Per the consensus recommendation from the Pelagic Longline Take Reduction Team (PLTRT) at the August 2012 meeting held in St. Petersburg, FL, a work group was formed to update the current Pelagic Longline Take Reduction Plan (PLTRP) research priorities with the goal of eliminating research that has been conducted or is no longer relevant, identifying new promising opportunities, and prioritizing among candidate activities. At that meeting, several PLTRT members volunteered for the work group, including: Terri Beideman, David Kerstetter, David Laist, Bill McLellan, Andy Read, Tim Werner, and Sharon Young. Lance Garrison of the Southeast Fisheries Science Center also agreed to participate in the workgroup.

The Research Priorities Work Group met via conference call on September 12 and 25, 2012 and on January 28, 2013. Priorities agreed to by the Work Group were based on the current PLTRP research priorities, the current state of relevant research, and new understanding of techniques and technologies. Work Group members prioritized items (highest, high, medium, or low) through discussion and based on their perceived usefulness at addressing key issues for reducing pilot whale and Risso’s dolphin bycatch, understanding effects of implemented PLTRP management measures, and the feasibility of conducting the actual research (available methods, not necessarily available funds/funding sources). Items with the same priority level are considered of equal importance across the categories identified below.

Over the course of the conference calls and follow-up e-mails, the following research priorities were identified.

**PLTRP Research Priorities**

1. *Investigate possible attractants/deterrents for pilot whale/Risso’s dolphins to pelagic longline gear and experiment with gear modifications to decrease the likelihood of hooking and/or entanglement -*

   **HIGHEST PRIORITY:**
   
   a. Investigate modifications to hooks (e.g. weak hooks).
   
   b. Investigate the properties of hooks and leader lines that are currently in use in the pelagic longline fishery (to determine a baseline for further evaluation).
   
   c. Test performance of different hook types in toothed whale carcasses to evaluate hook properties that could minimize serious injury/mortality (minimize tissue damage), including weak hooks.

   **HIGH PRIORITY:**
   
   d. Examine the rate of deterioration of hooks to determine whether hook corrosion over time has the potential to minimize serious injury.
   
   e. Experiment with gear and bait alterations (e.g., bait dyes, or alternate baiting methods), particularly for Risso’s dolphins.
f. Investigate the use of acoustic deterrents (e.g. pingers, Dolphin Dissuasive Devices) (what are potential negative effects, how effective are they, are they a potential attractant to pilot whales/Risso’s dolphins).

LOWER PRIORITY:

g. Conduct experimental acoustic playbacks that simulate vessel activity to investigate the role of acoustics in interactions between pilot whales and Risso’s dolphins and the pelagic longline fishery.

h. Investigate if setting gear with tension reduces the likelihood of entanglement (could also be a compounding effect with weak hook research).

i. Determine whether offal discarded by vessels is a cue or attractant to pilot whales and/or Risso’s dolphins. Look at other observer program data to determine if pilot whales and/or Risso’s dolphins are associated with offal from other fisheries discards.

j. Develop and test the effectiveness of potential deterrents.

k. Investigate effects of altering the detectability of pelagic longline gear (e.g. making gear more visible or acoustically reflective, etc.).

2. Evaluate the effects of implemented PLTRP Management Measures -

HIGH PRIORITY:

a. Conduct research on the effects of reducing mainline length to <20 miles and how this affects fishermen behavior, catch, bycatch, etc.
   - Investigate the effects of distance between sets on catch, bycatch, etc.
   - Investigate the mechanism that links shorter mainlines to reduced bycatch
   - Investigate where along the mainline (i.e. basket number) bycatch and/or depredation occurs

b. Test methods to remotely and accurately monitor/measure lengths of mainlines.

3. Investigate preferred habitat of pilot whales in the Mid-Atlantic Bight region -

HIGH PRIORITY:

a. Investigate the fine scale spatial distribution of pilot whales in relationship to habitat and determine if there are preferred habitats and/or if certain areas are used by pilot whales for reproduction and feeding.

b. Evaluate whether bycatch of marine mammals and target species is affected by specific habitat features. (e.g. what is the overlap between the distribution of whales and fishing effort, what are the habitat features?)
4. Disentanglement techniques -

MEDIUM PRIORITY:

a. Evaluate disentanglement protocols. Investigate fishermen experiences with de-hooking and disentangling pilot whales and Risso’s dolphins, including the extent to which such de-hooking and disentangling have occurred in the past and the results of these efforts. A workshop could be convened to amend the marine mammal handling and release guidelines, if necessary.
   - Determine what data may already be recorded by pelagic observer program and use these data to begin addressing effectiveness of disentanglement protocols

b. Develop and test new Careful Handling/Release tools (i.e. in-line hook cutter and throw grapple). The necessity of and priority accorded to this recommendation may depend on the success of disentanglement techniques currently in use (see above item a.).

c. Evaluate the type, frequency, and success rate of release techniques and tools used to disentangle marine mammals.

5. Determine survivorship of hooked/entangled pilot whales and Risso’s dolphins -

MEDIUM PRIORITY:

a. What is the post-release survival rate of entangled/hooked pilot whales/Risso’s dolphins (e.g., explore the use of tagging and telemetry)?

b. Investigate the extent to which serious injury is related to the size and age class of the animals.

c. Investigate the frequency, occurrence, and location of healed scars on stranded pilot whales and Risso’s dolphins. While difficult to interpret, this may provide useful information that could contribute to better understanding serious injury.

6. Characterize and investigate interactions between pilot whales/Risso’s dolphins and the pelagic longline fishery -

LOWER PRIORITY:

a. Investigate how pilot whales and Risso’s dolphins are interacting with longline gear. As part of this investigation, further examine the prevalence of depredation in hooking/entanglement of pilot whales and Risso’s dolphins. Sub-issues for this examination of depredation include:
   - Examine the relationship between the presence of pilot whales/Risso’s dolphins prior to haul back and evidence of depredation/hooking/entanglements.
- Determine how much of the observed interaction is due to feeding on the catch vs. feeding on the bait vs. simply “blundering into the gear”.

- Determine the frequency of depredation by marine mammals in the pelagic longline fishery and whether or not entanglement is involved.

- Determine whether or not, and how often, the presence of marine mammals and/or depredation by marine mammals results in hooking/entanglement.

- Describe what is left on the hooks after depredation by marine mammals.

- Determine source of depredation (e.g. shark, marine mammal, squid).

- Identify alerting cues used by pilot whales and other marine mammals when in the vicinity of pelagic longline fishing. Investigate how pilot whales and Risso’s dolphins detect the gear.

- Investigate the interaction potentials of PLL gear and pilot whales/Risso’s dolphins with regard to depth and temperature.

b. Characterize pilot whale social structure/behavior in the Mid-Atlantic Bight (MAB) region and how it may influence interactions with pelagic longline fishing. Studies may include, but are not limited to, satellite tagging individuals within a group and from many groups of whales in the MAB, determining whether certain individuals or groups are more likely to engage in depredation, and determining whether interactions with longline gear may be a learned behavior.