i.e., female lobsters that have mated) is lower at larger sizes, suggesting that large females are not contributing as much to SPR, those data should be presented.

- **Explain the ramifications of SPR being independent year to year.**

Each model run begins with exactly 1,000 larvae, and ignores variable and episodic recruitment, and the relationship between spawning biomass and recruitment. The model also assumes constant carrying capacity and a constant function for density dependence, among other considerations. These limitations should be made more explicit in the FMP and model report.



## Sensitivity Analyses

- **Make greater use of sensitivity analyses in explaining the model.**

Sensitivity analyses are important for understanding the impacts of a model's input variables. They can help identify parameters that are likely to have no effect on the output (and could potentially be removed), as well as variables that have a large effect (where attention should be focused on ways to reduce uncertainty around these values/inputs). The Department should conduct explicit sensitivity analyses each time the SPR cable model is revised, and make this information available in the accompanying report to provide additional credibility to the reasoning behind such revisions. Standard practice is to double and halve the variable of interest and observe the impact to the outputs. The Department should consider assembling and formally communicating the error and uncertainty associated with the cable model results.

### 1.1.2 Longer-Term Considerations for the SPR Model

The review scope charged reviewers with conducting an assessment of the SPR model based on the Department's currently available data streams that would not require additional information or research. However, the model may benefit considerably from and be more robust as a result of addressing the following longer-term recommendations after adoption of the FMP.

#### Research Needs

- **Explore alternative methods to estimate lobster growth.**

Novel methods for age validation and improved growth estimation continue to emerge and should be explored, either by the Department or by academic and other independent research institutions. For example, direct methods of growth and age determination are now possible for crustaceans by measurements of annual molt-independent growth bands. Detection of growth bands in calcified regions of the eyestalk or gastric mill using the cold cure epoxy resin technique has been reported for cold-water shrimps (*Sclerocrangon boreas* and *Pandalus borealis*), snow crab (*Chionoecetes opilio*) and American lobster (*Homarus americanus*) (Kilada et al. 2012). A similar technique could be used to better estimate growth for the California spiny lobster (even on a spatially explicit basis), and perhaps elaborate or modify the 2011 stock assessment model to include an age-based parameter. Identifying these as key research priorities in the FMP may incentivize outside researchers and funders to pursue this research.

**Direct methods of growth and age determination are now possible for crustaceans**

- **Explore additional technical models that can account for variable recruitment.**

Given that lobster recruitment is likely highly variable and episodic, a key longer-term research objective should be the development of a more sophisticated modeling approach that can track cohorts over time.

- **Develop a sampling program to collect individual lobster length or weight composition data from both sectors of the fishery.**

Estimates of fishing mortality used to obtain a corresponding SPR value each year are currently determined using average weight data from the commercial sector. The relevant parameters are derived using an extrapolation, linking logbook data to fish ticket data. These estimates would be greatly improved by a program in which actual length or weight measurements (by individual) could be collected. The sampling program needs to include the recreational sector as well because it accounts for approximately 30% of the landings and their vulnerable sizes may differ from commercial traps. Such data would be helpful in informing more sophisticated modeling approaches (e.g., that track cohorts over time) in the longer-term as well.

- **Prioritize obtaining intermediate recapture data, which could be useful for better understanding the dynamics of lobster growth rates.**

While alternative methods to estimate growth are ultimately necessary, reviewers provided a suggestion that may improve upon the existing estimates in the near term.

The growth curves were developed from data sets with gaps at important size ranges. Tag-recapture data gaps exist between the Engle (1979) and Hovel et al. (2015) data sets, in the 30 mm and 55 mm size classes. Currently, juvenile data must be extrapolated out in any growth curve model. Additional data would be valuable in “filling in” the points between data sets for a more accurate estimate of California spiny lobster growth.

## Model Functionality

- **Develop a function or method to incorporate recreational catch into the model.**

Recreational catch is a substantial portion of overall catch and is not accounted for in the SPR model. This sector is potentially harvesting larger lobsters, thus, the vulnerability to fishing differs between the recreational and commercial sectors. It is important to parse out the proportion of the spawning potential coming from larger individuals. If this is the case, the vulnerability curve applied in the SPR cable model for the recreational sector should not be dome-shaped, but rather should be asymptotic, and there may be other facets of the recreational fishery of significance in accurately assessing SPR.

- **Revisit the SPR model as MPAs reach their full maturity.**

The SPR cable model assumption that South Coast MPAs have reached full maturity (thus, are having a threshold impact on the fishery) is unlikely given the MPAs are newly established. A number of factors will differ as MPAs reach full maturity, including the possibility of increased density dependence which could affect movement and reproduction as well as that spawning stock (given growth curves) may not yet be optimized through size and density. In other words, the current SPR model inputs may be over- or underestimating the effects of MPAs.

- **Formalize a process to review, revise, update, and evaluate the SPR model and its effectiveness in meeting management goals as new data, information, or analyses become available.**

Models like SPR will require continual refinement as new information and data are obtained. Many such improvements can be accomplished within this FMP framework. The reviewers commend the Department for removing a prescribed SPR threshold from the language of the draft FMP. This allows the ability to recalculate an appropriate threshold as the model is improved rather than needing to delay implementing these changes by waiting for the FMP to be formally amended. It would be valuable to formalize a process for considering revisions to the model – which may have substantial implications for the SPR outputs – as changes and updates are made. Reviewers recommend convening fishery managers and biologists with independent experts to evaluate the input data, coding, and effectiveness of the model at regular intervals.

## 1.2 Catch- and CPUE-based Reference Points

As noted previously, the process of reviewing current seasonal catch and CPUE data should permit the Department to monitor the fishery and its stock, and prevent any of the measures from reaching a threshold. However, reviewer consensus is that the Catch and CPUE-based reference points are not very robust or sensitive to picking up trends or slow declines. There is concern that “sliding” calculations will rarely exceed the established thresholds. Even when a threshold is exceeded, no specific management responses are required, thus these measures act more as indicators than as reference points. Section 1.2.1 contains key recommendations that would allow for a more robust method to monitor the condition or trajectory of the fishery, and should be addressed before adopting the FMP. Section 1.2.2 includes recommendations that could be addressed in the longer-term.

### 1.2.1 Key Recommendations for Catch and CPUE-based Reference Points

- **Describe the catch and CPUE thresholds as “fishery indicators” instead of reference points.**

A more informative approach to identifying declines in the fishery may be to present the proposed catch and CPUE reference points as indicators of fishery condition, and set the thresholds to more conservative levels. This could provide a more sensitive measure (i.e., reference thresholds would be crossed more easily, making for earlier “warning signs”) and allow the Department to elicit useful scientific information for interpreting any changes observed in SPR.

Reviewers conducted some additional analyses to explore the sensitivity of the threshold to detecting changes in the fishery (see Appendix B for a description of the full method). They compared California’s proposed approach to a method currently under development for the American lobster (*Homarus americanus*) in Canada. In 2014, Canada established a reference point for the American lobster using commercial catch based on the Precautionary Approach (PA) for the southern Gulf of St. Lawrence fisheries. Employing the PA on a 123-year long data series, American lobster landings were below an upper stock reference point 85 times (Appendix B, Figure 1). However, applying the California spiny lobster approach to the same American lobster data revealed that California’s proposed 0.8 catch-based reference point would only be exceeded two times (Appendix B, Figure 2), indicating it may not be a very sensitive measure for detecting fishery declines.

Reviewers then applied Canada’s Precautionary Approach to the California spiny lobster commercial landings data (Appendix B, Figure 3). Based on the PA and using a three year running average for landings, California spiny lobster commercial landings would have dropped below an upper stock reference point 31 times between 1935 and 2013, compared to 11 times as indicated in the draft FMP using the current 0.8 catch-based reference point (FMP Figure 4-6).

Based on these preliminary analyses, the 0.8 thresholds are not very sensitive to picking up trends in the fishery. If catch and CPUE data were used as contextual information for interpreting SPR, the thresholds could be set to more conservative levels to allow for greater sensitivity to detect fishery declines.

Another approach for detecting trends would be to report both a static number for  $CATCH_{threshold}$  and  $CPUE_{threshold}$  in addition to the moving averages, along with a discussion of the pros and cons of each method and what information they can provide.

- **Clarify rationale for the use of 0.8 thresholds prescribed in the FMP.**

The FMP should provide more clarity about how the thresholds were derived. They appear to be derived from the Hilborn 2010 citation referenced in the FMP. That study made the point that a broad range of relative abundance levels are typically associated with a more narrow range of relative yield (e.g., most give 80% or more of theoretical maximum), such that declines below 80% of the theoretical maximum could indicate substantial stock declines (if not driven by declines in effort or markets). This is an important aspect of the Catch and CPUE component, and should be better explained in the text.

- **Report the CPUE statistic in mass per unit effort.**

The current approach to calculating the CPUE statistic in the FMP is in numbers of individual lobster, not total weight of catch. Using weight (linked to fish tickets) may be more appropriate and is a more typical metric used in such fisheries.

- **Include greater discussion of the reliability of recreational catch estimates.**

Recreational catches are a substantial portion of the total catch for spiny lobsters, but seem to have a different trajectory, and one might expect trends to vary from commercial trends in the future as well. The Department should discuss the uncertainty around these recreational catch estimates in greater detail, and clarify whether they were adjusted or tuned to account for non- or under-reporting. Understanding the magnitude and significance of recreational catch is key in considering control rules.



## 1.2.2 Longer-Term Considerations for Catch and CPUE Data

Again, the review scope charged reviewers with conducting an assessment of the existing reference points and associated thresholds. However, the model may benefit considerably from, and be more robust as a result of addressing the following longer-term recommendations.

- **Explore other technical models to obtain additional or alternative biological reference points that account for inter-annual variability in recruitment and other variables.**

The Department could consider estimating the annual fishing mortality rates with a modified Delury depletion model (González-Yáñez et al. 2006, Puga et al. 2013) rather than the moving average approaches for catch and CPUE from average size used in the FMP. A Delury model includes the total numerical catch, the effort and the index of abundance in number (CPUE) as input data, which also takes into account inter-annual variability in recruitment. This approach would allow for both the commercial and recreational sectors to be modeled and there are extensions of the model that include a stock-recruit relationship for obtaining biological reference points. If size composition data become available in the future, the Department may also want to consider a more robust population dynamics analysis similar to one used for Australian southern rock lobsters (*Jasus edwardsii*) (Punt and Kennedy 1997). Additional age-structured analyses (Muller et al. 1997) or yield or egg production models that account for individual variability in growth (Fogarty and Idoine, 1988) may also be informative and should be explored further.

