

False Killer Whale Take Reduction Team
Research Priorities Work Group Teleconference
July 24, 2013

Attendees

Scott McCreary, Bennett Brooks, Erin Oleson, Nancy Young, Sharon Young, Robin Baird, John La Grange, Paul Nachtigall, Ryan Steen. David Laist, Tory O'Connell, Paul Dalzell

Work Group members unable to attend

Andy Read, Eric Gilman, Asuka Ishizaki, Hannah Bernard

Call Objective

The objective of the call was to review candidate research projects, and to refine and agree to a prioritization process. This will then set the stage for consideration and ranking of candidate research projects at a later date.

Review of Candidate Research Projects

- Nancy described how the spreadsheet (July 23, 2013 version) was updated since the 2010 ranking exercise.
- Erin led a discussion of the research activities identified in the spreadsheet, focusing on the projects in which some progress has been made (rows with a red background in the spreadsheet). She noted it would be useful to refine or confirm that projects are described the way the Team would like them to be described. Erin explained to the Work Group that proposed changes were noted in strikethrough and blue text. Additionally, Erin noted that the spreadsheet's cost and feasibility columns were not yet updated, so they may be out of synch with some of the other updated text.
- Discussion and initial recommendations related to the spreadsheet include:

Split:

- Split telemetry study (FKW biology tab, row 4) into three rows as separate projects for each false killer whale stock (pelagic, NWHI, MHI insular), because there are different data gaps and research questions for each stock, and they likely have different priorities.

Combine:

- Consider combining projects related to acoustics (e.g., FKW biology tab rows 5, 6, and 19, and FKW assessment tab row 7), or more specifically define their objectives, methods, etc. to differentiate them
- Longline gear tab – consider combining rows 8 and 10 or revise the language to ensure there is a clear distinction in the two research efforts
- Longline gear tab – combine rows 6 and 17; ensure language is fleshed out to ensure there is a clear distinction from the earlier weak hook study already conducted
- State fisheries tab – combine rows 6 and 11

Add:

- Monitoring abundance of MHI insular stock (FKW assessment tab)
- Evaluate importance of longline fishery as food source for false killer whales, potentially based on evaluation of observer-collected depredation data (FKW biology tab)
- State fisheries characterization and evaluation of risk to false killer whales (State fisheries tab)

Move:

- Move the project in FKW biology tab, row 18 (Evaluate role of vessel and light profiles on interactions) to the longline gear tab, or combine with other projects involving vessels' acoustic and light profiles

Revise description:

- FKW biology tab, row 21 – broaden to include false killer whales or similar marine mammals (small whales), or broaden further to “Evaluate false killer whale survival following fishery interactions” (not just a literature search), which could encompass many different assessment methods (e.g., strandings, photos of animals' mouthlines, rate of fishery-related injuries in MHI insular population)
- FKW biology tab, row 22 – broaden to include false killer whales or other similar marine mammals (small whales)

Discuss and Confirm Prioritization Process To Be Used

- Scott and Bennett provided an overview of the prioritization process used in 2010 (see Draft TRP Chapter 9 for more details):
 - Ranking both within and across categories, considering the research question/activity, approach and purpose/benefit, feasibility, and relative cost
 - Projects scored as 2 (high), 1 (medium), or 0 (low); points summed across reviewers to obtain a score for each project
 - Work Group discussed and confirmed final within- and across-category rankings
- Work Group members supported using the same process and agreed that rankings should not be anonymous, to facilitate discussion of individual ranking choices and rationale.
- Work Group members also requested that similar projects be grouped together within each category on the spreadsheet to make it easier to prioritize.

Next Steps

- Erin/Nancy revise spreadsheet based on the discussion and email updated version to Work Group by 7/24¹
- Work Group members submit comments on revised spreadsheet to Erin/Nancy by 7/31
- Erin/Nancy again revise spreadsheet based on Work Group written comments, and email updated version to Work Group on/around 8/2
- Work Group reconvenes by teleconference to review/discuss final spreadsheet and prepare for rankings²

¹Nancy emailed this to the Work Group on July 25.

