



Agreement on the Conservation of Albatrosses and Petrels

Fourth Meeting of Seabird Bycatch Working Group

Guayaquil, Ecuador, 22 – 24 August 2011

ACAP Observer Report for WCPFC-SC6

Secretariat

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ACAP RFMO Observer Report – WCPFC-SC6

Meeting Title: Western & Central Pacific Fisheries Commission Scientific Committee 6

Meeting Organisation: Western and Central Pacific Fisheries Commission

Date and Location: 9 – 19 August 2010

Website Address: www.wcpfc.int

Name/Affiliation: Warren Papworth, ACAP Secretariat

Capacity of Attendance: ACAP Observer

Relevant Paper(s) Tabled:

EB-WP-02	N.Sato et al. Experimental Comparison among four types tori-line designs in the western north Pacific.
EB-WP-04	ACAP. Review of seabird bycatch mitigation measures for pelagic longline fishing operations.
EB-WP-05	ACAP. Options for differential management and monitoring of seabird bycatch.
EB-WP-06	G.Robertson <i>et al.</i> Experimental determinations of factors affecting the sink rates of baited hooks to minimize seabird mortality in pelagic longline fisheries.
EB-WP-07	G.Robertson <i>et al.</i> Effect of line shooter and mainline tension on the sink rates of pelagic longlines and implications for seabird interactions.
Information Papers	
EB-IP-01	D.Filippi, S.Waugh, S. Nicol. Revised spatial risk indicators for seabird interactions with longline fisheries in the western and central Pacific.
EB-IP-04	Secretariat. Seabird bycatch mitigation
EB-IP-05	Report on the Kobe II Workshop on Bycatch
EB-IP-06	L.Fitzsimmons. WCPFC Bycatch Information System (BMIS)
EB-IP-07	G.Robertson and P.Ashworth. Progress report on the development and testing of the underwater bait setter for pelagic longline fisheries.
EB-IP-09	E.F.Melvin, T.J.Guy and L.B.Read. Shrink and defend: A comparison of two streamer line designs in the 2009 South Africa tuna fishery.

Author(s) and/or Presenter if Different:

Warren Papworth presented elements of EB-IP-01 when introducing WP-EB-05.

Summary of Content:

EB-WP-02

21. D. Ochi (Japan) presented Experimental comparison among four types tori line designs in the western North Pacific” (EB-WP-02). This paper presented results of two experiments to

evaluate four tori line designs using both commercial and research longline boats. The first experiment was conducted by 20 offshore commercial longliners with 567 sets, and the seabird abundance and bycatch number was compared between tori lines with long and light streamers, as well as between ones with red and yellow colored light streamers. During line setting, albatross species (black-footed and Laysan albatross) are mainly aggregated and other seabirds including shearwater species were rarely observed. There were no significant differences in albatross bycatch number among different streamer types, and no bycatch of petrels and shearwaters were observed. During deployment of long streamer tori line, serious tangling problems were reported many times. The second experiment was conducted by a chartered longline boat deploying three types of tori-lines (light, hybrid and modified light streamers) tested in each set. Difference in seabird attacking behavior and bycatch number were compared among these tori lines with data of 72 observations obtained by 24 operations. The most primary attacks were recorded by albatrosses and that by shearwaters were rare, and also, most of secondary attacks were caused by albatrosses. There were no difference in primary attacking rate and bycatch number of albatrosses among the three tori lines. The results in this study indicated that four types of tori line have same ability of seabird bycatch mitigation. It was also revealed that further improvement of design would attain that further reduction of seabird bycatch as the effective design of tori-line supposed to be changed by area, season as well as the shape and size of vessel. Observed rather low interaction of shearwaters and petrels with longline baits indicated that the bycatch system in the North Pacific may different from the South Africa, where many albatross bycatch caused by petrels. From sighting study during gear setting, improvement of bait casting method supposed to reduce the seabird bycatch. Further studies should be needed to develop appropriate mitigations majors of seabird in the North Pacific.