- **Standardize commercial and recreational catch data to the same spatial reference points.**

Commercial and recreational fishermen report location at different spatial scales. In comparing Figures 2-3 and 2-10 in the FMP, it appears that commercial fishermen report by Department of Fish and Wildlife block, while recreational fishermen may report by various specific locations (e.g., each of the Channel Islands has a single location code). This discrepancy will confound comparisons in evaluating questions such as the extent of spatial overlap in the commercial and recreational fisheries (e.g., line 825-26 in the FMP).

## 2. SCIENCE SUPPORTING THE DECISION TO MANAGE AS A SINGLE-STOCK

The FMP provides evidence to suggest that California spiny lobster larvae are well mixed throughout the Southern California Bight (“...complete population mixing due to the species’ protracted larval phase”). Accordingly, the Department proposes considering the entire lobster stock within the U.S. border with one spawning potential ratio (SPR) value and threshold. However, Department data show that individuals in the northern Channel Islands are notably larger than the minimum legal size, while lobsters in the south are generally caught very close to the legal size, suggesting northern lobsters participate in more spawning seasons than southern lobsters before capture.

Reviewer’s evaluation of the literature and existing research on the population structure of California spiny lobster suggests there is some potential for localized recruitment, and that the species does not maintain a single homogenous population despite the extended pelagic larval duration (Iacchei et al. 2013). However, reviewers recognize that the decision on single-stock management must take into account social, economic, and other factors in addition to the science. It is ultimately up to the Fish and Game Commission to determine the most appropriate method to manage the stock.

- **Assess and report any spatially explicit differences between regions of the fishery.**

Available data suggests there are clear regional differences in size distribution, catch, timing of catch, and effort – several of which are meaningful to the calculation of SPR and to determining how it varies in space and time. There is also evidence that growth and reproduction differ spatially, which could lead to spatially structured source-sink dynamics that may interact with fishing in a way inconsistent with single stock

predictions. While lobsters have an extended larval period with extreme dispersal potential (which could lead to assumptions of complete larval mixing), studies in other lobster species suggest substantial localized recruitment (Iacchei et al. 2013).

Reviewers recommend reporting any spatial differences among regions of the fishery to assist decision-makers with parsing out trends in catch and life history traits across the region, and assess whether current harvest control rules are adequately meeting management goals.

**Reporting spatial differences among regions of the fishery can help decision-makers parse out trends in catch and life history traits**

- **Interactions with the Mexican spiny lobster stock should be considered and discussed in greater detail throughout the FMP.**

The reviewers expressed concern about the decision to neglect potential interactions between California and Mexico lobster populations. Given how the biology and management of Mexico's portion of the stock has implications for the entire range of the species, the FMP should include discussion of the potential uncertainty in SPR calculations associated with neglecting potential contributions from the south.

For example, regardless of the genetic structure of California spiny lobster, if the larval pool for California's population includes a large contribution from the Mexican portion of the stock, the actual SPR may be insensitive to management actions in California. The Department should discuss uncertainty around larval transport and reproductive interactions between California and Mexico's lobster populations. This should include a more comprehensive review of the literature (e.g., bolstering literature citations supporting the idea that stock is, or is not, well mixed).

- **Prioritize longer-term research needs relating to regional differences in the species' biological parameters.**

The Department should prioritize collection of data aimed at better understanding lobster population genetics, plankton connectivity modeling, and the benthic stage. This could provide greater insight into source and sink populations, interactions with Mexican spiny lobster populations, and how management in California will affect the population.

Evidence from multiple lobster fisheries suggests local recruitment processes are possible. A recent microsatellite and mitochondrial DNA study in California spiny lobster suggests that the genetic structure of the *P. interruptus* exhibits genetic patchiness (Iacchei et al. 2013). The species does not maintain a single homogenous population, despite the species' 240-to 330-day pelagic larval duration. Instead, these lobsters appear to either have substantial localized recruitment or maintain planktonic larval cohesiveness whereby siblings more likely settle together than disperse across sites. However, DNA analysis in the Caribbean lobster (*P. argus*) suggest that populations of this spiny lobster are highly interconnected throughout its range, with a single genetic stock structure (Truelove et al. 2014, Lipcius and Cobb 1994; Silberman and Walsh 1994), except for a few sites where self-recruitment is enhanced by persistent offshore gyres. Lastly, a genetic study in the American lobster (*Homarus americanus*) indicated a genetic homogeneity of the northern region of the lobster population (suggesting a single genetic stock) within the Gulf of St. Lawrence (Kenchington et al. 2009). However, a larval transport model for this species also showed an extensive pelagic connectivity with some level of local recruitment (Chassé and Miller 2010) and no physical features that restrict benthic stage exchanges (Comeau and Savoie 2002).

**Research suggests California spiny lobster populations exhibit localized recruitment**

### 3. ESTIMATE OF LOBSTER HABITAT CONTAINED WITHIN MARINE PROTECTED AREAS

The FMP factors in the effects of California’s network of MPAs by including them as a component of the fishing mortality calculation in the SPR cable model. The model includes an estimate that 14.6% of all available lobster habitat is protected by MPAs. This is based on available hard-bottom habitat data, augmented by proxy information where suitable bottom-type data are not available, for all the areas that comprise lobster habitat. Only areas that prohibit both recreational and commercial take were used for this calculation. In the near term, reviewers would like to see additional discussion in the FMP of the data sources used, and going forward, refinements to these estimates as the model is improved. Given other uncertainties in the spatial analyses, reviewers suggested that an estimate of 15% is likely adequate.

- ***Provide greater discussion of the data sources used to estimate suitable lobster habitat.***

Reviewers acknowledge the rigor of the hard bottom data set used to generate the estimate, however the Department should provide more clarity on the locations where information was not available from this data set. It would also be informative to report a rough percent of unmapped habitat and percent of the estimate that was calculated using kelp canopy.

- ***Continue to refine the MPA estimate as new information becomes available.***

The data used to estimate lobster habitat contain critical data gaps within the shallow nearshore regions (typically 10-15 meter depths) where remote sensing techniques are generally infeasible (known as the “white zone”). New research is providing better information to bridge these data gaps.

Ongoing research through UC Santa Cruz, the California Department of Fish and Wildlife (staff contact: Paulo Serpa), and Ocean Science Trust is making progress on estimating sand versus rocky habitats across the State within this white zone. The first stage has been completed in the North Central coast and may be expanded statewide over the coming years, and could potentially provide an additional data source to incorporate into the Department’s MPA estimate. The Seafloor Mapping Lab at California State University, Monterey Bay developed a shallow water mapping vessel, the R/V Kelp Fly, uniquely able to map the white zone. As these new data sources become available, the Department should include them as refinements to the cable model. The Department should also explore the contribution of habitat from breakwaters and artificial jetties.

- ***Consider developing a function or method to consider actual marine protected area sizes in the SPR cable model.***

The SPR cable model makes coarse assumptions about the size and spacing of MPAs within the lobster range. The actual values of these parameters are well known, and accounting for California’s actual MPA sizes and spacing – which differ regionally – could have implications for regional estimates of vulnerability because of the assumptions of movement that interact with the size and location of MPAs.

### 4. RESEARCH AND MONITORING

- ***Continue to update and prioritize research and data needs in the FMP.***

The FMP includes Table 5-1, a prioritized list of research and data needs. Throughout this report, reviewers have identified additional research and data needs that would support more robust management of the fishery (some of which parallel those noted in the FMP). Additional recommendations from this review should be incorporated in the table as well. These science needs could provide further impetus for collecting the information identified and prioritized. A resource with up-to-date research and monitoring needs

provides independent researchers (and potential funders), with the basis for assessing the applicability of given research or other proposals to spiny lobster management and/or state information needs. The Department should continue to update this prioritization and guidance.

## 5. ADDITIONAL RECOMMENDATIONS

This section contains additional recommendations reviewers considered important, but were not clearly outlined in the formal scope of review.

- ***The harvest control rule matrix should include predetermined management options.***

While reviewers recognized that this recommendation might be outside of the review scope, they agreed that scientific recommendations are most successful when they are accompanied by predetermined management actions. The lack of pre-determined management response options when one or more of the management thresholds are exceeded has the potential for inaction if the indices or data suggest there are troubling in the fishery. Table 4-2 in the draft FMP lists the suggested management response sequence, including four scenarios in which “No response is required,” and another four in which a response is required. However, the required response in these scenarios is an investigation of underlying causes and confirmation with multiple models and approaches; if management action is required, the FMP guidance is to “tailor management response to prevailing conditions.” The reviewers found these requirements vague.

One of the key benefits of pre-specified harvest control rules is a higher certainty of the actions that will be taken when reference points are exceeded. This allows models to be used to evaluate the effectiveness of these actions to restore the fishery to the desired condition.

Other fisheries that have used SPR for developing harvest control rules may provide good resources for identifying appropriate management responses to thresholds that have been exceeded. Consider supplementing FMP Table 4-1 (summary of SPR thresholds for other lobster fisheries) with a discussion of the management response are in those various management scenarios, as well as whether any of those fisheries also include target SPR rates.

- ***Clarify the information required for setting total allowable catch (TAC).***

Lines 1964-1965 state that “Creating a TAC for the CA lobster fishery would likely require the Department to estimate the total biomass of the stock...”. This is not necessarily true. For example the Market Squid fisheries established a TAC based on historical high catch levels in the absolute absence of total biomass estimates or idealized CPUEs. For many groundfish and other exploited fishes, a common practice in the absence of a quantitative guidance for stocks or stock complexes is to set a TAC at some fraction (e.g., 0.5, 0.75) of the peak historical catch. Any TAC that might be implemented should have a rationale, but it does not mean it requires a sophisticated model.

# Looking Forward: Considerations for developing scientific models for state fishery management plans

The California spiny lobster FMP represents one of the first examples of a state fishery management plan including the use of a technical model to obtain harvest control rules. The experts who participated in this review have experience developing and using fisheries models at the federal and international levels, and thought it valuable to provide insight into processes employed elsewhere.