² Next Work Group call scheduled for August 26.

- Work Group rank research projects (post-teleconference) and email results to Erin/Nancy
- Erin/Nancy compile rankings and distribute to Work Group
- Work Group reconvenes by teleconference to discuss and tentatively finalize rankings
- Rankings distributed to full TRT for final approval and adoption

Final Comments

- Ryan noted a typo in David and Hannah's memo; David will revise and resend to the Work Group³

Adjourn

³ David emailed this to the Work Group following the call on July 24.

False Killer Whale Biology							
Row #	Rank (2010)		Research Activity	Approach & Purpose/Benefit	Feasibility	Cost	Funding Opps or Partners?
	Within topic	Overall					
1	2	6	Continue telemetry studies Continue telemetry studies on pelagic and NWHI stocks	Assess FKW movements relative to fishing activity and refine stock boundaries	Possible, but requires significant search effort as FKW densities are low	High: tags alone cost ~\$4000 ea. Need several tags deployed on a number of groups to assess population movements	
2	7		Evaluate acoustic differences between insular vs. pelagic animals	Allows alternative method for identifying individuals during surveys or interacting with fishing activities	Possible with existing data, better with more data	Low- hydrophones already available to researchers & analysis methods are defined	
3	1	5	Distinguish FKW calls from other odontocete species Develop real-time assessment capability for distinguishing between FKWs and other odontocetes using whistles and echolocation clicks	Allows alternative method for identifying individuals during surveys or interacting with fishing activities	Possible with existing data, better with more data, particularly from pilot whales	Low- hydrophones already available to researchers & analysis methods are defined. Can be done as piggy-back project	
4	3		Evaluate acoustic behavior near longlines using recorders on fishing gear	Understand the dynamics of how false killer whales are interacting with gear and how animals are attracted to the gear. Also provides acoustic ID following depredation.	Project to begin this year with specific vessels and through the observer program. Will take significant effort to adequately assess interactions given low interaction rate and length of sets	High start-up cost: recorders expensive (>\$10K ea.) and many sets will need to be recorded.	
5	9		Understand foraging and acoustic behavior using acoustic tags	Understand how animals capture prey and how they communicate with conspecifics	Possible, but requires significant search effort as FKW densities are low, must get close to the animal to apply suction-cup tags, specific training required	High start-up cost: suction-cup acoustic tags are expensive (>\$15K ea.)	
6	14		Study adaptive learning, particularly by young FKW	Evaluate how young animals learn to depredate gear, and if hook-up of an individual in the group deters depredation in the future	Very difficult: not clear how this study would be done given no young captive animals	Undetermined	
7	4 (tie)		Determine range at which a hook in a fish can be detected by FKW	Tank experiment to evaluate detection ability with different prey species	Easy: Kina already trained to do echolocation experiments	Low	
8	8		Assess impact of hook density on FKW ability to follow line	Would help understand whether FKW are actively searching for fishing vessels, and could evaluate impact of moving fishing effort elsewhere	Two ways to assess: 1. Use logbook data, but limited info on interactions on trips without observers- initial evaluation feasible, 2. Use satellite tagged individuals versus VMS data- very difficult to locate pelagic animals for tagging	Observer data- Low Satellite tagging-High	
9	4 (tie)		Carry out underwater observations of foraging behavior	Use audio & video to understand the mechanism of depredation- how are they removing fish, when are they near gear, what are the group dynamics (calm vs. frenzy)	Doable if targeted in areas with high rates of interactions	High start-up cost: video and audio recorders expensive (>\$10K ea.) and will need several to assure recordings in a given set. May require chartering contracts.	
10	13		Test visual acuity using different types of lights	tank experiment with Kina	Possible, will require some retraining	Moderate- additional cost of re-training and acquiring testing objects	
11	10 (tie)		Evaluate FKW capability to see floats, as well as monofilament line of different colors and width	tank experiment with Kina	Possible, will require some retraining	Moderate- additional cost of re-training and acquiring testing objects	
12	6		Mine existing acoustic data from Cross Seamount and elsewhere Evaluate detection probability using for autonomous recorders in various locations	Use moored acoustic devices to assess level of fishing at Cross and frequency of false killer whale occurrence High or low rates of FKW detection at various recording sites may be due to instrument placement.	Easy: data are already available	Low	
13	10 (tie)		Conduct vessel sound playbacks	At what distance to false killer whale react to fishing vessels? Do insular animals react?	Possible, but need permits, which will take up to a year to obtain	High: tags alone cost ~\$4000 ea. Need several tags deployed.	
14	12		Assess FKW response to compounds found in oil fish and other fish species that FKWs do not depredate from the line	Purpose is to determine if this is a potential deterrent with commercial applications; tank experiment with Kina	Possible, will require some retraining, may need to assess Kina's taste sensitivity relative to wild FKWs first	Moderate- additional cost of re-training	
15	Not Rated - 2010		Evaluate role of vessel and light profiles on interactions.	Determine impact of these potential cues on bycatch and depredation rates			
16	New - 2013		Examine call types and rates by different FKW populations to better understand the variability and nuances of the acoustic data, allowing for more precise and useful examination of existing and ongoing acoustic data measurements.		Possible: some data already available, but additional data from all stocks would be needed	Moderate	
17	New - 2013		Sample stress and reproductive hormones	Collect skin/blubber samples from false killer whales to examine stress hormones and various demographics including sex ratio and pregnancy rates.			
18	New - 2013		Literature search on FKW survival following fishery interactions				
19	New - 2013		Examine FKW physiological response during/following an interaction	Collect tissue, blood, or blubber samples from hooked FKWs			

