

**False Killer Whale TRT – Research Needs Work Group**  
Teleconference #1, March 24, 2010

**Attendees:** Tory O’Connell, Marlee Breese, Robin Baird, Kris Lynch, David Nichols, David Laist, Erin Oleson, Karin Forney, Bennett Brooks, Scott McCreary, Nancy Young

Erin prepared a handout with background materials and updates (Attachment 1) that was circulated to the Work Group prior to the call. The discussion on the call was structured around the handout.

**A. Update on progress since February TRT meeting**

- Reviewed the list of research needs identified at the first TRT meeting
- Additional research ideas generated since the first meeting
  - Underwater video of depredation events
    - Observer Program may already have videos, but not underwater
  - Hydrophones broadcasting vessel noise
    - Draw false killer whales away from actively fished lines
    - Playback experiments, particularly involving satellite-tagged false killer whales, to determine if/how they react, distance at which they react, if/how animals share information
- Progress on short-term research needs
  - Changes in depredation before/after December 2004 gill/gut regulations
    - Good quality information on depredation exists in observer dataset only after Aug/Sep 2003, so smaller sample size and low power of analysis
    - Karin/Erin have not yet addressed this question specifically, but might before the TRT meeting
  - Capability of false killer whales to drag fully-loaded line to the surface (Attachment item 1)
    - Estimates from Steve Beverly indicate gear alone is not heavy, but calculations do not include drag or weight of catch
    - Distance between floats is much smaller than actual amount of line between floats (estimated 400-500m); using actual amount important for drag calculation
    - Steve reports having seen a false killer whale carry gear up to the surface
    - All animals that have been dead were entangled as well as hooked, except one (only mouth-hooked); Karin will investigate catch record for the basket and set in which that mouth-hooked animal was killed
    - Still working; no answer yet; may consult with expert regarding drag calculation
  - Evaluate which vessel characteristics serve as a proxy for noise (Attachment item 2)
    - Neither logbook nor observer data include vessel-specific characteristics
    - Information on other characteristics may be assessable by observers or interviews
    - If noise coming from something broken, need to know how long it was broken, and when/if it was fixed; do not assume something noisy was always noisy throughout all observer records for that vessel

- Potential options:
      - Collect data from the fleet, by questionnaire/survey, perhaps during mid-April information meeting with longline industry
      - Perform vessel acoustic profile recordings instead
  - Compile information on false killer whale echolocation capabilities
    - Erin will follow up with Paul Nachtigall on this topic and a potential presentation at the April TRT meeting
  - Insights from Geoff McPherson
    - Geoff will attend April TRT meeting and present on past/present efforts
  - Vessel light configurations
    - Like vessel noise, this could be addressed by a survey of what procedures vessels are using and how long they have been in place
  - Split sets (more than one mainline per set; possibly recorded differently in observer vs. logbook data)
    - Karin has not yet examined the observer data, but plans to do so
    - Comment about increased depredation at both ends of the sets; may be related to soak time
      - Comment was forwarded to Data Analysis Work Group
      - If there is an effect of shorter lines, this would be seen in the analysis of split sets
      - No explanations yet
  - Fishermen input on depredation avoidance techniques
    - May discuss this at the mid-April information meeting with longliners
- Progress on medium- and long-term needs
  - Photo-identification of pelagic individuals encountered during observed trips
    - Jamie Marchetti is compiling photos from encounters (sightings and interactions); will forward on to be included in rest of catalogue
    - Looking into ways to get cameras out to fleet
  - Recorders on longlines
    - Funding from MMC
    - Recorders under development, hope to deploy by early summer

## **B. Use of R/V Sette for TRT research needs**

- Month of September allocated; need to finalize cruise plan within next month
- Three possible uses discussed:
  - Palmyra abundance survey (PICEAS 2)
  - Start on Hawaii abundance survey (HICEAS 2 – part 1)
    - Need to investigate considerations for including multi-year effort in abundance calculations; might require coarse, broad-scale spatial coverage
    - Not confident 2011 EEZ-wide survey will happen, so value in starting now
  - Pelagic false killer whale tagging, particularly near fishing operations
    - Would provide valuable information if can tag animals that are depredating; could overlay tracks with VMS data to see how animals encounter gear, if they follow vessels, etc.

