False Killer Whale Take Reduction Team Webinar
October 7 & 9, 2020

Key Outcomes Memorandum

I.   OVERVIEW

NOAA's National Marine Fisheries Service (NMFS) convened the False Killer Whale Take Reduction Team (FKWTRT or the Team) via webinar on October 07, 2020, and October 09, 2020, with the goal of bringing the team to consensus on the 2019 draft recommendations. NMFS also provided updates to the team on the following:

- False Killer Whale Abundance, Potential Biological Removal Levels (PBR), and Mortality and Serious Injury Estimates

- Hook Study Timeline

- Electronic Monitoring (EM)

This summary, prepared by the facilitation team, provides an overview of the meeting's key outcomes. It is presented in eight main sections: (1) Overview; (2) Participation; (3) Opening of Meeting; (4) Presentations; (5) Initial Discussion: Overview of Team Recommendations; (6) Continued Discussion: Refining and Confirming Team Recommendations; (7) Public Comment; (8) Next Steps and Close of Meeting and (9) Attachments.

II.   PARTICIPATION

The following team members or alternates participated in the call: Robin Baird, Hannah Bernard, Brendan Cummings, Roger Dang, Jane Davenport, Ann Garrett, Eric Gilman, Dennis Heinemann, Asuka Ishizaki, Michael Jasny, Ryan Jenkinson, John LaGrange, Kristy Long, Aude Pacini, Trevor Ryder, and Ryan Steen.

Additionally, Joe Fader (Researcher, Duke University) participated to answer questions and deliver a presentation on false killer whale depredation research.

The webinar was convened by FKWTRT Coordinator Diana Kramer; Scott McCreary with CONCUR Inc. and Bennett Brooks with the Consensus Building Institute (CBI) facilitated the discussion. NMFS staff included Ann Garrett (PIRO), Kevin Brindock (PIRO), Erin Oleson (PIFSC), Amanda Bradford (PIFSC), and Jennifer Stahl (PIFSC), and Jamie Marchetti (PIRO).

Below is a brief summary of the introductions, updates and presentations provided during the meeting. This summary is not intended to be a meeting transcript. Rather, it provides an

overview of the main topics covered, any primary points and options raised in discussion, and any areas of full or emerging consensus.

III.   OPENING OF MEETING

A.   *Welcome, Introduction, and Agenda Review*

After a review of the webinar platform use by D. Kramer (NMFS), S. McCreary (CONCUR, Inc.) reviewed the meeting purpose, objectives, and meeting agenda. B. Brooks (CBI) provided an overview of ground rules.

B.   *False Killer Whale Take Reduction Team Plan Reminders*

A. Garrett (NMFS) welcomed the team to the webinar. She appreciated the patience and willingness of the team to engage in a virtual format due to COVID impacts.

Next, she highlighted the goals of the team and the plan in relation to the Marine Mammal Protection Act (MMPA): (1) short-term goal of reducing mortality and serious injury (M&SI) of the Hawaii Pelagic and Insular stocks to less than stock's PBR levels and (2) long-term goal of reducing M&SI of the Hawaii Pelagic and insular stocks to insignificant levels approaching zero (i.e. less than 10 percent of PBR).

A. Garrett (NMFS) summarized key points of where the team is now: (1) recently available studies of the false killer whale pelagic stock provide a deeper understanding of the population, with a new abundance estimate (2,086) and PBR (16); (2) based on the most recent five years of data (2015-2019), fishery-related average annual M&SI is below PBR for the pelagic stock within the EEZ, and below PBR for the insular stock of false killer whales; (3) Estimated M&SI in the deep-set longline fishery has increased each year over the most recent 5 years (2015-2019), both inside and outside the EEZ, and is not at insignificant levels approaching zero; (4) therefore, given the upward trend in M&SI, more work is needed to be done to meet the goals of the take reduction plan.

Lastly, A. Garrett (NMFS) summarized the objectives of the meeting: (1) asking the team to consider finalizing recommendations over the next 3 days (2) encouraging the team to have effective dialogue in the hopes of reaching consensus to provide NMFS recommendations for reducing M&SI.