When considering the development and use of other technical models going forward, the Department should ensure that the plan for producing the science is decoupled from any management concerns. This will include scoping the objectives, approaches, reporting requirements, and responsibilities of various participants in advance. Model development should take place from a position of academic freedom focused on developing the best model, given the resources and data. The Department should ensure the process is inclusive and transparent from the outset.

Reviewers also suggest decoupling the review of technical models from review of the FMP that such models inform. Future model reviewers should have the responsibility of ensuring that the models represent the best available science and the most robust methods. This review committee acknowledges that ideally an in-person, multi-day review workshop with the model development team would allow more detailed technical discussion and model improvement. It is advantageous to have several days to review, so that modelers can be given “homework” on sensitivity tests or alternative analyses that come up during the review and report back. Any future review team should include scientists from outside the region and fishery, and if possible, international expertise. A goal should be to ensure that the model is clearly understandable to those with no background in the particular fishery under consideration. Only models that have been accepted by reviewers as the best available science are advanced to managers. This way, managers can make recommendations and develop harvest control rules based on a model that has been independently recognized as scientifically rigorous.

As noted in this report, models like SPR will require continual refinement and review to ensure they are effectively meeting management goals. Formalizing a process to periodically review the model coding and configuration, and incorporate recent information is recommended. Groups like SouthEast Data, Assessment and Review<sup>1</sup> (SEDAR) and NOAA PFMC Stock Assessment Review (STAR) Panels may provide informative examples of successful approaches that vary in detail and level of time and analyses required.

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<sup>1</sup> More information at <http://sedarweb.org/>

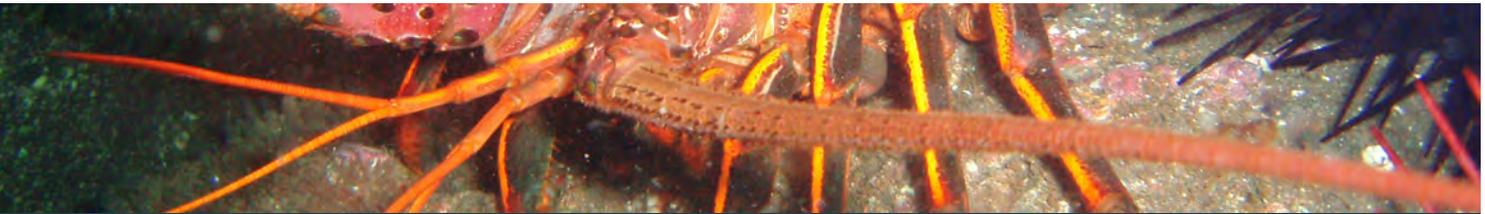




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# Appendices

*Appendix A: von Bertalanffy and Gaussian Growth Curve Comparison, and Appendix B: Applying the Canadian Precautionary Approach to California Department of Fish and Wildlife Commercial Landings* contain additional analyses that were conducted by the review committee as part of their assessment in support of the recommendations contained within this report.

*Appendix C: Scientific and Technical Review Process* details the process Ocean Science Trust developed and implemented for this review.

## APPENDIX A: VON BERTALANFFY AND GAUSSIAN GROWTH CURVE COMPARISON

We (the review committee) compared the von Bertalanffy and Gaussian growth models to determine which would be most appropriately applied in the SPR model. The first step was to examine the cumulative fecundities, in millions of eggs, over the projected 25-year lifetime. The age-specific fecundities from the Cable 6.0 model, which uses a von Bertalanffy growth curve, and those from the CDFW 1.0 model, that uses their new growth model, are shown in Figure 1 plotted at the same scale. The main difference is the levels of fecundity. In the Cable model, the cumulative fecundity at  $F = 0$  is 147.2 million eggs while the fecundity at  $F = 0$  in the CDFW model is 46.4 million. At high fishing mortality rates, the fecundities are similar (17.7 vs. 15.8 million eggs at  $F = 3.0$ ) which means that the SPR ratio will be much higher in the CDFW model; the higher SPR is just the result of the much lower unfished cumulative fecundity (Figure 2).

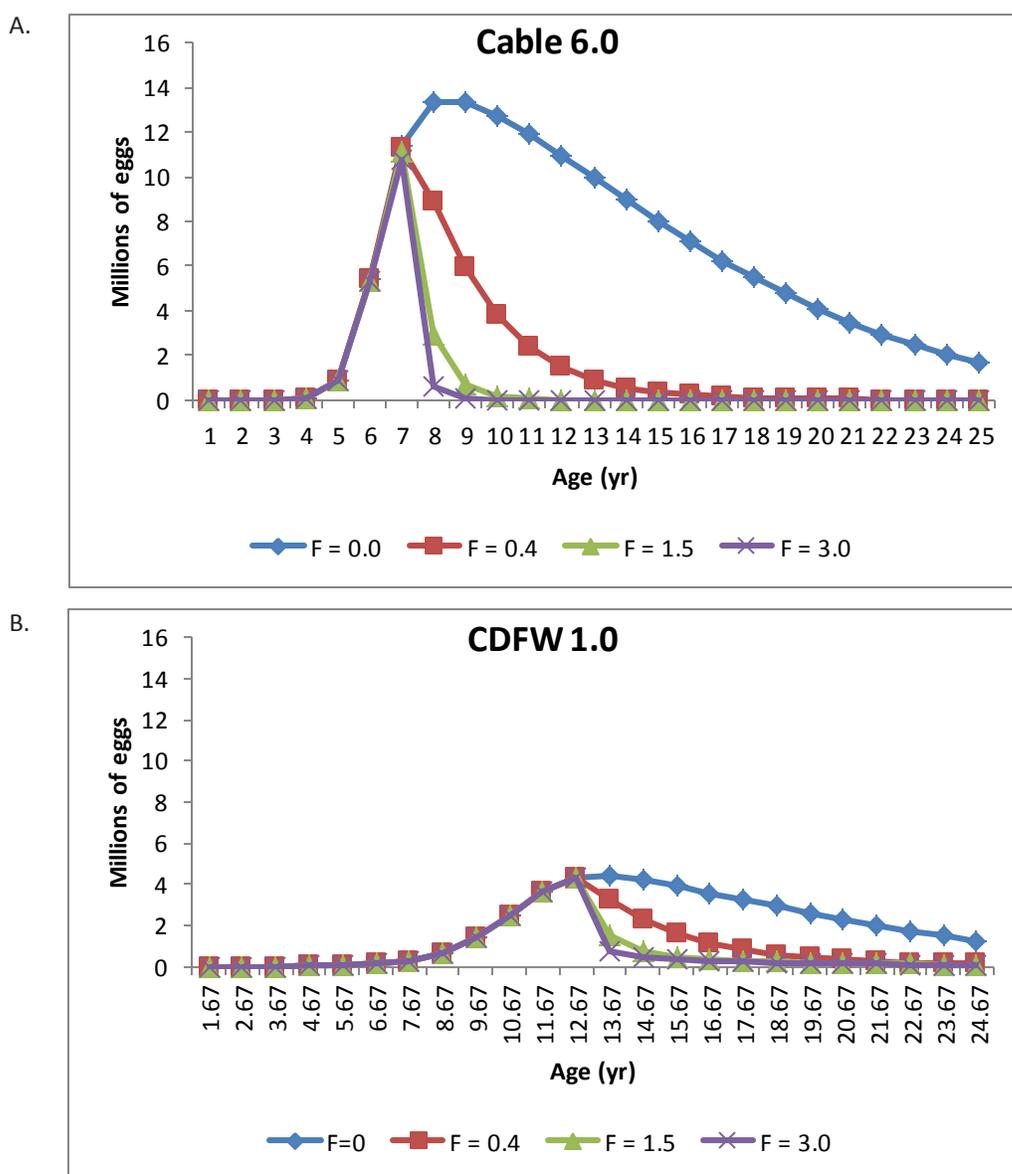


Figure 1. Fecundity by age for the two SPR models: a) the Cable 6.0 and b) CDFW 1.0 for a range of fishing mortality rates.

Even for a high fishing mortality rate of 3.0 per year, the CDFW model still has a SPR value of 34%. However, when we plotted the corresponding average lobster weight against fishing mortality (Figure 3), which is the basis of the control rule, we found that neither model would be a very sensitive way of determining fishing mortality and the corresponding fishing mortality rate that would be used to obtain the SPR value each year. Note that the axes in Fig. 3 are plotted to reflect that the average weight is what is measured so as to estimate the fishing mortality rate. With the current SPR model, fishing mortality would be undefined at average weights less than 1.40 lb. For comparison, the average weight at legal size (82.5 mm CL is 1.25 lb for males and 1.38 lb for females).

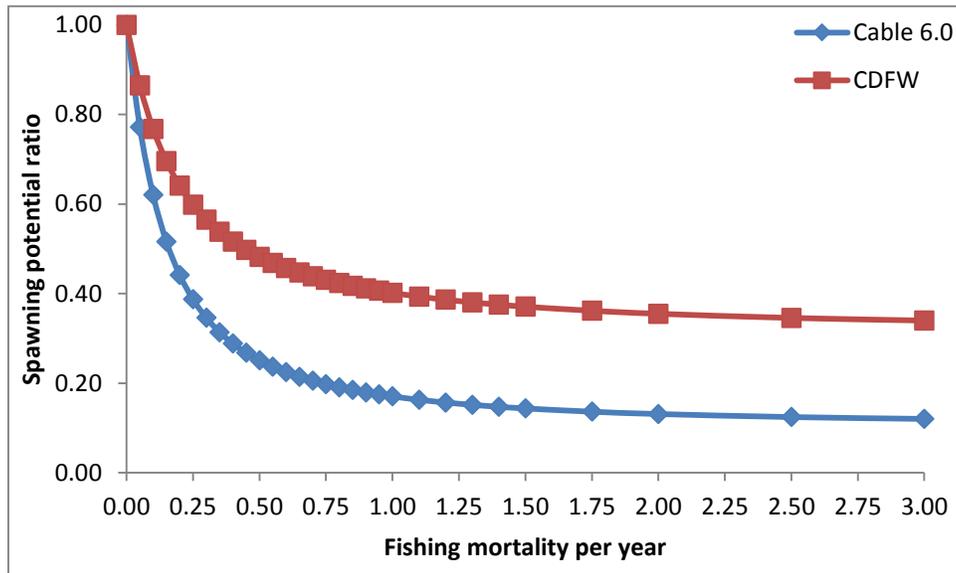


Figure 2. Spawning potential ratios for the two SPR models (Cable 6.0 and CDFW 1.0) for a range of fishing mortality rates.

