Squid Fishery Advisory Committee Meeting 10
May 1-2, 2024
Aquarium of the Pacific, Watershed Classroom
100 Aquarium Way, Long Beach, CA 90802

KEY OUTCOMES MEMORANDUM

OVERVIEW

The Squid Fishery Advisory Committee (SFAC or Committee) held its tenth and final meeting on May 1-2, 2024. The goals of the meeting were to:

- Summarize SFAC deliberations and emerging themes
- Provide an update on Empirical Dynamic Modeling (EDM) preliminary results
- Review, discuss, and refine preliminary recommendations

PARTICIPANTS

The following SFAC members attended: Caitlin Allen-Akselrud, Richie Ashley, Ryan Auguello, John Barry, Joe Cappuccio, Mark Fina, Russell Galipeau, Corbin Hanson, Greg Helms, Porter McHenry, Tom Noto, Brian Susi-Blair, Joe Villareal, Anthony Vuoso, and Dan Yoakum. Susan Ashcraft, Marine Advisor to the California Fish and Game Commission, and Michelle Horeczko, Senior Environmental Scientist at the California Department of Fish and Wildlife (CDFW) participated as observers. David Crabbe and Ken Towsley were absent.

Katie Grady, Briana Brady, Julia Coates, Harrison Huang, Trung Nguyen, Dianna Porzio and John Ugoretz with the CDFW convening team and Todd Van Epps with CDFW's Law Enforcement Division participated. Scott McCreary and Debbie Schechter with CONCUR served as neutral facilitators.

KEY OUTCOMES

Below is a summary of the main topics discussed during the SFAC meeting. This summary provides an overview of the main topics, primary points, and options raised in discussions and next steps. It is neither a detailed transcript nor a decision document.

1. Welcome, Agenda Review

Katie Grady welcomed SFAC members to the final SFAC meeting and expressed appreciation for the SFAC's commitment over the last year and a half. She reminded the SFAC of its charge to review and advise CDFW on potential changes to California market squid fishery management. She explained that CDFW has carefully considered the advice received from the SFAC to develop preliminary recommendations. The preliminary recommendations will be refined at this final meeting and will be presented to the Fish and Game Commission in November. Scott McCreary reviewed the meeting agenda.

2. Summarize SFAC Discussions To-Date and Review Preliminary CDFW Recommendations for Squid Fishery Management

Katie reminded the SFAC that the framework for the deliberations is the 2005 Market Squid Fishery Management Plan (FMP). The FMP includes a seasonal catch limit, a restricted access permit program, a 48-hour weekend closure, and lighting restrictions. The Marine Life Management Act goals summarized in the FMP (below) also guided the SFAC discussions and preferred recommendations:

1. Ensure long-term resource conservation and sustainability
2. Employ science-based decision-making
3. Increase constituent involvement in management
4. Balance and enhance socio-economic benefits
5. Identify implementation costs and sources of funding

SFAC deliberations so far have addressed the following broad topics:

- Monitoring: There is broad-based support for electronic logs and wildlife interaction monitoring. There is support for continuing egg escapement as status quo and interest in exploring EDM as a tool to support future development of management procedures.
- Fishing effort: There is a greater reliance on market squid due to other fishery closures. Regional differences between the north and the south and environmental drivers were also discussed.
- Gear and habitat: The SFAC discussed mitigating impacts to spawning habitat, concerns about lighting impacts on nocturnal seabirds, and ways to improve compliance with current lighting regulations.
- Fishery access: Financial barriers limit access to the existing fishery. The definition of small-scale, exploration of local or fresh markets that would not compete with the restricted access fishery, and interest in small-scale allocations for harbor areas were discussed.

These prior discussions helped shape the preliminary recommendations developed by CDFW.

Monitoring:

CDFW Preliminary Recommendation: CDFW is recommending a transition from paper logs to electronic logbooks (e-logs) that would begin with a pilot study. CDFW has potential funding for a pilot study and multiple SFAC members/vessel operators have volunteered to pilot e-logs. There was interest in adding new fields including search time for seiners, lightboat data, more descriptive wildlife interactions, frequency of reporting gear modifications, more detail on market orders, and additional modifications. CDFW explained that the pilot study would consider how various applications such as GPS tracking would work on the user end. The pilot program contract could begin within a year, but implementation would likely be two to three years out.

