WESTERN PACIFIC REGIONAL FISHERY MANAGEMENT COUNCIL

Biological Opinion Review Advisory Panel Meeting

April 12, 2019
9:00 a.m. – 11:00 a.m.
Council office
Honolulu
And by Teleconference

DRAFT REPORT

1. Introductions

SSC Chair Jim Lynch opened the Biological Opinion Review Advisory Panel (BORAP) meeting at 9:07 am. Participating members via teleconference were Jim Lynch, Steve Martell, Milani Chaloupka, Ray Hilborn, and Shelton Harley. At the Council Office is Don Kobayashi and Justin Hospital. Others present wereKitty Simonds, Asuka Ishizaki, Marlowe Sabater, and Mark Fitchett from the Council and Ann Garrett (Pacific Islands Regional Office Protected Resources Division; PIRO PRD).

Members of the public in attendance at the Council office were T. Todd Jones (PIFSC), Josh Lee (PIRO-SFD), Julie Leialoha (Conservation Council of Hawaii), Ed Watamura (Council member), Michael Tosatto (PIRO), Eric Kingma (HLA), Fred Tucher (NOAA-GC), Jarad Makaiau (PIRO). Members of the public on the teleconference included: Rebecca Walker (PIRO), Catherine Kilduff (Center for Biological Diversity), Josh Rudolf, Jonathan Gonzales (Pacific Seafood), Liz Hellmers (California Department of Fish and Wildlife and Pacific Fishery Management Council Highly Migratory Species Management Team), Steven Stohls, Thomas Swenarton, Peter Flournoy, Teresa Dawson (Environment Hawaii), Austen Brown (PFMC HMS Advisory Panel), Tina Fahy (West Coast Region), Taylor Debevec, Therexa Labriola; John Hall, Lesley Hawn, and Tonya Wick.

2. Overview of the Advisory Panel Task

Council staff provided the background regarding the BORAP task. The Council directed the BORAP to focus the review on the effects analysis (including the Integration and Synthesis chapter), conclusions, and any Reasonable and Prudent Measures/Alternatives, if applicable, and provide their recommendations to the Council at its April meeting. Each panel member was requested to review specific sections of the draft BiOp.

3. Overview of the Draft Biological Opinion for the Hawaii-based Shallow-set Longline Fishery

Ann Garrett, PIRO PRD, presented an overview of the draft BiOp for the Hawaii-based shallow-set longline fishery. The presentation included background on the BiOp analysis, consultation

requirements for Endangered Species Act (ESA), effects analysis, Incidental Take Statement (ITS) and Reasonable and Prudent Measures (RPM). The draft BiOp concludes that the fishery does not jeopardize listed species.

4. Advisory Panel Review of the Draft Biological Opinion Advisory Panel Members

BORAP members discussed their comments in response to their review of the draft BiOp, focusing on seven key findings and recommendations as follows: 1) Comprehensiveness of loggerhead and leatherback turtle information/analyses; 2) Comprehensiveness of oceanic whitetip shark information/analyses; 3) Indirect effects and transferred effects; 4) General RPM issues; 5) RPM#1: Vessel limits; 6) RPM#2: Minimization measures with 25% reduction goal; and 7) RPM#7: Oceanic whitetip shark measures. BORAP members received additional clarification from Garrett on justification of RPMs.

5. Public Comment

A member of the public provided a public comment. Hawaii Longline Association (HLA) Executive Director, Eric Kingma, expressed disappointment regarding delays in the BiOp resulting in a closure of the fishery. Kingma agrees with the no jeopardy conclusion of the BiOp. He expressed concern with the RPMs specifically the legality and consistency with ESA. He added that these will have a significant impact on the fishery. With regards to the vessel limit, Kingma emphasized that it will remove participants in the fishery and will not sustain the fishery in the future. One interaction will impact the vessel's decision to continue on with the SSLL fishing. Kingma will be providing a copy of the comments to the Advisory Group.