IV.   PRESENTATIONS

A. *False Killer Whale Abundance and Mortality and Serious Injury*

D. Kramer (NMFS) reviewed current false killer whale abundance estimates, potential biological removal level and estimated mortality and serious injury, based on both published and preliminary data. She also presented tables showing year-by-year observed and estimated FKW mortality and serious injury inside and outside the EEZ, and a corresponding graph of the trend in mortality and serious injury from 2013-2019. She also reviewed the three overarching take reduction plan goals and whether those goals had been met.

The facilitation team, S. McCreary (CONCUR, Inc.) and B. Brooks (CBI), opened the floor for team member questions. Several team members commented that the team should consider that "unobserved fisheries" M&SI could also affect abundance estimates.

One Team member asked how the 5-year estimated MSI for the FKW MHI insular stock of 0.03 was calculated. E. Oleson (PIFSC) summarized the proration methodology, and referred team members to the Stock Assessment Report for more details on the methodology.

Referring to the observed FKW Interactions and % M&SI table, a team member suggested that the point estimates of interaction trends should be shown with the variance around the estimate (i.e., confidence intervals) given inter-annual variability of observer data.

J. Fader (Researcher, Duke University) noted that there was no clear evidence of an increased rate of reported depredation over time.

D. Kramer (NMFS) updated the team about the meta-analysis of hook studies, which currently is projected to be available in November-December for the team to review.

B. Electronic Monitoring (EM) in Hawaii Longline Fisheries

J. Stahl (NOAA) presented the team with updates regarding: (1) Electronic Monitoring Data Collection and Systems Overview, (2) Electronic Monitoring Program, (3) Electronic Monitoring Research, (4) Further Research Areas to be Explored, (5) Protected Species Research, and (6) Marine Mammal Electronic Monitoring Review.

First, J. Stahl (NOAA) provided an overview of the EM Data Collection and Systems that would be placed on a participating vessel. She stated that cameras are placed with views of the deck and rail area (which covers area outside the vessel and fish door); sensors include a GPS, Reel rotation & Hydraulic Pressure; and described that the computers run the operating software and connects to sensors and cameras using power-over-ethernet cables. J. Stahl (NOAA) provided a snapshot of the Review software that allows

simultaneous viewing of EM video footage and a timeline displaying sensor data and catch events. Then, she provided a snapshot of sensor data graphs, which showed how to determine when the set and haul occurs from these data. She stated that during hauling, vessel speed decreases, rotation changes magnitude, and pressure increases. Changes in sensors may occur with catch events, like big fish or protected species.

J. Stahl (NOAA) described how EM is processed and stored in the current pre-implementation program model and a Potential 3rd Party (Non-Federal) Program Model. Then, she described EM implementation plans that are underway or planned, including: (1) an ET steering committee; (2) the Pacific Islands Region (PIR) ET Implementation Plan; (3) a Regulatory roadmap; and (4) discussions between PIRO and PIFSC to implement EM coverage in fleet.

Next, J. Stahl provided an overview of EM research. Specifically, she highlighted the 2009 Pilot Study (McElderry et al. 2010) to determine the efficacy of EM in Hawaii longline fisheries. That study concluded that while EM is promising, there were some variable detection rates and misidentification. Next, she summarized a study that evaluated EM pre-implementation in the Hawaii-based Longline Fisheries, which improved on the pilot study with better camera placement and more experienced reviewers (Carnes et al. 2019). The authors concluded that while EM performed well on detecting retained fish, improvements were needed for discard detection and noted the need for a larger sample size to address protected species detection. Lastly, she summarized a study that evaluated EM detection accuracy in the Hawaii Longline Electronic Monitoring Program, comparing video speeds (Stahl and Carnes 2020) and with an emphasis on review of trips with protected species interactions. The authors concluded that protected species could be detected with EM and reviewers need guidelines limiting duration of review intervals to maintain focus and prevent skipping footage that potentially could contain protected species.

J. Stahl (NOAA) then summarized three areas for further EM research: First, issues surrounding Discard Detection are: (1) fishermen cut lines with sharks quickly in order to avoid fly-backs, which results in sharks generally out of field from camera views. The objectives for future studies are to: (1) improve shark detection through catch handling research by determining minimum handling standards to protect crews.