SFAC Discussion: SFAC members broadly supported e-logs with no opposition. SFAC members noted that e-logs and hydraulic sensors are being used in other fisheries. Members are interested in providing input as e-logs are being developed.

An observation from an enforcement and efficiency perspective is that a potential future regulatory strategy could establish that fishers who participate in the pilot program could be required to only complete the e-log with no requirement to complete a duplicate paper log.

3. EDM Preliminary Results

Katie explained that the EDM work is exploratory and preliminary in nature. Results are being presented to identify trends and gauge the model's prediction accuracy, to determine whether the model aligns with observations on the water and to inform the discussion of fishing effort.

CDFW Presentation: Julia Coates presented the results from EDM based on the work of Lucas Madeiros and Stephan Munch at UC Santa Cruz. She reminded the SFAC that the intent is to construct a model of squid abundance to understand and forecast future abundance and landings and to use the model for a harvest control analysis. Data sources for EDM include logbooks, landings, dockside sampling, Marine Protected Areas and sea surface temperature. EDM uses catch per unit effort (CPUE) as an indicator of squid abundance. CPUE is calculated from logbook data using the following formula: weekly average catch divided by weekly set time divided by search time. Logbook data, relative to other datasets, was the most robust and provided a consistent time series to use in the model.

The modelers found a strong positive correlation between fishery CPUE and paralarvae data from CWPA surveys within the same areas. Correlations were strongest at biologically relevant lags in the time series. For example, peaks in paralarvae abundance strongly correlated with peaks in fishery CPUE three months prior (a one quarter lag). Strong correlations at biologically relevant lags are expected when considering market squid life history, and help provide confidence that CPUE is a realistic indicator of abundance.

Separate models were constructed for the north and south regions of the fishery and hindcasts were performed to predict CPUE based on CPUE lags, hours fishing, and sea surface temperature (SST). The predictions were stronger in the north and much more accurate than an average seasonal trend in both regions. EDM did not capture extreme highs and lows in either region.

The modelers used EDM to explore how different harvest strategies could affect CPUE and landings by varying SST and hours fishing in the north and south. Analysis showed little impact to CPUE and landings with variations in SST. Simulations with fewer hours fishing resulted in higher CPUE in the north, particularly with a greater than 30% reduction in average hours fishing. In the north, a reduction in time spent fishing could result in improved fishery performance. The proposed extended weekend closure corresponds to a

20% reduction in fishing hours. In the south, simulated CPUE is fairly stable and landings increase with more hours fished. This modelling represents an effort to better understand the system and explore potential outcomes of alternative management actions and will continue to undergo refinements.

Katie presented the following preliminary information from EDM:

- CWPA paralarvae abundance positively correlates with CDFW squid abundance (fishery CPUE)
- On average, if hours of fishing are reduced in the north, landings and CPUE may increase
- In the south, a change in average hours fishing may have little impact to landings or CPUE on the scale that is being considered

SFAC Discussion: Key points from the SFAC's discussion of EDM were as follows:

- Consider using data on krill in the model because fishermen use krill as an indicator for squid.
- Areas with no data (no landings) are not reflected in the model. It's important to fill out logs for negative data (i.e., when fishers are searching for squid but don't catch any).
- Current logbook data may be insufficient, and insufficient data could affect CPUE; will need to evaluate EDM after collecting a few years of data via e-logs.
- Consider ensemble modeling, where different types of models are combined for management purposes.

4. Discuss and Refine Recommendations

Katie explained that the intent of the rest of the meeting is to discuss and refine preliminary recommendations. The options presented have been narrowed down from previous meetings based on the following criteria: feasibility, specificity/whether they represent a clear proposal, enforceability, and whether they have some level of support from the SFAC. The criteria for preferred options are based on the MLMA guidance presented previously.