Discussion

22. Discussion was held regarding the tori-line research, and clarification requested regarding attack rate by shearwater and albatross, which was lower immediately aft of the fishing vessel, as compared to 25–100 m astern. The presenter indicated they were awaiting additional data from the fishing master, which might help explain this. It was noted that small, low-powered vessels experienced problems with long streamers, and that the presence of streamers appeared to be the most important factor in reducing seabird interactions. Attack rates have been observed to vary spatially, by seabird species and feeding behavior. There appears to be a correlation between the length of the tori line and depth to which baited hooks sink. Once large tuna are caught, lines have been observed to rise to the surface. The need to conduct research beyond the wake zone and during hauls was noted. CCMs observed that there is a need for additional research, and spoke in favor of improvements in methodology, continued collaborations and peer review in such studies.

Seabird Spatial Ecological Risk Assessment

23. W. Papworth (ACAP) presented “Options for Differential Management and Monitoring of Seabird Bycatch” (EB-WP-05). At WCPFC-SC5 it was agreed to undertake further work to validate the spatial risk assessment (ERA) on seabirds to determine initial spatial zones for the differential management and monitoring of seabird bycatch. This paper considers some of the management options available to reduce seabird bycatch, including area or seasonal closures, application of bycatch mitigation measures and monitoring and data collection. Some recommendations are also provided on the type and level of monitoring that may be required to further validate the spatial risk assessment.

Discussion

24. It was commented that results of ecological risk assessments (ERAs) indicate that the area in the South Pacific where the capture of vulnerable birds was most likely extends north to 25° S. The IOTC recently passed a resolution extending the region where management measures are required to 25° S, and it was suggested that the SC recommend modifying its CMM to include the area between 25°S and 30° to bring the WCPFC in line with IOTC practice. It was noted that the annual reports from CCMs do not include an assessment of data on the number of seabirds caught, and that including this would help to validate and support the ERA process. Japan indicated it was undertaking a regional observer program and expected to collect a wider range of information on seabird interaction; it stressed the importance of adequate data in evaluating the need for additional mitigation measures.

25. Differences in the effectiveness of mitigation measures between the northern and southern hemispheres were noted, and the possibility was raised of adopting different mitigation measures in the northern and southern parts of the Convention Area, as appropriate. Difficulties in determining vulnerability in areas with low observer coverage (e.g. south of 20°S and east of New Zealand) were noted, as were seasonal changes in vulnerability. CCMs welcomed further analyses that include more observer data in order to better validate spatial risk assessments, and the view was expressed that current findings do not justify the need to extend the area of application of mitigation measures into equatorial waters. CCMs recognised that observer data can be used to validate spatial risk assessment, although coverage rates in some areas may be insufficient to achieve this, and limited budgets may preclude expansion of observer programs.

Update of CMM-2007-04 (Conservation And Management Measure To Mitigate The Impact Of Fishing For Highly Migratory Fish Stocks On Seabirds)

26. W. Papworth (ACAP) presented “Review of seabird bycatch mitigation measures for pelagic longline fishing” (EB-WP-04). Since the last meeting of the WCPFC Scientific Committee a considerable amount of research has been undertaken on seabird bycatch mitigation measures for pelagic longline fishing operations. Evidence is emerging that the use of appropriate configurations of weights on branchlines is currently the most effective means of reducing seabird access to baits, although it still needs to be used in conjunction with other measures, such as tori lines and night setting. The results of this research have been reviewed by ACAP’s Seabird Bycatch Working Group (SBWG) and a summary of key findings are provided to assist WCPFC SC6 in its consideration of the efficacy of seabird bycatch mitigation measures currently in use within the WCPFC convention area, in accordance with WCPFC Conservation and Management Measure 2007-04.

27. W. Papworth highlighted results from two papers: “Effect of line shooter and mainline tension on the sink rates of pelagic longlines and implications for seabird interactions” (EB-WP-07), and “Shrink and defend: A comparison of two streamer line designs in the 2009 South Africa tuna fishery” (EB-IP-09). It was noted that recent research shows that combinations of mitigation measures are still required, and only combinations that take bait to depth of 10 m or remove access to baited hooks will be effective in some fisheries. The need to modify CMM 2007-04 to focus on combinations that achieve this was emphasized.