Next, she noted Machine Learning (ML) as a focus area for further research. The issues surrounding this topic are: (1) EM review takes considerable amount of time and (2) human reviewers may miss detections. The objectives for future studies are to decrease the amount of review time for EM and improve detection rate with ML detecting catch events missed by humans.

Finally, she spoke about Protected Species as a focus area for further research. The

objective for future studies is to determine if EM allows MSI and sea turtle post interaction mortality (PIM) determinations. She also detailed potential methods for future studies.

J. Stahl (NOAA) summarized the review of EM footage of marine mammal interactions performed by an expert (Amanda Bradford) that will help inform future EM Protected Species Research. The reviewer looked at the following criteria to assess M/SI: species, fishermen handling, location of gear, and condition of animal during interaction and release. Then, she summarized the issues that could have impacted the marine mammal expert's assessment of MSI: (1) upside-down camera view, (2) camera clarity, unfocused, and (3) animal located out of field or far away due to fishers not following handling guidelines. In the new EM systems, she explained that some of these issues likely wouldn't occur with the camera views and out of focus cameras.

S. McCreary (CONCUR, Inc.) opened team member discussion. One Team member asked J. Stahl (NOAA) if her research team thought about including a third camera to help improve detection that may be missed due to human error. J. Stahl (NOAA) responded that there was discussion of a 360-degree view camera that could be mounted on the mast; however, the challenge in such a camera was having software capable of processing the video. She also said she could look into any prior discussion on other third camera placements. A team member asked J. Stahl (NOAA) if her research team considered implementing additive lighting as a solution for improving detection. J. Stahl (NOAA) replied that her team will be test using added light during the catch handling research study.

C. Depredation Research by Joe Fader (Researcher, Duke University)

J. Fader (Researcher, Duke University) presented his preliminary research on patterns of depredation. The key findings are: (1) high depredation with high percent effort (# of hooks and soak time), (2) higher depredation in productive (high CPUE) areas, and (3) higher depredation associated with previous depredation events.

Several team members posed clarifying questions to J. Fader (Researcher, Duke University) and discussed the prospect of including depredation research in a Team recommendation.

V.   INITIAL DISCUSSION: OVERVIEW OF TEAM RECOMMENDATIONS

The Team's consideration of possible TRP-related recommendations began with an update on the status of current discussions regarding a cross-caucus generated set of possible recommendations. The update, provided by B. Cummings and R. Steen, suggested that at this meeting, the Team was not in a position to advance the full

package of measures discussed at and since the April 2018 Team meeting (focus on gear modifications – weaker hook, stronger branchline; crew training; electronic monitoring) given recent developments (e.g., the new abundance estimate and PBR; reopening of the SEZ; Covid---related impacts to fishery economics; and the delay in the hook study due to COVID---19). A Marine Mammal Commission representative proposed characterizing the team's text as "recommendations" to explicitly convey that there is not yet that a consensus on a full suite of measures that would rise to the level of plan amendments.

Fishery representatives expressed three concerns regarding the SEZ: (1) the SEZ exerted a far greater impact on the fishery than was assumed by the TRT when it was originally recommended (because of the expanded Monument boundaries); (2) that closure of the SEZ is very harmful to fishermen – particularly during COVID – because it forces them to travel further out to sea, and (3) that the data suggests that closure of the SEZ forces concentrated fishing effort that is correlated with higher FKW interactions inside the SEZ. Thus, the fishery is opposed to the SEZ and believes it should be removed from the TRT regulations because it serves only a punitive purpose.

Fishery representatives referred to the Commission representative, where they pointed out that it would be worth analyzing the data regarding displacement of fishing effort.

Fishery representatives suggested, instead, that the team focus any future recommendations on two potentially productive measures: (1) reducing depredation and (2) removing all or as much gear as possible (with or without the hook) in an effort to decrease further injury to false killer whales.

