

APPENDIX B

Future Research and Monitoring

Future Research and Monitoring

The circle hook and mackerel bait combination that is being implemented in the Hawaii model swordfish fishery has been shown to be very effective at reducing loggerhead and leatherback sea turtle interactions with swordfish targeting shallow-set pelagic longline fishing in a three year trial in the Atlantic. It is expected that this will also be the case in Hawaii, although the proposed management action provides safeguards in terms of a hard cap on turtle take and limits on the total amount of swordfish effort that will be allowed. The implementation of these measures in the Hawaii swordfish fishery will also be monitored closely with 100% observer coverage as required under the 2004 Biological Opinion on this action.

However the degree of effectiveness of these measures is not assured in the Pacific and modification of these measures as well as other mitigation measures should be investigated in both the model swordfish fishery and the traditional deep-set tuna fishery. Some of these measures have been investigated by the NMFS Pacific Islands Fisheries Science Center (PIFSC), some are part of the Conservation Recommendations contained in the 2004 Biological Opinion, and some are new. These include:

- continued use of stealth fishing gear – methods to make longline fishing gear less visible
- the use of circle hooks and mackerel or other types of bait to reduce and mitigate interactions in the deep-set tuna fishery
- the use of existing technologies such as sonar, to detect and alert fishers if sea turtles or marine mammals become entangled in their gear
- re-arranging branch lines to move them further from the floats – methods to deepen the average depth of hooks
- moving light sticks away from the branch lines and closer to the floats – methods to avoid drawing protected species directly toward the baited hooks while at the same time attracting target species to the gear
- making floats more attractive to turtles by attaching light sticks to the floats – again to avoid drawing protected species directly to the baited gear
- placing images of sharks on floats to scare turtles away from the gear
- movement of vessels relative to ocean features such as temperature gradients or away from initial contact with protected species.
- other methods that may be identified by the fishing industry, fishery observers, and fishery scientists based on continued monitoring of the effectiveness of the Atlantic measures.

The 2004 Biological Opinion also recommends increased monitoring of global impacts on sea turtles through analyses of sea turtle interaction data to be obtained from the Forum Fisheries Agency

Research efforts in the Atlantic and with foreign countries will also be encouraged. The PIFSC already collaborates with the Southeast Fishery Science Center including support to the Galveston captive leatherback research and in the Caribbean. PIFSC is also continuing its turtle physiology research to see if the basic structure of sea turtles might shed light on alternative mitigation techniques. Research is also being conducted using satellite tags to investigate the movement of sea turtles and their relationship to oceanographic features.

Another avenue of research to be undertaken is reduction and mitigation of interactions with cetaceans (whales, dolphins, etc.). These interactions are at a much lower rate than the already limited interactions with sea turtles but the highest interaction rate is with false killer whales. Methods to reduce these even further could be investigated using sonic alarms or “pingers” on the mainline. The use of pingers has been successful in reducing interactions between dolphins and drift gillnets deployed by the Oregon/California drift gill net fishery, although their efficacy in reducing interactions with false killer whales is unknown.

Two research projects are already underway to examine the issue of transferred effects being realized through the market place. This project is analyzing the international trade response to the recent swordfish closures and whether consumption of swordfish and tuna increased from other countries with higher fishery interaction rates over the past three years.

Another continuing project is being conducted by the PIFSC, in conjunction with the University of Hawaii’s Pelagic Fisheries Research Program. This project is conducting statistical analyses of relationships between protected interactions in the Hawaii-based longline fishery and factors related to the fishery, such as location, season, gear configuration, oceanographic features, etc.

Although the preferred alternative would implement measures to ensure that the Hawaii-based longline fleet remains in compliance with the 2000 Biological Opinion of the US Fish and Wildlife Service on the Short-tailed Albatross, research should continue on ways to further reduce seabird interactions. In addition, although the use of 18/0 10° offset circle hooks with mackerel-type bait required under the preferred alternative (as compared to the current J hooks) are anticipated to potentially reduce and mitigate seabird interactions, monitoring will be necessary to determine their actual impacts. Again, the 100% observer coverage required under the 2004 Biological Opinion on this action will ensure that this monitoring occurs.