- Sea conditions near fishing operations might limit success of tagging
- Animals can travel large distances, so suggestion not to focus on tagging in an area of fishing operations, but go to where would find animals in best sea conditions, maximize chance of success
- Make sure to collect genetic samples whenever encounter false killer whales

### **C. Categorization and prioritization**

- Potential categories: gear-related, animal behavior and survey (whale-related), and shortline/kaka line
- Consider giving easiest items highest priority
- Understand and pursue contributions or capabilities of research partners, particularly in areas where NMFS lacks expertise
- May want to prioritize testing ideas that have been examined in other fisheries/areas, but do not waste time/resources “reinventing the wheel”

### **D. Next steps**

- Work Group should brainstorm potential research partners; be prepared to discuss at TRT meeting
- Work Group will communicate via email about contributing to Work Group presentation at TRT meeting
- No additional Work Group call before TRT meeting

**False Killer Whale Take Reduction Team  
RESEARCH NEEDS WORK GROUP  
First conference call, March 24, 2010  
Background materials and updates  
(prepared by Erin Oleson, 3/22/2010)**

**Agenda**

1. Update on progress since the February meeting (see below)
2. Discussion on use of R/V Sette for TRT research needs
3. Discuss categorization and need for prioritization of research needs, including identification of possible research partners
4. Wrap-up, decide if we need another call before the April meeting

**Research Updates***Research needs identified at the first TRT meeting (from KOM)*

<b>Research Needs to Support False Killer Whale Take Reduction Team</b>			
<b>Short-Term – General (by April meeting)</b>	<b>Short-Term – Observer Program Data (by April meeting)*</b>	<b>Mid-Term – General (over next four months)</b>	<b>Long-Term – General (six months to two years)</b>
<ul style="list-style-type: none"> <li>• Assess changes in depredation before and after gill/gut Dec. 2004 regulations</li> <li>• Determine extent to which false killer whales are able to drag hooks &amp; catch to surface if hooked at deepest part of set</li> <li>• Understand which vessel characteristics serve as proxy for noise profile</li> <li>• Compile information related to FKW echolocation capabilities</li> <li>• Identify further insights from Geoff McPherson &amp; Tom Nishida</li> <li>• Assess vessels using various light configurations</li> <li>• Evaluate split sets</li> <li>• Determine parity between observer and logbook datasets</li> <li>• Elicit fisherman input into depredation avoidance techniques</li> </ul>	<ul style="list-style-type: none"> <li>• Assess individual vessel effects (light, sound)</li> <li>• Identify spatial-temporal patterns in distribution of effort and depredation</li> <li>• Determine percent of boats with mixed hook types</li> <li>• Identify within-set patterns of depredation and bycatch</li> <li>• Tease out rates of false killer whale bycatch in sets/trips with/without depredation</li> <li>• Determine depredation rates given soak time pattern relative to other variables</li> <li>• Assess relationship between depredation and spacing of fishing vessels</li> <li>• Supplement observer data with vessel logbook or VMS data, if possible</li> </ul>	<ul style="list-style-type: none"> <li>• Develop photo-ID of pelagic-zone animals, including scars &amp; disfigurements</li> <li>• Pursue additional satellite tagging (April)</li> <li>• Develop acoustic characterization of insular vs. pelagic animals</li> <li>• Develop predictive model of potential measures (take rate, depredation rate, target catch, fleet movements)</li> <li>• Determine feasibility of mooring listening stations (FADs, NOAA weather buoys)</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct FKW-targeted research on the R/V Sette, September 2010</li> <li>• Pursue longline acoustic monitoring</li> <li>• Undertake photo-ID &amp; movement studies</li> <li>• Examine echolocation, foraging and acoustic behavior using acoustic tags</li> <li>• Conduct echolocation studies with respect to detection of hooks in fish</li> <li>• Develop methods for pro-rating “blackfish” bycatch</li> <li>• Pursue recording acoustic profile of individual longline vessels</li> <li>• Undertake HICEAS II-Hawaii EEZ survey 2011</li> <li>• Develop predictive habitat modeling</li> <li>• Better understand mechanism of hooking</li> <li>• Better understand adaptive learning by FKW, and particularly young animals</li> </ul>
<ul style="list-style-type: none"> <li>• Better understand depredation activity</li> </ul>	<ul style="list-style-type: none"> <li>• Access to non-confidential observer data</li> </ul>	<ul style="list-style-type: none"> <li>• Consider opportunity for fleet to use acoustic</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluate more efficient/alternate ways</li> </ul>