Longline Gear							
Row #	Rank (2010)		Research Activity	Approach & Purpose/Benefit	Feasibility	Cost	Funding Opps or Partners?
	Within topic	Overall					
1	3	3	Develop test methods for fleet to use acoustic recorders to determine FKW presence prior to setting	Use radio buoys to alert to FKW presence prior to and during setting	Development already underway (G. McPherson), still testing. Doable over the long-term.	Reasonable given fisherman already purchase radio buoys	
2	4		Survey all longline vessels to identify commonalities among those with high depredation rates	Is there a common feature of vessels that are commonly whaled or that have higher rates of bycatch?	Difficult given confidentiality restrictions	Low	
3	2	2	Understand impact of weak hooks on target species catch rates	Conduct experiment of catch rates given weak hooks versus other typical hook types	Very feasible- existing circle hooks may prove weak enough	High cost for experiment (vessel contracts, hook purchases). Low for opportunistic effort or gradual adoption by fisherman	
4	1	1	Evaluate impact of weak hooks on FKW bycatch rates	Long-term evaluation of bycatch rates using the observer data	High, but will take time	Low given gradual adoption of hooks by fisherman.	
5	9		Record individual sound profile of longline vessels.	Attempt to understand the link between vessel noise and FKW interactions. Could start simply with recorder on a buoy outside the harbor and later expand to more precise measures using more sophisticated equipment.	Relatively easy to install hydrophone on buoy, more difficult to do more sophisticated measurements. Vessel cooperation unclear.	Moderate- cost of hydrophone and maintenance on the buoy.	
6	8		Assess potential for hooks to be modified (foam coating, etc.) to increase or decrease detection range	1. Are hooks easy to modify, 2. do modified hooks increase or decrease detection range, and 3. does this change in range reduce depredation or bycatch	Easy to test detection range with Kina	Hook modification may be high. Experimental cost is low.	
7	7		Record acoustic profile of vessels across the fleet during setting, soaking, and hauling to assess potential cues to FKWs	Evaluate whether there are specific acoustic cues that may attract animals to the gear.	Project to begin this year with specific vessels and through the observer program	High start-up cost: recorders expensive (>\$10K ea.) and many sets will need to be recorded.	
8	10		Evaluate potential to use killer whale/other playbacks as deterrents	Evaluate if killer whale sounds are a deterrent to FKWs. Would need to use tropical transient killer whale calls.	May be difficult to identify appropriate sounds as little is known on killer whale ecology in the tropics. Need research permits (up to 1 yr to obtain).	Probably low.	
9	11		Evaluate feasibility of using moored listening stations (FADs, NOAA weather buoys, etc.) to determine FKW occurrence before a fishing trip	Would provide advanced notice to the fleet on FKW presence in specific areas.	Likely relatively easy to set up, but may not provide adequate information as buoys are few and far between.	Expensive given cost of transmitting data from the buoys	
10	5		Evaluate effectiveness of additions to terminal tackle or other items on the mainline wire loops-on-circle hooks as a method to reduce depredation on bait, catch and incidental takes of false killer whales	Is bait and/or catch depredation rate lower when other items or near hooks or on the mainline with wire loops on the hooks? Should be formally assessed using NMFS observer program.	Feasible, some experimentation already underway. May take considerable time to assess impact on false killer whale catch rates, and would require large scale study with well-defined experimental methods.	High cost for experiment approach (vessel contracts, hook purchases). Low for opportunistic effort or gradual adoption by fisherman	
11	6		Evaluate where animals are caught within a set and why	Initial analysis of observer data suggest higher interaction rate in the middle of a basket. Need to understand if this is an artifact of small sample size or if there is a higher probability of hooking in the middle of the set.	Difficult to evaluate given low interaction rates. The why could be assessed using other techniques already listed- acoustic and video recordings, etc.	Likely high given equipment required for conducting observations	
12	Not Rated - 2010		Examine role of bait type, size, and manner of threading on bait depredation				
13	New - 2013		Hook-tissue interaction research to better understand the relationship between type of gear and where the animal is hooked and the severity of the injury.	Pursue research collaboration with B. McLellan	Feasible - contract being sought	Already funded	
14	New - 2013		Follow-up weak hook study to understand impact on target catch.	Conduct experiment of catch rates testing hooks with smaller wire diameter than required by TRP (e.g., 4.3 mm, 4.2 mm, 4.0 mm) or with different properties (hook shape, metallurgy, etc.)			
15	New - 2013		Determine types of hooks and hook manufacturers used by Hawaii deep-set longline vessels (see details in doc prepared by Laist and Bernard)	Information request by observers, enforcement officers, and/or survey by PIRO or HLA of fishermen and/or gear suppliers			
16	New - 2013		Evaluate performance of gear used in deep-set fishery (see details in doc prepared by Laist and Bernard)	Using gear voluntarily collected from fishermen or purchased, confirm breaking or bending strength and likely injury severity given performance; evaluate performance over time			
17	New - 2013		Desktop study to assess size of false killer whales caught	May inform strength of weak hook needed to release FKWs.			
18	New - 2013		Identify and evaluate other factors that may affect hook strength (and severity of FKW injuries)				
19	New - 2013		Examine the ability of FADs to be used as decoys for false killer whales (to reduce depredation of active longlines).				
20	New - 2013		Collect straightened hooks for genetic sampling	Voluntary collection, potentially via observers, of straightened hooks for genetic analysis, to ID species that straightened the hook and possibly add to pelagic FKW sample size		Analysis already funded	