VI. **CONTINUED DISCUSSION: REFINING AND CONFIRMING TEAM RECOMMENDATIONS**

A. *Concerns of Current Status of Recommendations*

Some members expressed concern as to whether the recommendations are heading in the right direction, given that over the years since the FKWTRT was implemented, M&SI is trending upwards. Other members felt that there is merit in pushing forward towards consensus on a set of bounded measures. One Team member, citing the Marine Mammal Protection Act, suggested that the team should be focusing more on creating a high value, sustainable system rather than focusing on the economics of the recommendation.

As a pathway to address a team member's concerns about moving away from the hook

study that was originally proposed by NMFS, several team members suggested the recommendation would reference the hook study, but not incorporate it as a main focus.

Although still pending, a team member requested that NMFS provide results from a necropsy conducted earlier in 2020 on a false killer whale carcass brought in for study by a longline vessel.

B. Hook Study Discussions

A team member noted that while a hook in the jaw is a serious concern for marine mammals, the idea of reducing injury by removing as much gear as possible, notwithstanding of the final injury determination, was worth considering.

One Team member noted that it is good to attempt to straighten the hook, but sometimes it is better, rather than fighting with the whale, to cut the line close to the animal.

Another Team member noted that stronger branchlines are needed before the team can really look at cutting the line as close to the animal as possible. They said it would also depend on hook location. – If the animal is hooked in the lip, there is a potential for straightening the hook by applying tension. However, if the hook is ingested that is another matter.

Fishery representatives emphasized that they are opposed to any changes to hook requirements and, therefore, to the hook study. Instead, efforts should focus on training, depredation, and what factors constitutes "serious injury."

C. Fishery Financial Considerations

Several Team members emphasized the potential financial burden on the fishing community associated with implementation of new gear requirements. When asked to share draft recommendations, fishery representatives highlighted that in order for a team recommendation to move forward, the Team will need to consider the economic impacts of requirements, and that any new gear requirements should be implemented over a time frame that does not impose additional economic hardship on the fishery.

D. Bycatch Mitigation Measures Inclusion Discussion

A Marine Mammal Commission representative, underscoring the agency's oversight role to encourage federal agencies to move forward on bycatch reduction measures, noted that bycatch inside and outside EEZ are increasing at a fairly significant rate. Moreover,

the zero mortality rate goal for take reduction teams under the MMPA, has not been attained and the complete status of bycatch is unknown for unobserved vessels and fisheries. Therefore, the Commission believes any significant plan or recommendations must include strong bycatch measures. Absent these measures, the Commission is not able to support an otherwise broad package of measures as a plan amendment, though the Commission does support focused research and electronic monitoring. The same representative further noted that a lack of consensus does not absolve NMFS from amending the plan.

Responding to a question from a team member about what the Commission considers as bycatch mitigation, the Commission representative explained that in the Commission's view, measures such as putting cameras on boats, hook studies, and related research will not in themselves reduce bycatch. Measures that will reduce bycatch of whales immediately are those that either reduce the number of hookings, or, once an animal is hooked, result in a less severe injury outcome.

The same representative further noted one measure that had received little objection in the past: implementation of stronger branch lines, which might lead to more straightened hooks, and could be slowly phased in so as not to put a large burden on the fishery. He also clarified that the Commission is not suggesting to put in place hook requirements prior to completion of the hook study. The Commission could support recommendations that the hook study be carried out as soon as possible, with gear changes implemented immediately following the study (as warranted by study results).

One Team member agreed that the plan should not be amended without some kind of bycatch measures; however, this member still sees value in recommendations that are constructive even if they are not regulatory changes.

E. Depredation Recommendation Consideration

At the outset of discussions, team members expressed support for including a call for depredation research in their recommendations, and supported exploring options to remove more trailing gear from animals, as proposed by fishery representatives. B. Brooks (CBI) also cited crew training as an area of consensus in earlier Team deliberations. Regarding depredation research, team members clarified that the text of a recommendation could reference J. Fader's (Researcher, Duke University) research as an example of move-on best practices, though at the present time, data from his study is still preliminary.