Another member of the public, Julie Leialoha, Conservation Council of Hawaii, requested clarification regarding the 600 model runs but in the BiOp only mentioned a single stock assessment.

6. Advisory Panel Discussion and Recommendations

BORAP reviewed and agreed to the key findings and recommendations, which are contained in the attached review report.

7. Other Business

There were no other business

The meeting adjourned at 10:58 am.

Attachment: Biological Opinion Review Advisory Panel Report

Biological Opinion Review Advisory Panel

Review of Draft Biological Opinion for the Hawaii Shallow-set Longline Fishery
Summary Report

Members: James Lynch (chair); Milani Chaloupka; Shelton Harley; Ray Hilborn; Justin Hospital; Donald Kobayashi; Steve Martell

Background
The Council at its 176th Meeting in March 2019 established the Biological Opinion Review Advisory Panel (BORAP) to assist the Council in reviewing the draft Biological Opinion (BiOp) for the Hawaii shallow-set longline (SSLL) fishery. The Council directed the BORAP to focus the review on the effects analysis (including the Integration and Synthesis chapter), conclusions, and any Reasonable and Prudent Measures/Alternatives, if applicable, and provide their recommendations to the Council at its April meeting, where the Council will review the BiOp analysis and consider final action on managing loggerhead and leatherback sea turtle interactions in the SSLL fishery. BORAP's review of the draft BiOp primarily focused on sections pertaining to loggerhead turtles, leatherback turtles, and oceanic whitetip sharks.

Specific review questions were as follows:
- Does the draft BiOp thoroughly and accurately assess the effects (direct and indirect) of the SSLL on loggerhead turtles, leatherback turtles, and oceanic whitetip shark?
- Is the draft BiOp analysis comprehensive, or are there relevant scientific or commercial data or information that were not used in the analysis?
- Does the scientific or commercial data or information presented in the draft BiOp accurately interpreted and provide support for the discussion, findings, and conclusions made in the document?
- Does the scientific or commercial data or information presented in the draft BiOp provide support for the RPMs and associated Terms and Conditions as well as Conservation Recommendations?

Summary of Findings and Recommendations

1. For loggerhead and leatherback turtles, the draft BiOp presents comprehensive assessment of risk of exposure to the SSLL fishery and uses appropriate tools to evaluate the risk; however, a number of decisions made in the draft BiOp likely overestimates the threat posed from the SSLL fishery
2. For oceanic whitetip sharks, the draft BiOp summarizes much of the information on oceanic whitetip sharks; nevertheless, the draft BiOp missed some key conclusions regarding fishing impacts from longlining reported after the 2012 stock assessment, and treatment of uncertainty could be improved

3. The draft BiOp's conclusions regarding transferred effects are inadequate due to lack of supporting details on methods to generate foreign interaction rates and inaccurate due to deficient acknowledgement of uncertainties around estimated foreign fisheries interaction rates.
4. General RPM Issues
   a. Include RPMs that do not alter the basic design, location, scope, duration, or timing of the action, and that involve only minor changes. [50 CFR §402.14(i)(2)].
   b. Include RPMs that are developed in coordination with the Council.
   c. Revise RPMs 1 and 2 to be more consistent with input obtained from the Council and the SSC or explain in more detail why RPMs 1 and 2 are not consistent input from the Council and the SSC.
   d. Clarify the terms and conditions associated with RPMs 1, 2, and 7 to provide specific methods on how they may be accomplished consistent with agency regulations.
5. RPM#1: Vessel Limits
   a. This RPM should be modified to Individual Trip Limits for consistency with the Council recommendation that has been comprehensively analyzed and reviewed.
6. RPM#2: Minimization measures with 25% reduction goal
   a. Supporting evidence for 25% reduction goal is not provided in the draft BiOp
7. RPM#7: Oceanic whitetip shark measures
   a. The necessity of RPM 7.b. (explore options for minimizing incidental bycatch of oceanic whitetip sharks and giant manta rays) is not demonstrated in the draft BiOp given the extremely low estimated impact of the fishery and given that fishing techniques known to pose a particular risk to oceanic whitetips do not occur in this fishery (e.g. use of shark lines or wire leader). Further, any consideration of spatial modelling and move-on rules would need to be done in a multi-species framework.

