

ALTERNATIVE GEAR RESEARCH UPDATE

NOAA Southwest Fisheries Science Center's Deep-set Longline Experiments

Heightened focus on minimizing bycatch of protected species has lead U.S. fisheries managers to implement combinations of gear restrictions and time-area closures. For example in 2001, to reduce sea turtle bycatch in swordfish fisheries, shallow-set longline (SSLL) fisheries were closed in the Atlantic and Central Pacific and a time-area closure was imposed on California pelagic drift gillnet (DGN) fisheries. In response to the SSLL closures, fishers and scientists collaborated to develop gear modifications that reduced loggerhead and leatherback bycatch by 90% and 65%, respectively, leading to MSC certification of the Atlantic SSLL fishery. In contrast, the California DGN fishery has declined dramatically since the 2001 time area closure. The goal of this project was to explore potential gear alternatives for targeting swordfish off California building on previous efforts to reduce turtle bycatch in LL fisheries. The idea was to shift the longline gear to deeper water to capitalize on the difference in daytime depths; swordfish typically spend the daylight hours in waters deeper than 200m whereas leatherbacks remain above 120m.

On three cruises from 2011-2013, NOAA collaborated with longline fishers off central and southern California to investigate the efficacy of targeting swordfish during the day using a deep-set longline (DSLL). During 47 sets, with average hook depths of 230-247m and soak times 2.7-4 hours, 111 marketable fish (including 8 swordfish, 67 opah and 23 pomfret) and 352 non-marketable fish (including 328 blue sharks and 17 king of the salmon) were caught. Short soak times were used to maximize fish condition for tagging; two swordfish, five opah and five blue sharks were released with satellite tags and the majority of the remaining blue sharks were tagged with conventional tags. Based on previous research on blue shark post-release mortality, 81%-91% of blue sharks would be expected to survive after release. This study concluded that it is possible to catch swordfish and other marketable species below turtle habitat with a DSLL however, swordfish catch was low. Fishing conditions during these cruises were probably impacted by anomalous oceanographic conditions; catch for the DGN fleet was very low over the same time periods. Efforts to collect additional data under more realistic fishing operations (i.e. fishing when and where conditions are best, over longer time periods) would provide a further test of the gear's potential. Given the experimental and small-scale nature of this research, these results are promising, but should not be projected beyond the study and warrant more research.

Deep-set Buoy Gear Trials off Southern California – Progress Report

Dr. Chugey Sepulveda, Pflieger Institute of Environmental Research (PIER)

Dr. Sepulveda will provide an update to the Council on the progress of recent swordfish alternative gear performance trials conducted by the Pflieger Institute of Environmental Research (PIER) and NOAA (SWR)^{1,2,3,4}. The progression of these research efforts is directed at developing deep-set buoy gear off southern California. The presentation will include information on the collective catch (target and non-target) for all trials and discuss findings from

recent gear modification experiments focused on increasing feasibility, gear efficiency and the prevention of lost gear. Data will also be presented on the swordfish tagging and gear trial efforts within the Pacific Leatherback Closure Area (PLCA)^{3,4} and its relevance towards fishery development within the region. Future buoy gear research plans for 2014 and beyond will also be presented.

Funding sources

1. NOAA - Saltonstall Kennedy Grant Program
2. NOAA-Bycatch Reduction and Engineering Program
3. NOAA - Cooperative Research Program
4. Collaborative Fisheries Research West Program