***Fishing Effort*:** Modify the weekend closure.

Katie presented the following options for modifying the weekend closure:

- Extend the closure to Sunday at sunset or 7pm or Monday at 12am or 7am
- Begin the closure earlier on Friday at 7am
- Statewide closure, north of Point Conception, District 16, District 17, or Point Lobos to Moss Landing using a reference line of latitude.

Initial CDFW Preferred Option: CDFW's initial preferred option was extend the closure to Monday at 7am and begin earlier on Friday at 7am, statewide.

The rationale for this option is that there is stakeholder and empirical support for an extension of the closure in the north. A statewide closure is easier to enforce, provides operational consistency, and considers biological evidence that aggregations can continue to grow while potentially not impacting landings. It also reduces lighting activity in the south by one day to reduce perceived impact on nesting seabirds. This option can provide an added buffer for sustainability.

SFAC Discussion: Most SFAC members strongly opposed this option and provided the following input:

- Prior discussions of extending the closure were focused on Monterey due to greater concern about the impact on squid spawning and on-the-water conflicts with recreational users.
- Losing one day of production each week is not cost effective because processors need to employ people five days a week.
- While this could improve visitor experience at the Channel Islands National Park, one night of reduced lighting a week does not provide much benefit for nesting nocturnal seabirds.
- A 20% reduction in fishing combined with days lost due to weather may be crippling to the industry. It may also cause fishery participants to take undue risks to offset the 20% reduction.
- The proposal is not consistent with the premise that the fishery is generally well managed and sustainable. There is no evidence that squid stocks are in jeopardy and no evidence that reducing fishing statewide will increase spawning or increase landings.

Revised CDFW Preferred Option: Based on this input and robust SFAC discussion, CDFW provided a revised preferred recommendation to extend the closure from 7am Friday to noon Sunday, statewide. In the Monterey Bay Area (to be defined), the closure would extend to Sunday midnight. This provides more opportunity for squid to spawn at night while being conscious of the economic and social concerns.

SFAC Discussion: SFAC members supported this option and voiced no strong objections. The following key points were made:

- The revised preferred option alleviates some congestion in Monterey.
- A Sunday night start provides squid for processors on Monday.
- The proposal avoids a shotgun start at 7am in Monterey, which would be more likely in the daytime without the spatial etiquette provided by lighting and lightboats.
- The proposal provides additional sustainability and addresses the social and economic aspects of fishing.

***Fishery Access**:*

Katie presented the following options for fishery access. These options were narrowed down from the ideas discussed previously.

- Experimental Fishing Permit (EFP): Interested parties could apply to CDFW for an EFP that would provide an opportunity to test access for small-scale squid fishing using low volume gear (i.e., hand jig and hand brail) outside of current major fishing areas. EFPs could be used to develop local markets and could be considered to fish squid commercially for purposes of dead bait, farmers markets, and local restaurants.
- Open access small-scale: This option would provide open access for small-scale squid fishing under the same constraints as listed above for the EFP option (i.e., small-scale, low-volume gear, and outside of current major fishing areas) but would be incorporated directly into regulation without testing.

CDFW Preferred Option: CDFW's preferred option is to consider EFPs to test the possibility of local markets. This would allow CDFW to determine whether a new sector of small-scale access is viable and the potential impacts that small scale access would have on existing squid fishing operations. If successful, CDFW could consider how to set up small-scale access. This would involve a multi-year test period, a reporting process, and recommendations on how to proceed at the end of the EFP. In response to questions, CDFW clarified that EFPs would be intended to explore a different sector of commercial squid fishing that would, in practice, not conflict with the existing restricted access fishery and be at a smaller scale than the commercial export market. There would be a relatively small number of EFPs available. The total volume would be part of the seasonal catch limit and would likely be less than the incidental catch numbers, which are also incorporated into the seasonal quota tracking.

SFAC Discussion: SFAC members supported the preferred option. The following key points were made:

- The EFP provides the opportunity to try things out and address problems without interfering with the restricted access fishery. CDFW would work with interested parties to develop an EFP option.
- One SFAC member supported open access for what was referred to as small-scale to create a viable fishery North of Point Arena with up to five tons per day, 3,000 tons overall, not using hand gear.
- EFPs are expensive, ranging in cost from $4,271 to $9,786, and this needs to be considered.
- The current cost for a brail permit is roughly $180,000
- The option to lease a restricted access permit exists but this does not involve CDFW.