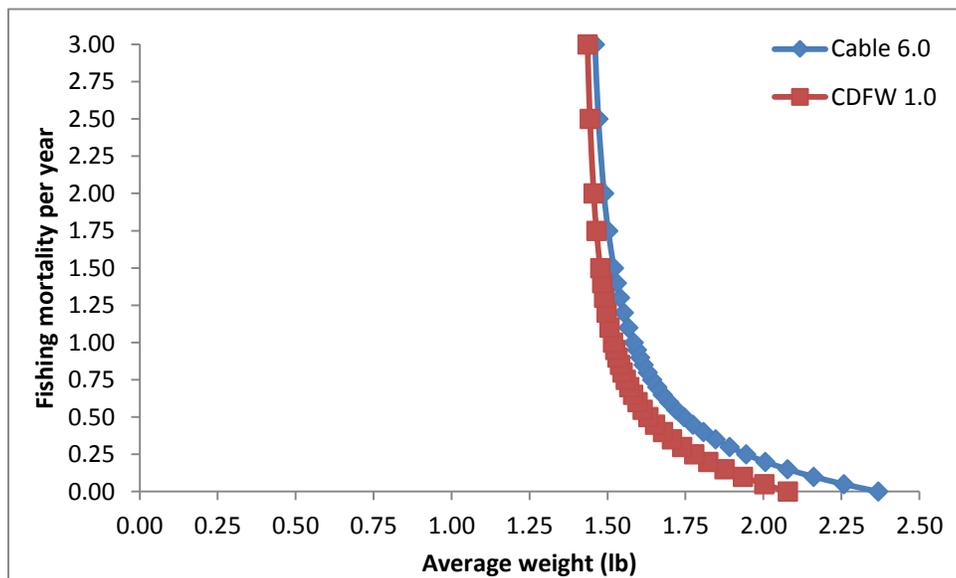


Figure 3. Average spiny lobster weights and the corresponding fishing mortality rates from the two SPR models (Cable 6.0 and CDFW 1.0).

## APPENDIX B: APPLYING THE CANADIAN PRECAUTIONARY APPROACH TO CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE COMMERCIAL LANDINGS

We compared the sensitivity of the Department's proposed catch-based threshold approach with another strategy in use for the American lobster in Canada. In 2014, Canada established a reference point for their southern Gulf of Saint Lawrence lobster fisheries using commercial catch based on the Precautionary Approach. Based on this approach, if landings are between an upper stock reference (USR) and the limit reference point (LRP, i.e., the caution zone) it automatically triggers management considerations. These harvest control rules are pre-set management actions aimed at exiting the caution zone and re-entering the healthy zone (i.e., above the upper stock reference point). Based on a 123-year data series for the southern Gulf of Saint Lawrence, management considerations would have been triggered for the American lobster 85 times, and 12 times in a recovery mode (i.e., drastic reduction of effort to a no fishing situation) (Figure 1). However, applying the California spiny lobster approach to the same American lobster data revealed that California's proposed 0.8 reference point would only be exceeded two times (Figure 2).

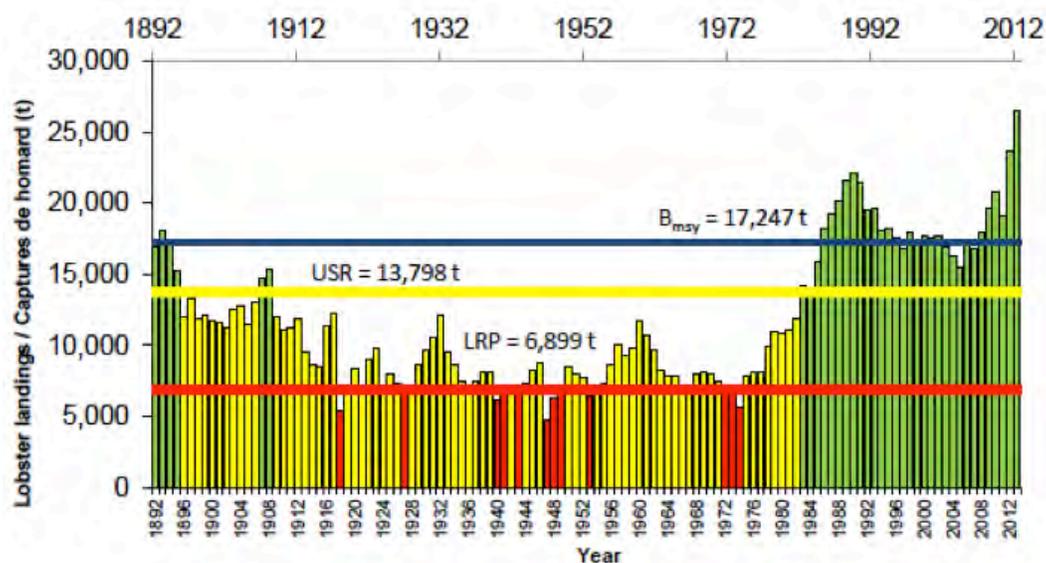
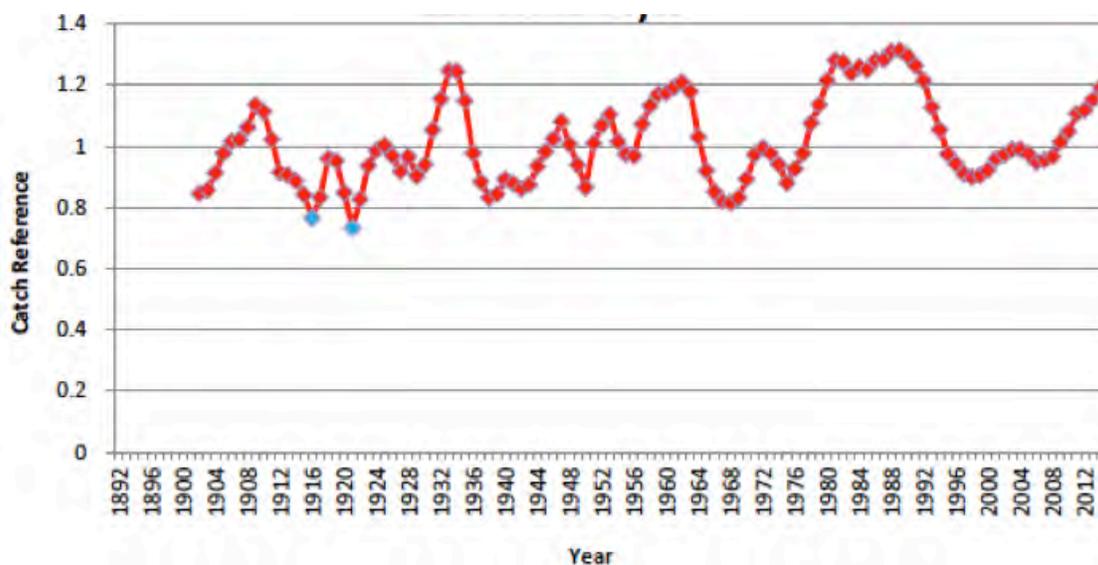


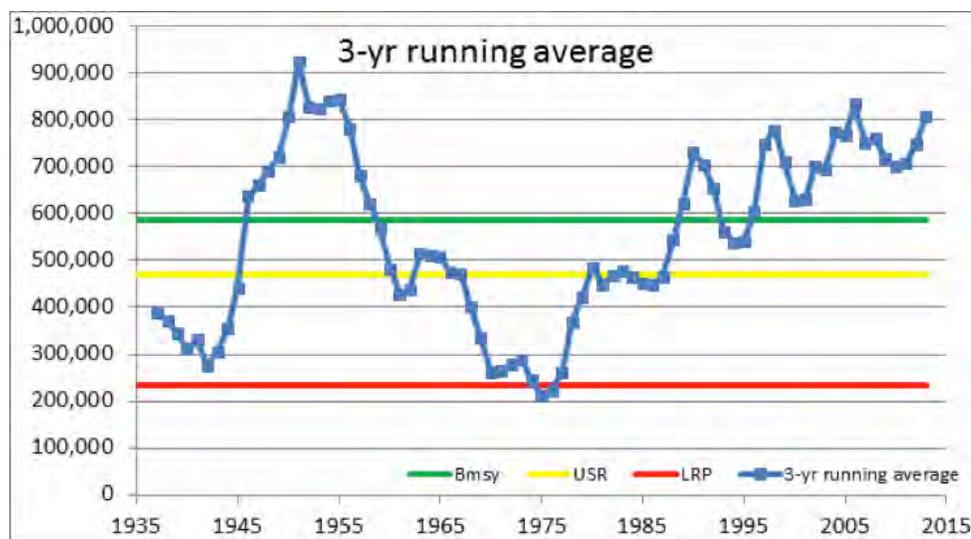
Figure 1. American lobster landings (1893-2013) in the southern Gulf of St. Lawrence; years in the healthy zone (i.e., above the upper stock reference [USR]) in green, caution zone (i.e., between the USR and the limit reference point [LRP]) in yellow, and below LRP in red. The biomass for the maximum sustainable yield ( $B_{msy}$ ) is estimated at 17,247 t.