Detailed Comments on Findings and Recommendations

1. For loggerhead and leatherback turtles, the draft BiOp presents comprehensive assessment of risk of exposure to the SSLL fishery and uses appropriate tools to evaluate the risk; however, a number of decisions made in the draft BiOp likely overestimates the threat posed from the SSLL fishery

The Bayesian state-space population models used to assess loggerhead and leatherback trends were sound and informative and provided a sound basis for the assessment of management actions. Nonetheless, the post-release mortality estimates for marine turtles used in the draft BiOp are outdated and should be reviewed and revised for future assessments.

There are three examples of decisions made by BiOp authors that seem biased:
● First with respect to the trends in abundance of Leatherback Turtles, the draft BiOp assumes a long term average rate of change – that is all of the actions documented in the draft BiOp have not had any impact on reducing the decline, and potentially turning the trend around. Yet Figure 10 of the draft BiOp would suggest that the trend has actually

turned around. The fitted blue line might suggest that their model does account for this, but the model will fit the recent uptick by assuming these were random variation around a long term decline, not that the long term trend changed. If the draft BiOp had considered this underlying change in the trend, it would have been much more optimistic about the future for leatherbacks, and consequently the threat posed by the interactions with the SSLL fishery.
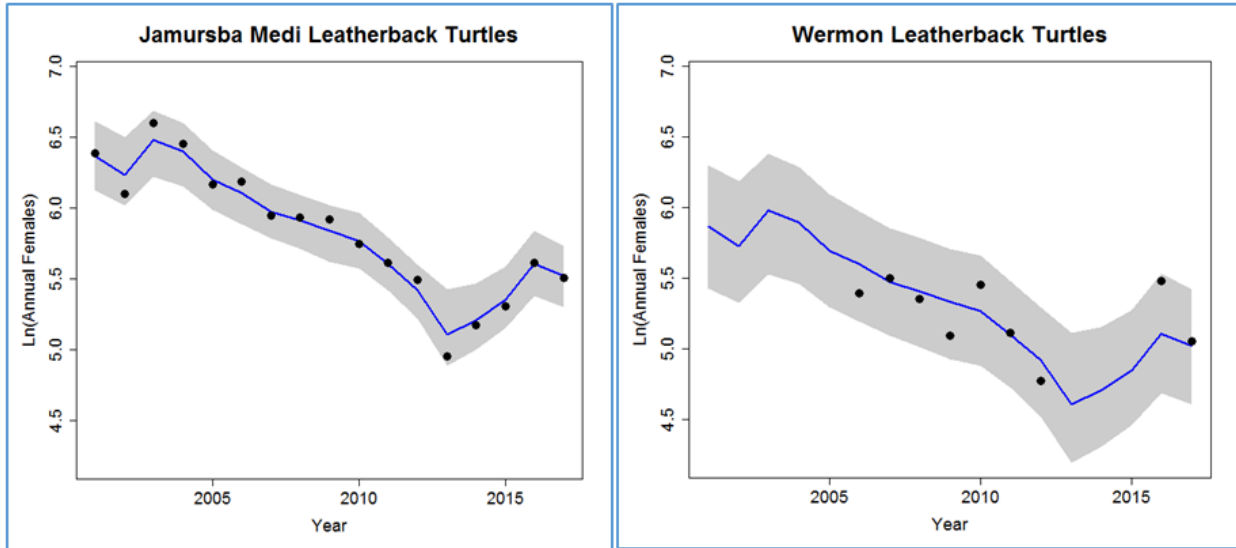

Figure 10. Predicted trends in nesting female leatherback sea turtles from Jamursba Medi and Wermon (median (blue line) of the natural log of annual nesting females with 95% credible intervals (gray shading)).