State Fisheries							
Row #	Rank (2010)		Research Activity	Approach & Purpose/Benefit	Feasibility	Cost	Funding Opps or Partners?
	Within topic	Overall					
1	1	4 (combined)	Determine number of vessels use shortline & kaka line gear	Currently no good measure of number of vessels using this gear type or how often.	Doable, but will require on-the-ground effort and cooperation with the State	Moderate	
2	2	4 (combined)	Begin data collection on when and how fishing	Work with the State to evaluate logbook data for these fisheries- not clear that the data are available.	May be difficult to acquire the data and present results given confidentiality restrictions.	Unknown	
3	3		Form an observer program to assess level of FKW and other cetacean bycatch	Develop a program using independent vessels to assess fisheries interactions.	Unclear, unlikely to gain cooperation from fisherman being observed.	High	
4	New - 2013		Cross-reference and otherwise examine existing data to assess consistency and QA/QC.				
5	New - 2013		Broaden current data collection protocols to include more precise information on gear types (other than shortline and kaka line) used in the state fisheries (e.g., troll, dangler, handline, hybrid).				
6	New - 2013		Evaluate the mixed and hybrid gear categories to distinguish among gear types actually used.				
7	New - 2013		Model the potential for FKW interactions with state fisheries by calculating a FKW CPUE in the deep-set longline fishery and then extrapolating that to the state fishery (based on rates of tuna caught).				
8	New - 2013		Institute observer coverage (possibly from an alternative platform) and/or video monitoring to better track state fisheries' practices and possible interactions.				
9	New - 2013		Better understand the distinctions and areas of commonality in federal and state reporting protocols.				