F. Electronic Monitoring Recommendation Discussion

Team members working on an EM recommendation text shared their draft with the team. After the presentation, J. Stahl (NOAA) provided some clarification on EM potential research and implementation strategies. Several team members agreed that including EM in the recommendation could be useful. However, a fishery representative said there was not currently support for an EM recommendation without a corresponding recommendation to remove the SEZ.

A team member asked NMFS whether it would be possible with a non-disclosure measure in place, for members to view EM videos to observe handling methods. A fishery representative commented that he would agree with a partial viewing of footage but did not want it shared; his concern was that the video could end up released beyond the team.

G. Meta-Analysis of Hook Studies Recommendation Discussion

Throughout the discussion, team members stressed the importance of including meta-analysis of hook studies to determine more definitively if a weak hook a stronger branch line combination is an effective solution to decreasing M&SI, while retaining catch.

With respect to hook studies, a team member suggested the team look at a variety of studies, rather than just one, and the meta-analysis is important in this regard. This member noted that in addition to the diameter of the branch line, the age of the line is significant as well. Another Team member suggested that a useful focus of research would be to better understand the effects of the SEZ closure on displaced fishery effort. Other team members suggested there should be more mandatory move-on efforts, even a fleet-wide move-on measure, different from the current move-on recommendation in the most recent version of the draft recommendations.

H. Crew Training Recommendation Discussion

A fishery representative noted that fishermen training and handling would be supported by the fishery given the low instances of captain notifications by crew.

S. McCreary (CONCUR, Inc.) asked the team if they would support crew training as a possible element in a draft recommendation. In response, several team members encouraged the inclusion of this measure.

I. Conclusion of Discussion

The facilitation team asked team members to express their willingness to support the

emerging research recommendations. Several team members from the fishery, conservation, and agency perspective specifically stated support for the emerging areas of convergence; no team members dissented. The support was expressed with the clear expectation that text of the draft research recommendations will be circulated for team confirmation before being deemed a final recommendation to the agency.

In expressing support for the bounded recommendation, some team members expressed disappointment that the team could not close on a broader recommendation to NMFS.

VII.   PUBLIC COMMENT

B. Brooks (CBI) asked members of the public for comment on discussions that the team members had so far. No public comments were offered.

VIII.   NEXT STEPS AND CLOSE OF MEETING

- B. Brooks (CBI) asked the team to work on framing the new consensus recommendation. He also summarized the new main points of convergence for NMFS, including: (1) depredation research; (2) crew training; and (3) synthesis science.

- M. Jasny (conservation representative) will draft a recommendation on depredation; B. Cummings (conservation representative) and R. Steen (fishery representative) will draft a recommendation on crew training; and E. Gilman (academic/scientific representative) will draft a recommendation on meta-analysis.

- All draft recommendation documents will then be sent to S. McCreary (CONCUR, Inc.) B.Brooks (CBI) for synthesis (Appendix A). The near-final recommendation will be sent to the entire team for review before sending the final recommendation to NMFS.

- Facilitation team will work with the Agency to prepare and distribute a Key Outcomes Memorandum (this document).

APPENDIX A.

False Killer Whale Take Reduction Team Recommendations - November 2020
***Revised* December, 2020**

In April 2018 the False Killer Whale Take Reduction Team met in person to discuss the effectiveness of current management measures under the False Killer Whale Take Reduction Plan and the regulations implementing the Plan, as well as what amendments, if any, to the plan might be appropriate. The Team failed to reach consensus at that meeting and at several subsequent telephonic meetings. At the most recent of such meetings, in October 2020, the Team concluded that a consensus on recommendations for changes to management measures would not be reached. Nevertheless, the Team was able to reach agreement on several non-regulatory measures that addressed training, analysis and research to be recommended to NMFS. The recommended measures are not a consensus recommendation to amend the Plan. The Team recommends that NMFS undertake the following actions:

1) Crew Training. The Team encourages NMFS, in coordination with the Hawaii Longline Association, to promptly train deckbosses and crews (in addition to the owners and operators) in marine mammal handling and release. Deckboss and crew training must be (i) provided in the languages spoken by the crews being trained and (ii) made reasonably available by NMFS in a manner that allows all crews to participate and does not impact fishing operations. NMFS's training program must account for the fact that crew changes occur frequently in the fishery and that it may not always be possible for all crew on board a vessel to be trained before the vessel leaves on a fishing trip. The intent of this recommendation is to require NMFS to develop and implement an effective deckboss and crew training program, not to prevent vessels from fishing because some deckbosses and crew members are not yet trained. The Team intends for this recommendation to be prioritized first and recommends that NMFS address it promptly.