- A second area where the draft BiOp makes decisions that exaggerate the threat is in the interpretation of estimates of anticipated number of interactions and associated mortality. The BiOp states "but we used the highest likely predicted interaction number and the highest estimate of mortality for our jeopardy evaluation." So rather than using the best estimates of the interactions and mortalities the jeopardy decision is made on the basis of the highest possible effects. Thus the real threat based on best available knowledge is actually lower.

- A similar decision was made with respect to the population size, where the lowest estimate of population status was used, rather than the best estimate. Again this maximizes the estimated threat of interactions and mortality.

Thus the actual threat of the SSLL fishery to these two turtle populations is less than estimated, and since the BiOp concludes "no jeopardy" then the need for further reductions in interactions would seem unnecessary.

2. For oceanic whitetip sharks, the draft BiOp summarizes much of the information on oceanic whitetip sharks; nevertheless, the draft BiOp missed some key conclusions

regarding fishing impacts from longlining reported after the 2012 stock assessment, and treatment of uncertainty could be improved

Whilst Rice and Harley(2012) had concluded that bycatch from tuna-target longlining was the most significant impact on oceanic whitetip sharks, subsequent work by Bromhead et al. (2013) and Caneco et al. (2014) demonstrated that this conclusion was wrong – in fact there was deliberate targeting of sharks (in particular oceanic whitetip) using 'shark-lines' on sets that were otherwise targeting tuna. Therefore, the draft BiOp expresses a potential bias towards the Hawaii fisheries because this fishery does not use shark-lines.

The draft BiOp conclusion that overfishing is still occurring relies heavily on conclusions reached using analyses of time series that are 5-10 years old and prior to the implementation of WCPFC Conservation and Management Measures. Section 4.2.5.3 (pg. 198) does cover this, but it is not covered elsewhere in the draft BiOp where the 2012 assessment conclusions are repeated.

Uncertainty in input data is well integrated in almost all aspects of the draft BiOp for oceanic whitetip. Uncertainty in catches, catch rates, biological characteristics are all well traversed. The one area not covered is uncertainty in the estimates of absolute abundance from the stock assessment. Given that considerable uncertainty in absolute abundance in the assessment (due to uncertain catches and biological scalars) it would be useful to consider the impacts from the fishery (which has very high observer coverage and good estimates of catches) across a broader range of possible stock sizes. This is covered on page 386.

McCracken (2018) and the authors of the BiOp made best efforts to come up with estimates of incidental take in the face of very complex data that included significant shifts in spatial extent of the fishery, time series trends for which an explanation has not been reached (i.e., large declines in recent years), a significant and large outlier, and incomplete fishing seasons in recent years.

These same factors do make interpretation of CPUE from the fishery difficult. It is recommended that efforts be made to try and find consistent time/area windows and/or vessels to attempt to construct new CPUE series instead of the traditional standardization techniques for future assessments.

3. Draft BiOp's conclusions regarding transferred effects are inadequate due to lack of supporting data and inaccurate due to deficient acknowledgement of uncertainties around estimated foreign fisheries interaction rates

The draft BiOp adheres to recommendations from the 129th SSC and 173rd Council by including an analysis of the "transfer effect" in the Indirect Effects section. In considering the "transfer effect", the draft BiOp provides an adequate review of the "transfer effect" concept as well as supporting literature that has examined this issue in the past, specifically as related to the 2001-2004 HI SSLL closure. BiOp authors acknowledge the contributions of past literature, but counter past findings with updated estimates of foreign bycatch rates to challenge the application of the "transfer effect" as an Indirect Effect of the proposed action. In summary, the analysis to support the conclusions from the Indirect Effects section (6.4) is inadequate at times (due to lack

of supporting data) and inaccurate in other cases (statements that do not acknowledge uncertainty around estimated foreign interaction rates).