We then applied Canada's Precautionary Approach to the Department's California spiny lobster commercial landings data. To do this, we calculated a hypothetical biomass at maximum sustainable yield ( $B_{msy}$ ) based on a time period from low landings followed by a "recovery" to higher and more sustained landings. Based on the information in the draft spiny lobster FMP, the lowest landings (with information available on effort) were observed in 1974 followed by increasing landings (with fluctuations) until 2013. Based on the trap pull haul (webinar presentation fig. 2.6), it seems that the effort level (traps hauled) increased 4 times: 200,000-400,000 between 1973-1979; 400,000-600,000 (with a drop in 1991-2) between 1980-94;  $\pm 800,000$  between 1995-2011; and above 1 million in 2012-3. A reasonable assumption is that the stock could sustain the 800,000 trap haul level (16 years) since the landings did not drop during the time. Hence, the time period could be established between 1974 and 2011. However, please note that based on the CPUE reference values (see fig. 4.7 in FMP document), one could reasonably argue that the stock does not seem to react well to the level of effort in the last 7 years and that the time period should/could be 1974-2007. Nevertheless, using the 1974-2011 period



**Figure 2. Catch reference for the American lobster landings (1892-2013) in the southern Gulf of St. Lawrence using the California spiny lobster catch-based threshold approach.**

the  $B_{msy}$  is estimated at 587,409, given an upper stock reference (80% of  $B_{msy}$ ; USR) of 469,927, and the limit reference point (40% of  $B_{msy}$ ; LRP) of 234,963 (Figure 3). The draft FMP (Figure 4.6) indicates that between 1935 and 2013 management considerations would have been triggered 11 times, mostly between 1960-74. Based on the precautionary approach and using a 3-year running average for landings, the spiny lobster fishery was below LRP in 1975-6 (critical zone; normal because the time period stated at low values), which would trigger a recovery period (i.e., drastic reduction of effort to a no fishery situation). Since 1935, landings were between LRP and USR (caution zone) 31 times (latest 1977-87) that would have triggered immediate management actions from pre-established harvest control rules (mainly effort reductions) to, hopefully, exit the caution zone and re-enter the healthy zone. Landings between USR and  $B_{msy}$  was observed 9 times (latest 1993-5) but does not trigger urgent management considerations, but could be used by managers to start a dialogue with the industry (e.g., to be cautious).



**Figure 3. Application of Canada's Precautionary Approach to California spiny lobster commercial landings data; years in the healthy zone (i.e., above the upper stock reference [USR; yellow line]), caution zone (i.e., between the USR [yellow line] and the limit reference point [LRP; red line]), and below LRP. The biomass for the maximum sustainable yield ( $B_{msy}$ ) is estimated at 587,409 lbs.**

## APPENDIX C: SCIENTIFIC AND TECHNICAL REVIEW PROCESS

The California Department of Fish and Wildlife (the Department) asked California Ocean Science Trust to coordinate an external scientific and technical review of the reference point thresholds prescribed in the California Spiny Lobster Fishery Management Plan (FMP) and supporting materials. Specifically, the Department sought an independent assessment of whether the technical components, spawning potential ratio model, and supporting documents that underpin the proposed reference point thresholds prescribed in the FMP are scientifically sound and reasonable given the Department’s currently available data streams and analysis techniques. See the “Scope of Review” for details on the charge to reviewers.

Ocean Science Trust designed and implemented all aspects of the review process, including compiling appropriate background materials, drafting instructions to guide reviewers throughout the process, scheduling and hosting remote meetings as appropriate, and working with reviewers to produce a written final summary report, among other activities. Upon completion of the review, the final report was delivered to the Department and made publicly available on the Ocean Science Trust website. Throughout, Ocean Science Trust facilitated constructive interactions between the Department and reviewers as needed in order to ensure reviewers provide recommendations that are valuable and actionable, while maintaining the independence of the review process and outputs

### Scientific Review Principles

In any review, it is our intent to provide an assessment of the work product that is balanced, fairly represents all reviewer evaluations, and provides feedback that is actionable. When building a scientific and technical review process, we seek to balance and adhere to six core review principles. These principles help guide the design and implementation of each review, and shape the final outputs:

- **Scientific rigor:** the process must yield an evaluation of whether scientific and technical components contained within products are valid, accurate and thorough.
- **Transparency:** given the context for the review, the process must include the appropriate level of information disclosure and openness in order to facilitate social recognition and accountability.
- **Legitimacy:** the process must yield an output that is viewed as authoritative in the eyes of scientific community, the requesting agency, and other constituents.
- **Credibility:** the process will seek to be unbiased and incorporate the best available science.
- **Salience:** the process will consider the most relevant scientific information while balancing management needs and timelines.
- **Efficiency:** the process will be as cost-effective as possible, and utilize time, resources, and effort in a proficient manner to create the most robust output possible.



## Review Process

The review took place from October 2014 through May 2015. A timeline of each task is provided below.

Milestone	2014			2015				
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
<b>Task 1 - Review Preparation</b>								
Scope and process development; budget and administrative preparation; reviewer solicitation and selection process; collateral material development	X							
<i>CDFW delivery of draft FMP to Ocean Science Trust</i>		X						
<b>Task 2 – Conduct Review</b>								
<b>Webinar 1:</b> Initiation of Review (Attendees: CDFW, Review Committee, Ocean Science Trust)			X					
<b>Webinars 2:</b> FMP Assessment (Attendees: Review Committee, Ocean Science Trust)				X				
<i>CDFW delivery of draft SPR model and report to Ocean Science Trust</i>						X		
<b>Webinar 3:</b> SPR Model Assessment (Attendees: CDFW, Review Committee, Ocean Science Trust)						X		
<b>Webinar 4:</b> Cont. SPR Model Assessment, Develop Review Recommendations (Attendees: Review Committee, Ocean Science Trust)							X	
<b>Task 3 – Finalize Summary Report</b>								
Deliver final report to CDFW and make available online; publish membership of review committee; present findings to the Fish and Game Commission								X

## Assembling the Review Committee

Ocean Science Trust implemented a reviewer selection process to assemble a review committee composed of four external scientific experts. Ocean Science Trust consulted with and accepted reviewer recommendations from the Ocean Protection Council Science Advisory Team (OPC-SAT), as well as Ocean Science Trust's own professional network among the academic and research community. Membership included experts from academia, research institutions, and government entities in order to deliver balanced feedback and multiple perspectives. Reviewers were considered based on three key criteria:

- **Expertise:** The reviewer should have demonstrated knowledge, experience, and skills in one or more of the following areas:
  - Fisheries biology, stock assessments and modeling, including spawning potential ratio analyses and application
  - Invertebrate ecology and/or population biology, with an understanding of California's coastal ecosystems, and how invertebrate stocks respond to fishing pressure, climate change and marine protected areas
- **Objectivity:** The reviewer should be independent from the generation of the product under review, free from institutional or ideological bias regarding the issues under review, and able to provide an objective, open minded, and thoughtful review in the best interest of the review outcome(s). In addition, the reviewer should be comfortable sharing his or her knowledge and perspectives and openly identifying his or her knowledge gaps.
- **Conflict of Interest:** Reviewers will be asked to disclose any potential conflicts of interest to determine if they stand to financially gain from the outcome of the process (i.e. employment and funding). Conflicts will be considered and may exclude a potential reviewer's participation.

Final selections for the review committee were made by the Ocean Protection Council Science Advisor (Ocean Science Trust Executive Director). Ocean Science Trust selected one member of the review committee to serve as chair to provide leadership among reviewers, help ensure that all members act in accordance with review principles and policies, and promote a set of review outputs that adequately fulfill the charge and accurately reflect the views of all members.

## Series of Review Webinars

All meetings took place via a series of remote online meetings (webinars) and phone calls. At the outset of the review, Ocean Science Trust worked with the Department to develop detailed reviewer instructions that encouraged focused scientific feedback throughout the process. Instructions included directed evaluation questions and delegated tasks for reviewers based on their individual areas of expertise. The instructions were used to guide the development of meeting agendas, and track progress throughout the course of the review. For each meeting, advanced work was required of participants (e.g., conducting analyses, drafting responses to guiding questions, preparing presentations) in order for all parties to come prepared for meaningful discussions. Ocean Science Trust notified CDFW of additional requested materials and data prior to the first "Initiation of Review" webinar in mid-November.

- **Webinar 1: Initiation of Review (December 2014)**

Ocean Science Trust hosted an initial remote meeting (webinar) to provide the review committee and Department staff an overview of the scope and process, and clarify the roles and responsibilities of each participant. The Department provided a summary of the relevant management context to ensure reviewers understood the role of the review in the FMP development process, and how the outputs would be considered. The bulk of the webinar focused on a presentation by the Department of the scientific and technical components

of the draft FMP. The webinar was an opportunity to develop a shared understanding of the tasks and allow reviewers to ask the Department any clarifying questions about the review materials before they convened independently to conduct their technical assessment.

- **Webinars 2-4: Reviewers convened with Ocean Science Trust to conduct review (*January through April 2015*)**

Ocean Science Trust convened three remote one- to two-hour webinars with the review committee to conduct an in-depth evaluation of the components identified in the Scope of Review. In advance of each webinar, reviewers were asked to prepare responses to guiding evaluation criteria questions from the review instructions. During each webinar, reviewers discussed their findings and developed conclusions and recommendations. Outputs from each webinar, as well as reviewer responses to the questions, guided the development of the final report.

## Final Summary Report

Ocean Science Trust worked with the review committee to synthesize reviewer assessments (responses to the review instructions and input during webinars) into a cohesive, concise final report. The final report was delivered to the Department in May 2015, and made publicly available on Ocean Science Trust's website along with the identities of the review committee members. Ocean Science Trust presented the review results on behalf of the review committee at the June 10, 2015 California Fish and Game Commission public meeting in Mammoth, California.

## Contact Information

**For information related to the scientific review process:**

**Hayley Carter**

Project Scientist  
California Ocean Science Trust  
hayley.carter@oceansciencetrust.org

**For information related to the spiny lobster FMP, and other management inquiries:**

**Tom Barnes**

Marine Region Program Manager  
California Department of Fish and Wildlife

**Tom Mason**

Marine Sr. Environmental Scientist Supervisor  
California Department of Fish and Wildlife

## **California Ocean Science Trust**

1330 Broadway, Suite 1530  
Oakland, California 94612  
[oceansciencetrust.org](http://oceansciencetrust.org)





## CDFW Feedback on Implementation Details of the Lobster Advisory Committee Commercial Recommendations:

The California Department of Fish and Wildlife (CDFW) recently met with the Lobster Advisory Committee (LAC) Commercial Representatives to discuss details regarding implementation of the proposed regulatory changes to the commercial lobster fishery recommended by the LAC. Input from CDFW Marine Region and Law Enforcement Division (LED) is provided in **Blue Font** below. This information is being disseminated to refine the details prior to the formal regulatory process which takes place after the Fisheries Management Plan (FMP) has been adopted in 2015. The LAC recommendations will part of the Lobster FMP implementing regulations that will be formally introduced to the Fish and Game Commission in mid-2015. Any new regulations that are adopted would not be implemented until the 2016-2017 lobster season.

