

**False Killer Whale Take Reduction Team  
Non-Longline Fisheries Work Group Teleconference  
November 18, 2014  
Summary**

**Participants**

*TRT members:* Robin Baird, Hannah Bernard, Asuka Ishizaki (alternate for Paul Dalzell), Michael Jasny, David Laist, Kristy Long, Alton Miyasaka

*Facilitators:* Bennett Brooks, Scott McCreary

*NMFS support staff:* Bryan Dieter, Nancy Young

*Invited experts:* Phil Fernandez, Craig Severance

**Background materials**

The five documents listed below were provided to the work group ahead of the call. They are also included as Appendix 1 to this summary.

1. *Fisheries information from DAR.* This document was prepared by the Hawaii Department of Land and Natural Resources, Division of Aquatic Resources (DAR) for the April 2014 Pacific Scientific Review Group (PSRG) meeting. It provides an overview of the State's license and trip reporting requirements, fishing gear types, and data uses and limitations. The fishing report forms and commercial fisheries area grid charts are included as appendices.
2. *Excerpt from DAR presentation to PSRG on State Fisheries.* This is an excerpt of a presentation DAR gave to the PSRG at their April 2014 meeting. It provides similar information to document #1 above, but also includes gear descriptions and basic data summaries for fisheries that were identified as being of interest to the PSRG.
3. *Baird et al. 2014 – False killer whales and fisheries interactions in Hawaiian waters.* This is a paper recently published in Marine Mammal Science that assessed scarring patterns on false killer whales as evidence of fisheries interactions.
4. *Intro to FEAT.* This presentation from the Kona Integrated Ecosystems Assessment Symposium in September 2014 gives an overview of the Fishery Ecosystem Assessment Tool (FEAT), a geospatial tool for state fisheries data.
5. *Excerpt from DAR ESA Section 6 grant proposal.* This excerpt from DAR's recently-submitted proposal to NMFS under ESA Section 6 describes a proposed assessment of the degree of spatial overlap between MHI insular false killer whales and state fisheries.

**Summary of key ideas and discussion, by agenda topic**

- *Introductions.* The Work Group was joined by two invited fisheries experts, who provided self-introductions.
  - Phil Fernandez is a small-boat troll fishermen in Kona, characterizing himself as a recreational fisherman with a commercial license. He is a member of the Hawaiian Islands Humpback Whale National Marine Sanctuary's Advisory Council and NMFS's Hawaiian Monk Seal Recovery Team. He is also President of the Hawaii Fishermen's Alliance for Conservation and Tradition

(HFACT), one of two statewide fishermen's groups.

- Craig Severance is a troller and handliner, though says he is not as active as he used to be, and is a weighmaster for Hilo trollers. He is active in the Hawaii fishing community and in marine resource matters: he writes a column for Hawaii Fishing News and is a member of the Western Pacific Fishery Management Council's Science and Statistical Committee, the Hawaiian Monk Seal Recovery Team, and MAFAC (NOAA's Marine Fisheries Advisory Committee). He is also Chair of the Council's Social Science Planning Committee.
- *Background Review: TRT's history with this topic.* Nancy Young provided a brief overview of the TRT's history with the topic of non-longline fisheries (sometimes referred to as "state fisheries" or "other fisheries"), including NMFS and TRT discussions of the scope from as early as the pre-TRT meeting in 2009, and opportunities that have been provided for the TRT to consider fisheries not formally within the identified scope of the TRT. To date, the other fisheries have mainly been considered in the context of research recommendations.
- *Overview of State of Hawaii fisheries data collection.* Alton Miyasaka briefly summarized the information in the first two background materials, which describe the State's mechanisms for fisheries data collection. Alton noted that updated fisheries data are shared regularly with PIFSC, and suggested that any analysis requests should be submitted to PIFSC, since DAR has limited analysis capabilities.
  - Discussion (all answers are from Alton unless otherwise noted)
  - How are data shared between DAR and PIFSC?
    - o There is a Memorandum of Agreement between DAR and PIFSC which allows for the data to be shared while ensuring protection of data confidentiality.
  - What is a typical timeline for a response to a request for data analysis?
    - o Data are provided to PIFSC almost daily, but analysis would be done on PIFSC's timeline, likely depending on what you're asking for and when you ask. The analysis step might take months, depending on work flow and the complexity of analysis.
  - Can spatial data on fishing effort, and not just catch, be made available to the TRT?
    - o Yes; again, this would need to be requested through PIFSC.
  - Has preliminary information on marine mammal "interactions" (i.e., depredation as reported on the trip report form) been aggregated?
    - o Yes, though the data are fairly sparse. The number of reported "interactions" is low, and the identification of the predator is mainly sharks and dolphins (not false killer whales or blackfish).
- *Review evidence of false killer whale fisheries interactions.* Robin provided a synopsis of his recently published *Marine Mammal Science* paper. The paper evaluates scarring patterns as an indirect approach to assess fisheries interactions. Dorsal fin photographs were scored based on consistency with fisheries interactions.