The analyses hinge upon updated foreign *estimated median interaction rates* from Peatman et al (2018). A brief review of Peatman et al (2018) *Summary of longline fishery bycatch at a regional scale, 2003-2017*, found that it does not present the interaction rates in a comparable format as the draft BiOp so it is unclear how the BiOp authors calculated foreign estimated median interaction rate measures. Reviewers were able to find estimates of shallow set effort in north temperate (>=10 N) waters (Table 2, pg 14), but were unsuccessful in finding estimates of sea turtle catch at a comparable scale. The report seemingly provides estimates by region or by shallow set, but not the combination of the two. Further, it is unclear how the BiOp authors derived interaction rates of WCPFC shallow-set fisheries excluding Hawaii, as Peatman et al. (2018) does not present such data. The reviewers noted that PIFSC sent a memo to PIRO identifying the same issue[1].

Further, the authors base their conclusions on an inaccurate assessment of recent trends in foreign median estimated interaction rates based on Peatman et al (2018). As written, the authors are deficient in their acknowledgement of the uncertainties associated with median estimated foreign fishery interaction rates, their compliance with regulations (CMM 2008-03, 2018-04) in light of foreign observer coverage rates (1.0 – 4.5%), and unnecessarily discount the certainty (conservation benefit) afforded by 100% observed interaction rates from the HI SSLL fishery.

The authors conclude that, "studies that assert a market transfer effect and subsequently, a beneficial effect from the existence of the HI SSL fishery are no longer relevant", on account of interaction rates presented in Table 98 and 99 of the draft BiOp. Statements that foreign interactions rates are lower than the Hawaii shallow-set longline fishery are false, when considering the uncertainties surrounding the median interaction estimates. The authors cite two recent years (2016-2017) of median estimated foreign interaction rates, which are nominally lower than known HI SSLL interaction rates, but are not statistically different from the HI SSLL fishery. The only conclusive take home from Table 98 is that in 2015, HI SSLL loggerhead interaction rates were definitively lower, by an appreciable amount relative to median estimated foreign estimated interaction rates, (HI SSLL interaction rates were 150% lower at the median, 16% lower at the lower bound and potentially more than 5.5 times less than the upper bound estimate). A prudent analysis would give more weight to the upper limit estimate in light of foreign observer coverage rates of 1.0-4.5%. Peatman et al (2018) indicate, "region-wide estimates north of 10N are unlikely to be robust given that there are large areas in the region with limited observer data".

4. General RPM Issues

There are inconsistencies in the RPMs described in the draft BiOp with prior SSC and Council recommendations and relevant policy guidance. Some of which are described below:

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[1] Memorandum from Michael Seki to Michael Tosatto dated April 10, 2019 regarding comments on Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion (distributed 28 March 2019)

- RPM 1 (individual vessel limits for loggerhead and leatherback sea turtles) is an action that has not to date been recommended by the SSC and Council. The SSC and Council did discuss and recommend the use of trip limits as a way to manage take of loggerhead and leatherback turtles, and concluded such a measure was supported by available scientific information.

- RPM 2 (develop a minimization measure to reduce the incidental capture and associated mortality of leatherback and loggerhead sea turtles by at least 25%) is an action that has not been endorsed by the SSC and the Council. It is unclear how the BiOp can reach a no jeopardy determination, but then in an RPM require the reduction in take of these two species by 25%.

- RPMs 1 and 2 may conflict with agency guidance and regulations which requires that RPMs do not alter the basic design, location, scope, duration, or timing of the action, and that involve only minor changes (50 CFR §402.14(i)(2)). NMFS should revise RPMs 1 and 2 to address these issues.

5. RPM#1: Vessel Limits

The RPM is trying to provide a strong incentive to reduce turtle interactions. The suggested per vessel limits are 2 leatherback sea turtles and 6 loggerhead sea turtles annually. The objective of this condition is two-fold: (i) provide incentives to reduce turtle interaction and (ii) provide early detection of fleet-wide interactions.

There is an existing observer hail-in program that reports each turtle interaction on the fishing grounds. This program requires observers to immediately report the interaction, and the confidential details of the interaction are disseminated through confidential email. This addresses the second objective (ii). Imposing vessel limits will not further improve the early detection of higher fleet-wide interactions, as the protocols for reporting an interaction do not change. Instead, vessels limits would result in fewer vessels on the grounds and less information for potential turtle avoidance.