### LAC Commercial Proposal

**Table 1. COMMERCIAL TRAP LIMIT**

CATEGORY	NUMBER OF TRAPS	PROVISIONS
"300" Transferable Permit (T)  "300" Non-transferable permit (NT)	300	<ul style="list-style-type: none"> <li>May stack another permit for a maximum of 2 permits (2 x 300 traps = 600 trap maximum)</li> <li>The second permit remains transferable</li> <li>Death provision applies only to transferable permits (NT permits are not transferable – even due to death)</li> </ul>
<p><b>CDFW supports the proposed LAC trap limit of 300 traps with the ability to stack another permit for a maximum of 2 permits (2 permits X 300 traps = 600 trap maximum). The second permit remains transferable, and the death provision only applies to transferable permits.</b></p>		
Phase-In Stacking Permit	300	<ul style="list-style-type: none"> <li>Available to either transferable or non-transferable permittees</li> <li>Non-transferable permit</li> <li>Only available for three years (must be renewed annually)</li> <li>Permit funds would go for commercial lobster research &amp; monitoring – (\$5,000 - \$10,000 annual permit fee)</li> <li>Would become effective when trap limits go into effect</li> </ul>
<p><b>CDFW recognizes that a "Phase-In Stacking Permit" may no longer be necessary given the projected timeline for the proposed implementing regulations. New regulations would become effective for the 2016/2017 season.</b></p>		

**Table 2. GENERAL PROVISIONS**

- Death provision applies only to transferable permits  
**CDFW Proposed Details:**
  - non-transferable permits can never be transferred - even upon death
  
- All traps must be tagged (on trap or buoy or both)(must be purchased annually); details to be worked out with LED  
**CDFW Proposed Details:**
  - Traps shall be tagged w/ Dept. issued trap tags
  - 300 trap tags shall be issued once a year to each permittee before the start of the season
  - Program costs to be incorporated into permit fees, and tags will not be purchased separately
  
- Catastrophic gear loss provision; details to be worked out with LED (application would include requirement to report details of loss)(Information could be shared with permitted recovery projects)  
**CDFW Proposed Details:**
  - The Department is considering defining catastrophic loss as the loss of 75 or more tags per permit. Catastrophic loss claims will be formally submitted to the Department for approval. LED will determine whether to approve or deny catastrophic loss claims. Claim information must include a detailed description of the circumstance that caused the loss, date of loss, number of traps lost along with their tag numbers, and location of lost traps (Latitude and Longitude coordinates).
  - Catastrophic loss tags\_would be uniquely identifiable.
  
- Allow scuba equipment on board commercial vessels to retrieve lost traps or remove line from prop (not allowed to “fish” when on scuba)  
**CDFW Proposed Details:**
  - Scuba gear already allowed per T14 122. Cannot be used for “take”
  - Provide clarification that no lobsters can be taken or possessed w/scuba gear, or any other underwater breathing apparatus (including hookah). However, this equipment can be used to locate and secure (retrieve) traps
  - Provide clarification that lobsters contained in a trap that has been secured using scuba gear, or any other underwater breathing apparatus equipment (including hookah), can be possessed after the trap has been serviced aboard the vessel
  
- More than one permittee may operate from a single vessel; each permittee whose traps are being pulled must be aboard  
**CDFW Proposed Details:**
  - Dual Permittee on board – both permittees will be responsible for any violation found on vessel
  
- 7 day soak time using “Federal Rules” regarding weather  
**CDFW Proposed Details:**
  - Adopt similar language to CFR Title 50 §660.230(3)
  - Traps must be attended at least once every 7 days. No specific weather exemption. If traps cannot be pulled due to weather, fishermen will be responsible for burden of proof (e.g. NOAA weather advisory, or other formal documentation from a government weather agency)

- Limit use of “note” to fish traps by other than permit holder. May open (and retain the lobsters within) or retrieve traps belonging to another lobster fisherman with a note and notification to DFW LED (details to be worked out with LED); may not bait or fish traps for another permittee

**CDFW Proposed Details:**

- Formalize the “note” process by requiring permittees to submit a waiver request to the Department. Waiver should be similar to the Dungeness Crab Waiver to Pull Traps
- Specific protocol and procedures for the Lobster Waiver to be established by LED
- CDFW will determine each waiver request on individual case basis. The information submitted in the waiver request will be used to determine the conditions. Lobsters may not be retained unless specified by CDFW as a condition on the waiver
- Department to be notified in advance
- Responsibility for violations is transferred to the individual permittee that has permission to pull
- Traps need to be either removed from water or wired open as specified by CDFW as a condition on the waiver.
- Establish provision to allow other fishermen targeting other species to recover lost or derelict gear (if found more than 9 days after the close of lobster season). This would be modeled after the existing provision for the recovery of up to 6 Dungeness crab traps.

- Allow commercial fishermen to start hauling their traps to sea before the season starts on the Monday before opening week (9 days before the commercial opener) and allow traps with doors open to remain in the water not more than 9 days after the close of the season

**CDFW Proposed Details:**

- Allow traps to be deployed (unbaited and doors wired open) 9 days before the commercial opener, and allow traps to remain in the water (unbaited and doors wired open) not more than 9 days after the close of the season. Traps must be out of the water no later than 9 day after the close of the season.
- “Bait day” remains the same

- Branding of floats allowed (details to be worked out with LED)

**CDFW Proposed Details:**

- This is already allowed under current regulations and so a regulatory change is not necessary to implement it. Therefore, the following clarification is provided as guidance to encourage effective compliance. Each buoy identifying a lobster trap would display the commercial fishing license identification number of the lobster operator permit holder followed by the letter P. The commercial fishing license number and the letter P would be at least one (1) inch in height and at least one-eighth (1/8) inch in width, and either branded on the buoy in a way that is clearly readable or painted in a color that contrasts with that of the buoy. All lobster permit holders would maintain lobster trap buoys in such a condition that buoy identifying numbers are clearly readable.

- **Additional Issue (Not addressed by the LAC):** Traps that are wired open and unbaited still need to be serviced every 96 hours per FG9004

**CDFW Proposed Details:**

- Traps that are wired open and unbaited would be exempt from the trap service requirement for a period up to 14 days. Traps that have not been serviced after 14 days will be considered

abandoned.

**CDFW Staff**

**Bob Puccinelli – Captain, Law Enforcements Division**

**Craig Shuman – Regional Manager**

**Tom Barnes – Manager of State Managed Species**

**Kai Lampson – Lobster FMP Coordinator**

**Representatives on the LAC**

**Rodger Healy – Commercial Fishing Representative**

**Shad Catarius – Commercial Fishing Representative**

**Jim Colomy – Commercial Fishing Representative**

**Josh Fisher – Alternate Commercial Fishing Representative**

**MEETING PARTICIPANTS**

Prepared by CDFW February 20, 2015

# Spiny Lobster Fishery Management Plan Lobster Advisory Committee Recreational Lobster Fishery Management Recommendations



The California Department of Fish and Wildlife (CDFW) recently met with the Lobster Advisory Committee (LAC) Recreational Representatives to discuss details regarding implementation of the proposed regulatory changes to the recreation lobster fishery recommended by the LAC. Input from CDFW Marine Region and Law Enforcement Division (LED) is provided in [Blue Font](#) below. This information is being disseminated to refine the details prior to the formal regulatory process which takes place after the Fisheries Management Plan (FMP) has been adopted in 2015. The LAC recommendations will be part of the Lobster FMP implementing regulations that will be formally introduced to the Fish and Game Commission (Commission) in mid-2015. It is expected that any new regulations adopted by the Commission would be implemented at the start of 2016-2017 lobster season.

**Please Note:** Proposals to prohibit or “ban” the use of conical hoop nets or to establish a seasonal limit were not part of the LAC’s consensus recommendations for the recreational fishery. CDFW will not be forwarding these proposals to the Commission as part of the LAC recommendations.

---

## Full consensus was achieved by the Lobster Advisory Committee for the following:

**Issue:** Lobster caught by recreational fishermen is being illegally sold in the commercial market place. Requiring sport fishermen to clip or punch the center tail flap makes it possible for law enforcement to identify lobsters caught in a recreational fishery that end up in the market and take appropriate legal action. This proposal will give law enforcement a tool to address buyers and markets that purchase lobster from recreational fishermen.

**Proposal:** Recreationally caught lobsters are to be tail-clipped (removing the bottom half of the central tail flap) or tail-punched in the central tail flap (Australia requires a 10 mm minimum hole). Additional details will be worked out with LED (e.g. clipped when landed?).

**LAC Action:** The LAC achieved consensus on the tail-clipping proposal above.

## CDFW Proposed Details:

- Allow both tail clipping and tail punching as an option: remove at least the bottom half of central tail fin or single hole punch the center tail fin with a hole no less than ¼ inch in diameter

- The tail must be clipped or punched at the same time the catch information is reported on the report card (T14 29.91(C): When the cardholder moves to another location code, or finishes fishing for the day, he or she must immediately record on the card the number of lobster kept from that location
- 

**Issue:** Use of mechanized pullers has made it easier to rob from commercial traps.

**Proposal:** Restrict the use of mechanized pullers only to persons in possession of proof of disability/medical (Disabled Mechanized Hoop Net Puller Permit). This restriction would only pertain to power driven mechanized pullers and not hand operated davits with single pulley systems.

Clarification: This restriction only applies to individuals targeting or in possession of lobster, not persons solely targeting crab.

Proposed CDFW Disabled Mechanized Hoop Net Puller Permit Form:

The following conditions must be met to qualify for issuance of a Disabled Mechanized Hoop Net Puller Permit: “For the purposes of this permit a disability means a permanent loss, significant limitation, or diagnosed disease or disorder, which substantially impairs an individual’s ability to physically pull by hand and retrieve a hoop net for the purpose of targeting lobster.” A medical physician must sign the permit application form.

**LAC Action:** The LAC achieved consensus on the mechanical puller restriction proposal above.

Some members noted that the broad wording of the disability option could render the management measure ineffective and suggested that the LAC work with LED to ensure the new rule has “teeth” when it is applied.