Attachment 1

	<ul style="list-style-type: none"> <li>• Understand relationship between depredation &amp; CPUE</li> <li>• Identify vessels with higher or lower than average depredation to understand factors influencing depredation/bycatch</li> <li>• Understand % of boats using uniform hook types</li> </ul>	<p>recorders to determine FKW presence</p> <ul style="list-style-type: none"> <li>• Begin data collection on shortline/kaka line fishery (where &amp; how fishing)</li> </ul>	<p>to estimate abundance</p> <ul style="list-style-type: none"> <li>• Pursue industry support for FKW photo-ID on fishing vessels</li> <li>• Consider ways for team members to generate funding/support for 2011 survey</li> </ul>
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\*Note: research needs listed in the ‘Observer Program Data’ column are the subject of the Data Analysis WG and aren’t described further here. If interested, contact Erin or Karin for updates on the status of those items.

Updates relating to short-term research needs

- Currently working to compile information on false killer whale echolocation abilities- presentation at next meeting from Paul N or Erin
- Geoff McPherson will attend TRT meeting #2 to provide insight into his efforts to reduce depredation by and bycatch of false killer whales in the Coral Sea longline fishery
- Outreach WG working on strategies to get input on false killer whale avoidance from fishermen
- Email sent to knowledgeable TRT members soliciting input on vessel noise profiles, lighting configurations, and the weight between floats of longline gear with full catch

Progress on short-term research needs

1. **Capability of false killer whales to drag fully-loaded line to the surface:** Steve Beverley provided detailed information on the weight of all longline components between floats. His analysis is below, suggesting that a false killer whale would be able to swim a full-loaded basket to the surface if hooked at the deepest point.

Gear Weight by Component

Item	Air weight	Component configuration	Weight between floats (air/water)
Snap	52 g		
Hook (16/0 circle hook w/out ring)	25 g		
1/2 m wire trace	10 g	30 branchlines +	
45 gr lead swivel	45 g	2 snaps / basket	4.1/3.6kg
		25m between	
3.5 mm mono mainline	11 g/m	floats	8.5/1.0kg
		20m/branchline,	
2.0 mm mono branchline	2.3 g/m	30 hooks/basket	1.38/0.17kg
		2 floats per	
		basket, 30m	
6.4mm tarred polyester floatline	65 g/m	line/float	3.9/1.1 kg
			<b>17.9/5.87 kg</b>

These calculations do not include the resistance of pulling gear through the water or the weight of attached fish; however, the it seems plausible that a false killer whale could pull empty gear to the surface.

2. **Evaluate which vessel characteristics serve as a proxy for noise:** The hope was to identify variables with the observer dataset that may provide insight into the noise profile of individual vessels. Unfortunately, neither logbook nor observer records include vessel specific characteristics. We may need to request the observer program collect some vessel information during future trips to assess permanent and transient noise sources from individual vessels. In the long-term we will need to make recordings of individual vessels to fully understand their noise profile. The following characters, assessable by the observers or through interviews with skippers, may yield some information on noise in the meantime:

Single screw/ Twin screw	Audible shaft noise during set/haul
No. blades on propeller(s)	Audible bearing noise during set/haul
No. generators running during set / haul	Sonar y/n
Audible propeller noise (singing)	Sonar freq.
Audible rudder noise during set/haul	Sonar used during set/haul y/n

The outreach working group is evaluating methods for obtaining information from a wide cross-section of skippers, so this may be among the questions asked during that process.

Given short time-horizon for developing mitigation measures, is this a worthwhile exercise in the short-term given observer workload, or do we invest in another avenues and make recordings of specific vessels as funds become available?

3. **Assess vessels using various light configurations:** The presence or absence of crab lights (sodium lights), whether lights are shielded, and the procedures for using lights can be easily assessed by asking skippers. However, some skippers have changed their lighting procedures recently or over time so how do we assess the impact of lighting from the observer data? Again, the observers could question skippers or even just note the light configuration on future trips, but the significance will be difficult to quantify.

Updates on medium and long-term research needs

- Photo-ID of pelagic-zone individuals encountered during observed trips: A number of photographs are available and are being cleared for release to Robin to run through the false killer whale catalog
- Miniaturization of recorders for placement on longlines is underway. Once recorders are available, 2-3 recorders will be placed over the length of the set to record vessel and gear noise and false killer whale sound to evaluate how, when, and where the animals interact with the gear. Recordings should start by summer.

Possible uses of R/V Sette in September identified to date

- Palmyra abundance survey (PICEAS 2)
- Start on Hawaii abundance survey (HICEAS 2- part 1)
- Pelagic false killer whale tagging, particularly near fishing operations