The SSC discussion in its 129th meeting noted that there are no clear data that identify individual vessels as having a large affinity for turtles. Turtle interactions are extremely rare relative to the target species being sought after. Some clustering have been observed with loggerhead interactions in recent years; however such pattern does not appear to exist for leatherback turtles. The SSC noted there is no information on behavioral response of the fleet to turtle interactions. Both vessel or trip limits provide the economic incentive to avoid turtles; however, the incentive is diminished by simply switching over to the deep-set fishery, especially if it is equally profitable. Moreover, under vessel limits, the vessels that provide and share information for the rest of the fleet are punitively damaged for providing information that is of benefit to others.

The SSC has previously supported individual trip limits for loggerhead interactions rather than an individual vessel limits as proposed in the draft BiOp RPMs. The SSC considered that a trip limit should be sufficient to provide an economic incentive to minimize marine turtle interactions in the Hawaii-based shallow-set longline fishery. The ability for vessels to return to fishing after

returning to port under after reaching a trip limit creates a more socially acceptable atmosphere for sharing location data on turtle interactions among the fleet that others in the fleet would benefit. Setting a trip limit lower than the annual vessel limit of 6 would create a stronger and more appropriate economic incentive to avoid loggerhead turtles. Further, biological benefits are realized by supplying a larger fraction of the global swordfish market from the domestic fishery which has lower turtle interaction rates, 100% observer coverage, and enforces the annual limits to directly curtail fishing mortality on loggerhead and leatherback turtles. Consumer benefits are realized by providing a longer season with stable supply when vessels are allowed to re-enter the fishery that targets the North Pacific swordfish stock that is not overfished nor overfishing is occurring.

The draft RPM recommending vessel limits disregards the scientific advice of the SSC, previous Council recommendations, and opposes industry-supported regulatory trip limits and non-regulatory solutions. Within the draft BiOp, there is no evidence of a comparative analysis to support the merits, efficiency, and implementation considerations for vessel-based quota limits relative to SSC/Council-recommended and industry-supported trip limits. There is no evidence to support the establishment of vessel limit amounts as specified in RPM#1 Terms & Conditions 1.a for leatherback (2) and loggerheads (6). NFMS should reconsider recommendations put forth by the SSC/ Council and supported by industry requiring trip-based interaction limits. This action would provide industry flexibility to reduce interactions through improved communication strategies, provides an economic incentive to avoid interactions, and affords a mechanism for behavioral response at sea.

Furthermore, the inherently patchy and unpredictable distribution of sea turtles, particularly loggerhead turtles, could quickly decimate the fleet and fishing season under vessel limits if another situation such as in 2018 occurred. Trip-limits could accomplish the same desired effect, a slow-down of incidental captures, with a more gradual impact to the fishery.

Pascoe et al (2010) review the use of incentive-based management systems to limit bycatch and discarding, and highlight the role of social norms and expectations as important influencing factors to fisher behavior in addition to economic incentives. Research suggests that getting community buy-in to bycatch reduction may be more important than gear or other regulations, and involving fishers in the design of any regulation can result in targeted actions that are more effective in terms of reducing bycatch with a lower impact on the profitability of the vessel (Santora, 2003). Pascoe et al (2010) compare financial instruments, market-based instruments, access, and social incentives as applied to reducing bycatch and discarding specific to marine megafauna and charismatic species, and find a tax-based system may be more viable than a quota system. The authors emphasize the importance of social incentives and industry support for regulatory and non-regulatory approaches.

6. RPM#2: Minimization measures with 25% reduction goal

RPM #2 (developing minimization measures to reduce the incidental capture and associated mortality of leatherback and loggerhead sea turtles by at least 25%) is an action that has not been endorsed by the SSC and the Council. It is unclear how the draft BiOp can reach a no jeopardy determination, but then in an RPM require the reduction in take of these two species by 25%.