**CDFW Recommendation:**

- Mechanized pullers should not be restricted beyond current legal use
  - The potential for illegal use given the circumstance is not viewed as a reasonable justification for restriction
  - Illegal use of mechanized pullers is not a commonly observed problem. LED reported one case over ten years ago, with four lobsters taken from a commercial trap using a mechanized puller
  - The creation of disabled hoop net puller permit creates an unnecessary burden on disabled persons through the potential added expense and time to obtain the necessary note from a physician in order to obtain a permit
-

**Issue:** The midnight opener creates a “rush” mentality that fuels conflicts between recreational users and poses a safety risk. The current lobster opener date and time can be difficult to understand (confusion regarding when the season actual “starts”) and constituents are having trouble following the law. CDFW has been asked to consider an alternate start time.

**Proposal:** Make the lobster opener 6:00 a.m. on Saturday instead of 12:01 a.m. on Saturday.

Key discussion points:

- New time is workable for LED
- Proposal improves safety conditions
- Regulatory change has no impact on the resource
- Commercial season dates would not change

**LAC Action:** The LAC achieved consensus on the lobster opener proposal above. The group acknowledged concerns regarding the economic impact this proposal may have on some dive charters.

LAC recommendation is for a 6:00 a.m. Saturday start time (lobster opener)

#### **CDFW Recommendation:**

- Proposed 6:00 am Saturday start time is easier to facilitate enforcement patrols
  - Promotes a safer environment for both boaters and divers on opening day
  - Reduces the “rush” mentality which fuels negative diver/hoop netter interactions at harbors and jetties
- 

**Issue:** Marking hoop net floats will improve accountability and safety among recreational fishermen, and may help reduce illegal commercialization.

**Proposal:** Hoop net floats should be marked with unique ID (DL, Go ID, etc. — details to be worked out with LED).

**LAC Action:** The LAC achieved consensus on the marked hoop net proposal above.

#### **CDFW Proposed Details:**

- Buoy identification should be required with GO ID number. This number shall be legible, but there will be no size or color specification. Go ID number helps maintain fishermen’s confidentiality, and minimizes the risk of identity theft
  - LED can easily verify this number in the field as it can be cross referenced with the fishing license
-

**Issue:** Spear fisherman have been harassed or cited for carrying a spear gun while in the pursuit of lobster. Constituents have asked for clarity on the definition of a “hooked” device.

**Proposal:** Keep change simple. Ensure regulatory language focuses on how lobster can be taken (i.e. “skin and scuba divers may take lobsters by hand only”) and not how it cannot be taken; remove “hooked device” term from current regulations. The proposal allows for possession of a spear gun or pole spear underwater while hunting lobsters. Misuse of this equipment to take lobster (lobster can only be taken by hand) would remain illegal.

**LAC Action:** The LAC achieved consensus on the hooked device proposal above.

**CDFW Recommendation:**

- Remove “hooked device” for clarification
- 

**MEETING PARTICIPANTS**

**CDFW Staff**

**Bob Puccinelli** – Captain, Law Enforcements Division

**Craig Shuman** – Regional Manager

**Tom Barnes** – Manager of State Managed Species

**Kai Lampson** – Lobster FMP Coordinator

**Representatives on the LAC**

**Jim Salazar** – Recreational Fishing Representative

**Michael Gould** – Recreational Fishing Representative

**Al Stasukevich** – Recreational Fishing Representative

**Paul Romanowski** – Recreational Fishing Representative

# Memorandum

2015 MAY 29 PM 2:55

Date: May 22, 2015

To: Sonke Mastrup  
Executive Director  
Fish and Game Commission

From: Charlton H. Bonham  
Director



Subject: **Briefing Binder Submission for the June 10-11 Fish and Game Commission Meeting Regarding the Spiny Lobster Fishery Management Plan**

## Background

An extensive public scoping process was used by the Department of Fish and Wildlife (Department) to develop implementing regulations for a Spiny Lobster Fishery Management Plan (FMP). The Department established the Lobster Advisory Committee (LAC) as a formal stakeholder group who met over a period of two years to make management recommendations, including regulation changes. The LAC consisted of seated representatives from a broad spectrum of constituencies. Through consensus, the LAC approved a management framework that established proposed mechanisms to promote an orderly fishery while assuring sustainability and also taking into account the economic implications of that same framework. The Department supports the efforts of the LAC, and has made every effort to recommend FMP regulations that are consistent with the LAC consensus-based proposals. The Department and LAC regulatory recommendations were transmitted to the Commission for consideration at its April 8<sup>th</sup>, 2015 meeting.

The Department is requesting direction from the Commission on options to include in a regulatory package that is associated with the FMP. The enclosed table summarizes the LAC and Department commercial and recreation spiny lobster regulatory recommendations. This table provides a summary of the recommendations transmitted to the Commission at its April 8<sup>th</sup>, 2015 meeting. The Department will also be requesting direction from the Commission on four additional Department recommendations for the commercial spiny lobster fishery that are included in the table.

The additional recommendations include:

1. Require each lobster operator permit holder to report the number and location of traps lost at the end of each season. This will allow the Department to estimate gear loss for the fishery and help facilitate recovery efforts.

Sonke Mastrup, Executive Director  
Fish and Game Commission  
May 22, 2015  
Page 2

2. Extend the lobster operator permit death provision transfer period from one to two years. This is recommended by the Department's License and Revenue Branch (LRB) to provide families or estates an extra year to transfer a permit.
3. Add a prohibition on the transfer of lobster operator permits to include pending violation(s). Current regulations allow permits to be transferred when a permit holder has pending violations. This recommendation was added at the request of LRB and Law Enforcement Division to prevent transfers from occurring before results of the pending violation(s) are known.
4. Require a Department application for the transfer of lobster operator permits.

If you have any questions or need additional information, please contact Dr. Craig Shuman, Regional Manager of the Marine Region, by telephone at (805) 568-0216 or by email at [craig.shuman@wildlife.ca.gov](mailto:craig.shuman@wildlife.ca.gov).

#### Attachment

ec: Dan Yparraguirre, Deputy Director  
Wildlife and Fisheries Division  
[Dan.yparraguirre@wildlife.ca.gov](mailto:Dan.yparraguirre@wildlife.ca.gov)

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Tom Mason, Senior Environmental Scientist  
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## Summary Table of the Lobster Advisory Committee and Department of Fish and Wildlife spiny lobster regulatory recommendations

Background: The Department of Fish and Wildlife (Department) is requesting direction from the Fish and Game Commission (Commission) on options to include in the regulatory package that is associated with the Spiny Lobster Fishery Management Plan. This table provides a summary of the Lobster Advisory Committee (LAC) and Department commercial and recreation spiny lobster regulatory recommendations transmitted to the Commission at its April 8th, 2015 meeting. The table also includes additional Department recommendations not addressed by the LAC.

LAC Consensus and Department Recommended Lobster Regulatory Changes	
1	Regulations to implement the lobster Fishery Management Plan (FMP). <i>Identifies the purpose and scope, harvest control rules, management responses, and lists definitions specific to the FMP.</i>
<b>Recreational Recommendations</b>	
<b>Change Summary</b>	
<b>Purpose</b>	
2	Require the hole-punching or fin-clipping of all retained lobsters. <i>To reduce illegal commercialization of sport caught lobsters.</i>
3	Change recreational season opener from 12:01 am to 6 a.m. on Saturday. <i>To increase safety during the season opener.</i>
4	Require hoop net operators to mark hoop net floats with GO-ID numbers. <i>Allows Enforcement to easily identify the owner of a hoop net.</i>
5	Clarify methods of take for crustaceans. <i>Clarifies that spear gear can be possessed by divers while targeting or in possession of lobsters so long as the gear is not used in the taking of lobster.</i>
<b>Commercial Recommendations</b>	
<b>Change Summary</b>	
<b>Purpose</b>	
6	Trap limit of 300 traps per permit with the ability to purchase a second permit for a maximum 600 traps. <i>To improve the commercial fishery and create a more orderly fishery.</i>
7	Add fees and forms associated with trap tag program. <i>Required to add new fees and other administrative requirements for the trap tag program.</i>
8	Catastrophic trap tag loss provision. Catastrophic loss defined as the loss of 75 or more tags per permit. <i>To allow for the replacement of tags lost over a season.</i>
9	Clarify use and possession of SCUBA equipment from commercial lobster vessels. <i>Amended for clarification purposes.</i>
10	More than one permittee may operate from single vessel. <i>Added for clarification purposes. Each permittee whose traps are being pulled must be aboard and both permittees will be responsible for any violation found on vessel.</i>
11	Require traps to be serviced at least every 7 days (currently 4 days). <i>Proposed as part of the trap limit proposal.</i>
12	Waiver requirement for allowing lobster operator permit holders to service another fishermen's traps. <i>To formalize the process to meet enforcement and fishermen's needs.</i>
13	Add a provision to allow fishermen to recover up to 6 lost traps. <i>To allow for the retrieval of lost gear.</i>
14	Extend the period (from 6 to 9 days) for deploying and retrieving traps before and after the season. <i>Proposed as part of the trap limit proposal.</i>
15	Allow branding of trap buoys. <b>No regulatory change needed:</b> Already covered by existing regulations and will be clarified.

**Summary Table of the Lobster Advisory Committee and Department of Fish and Wildlife spiny lobster regulatory recommendations**

<b>Additional Department Recommendations Not Addressed by the LAC</b>		
	<b>Change Summary</b>	<b>Purpose</b>
16	Define abandoned traps. Traps considered abandoned if not retrieved 14 days after the season ends.	To define when a trap is considered abandoned.
17	Improving fishery dependent data collection.	Department recommends modifying lobster logbooks and landing receipts to gather essential fishery information to better manage the fisheries.
18	Prohibit the transfer of a lobster operator permit when there are pending violation(s).	Added as an enforcement need.
19	Extend the lobster operator permit death provision transfer period from 1 to 2 years.	Added at the request of the Departments Licenses and Revenue Branch to allow more time to transfer a permit.
20	Require an application for the transfer of lobster operator permits.	Require an application to transfer a permit. Add appeal requirements when a transfer is denied. Add criteria for transfer of permit under a tag system.
21	Reporting of commercial trap loss.	At the end of each season, require commercial fishermen to report the number and location of traps lost over the season.
<b>LAC Consensus Recommendations Not Supported by the Department</b>		
	<b>Change Summary</b>	<b>Rationale for not Supporting</b>
22	Restrict the recreational use of mechanized pullers to only disabled fishermen.	Proposed by the LAC due to concerns of the illegal use of mechanized pullers to poach commercial traps. Law Enforcement Division indicates that illegal use of mechanized pullers is not a commonly observed problem. Proposed regulation would penalize the lawful anglers using mechanical pullers due to the very few anglers that may abuse the use of mechanized pullers.
23	Three-year phase-in trap limit approach.	The Department does not support this recommendation as the projected timeline for the proposed implementing regulations is later than anticipated by the LAC. This gives industry more time to prepare for the proposed new trap limit. In addition, it will be difficult for the Department to implement and administer the program as proposed by the LAC.