False killer whale populations showed significant differences in rates of scarring consistent with fisheries interactions (7.1% MHI insular, 1.3% pelagic, and 0% NWHI distinctive individuals), and of those with sex information, all (7) were females. One conclusion is that MHI insular false killer whales are interacting with fisheries at much higher rates than expected, at ~5 times the rate of the pelagic population where bycatch is known to exceed PBR. Caveats to the study and conclusions are described in the paper, such as the possibility of lower mortality in nearshore fisheries because gear is lighter than longlines, though population consequences of any mortalities may be greater because of the significant sex bias.

Discussion (all answers are from Robin unless otherwise noted)

- What proportion of dorsal fin injuries were due to fisheries interaction?
  - o There are a number of potential sources of injuries; none of the whales' injuries were consistent with vessel strikes or killer whale attacks and only one animal in the population had evidence of a large shark bite wound. Some injuries are from conspecifics or possibly billfish, while the source of other injuries is unclear. However, the analysis shows that 7.1% of MHI insular false killer whales that have distinctive identifying features have injuries consistent with fisheries interactions.
  - o Dorsal fin injuries are secondary, likely from a struggle during a mouth hooking. A more direct measurement of interactions would be from mouth-line injuries. A graduate student is looking at this now, but there is a small amount of data and it is difficult to get photos of whales' mouths.
- In the MHI insular population, do the injury rates vary by social cluster?
  - o Yes, there are distinctions, though the differences are not statistically significant. Cluster 3 has a higher proportion than other clusters. The 2012 critical habitat paper showed that cluster 1 and 3 have different spatial use patterns, but we don't know where cluster 2 is spending its time (individuals have not been satellite tagged).
- How will you differentiate injuries from longline versus non-longline fisheries?
  - o The main way of assessing the probability of interactions is where the animals spend time relative to where the fishery operates.
- *Introduction to Fishery Ecosystem Assessment Tool (FEAT)*. Bryan Dieter, a GIS analyst at PIFSC, provided an overview of FEAT. FEAT was developed by PIFSC's socioeconomics group as a tool to help define fishing communities. It is a geoprocessing tool in the ArcGIS application that automates the workflow to query the fisheries database; merge the data with the fisheries reporting grids, zip codes, and ports of origin; cleanse the data to protect confidentiality; and output map layers. The three main outputs are pounds caught by grid square, Zip Code, and port of origin. The background PowerPoint presentation shows additional analyses beyond FEAT's outputs, such as gear usage patterns, pounds caught by gear type. FEAT uses a modified dataset from DAR, which does not include fishing effort or marine mammal (or other) depredation data.

Discussion (all answers are from Bryan unless otherwise noted)