Quite simply the BiOp presents no justification for either – certainly there is no scientific process in the draft BiOp that can be used to explain how these RPM are arrived at.

The math to determine how a 25% reduced 95% confidence interval will impact year to year likelihood of being off the projected mark is challenging, but it could easily put the fishery in a scenario as bad or worse than the one described using a mean with a 50% error rate. Given the acknowledgment that the projected takes may be compounded with allowable takes, moving away from the established 95% marker is quite perplexing. If this proposal stands, then that likely error rate should be quantified so that the RPM #2 proposal can bundle that add-on negative effect to the verbiage so that the cumulative impact of this RPM can be assessed (e.g., forcing more frequent consultations?), in addition to explaining how this will circumvent an undesirable "ratcheting-down" effect if this becomes a habit. Generally speaking, this arbitrary 25% reduction is confusing at best, and a disconcerting precedent to consider at worst.

7. RPM#7: Oceanic whitetip shark measures

While the BiOP comes to a sensible conclusion about fishery risk, it is not clear that the associated RPMs, Terms and Conditions and conservation recommendations are consistent with that conclusion.

The draft BiOP correctly found that incidental take of oceanic whitetips is not likely to reduce the viability of the species. The Terms and Conditions 7a relating to dehooking is sensible, while recognizing that this is likely to be more important for the deep set fishery than the shallow set fishery under consideration here. However, it is less clear that 7b is warranted given the extremely low estimated impact of the fishery. Further, given the status for some of the other species encountered as bycatch, any consideration of spatial modelling and move-on rules would need to be done in a multi-species framework.

Further it is unclear that the recommendation to continue banning wire leaders is warranted. The Hawaii shallow-set longline fishery uses monofilament wire leaders by preference rather than by requirement. The mitigation option simulation work of Harley et al. (2015) is relevant to concerns about the use of wire leaders and the suggestion to continue their prohibition in the shallow set fishery. In particular there is a complex interaction between hook type and leader material, which while easy to explain conceptually was difficult to analyze due to the lack of 'balanced' data sets. The following combinations are ranked from worst to best in terms of impact on oceanic whitetips. The Hawaii shallow-set longline fishery is currently using the best scenario with the least impact on oceanic white tips.

Hook type	Leader material	Outcome
J-hook	Wire	Higher rate of gut hooking (higher on-the-line, post-release and post-bite-off mortality) and less likely to bite off (additional mortality associated with handling/release process). Release process may be more difficult (higher associated mortality) due to wire leader.

J-hook	Mono	Higher rate of gut hooking ((higher on-the-line, post-release and post-bite-off mortality) and more likely for bite off (less instances of increased mortality associated with handling/release process). Release process easier (lower associated mortality) due to mono leader.
Circle hook	Wire	Lower rate of gut hooking (lower on-the-line, post-release and post-bite-off mortality), and less likely to bite off (additional mortality associated with handling/release process). Release process may be more difficult (higher associated mortality) due to wire leader.
Circle hook	Mono	Lower rate of gut hooking (lower on-the-line, post-release and post-bite-off mortality), and more likely for bite off (less instances of increased mortality associated with handling/release process). Release process easier (lower associated mortality) due to mono leader.

References

Bromhead D, Rice J, and Harley S. 2013. Analyses of the potential influence of four gear factors (leader type, hook type, "shark" lines and bait type) on shark catch rates in WCPO tuna longline fisheries. Oceanic Fisheries Programme, Secretariat for the Pacific Community.

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Pascoe S, Innes J, Holland D, Fina M, Thebaud O, Townsend R, et al. 2010. Use of incentive-based management systems to limit bycatch and discarding. Int. Rev. Environ. Resour. Econ. 4:123–61.

Peatman T, Bell L, Allain V, Caillot P, Williams S, Tuiloma I, Panizza A, Tremblay-Boyer L, Fukofuka S, and Smith N. 2018. Summary of longline fishery bycatch at a regional scale, 2003-2017 Rev 2 (22 July 2018). Busan, Republic of Korea 8-16 August 2018. p. 61.

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