False Killer Whale Assessment							
Row #	Rank (2010)		Research Activity	Approach & Purpose/Benefit	Feasibility	Cost	Funding Opps or Partners?
	Within topic	Overall					
1	1	7	Hawaiian EEZ survey (at least every 5 years)	Conduct large-scale (2 ships, 175 days-at-sea) covering the entire Hawaiian EEZ with visual and acoustic observing. Survey is intended to update abundance estimates for all cetaceans, but FKW will be priority for auxiliary projects.	Is happening in collaboration with SWFSC-Next survey may need to occur in collaboration with SWFSC	High	
2	5		Develop methods to pro-rate blackfish cetacean bycatch	Bycatch is currently underestimated as a sizeable number of takes are identified only as pilot whales or FKWs.	Several methods proposed, but require careful consideration.	Low	
3	6		Develop predictive habitat models of FKW density	Incorporate <i>in situ</i> and remotely-sensed oceanographic data to develop models of FKW habitat which can be applied to unsurveyed areas or identify hotspots for further evaluation during a future survey	Currently under development, but will require more FKW data to build a robust model	At-sea data collection cost is high, but collected as part of cetacean survey. Low cost for remotely-sensed data.	
4	2	8	Continue research into FKW abundance using towed and stationary acoustics Develop new towed systems that allow for real-time localization of vocal FKWs	Detection rates are higher acoustically than visually so this may provide an alternative means of estimating abundance. Many questions need to be addressed.	Research in ongoing	High	
5	4		Evaluate alternative methods for estimating abundance, with emphasis on improving precision	Consider alternatives that may provide a means for 1) surveying populations, and 2) modelling density. New methods for surveying may include fishery-dependant data evaluation, acoustic gliders, etc.	Survey and analysis methods must be developed. Long-term research goal.	High	
6	3	9	Collect additional genetic samples from the leaiguic, NWHI, and other distant FKWs to assess population structure	Collect biopsy samples using observers biopsying from bow of fishing boats, or during dedicated cetacean surveys	Feasible, but may not have many opportunities	Low- collection,, Moderate- analysis	
7	7		Evaluate degree of genetic differentiation between insular and pelagic stocks	Requires additional effort to obtain samples to the west and north of Hawaii	Difficult	High	
8	Not Rated - 2010		Use mark/recapture studies to supplement info on abundance, demographics, stock structure, and injury categorization				
9	Not Rated - 2010		Further study to validate current assignment of M&SI designations to FKW and the longline fishery				
10	New - 2013		Review stranding data to inform evaluation of effects of particular injuries	Note types of injuries, frequency, severity (fatal vs. non-fatal)			
11	New - 2013		Use Observer Program data (in combination with other fishery-dependent data where applicable) on FKW sightings, interactions, and depredation to develop abundance estimates, estimate depredation rates, and identify hot spots.				
12	New - 2013		Determine the extent to which FADs attract FKWs.	Place acoustic monitors strategically to examine the impact of FADs on FKW distribution.			
13	New - 2013		Survey windward side of Hawaiian Islands to assess differential FKW encounter rates	Cross-reference collected information with existing telemetry data			
14	New - 2013		Re-analyze the proportion of SI vs. NSI for circle hooks vs. tuna and J-hooks		Feasible - analysis of existing observer data	Low	