- How long would it take to produce a map, such as the one on slide 10 of the background presentation?
  - A few hours, depending on how much data refinement is needed after the FEAT output (e.g., modifications and analysis from the query table, and then feeding it back into GIS).
- Can the output query table be used to calculate catch per unit area, rather than catch by grid cell, since cells vary in their areas?
  - Yes, anyone with intermediate GIS skills could take the FEAT output and do a follow-on analysis.
- Can effort data (e.g., # days on the water, # trips, # hooks) be incorporated into FEAT?
  - [Alton] Effort parameters are troublesome because the methods used to measure effort are inexact and leave room for a lot of interpretation. It is sometimes difficult to select a measure of effort appropriate for fishery management or any other purpose. Broader measures of a trip or day are okay for general trend analysis, but it is harder to tease out specific measures.
  - [Phil] Comparing effort measures within gear methods is okay, but it may not be useful to compare a particular measure of effort across gear methods because of differences in how gear is fished. For example, troll fishermen report the number of lines and number of hours fished. The same information from another gear method, such as shortline, where one line might have 1,000 hooks, does not capture the actual differences in effort.
  - [Craig] You also won't be able to tease apart differences in fishing styles from just the effort data. For example, while trolling with lures, you can cover a lot of ground since the vessel is moving at high speed, and it seems highly unlikely a cetacean would take a lure. But trolling with bait may be more visible to cetaceans, and it may leave an odor trail.
- Can we break down the gear characteristics by fishery?<sup>1</sup>
  - [Phil] We can, but we don't know the behavior of blackfish on bait versus artificial lures. We could assume they don't chase lures (which are meant to attract fish by flashes and lights), and that blackfish are more attracted to bait and its smell. I would guess that artificial lure trolling is the dominant method, and if blackfish are not attracted to lures, then it's a low-risk fishery. This could be the basis for a study.
  - [Phil] Trollers use lighter gear compared to ika shibi and handline. For trolling, the monofilament is "light" (30-50 lb) or "heavy" (80 lb), with the weights largely driven by the International Game Fish Association (for what can be used in tournaments), so that's how the gear is usually sold. Ika shibi and handline use much stronger mainline

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<sup>1</sup> Following the call, Phil Fernandez and Craig Severance provided to the Work Group additional information on troll fishing, the use of bait versus lures, and depredation. This information is provided as Appendix 2 to this summary.

(~130 lb) with relatively lighter leaderline (~80 lb), since that fishery is interested in catching and landing quickly, not fighting the fish.

- Do some trollers seek dolphins?
    - [Phil] Some of the ahi tuna fishery is fished alongside spotted dolphins. The number of vessels anecdotally varies, and Robin has studied this, but this is the only fishery fishing close to marine mammals.
    - [Craig] This may be related to leeward current gyres, since it happens off leeward Oahu and Kona, but not Hilo.
  - Do fishermen fish close to their homes (as indicated by zip codes)? Or do they move between islands?
    - [Phil] Small boat fishermen (generally 26-28' vessels) are very localized, as movement between islands is difficult, though larger boats (30+' ) can move between islands.
    - [Craig] There is occasional movement east/west. Larger boats (30-38') can move between the north shore of Maui and windward Big Island, some to weather buoys or their own buoys.
  - We should examine whether the kaka line fishery is worth pursuing, given the very low effort, and because the gear has been misidentified in the literature.
  - Have fish on lures been depredated?
    - [Robin] A paper by Shallenberger documents depredation in the troll fishery; it's likely that the depredating false killer whale is trying to take catch, not bait, unlike smaller dolphins like rough-toothed dolphins that take bait.
  - If depredation by false killer whales is primarily on catch, would catch data in FEAT suffice as a proxy for effort?
    - [Craig] There needs to be some consideration of effort; catch data alone are not that useful.
    - [Robin] I am interested in the rate of interactions in different types of gear, so catch and effort are equally important.
  - Can we fill in info on line weight, etc., in fisheries descriptions for the TRT?
    - [Craig] Yes, but be aware that there will be regional differences.
- *Proposed fisheries/false killer whale overlap analysis.* Robin provided a brief summary of a portion of the state's recently-submitted ESA Section 6 species recovery grant proposal. The proposal includes a field component and an analysis of the overlap between fisheries and false killer whales by fishing gear, area, and effort to identify the areas where the likelihood of interactions is the greatest. The expected output could be used to work with fishermen on cooperative methods to minimize interactions. Robin said notice should come in March/April whether the grant has been funded.