Public Comment: The following comments were provided by members of the public regarding fishery access:

- A representative of the San Diego Fishermen's Working Group spoke in support of open access for small-scale. Allowing small-scale access with a daily catch limit of one half to one ton per day would provide benefits to the diverse population of

fishermen in the area and would support the local fish market. An EFP would be another way. This would provide socioeconomic benefits. This group would prefer to go straight to open access but would support and may participate in an EFP.

- Two members of the public from Fort Bragg spoke in favor of providing open access to benefit fishermen and processors in that region.
- One commenter opposed open access for small-scale because it devalues the existing limited entry permits.

Gear: Nets

Katie presented the following options for gear, with the goal of finding ways to mitigate impacts of fishing/gear on squid spawning habitat:

- Require a ribline
- Require a ribline when fishing shallower than a specified depth boundary
- Require rope purse lines, no cable (metal)

CDFW Preferred Option: CDFW's preferred option is to require a ribline and a rope purse line. The rationale for this option is that using a ribline can help reduce the amount of benthic bycatch and squid eggs. At least 50% of the active fleet has already switched to a ribline. In addition, there are operational benefits to a ribline as it flutters across the bottom and prevents damage to the net. Metal purse lines are heavier and more destructive than rope and can drag on the sea floor. In recommending this option, CDFW would provide 3 to 5 years for the fleet to transition to riblines and rope purse lines. For enforcement purposes, the ribline should be easily identifiable.

SFAC Discussion: SFAC members supported the preferred option and had no strong objections. The following are key points from the discussion:

- CDFW, including law enforcement, will need to work with the fleet to observe riblines in operation and learn what to look for to develop a regulation.
- Placement of the ribline in terms of distance from the lead line is important. A minimum of 30 inches was mentioned with a preferred stretch length of 36 inches. CDFW would like input from the fleet on this point.
- Few squid boats currently use a cable purse line.
- Implementation costs for transitioning to a ribline and rope purse line are high. Some fishers will need to change multiple nets. Funding support through grants, legislation, or nongovernmental organizations would be appreciated by the fleet. Time for transitioning is also needed with a preference toward 5 years. Considering the length of time required to implement a regulation, it may be 5 years anyway.
- It makes sense to add a ribline and modify purse line at the same time if both changes are needed.

Public Comment: One member of the public spoke in support of riblines and noted that the regulatory language is important.

Gear/Habitat: Lighting

Katie presented the following options and recent SFAC member proposals for gear/habitat topic and lighting:

- Fishery Best Practices
- Evaluate potential wildlife interactions (primarily nocturnal seabirds at the Channel Islands National Park) with squid fishery log data.
- Close nighttime fishing on Anacapa, San Miguel, and Santa Barbara islands from February through October to provide additional protection for the breeding State-listed (Threatened) Scripps's murrelet.

CDFW Preferred Option: CDFW's preferred option is a fishery best practices and to evaluate potential wildlife interactions with squid fishery logbook data.

SFAC Discussion: SFAC members supported the preferred option. The following were key points of discussion regarding each of the options:

- Fishery Best Practices: Katie presented an outline of what best practices might look like and solicited feedback from the SFAC. The outline includes best practices for lights when fishing to avoid unnecessary lighting and minimize the impact on sensitive habitats. In addition to lighting operations, other best practices reference marine mammal deterrents and minimizing weights on nets in shallow water. SFAC members had the following comments:
    - If something is illegal (e.g., using forward facing lights when lighting squid), make it clear.
    - Replace "sensitive habitats" with "the shoreline".
    - Make the best practices document easy to post in a wheelhouse. Send it out to the fleet annually. Include it to paper squid logbooks or with the e-log.
    - The outline is like a placard. CDFW could include another page with detailed explanations.
- Evaluate potential wildlife interactions with squid fishery log data (see discussion below under Collaborative Future Research)
- Close night time fishing on Anacapa, San Miguel, and Santa Barbara Islands from February to October:
    - Lighting in the areas of concern on the Channel Islands has already been reduced over the last 25 years with the use of light shields, the designation of the Channel Islands MPAs and the implementation of the FMP. There is little lighting and squid fishing in the areas of concern during the primary seabird nesting and breeding periods.