**From:** Puccinelli, Robert@Wildlife

**Sent:** Thursday, April 02, 2015 8:41 AM

**To:** Brittain, Mary@FGC

**Cc:** Farrell, Bob@Wildlife; Shuman, Craig@Wildlife; Barnes, Tom@Wildlife; Mason, Tom@Wildlife

**Subject:** RE: April Agenda

Thanks Mary. I know that it is getting late in the game, but I received the attached lobster letter that was sent to the Director a year ago. I responded to the letter writer and told the subject that I would forward his letter to the FGC when the lobster issue was to be brought up to the FGC. Almost forgot about it until now.

Thanks,

Bob

**Puccinelli, Robert@Wildlife**

---

**From:** Brown, Leslie@Wildlife  
**Sent:** Monday, March 24, 2014 8:49 AM  
**To:** Farrell, Bob@Wildlife; Puccinelli, Robert@Wildlife  
**Subject:** FW: Mechanized lobster hoop puller ban

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Bob or Bob-

If this should go to someone else please let me know. Thanks!

--Leslie

---

**From:** Wildlife DIRECTOR  
**Sent:** Friday, March 21, 2014 3:59 PM  
**To:** Brown, Leslie@Wildlife  
**Subject:** FW: Mechanized lobster hoop puller ban

Hi, Leslie -

Please have the appropriate staff member respond to Vartan Chorbajian's allegation. Please instruct staff to 'cc' [Director@wildlife.ca.gov](mailto:Director@wildlife.ca.gov) while replying.

*If you have received this message in error, please let me know, so it can be forwarded promptly to the correct individual.*

Thank you -

Sandi K.

For: [Director@wildlife.ca.gov](mailto:Director@wildlife.ca.gov)

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**From:** Ace Line Hauler [<mailto:info@acelinehauler.com>]  
**Sent:** Friday, March 21, 2014 12:31 PM  
**To:** Wildlife DIRECTOR  
**Cc:** [jim@sabaslayer.com](mailto:jim@sabaslayer.com)  
**Subject:** Mechanized lobster hoop puller ban

To whom it may concern:

It has come to our attention that the California Department of Fish and Wildlife is under pressure to ban the use of electrical hoop pullers.

Our company Ace Line Hauler has been manufacturing these devices for the last fourteen years and it is our belief that our devices only enhance the lives of our customers.

No matter where you live; California, Washington or British Columbia we see the same type of resistance from commercial fishermen. They view the entire resource as theirs and do not want to see any sport fisherman using a product that will make them more efficient. What our product does is very simple. Electric pot or hoop pullers allow sports fishermen who are older or handicapped in any way to be able to go out and enjoy fishing. We hear from

customers all the time who were not able to go out for Lobster, crab or Shrimp anymore because of shoulder injuries, arthritis and a variety of other issues before they purchased a puller. We are not suggesting that all of our customers are disabled; many of them are able but looking for an easier way to pull their traps and there is nothing wrong with this. One thing that nobody can dispute is that a lobster caught by a sports fisherman brings much more into the local economy than a commercially caught lobster so if a fisherman wants to use a device that makes life easier that should be his decision.

Ace Line Hauler buys products for the manufacture of our puller from the United States. We then assemble in Canada and then resell to the United States. This provides jobs for not only our Canadian employees but also Americans in the manufacturing and retail sectors.

One of the main arguments against people possessing a mechanized puller is that they will use it to rob from Commercial traps. The cost for our puller is roughly 600 dollars. Many other mechanized pullers are upwards of 1300 dollars. Many of the people who purchase pullers have boats that are 100,000 dollars. People spending this type of money have worked hard their entire lives; they have fishing permits and are law abiding citizens. Speaking with Jim Salazar who is on the Lobster Advisory Committee he says that there has never been a citation or conviction to back up this claim. The claim that they would risk breaking the law is ridiculous.

Obviously for us we have an interest in seeing mechanized pullers being made available to all sports fishermen as this is our primary business..... but there is a larger issue at play here. The larger issue is that commercial fishermen will always be looking for more of the resource. They will always be working at limiting sports fishing opportunities and it seems that in southern California they have the DFG on their side. The DFG is supposed to be managing the resource for everyone. How sad that future generations may not have the sports fishing opportunities we did.

Sincerely

Vartan Chorbajian  
Ace Line Hauler  
690C Comox Road  
Nanaimo, BC V9R 3J3  
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250.753.7178 fax  
Toll free 1.866.753.7179  
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# ACE LINE HAULER

## FISHING PRODUCTS

Josh Fisher



RECEIVED  
CALIFORNIA  
FISH AND GAME  
COMMISSION

April 29, 2015

2015 MAY 18 PM 3:57  
MLS

California Fish and Game Commission  
P.O. Box 944209  
Sacramento, CA 94244-2090

Commissioner,

As a commercial fisherman and alternate member of the Lobster Advisory Committee, I urge you to reject the Spiny Lobster LAC proposal in its current form.

The Lobster FMP and proposed regulations would negatively impact the commercial fishery of spiny lobster and the availability of sustainability caught lobster. The often referenced commercial fishery survey used to suggest that the industry supports low trap limits was not completed by a large number of fisherman and is not by any stretch of the imagination a scientifically valid survey. I do not support the proposed trap limitations.

The issue that is frequently mentioned by Department staff as a rationale for dramatic trap limits is decreasing CPUE and the danger of allowing the current level of traps fished by the commercial industry.

However, according to the CDFG California Spiny Lobster Stock Assessment - Executive Summary,

*"The number of traps deployed is expected to continue to decline, and the number of permit transfers in any given year (who may fish at higher effort levels) is not expected to be significant. Measured CPUE, while currently lower than two or three decades ago, is still within a standard deviation of the average CPUE over the last decade."*

*"Catchability, the percent of the total catch caught with each trap pull and estimated using depletion models, has been consistent since 1998, the earliest year considered. This consistency is seen despite fluctuations in the ultimate size of the catch each season."*

The real threat to the sustainability of California spiny lobster is the vastly under-regulated recreational fishery. No biological imperative exists to necessitate the need for any immediate resource collection restriction measures on the commercial industry. The Departments' own studies have shown that the current fishery regulations are working as intended to preserve the fishery stock and the fishery is sustainable.

Recreational lobster fishing is growing substantially and currently represents nearly 30% of the overall (commercial + recreational) catch. Regulations limiting the use of conical hoop nets should be implemented to limit the potential long-term negative effects on the lobster stock sustainability.

Sincerely,

Josh Fisher

Fish Market Restaurant  
Suzanne C. Fish, General Manager  
750 N. Harbor Dr.  
San Diego, CA 92101

California Fish and Game Commission  
P.O. Box 944209  
Sacramento, CA 94244-2090

Commissioner,

I wish to express my opposition to the current LAC proposal before the Commission regarding the commercial spiny lobster fishery. I urge you to reject the proposal in its current form and to modify the plan to mitigate the negative impacts on long-term commercial fishermen who would be unfairly and unjustifiably impacted.

The LAC was predetermined to implement significant trap limitations without a scientific reason. The number of sublegal-size lobsters caught by commercial fisherman has increased in recent years, which suggests that the current size limit is effective, and that a sizable number of sublegal-size lobsters are present in the wild and contributing to reproduction (Neilson, 2011).

According to the CDFG California Spiny Lobster Stock Assessment - Executive Summary,

*"The number of traps deployed is expected to continue to decline, and the number of permit transfers in any given year (who may fish at higher effort levels) is not expected to be significant.*

*Measured CPUE, while currently lower than two or three decades ago, is still within a standard deviation of the average CPUE over the last decade.*

*"Catchability, the percent of the total catch caught with each trap pull and estimated using depletion models, has been consistent since 1998, the earliest year considered. This consistency is seen despite fluctuations in the ultimate size of the catch each season."*

The proposed 300 trap limit is unjustified and no scientific rationale was utilized in developing this trap limit.

I ask that a compromise be crafted that protects the economic viability of existing businesses that have historically fished a larger number of traps and yet still meets everyone's long-term goal of protecting the fishery.

Sincerely,

*Suzanne C Fish - General Manager  
750 N. Harbor Drive Fish Market Restaurant  
San Diego, CA 92083  
3fish@thefishmarket.com*

**Bruce Campbell**



April 28, 2015

California Fish and Game Commission  
P.O. Box 944209  
Sacramento, CA 94244-2090

Commissioner,

As a commercial fisherman, I wish to express my opposition to the current Fishery Management Plan and regulatory proposal sent to the Commission by the Spiny Lobster Advisory Committee and the Marine Resource Committee. I urge you to reject the proposal in its current form and to modify the plan to protect long-term commercial fishermen who would be unfairly and unjustifiably impacted.

The LAC was predetermined early on to implement significant trap limitations without a scientific reason.

According to the CDFG California Spiny Lobster Stock Assessment - Executive Summary,

***“The number of traps deployed is expected to continue to decline, and the number of permit transfers in any given year (who may fish at higher effort levels) is not expected to be significant.***

***Measured CPUE, while currently lower than two or three decades ago, is still within a standard deviation of the average CPUE over the last decade.”***

No biological imperative exists to necessitate the need for any immediate resource collection restriction measures. The Departments own stock assessment studies have shown that the current fishery regulations are working as intended to preserve the fishery stock and the fishery is sustainable.

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Sincerely,

A handwritten signature in black ink, appearing to read "Bruce Campbell".

Bruce Campbell

California Fish and Game Commission  
P.O. Box 944209  
Sacramento, CA 94244-2090

Commissioner,

I wish to express my opposition to the current LAC proposal before the Commission regarding the commercial spiny lobster fishery. I urge you to reject the proposal in its current form and to modify the plan to mitigate the negative impacts on long-term commercial fishermen who would be unfairly and unjustifiably impacted.

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The proposed 300 trap limit is unjustified and no scientific rational was utilized in developing this trap limit.

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Sincerely,

Bruce Kirkbride

Bruce A. Kirkbride