### **Next steps**

- Nancy will send out a poll to assess availability for a follow-up Work Group call to be held in early December. Phil and Craig will be invited to participate in the follow-up call. [Completed; teleconference date set for 12/8/14]

- Call participants will send to Nancy any ideas for data analysis, to be compiled, distributed, and discussed on the next Work Group call
- NMFS will consider internally the issues related to TRT scope and membership, including the request to add a Hawaii troll fisherman and/or other non-longline fishermen to the TRT or Work Group, and provide an update to the Work Group and full TRT

## Appendix 2

## **Appendix 2 - Additional Information on Trolling, Use of Bait versus Lures, and Depredation**

Craig Severance and Phil Fernandez provided first-hand anecdotal information to the Work Group by email subsequent to the Work Group call. The information from their emails has been reproduced below, with slight editing for clarity and formatting.

### Craig Severance

For clarification on bait as an attractor: on Hilo side, bait will be primarily used in the handline fisheries (both palu ahi and ika shibi, and both may use chum), and the vessel may be anchored (on an ahi Koa sometimes 70-100° F) or drifting with a chute near a FAD (the latter more frequent).

Trollers may drag bait in three ways:

1. Cut bait (i.e. aku belly strip), which is the least frequent and is used primarily for targeting mahi;
2. Whole opelu, which is somewhat more frequent, and is rigged with smaller J hooks targeting mahi and Ono; and
3. "Live bait," which is more frequent, especially at FADs. Live baiters use light-gear-caught aku or ahi in the 3-5 lb range, bridled with J hook in front of the nose. Live baiters target marlin and larger ahi (i.e. 80-100 and up).

Porpoises (species unknown) sometimes (rare events I think!) take a live bait leaving the head, bridle, and hook. Predation on live bait by sharks does occur, and can sometimes be recognized if the bridle is cut. Predation on smaller aku and ahi that have been hooked on light gear (i.e. spinning gear 30 lb and aku lures.) may also occur. I have never seen or heard of predation on larger hooked fish like marlin or ahi 50 lbs and up, and I've only seen blackfish once. Like most everyone else I know, we just left the scene. We might consider some educational outreach on recognition and avoidance practices.

### Phil Fernandez

Bait use by trollers are relatively rare - I would probably say about 10% or less of the effort is trolling with bait. Unless you are pretty certain there is fish in an area, doing a slow troll with bait is pretty much a waste of time since you troll with bait at a very low speed (~2 - 3 knots). With artificial lures, the speed range is 8 to 10+ knots so you can cover a much larger area. Predation of bait will likely be either rough-toothed dolphins or sharks. After the first bait is lost to a dolphin or a shark, you quit baiting and go to artificial lure because it is a waste of time and fuel to drag a bait just to feed a dolphin or a shark. They will follow a boat until you run out of bait. Troll fishermen also may carry bait (but not for trolling) to have in case they come across a school of mahimahi. They will stop the boat and try to drift with the mahimahi school and cast baited hooks toward the school. Fishermen may also throw cut bait to the school of mahimahi to create a feeding frenzy (but at this point they are no longer trolling, just drifting, but fish caught in this manner will likely be reported under trolling).

Predation of catch occurs, mostly shark. Sharks will follow a hooked fish on the end of the fishing line right up to the boat, and just as you prepare to gaff the fish, the shark will take a big chunk out of the fish. Sometimes they succeed in taking the whole fish, but mostly it will rip off the back end of the fish (this is true with either tuna or marlin). The shark seem to wait until the fish is close to the boat since when the fish is far away from the boat, it can swim in a larger arc, but as the line is pulled in the fish can only swim in a short arc and it makes it easier for the shark to bite the fish.

There is predation of caught-but-escaped fish. These are fish, including "bait size" (i.e. 2 - 4 lb tuna) to medium (10 to 25 lb mahi, ono, tuna, etc.) to even large fish, that break off while the fisherman is fighting or landing a fish. These fish become easy prey as they may be injured, tired, or are dragging a hook and broken fishing line. In the Northwest and in Alaska, injured salmon or salmon with hook and broken line are often seen swimming at the surface and become easy prey to eagles and other birds of prey. It is not unusual to find fishing hooks in eagles' nests or osprey nests from this type of predation. It's likely that in Hawaii, larger swimming predators find these injured or compromised hooked fish.