- The status of the Scripp's murrelet has improved largely due to the eradication of predators. The species is not on the priority list for review by CDFW.
- A few SFAC members stated that evidence of lighting impacts on Scripp's murrelet breeding is lacking.

Collaborative Future Research

CDFW Preferred Option: CDFW's preferred option is to:

- Evaluate potential wildlife interactions (primarily nocturnal seabirds at the Channel Islands National Park) with squid fishery log data. This would involve engaging outside researchers who would use existing data to identify and confirm, if any, overlap between nesting seabird sites and lighting activity.
- Continue forecasts with EDM (3-5 years, pending funding):
  - Test forecasting for industry and management planning and share forecasts to determine the accuracy between the model and observed landings and CPUE.
  - After a testing period and implementation of e-logs, explore the potential of using real-time data to test management procedures with EDM.

Katie explained that from 2022 to 2024, the post-doc who has been supporting SFAC deliberations (Lucas Medeiros) has been working to forecast future squid landings and CPUE, explore fishery dynamics with environmental metrics (i.e., sea surface temperature), and conduct a harvest control analysis to evaluate different fishing effort scenarios in response to climate change. The latter analysis is preliminary and requires additional work and discussion. The goal is to publish this work in the coming year.

SFAC Discussion: Key points from conversations were as follows:

- A shift to e-logs may complicate the use of EDM because new data will be captured and data will differ, especially if paper logbooks are inaccurate. Katie reminded the SFAC that strong correlations between logs and landing tickets provide evidence for the accuracy of historical logbook data, which is also used to protect fishing grounds from other marine resource interests (i.e., offshore wind and aquaculture). She also clarified that while some data fields will change (i.e., adding search time for seiners), many important data fields will remain the same information with a transition to an e-log (i.e., set location and lightboat search time), though the quality and timeliness of information can improve with electronic data collection.
- Skepticism was expressed about predicting environmental changes that impact squid and moving to model-based management.
- Many SFAC members and members of the convening team agreed that forecasts are only useful for up to one or two years at most. Predicting beyond six months is tough for a species like squid.
- Consider putting models together and using ensemble modeling.

Based on input from the SFAC, the preferred option was revised to "continue exploring forecasts with EDM". The SFAC supported the preferred option with this revision. The SFAC also supported further research into potential wildlife interactions at the Channel Islands National Park.

SUMMARY AND NEXT STEPS

Based on the recommendations presented by CDFW and discussed and supported by the SFAC, CDFW intends to present a draft report of its recommendations to the Marine Resources Committee (MRC) of the Fish and Game Commission (Commission) on July 18, 2024, in Santa Rosa and on Zoom. The draft report will be followed by final CDFW recommendations to the MRC in November in Sacramento and on Zoom. The full Commission will then consider the recommendations provided by the MRC in December.

CDFW, SFAC members, and the public provided closing reflections on the SFAC process. CDFW staff expressed appreciation for the learning opportunity, the open and honest participation by SFAC members, and a continued working relationship with stakeholders. CDFW thanked SFAC members for a successful outcome that will help the fishery and management in the future. SFAC members also noted that they learned throughout the process and refined their thinking. A member of the public thanked the group for protecting the opportunity to fish for squid.

SFAC Members:

- Each SFAC member is asked to review the draft meeting summary after it is distributed and propose bounded edits to address key misstatements or omissions. Consistent with past practice, the Convening Team will consider suggestions and incorporate edits in the meeting summary as appropriate.

Facilitation Team/Conveners:

- Prepare and distribute NEAR-FINAL meeting summary for red flag review by SFAC members.
- Share meeting presentations.

For questions regarding this meeting summary, please contact sfac@wildlife.ca.gov or katie.grady@wildlife.ca.gov and Scott McCreary at scott@concurinc.net.