2) Depredation Research. The Team recommends that NMFS devote substantial effort and resources to the conduct and support of investigation and research regarding FKW depredation on longline gear, with the goal of identifying mechanisms to reduce and avoid such depredation without causing any significant economic impacts to the fishery. Such research should include but not be limited to investigation into the acoustics of fishing gear and vessel operations, false killer whale hearing and behavior, and gear-based deterrents; it should not include investigation into the use of acoustic harassment devices [given the low probability of success and the potential for impacts on non-target species]. If successful mechanisms or practices to avoid or minimize depredation can be developed and implemented in the Hawaii-based deep-set longline fishery, then those mechanisms or practices stand a better chance of providing direct economic incentive for adoption in international fisheries than do gear-based measures that are not aimed at reducing depredation.

3) Post-Hooking Mortality Research. The Team recommends that NMFS devote substantial

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effort and resources to conduct and support research dedicated to quantifying and assessing post-release FKW mortality. This research should build on current research on the insular FKW population, including but not limited to, obtaining information on FKW interactions with near-shore fisheries and using mark-recapture data to chart health outcomes from those interactions. This research should also examine hook degradation rates to determine survival duration after hook interactions in dead and stranded odontocetes, survival duration after hook interactions in dead and stranded odontocetes, and injury healing rates in captive animals. In addition to this research, NMFS should support a workshop to review available information on the impact of injuries and survival potential. This research and workshop should specifically be aimed at informing NMFS's Policy for Distinguishing from Serious and Non-Serious Injuries and, relatedly, the content of trainings provided by NMFS to the fleet. For example, this Team has long debated whether FKW health is most benefitted by guidelines that encourage crew to reduce the amount of gear left on an animal (*i.e.*, cutting the line at the hook) or guidelines that encourage crew to apply significant tension in order to straighten hooks to release the animals. Research is needed to inform this important question. Additionally, the Team recommends that NMFS, if and when it updates its Policy for Distinguishing Serious from Non-Serious Injuries, provide meaningful transparency to interested members of the public and gather comprehensive information on which the review may be based. Such steps may include webinars and information-sharing workshops for interested members of the public (e.g., fishermen, veterinarians, scientists, conservationists), and should begin early in the review process. Team members should be invited to listen during workshops and webinars if held.

4) <u>Data Synthesis</u>: The FKW TRT recognizes that correctly designed studies employing synthesis science, including meta-analysis, mega-analysis) and data fusion, due to larger sample sizes plus the number of independent studies, can provide estimates with increased precision and accuracy over single studies, with increased statistical power to detect real effects. By synthesizing estimates from a mixture of independent, small and context-specific studies, pooled estimates from a synthesis of accumulated evidence are generalizable and hence relevant over diverse settings. Benefits of fisheries data synthesis include:

- Combines all known relevant data into a single coherent modelling framework
- Increases precision by combining sample sizes for many (underpowered) studies
- Uses robust and reproducible statistical procedures to synthesis those data
- Helps to evaluate the uncertainty of the conclusion based on the evidence
- Communicates clearly any conclusion that can validly be drawn from the evidence
- Helps resolve controversies that arise when various study results conflict
- Robust and cost-effective way to support informed management decision making
- Identifies knowledge gaps and helps plan future management-focused research
- Supports evidence-based fishery interventions for threatened species

The FKW TRT therefore recommends conducting data synthesis when possible (e.g., when sample sizes of compiled studies support robust meta-analysis). This includes conducting synthesis science to assess potentially significant explanatory factors for bycatch risk, escapement rates and post-release mortality, such as the effects of weak hooks and other modifications to fishing methods and gear, on target species catch rates and odontocete escapement rates, and use the findings to inform decisions on the management of false killer whale interactions in Hawaii's longline fisheries.