28. D. Wilson (Australia) presented “Experimental determinations of factors affecting the sink rates of baited hooks to minimize seabird mortality in pelagic longline fisheries” (EB-WP-06) on behalf of the authors.

- i. While line weighting and other mitigation measures are required in the pelagic longline fishery off Australia's east coast, some seabirds are still caught, suggesting that mitigation measures are not fully effective in all conditions. An experiment was conducted in that fishery to establish a scientific basis for potential changes to reduce seabird mortality; in particular, by evaluating different combinations of line weighting and other variables affecting line sink rates.
- ii. The experiment examined the effects of different bait species (blue mackerel, yellow-tail mackerel and squid), bait life status (dead or alive), weight of leaded swivels (60 g, 100 g and 160 g) and leader length (distance between leaded swivel and hooks: 2 m, 3 m and 4 m) on the sink rates of baited hooks from 0-6 m deep.
- iii. On average, live bait sank much slower than dead bait, greatly increasing the exposure of baited hooks to seabirds. Sink rates of individual live bait were highly variable. Many were < 2 m underwater 18 seconds after deployment, including some on the heaviest swivels, and some were < 10 m deep after 120 seconds.
- iv. Within the dead bait group, gear with 60 g and 100 g swivels on the same leader length sank at similar rates, as did all three swivel weights on 4 m leaders. The 160 g x 2 m combination sank the fastest, averaging 0.27 m/s and 0.74 m/s from 0-2 m and 4-6 m, respectively. The 60 g x 4 m combination sank the slowest, averaging 0.16 m/s to 2 m depth and failing to attain 6 m depth after 18 seconds. Initial sink rates (0-2 m) were increased by placing leaded swivels close to hooks and final sink rates (> 4 m) by increasing the weight of the swivels.
- v. The results indicate that the small (incremental) changes to the weight of leaded swivels and the length of leaders typically preferred by the fishing industry are unlikely to make an appreciable reduction in seabird mortality because resultant increases in sink rates will be insubstantial.
- vi. Changing line weighting regimes to reduce seabird mortality requires consideration of sink rates close to the surface (i.e. 0-2 m) in addition to cumulative rates to the deeper depths. It is suggested that to substantially reduce seabird mortality compared to that associated with 60 g swivels and ~3.5 m leaders (the preferred option by industry) may require branch lines be configured with swivels $\geq 120 \text{ g} \leq 2 \text{ m}$ from hooks. An alternative to the latter regime would be to place a smaller amount of weight at or very close to the hook. The exact amount of weight would have to be determined experimentally.

29. D. Wilson also spoke to the "Effect of line shooter and mainline tension on the sink rates of pelagic longlines, and implications for seabird interactions" (EB-WP-07).

- i. The likelihood seabirds will be hooked and drowned in longline fisheries increases when baited hooks sink slowly. Fishermen target different fishing depths by setting mainline through a line shooter which controls the tension (or slackness) in the line. An experiment was conducted in Australia's pelagic longline fishery to test the hypothesis of no difference in sink rates of baited hooks attached to mainline set under varying degrees of tension.
- ii. Mainline was set in three configurations typically used in the fishery: a) surface set tight with no slackness astern; b) surface set loose with two seconds of slack astern and; c) deep set loose with seven seconds of slack astern. Sink rates of baited hooks were measured using time depth recorders.
- iii. Tension on the mainline had a powerful effect on sink rates. Baited hooks on branch lines attached to tight mainlines reached 2 m depth nearly twice as fast as those on the two loose mainline tensions, averaging 5.8 s (0.35 m/s) compared to 9.9 s (0.20 m/s) and 11.0 s (0.18

m/s) for surface set loose and deep set loose tensions, respectively. The likely reason for the difference is propeller turbulence. Tight mainline entered the water aft of the area affected by turbulence whereas the two loose mainlines and the clip ends of branch lines were set directly into it about 1 m astern of the vessel. The turbulence presumably slowed the sink rates of baited hooks at the other end of the branch lines.

iv. The results suggest that mainline deployed with a line shooter (as in deep setting) into propeller turbulence at the vessel stern slows the sink rates of baited hooks, potentially increasing their availability to seabirds. Unless mainline can be set to avoid propeller turbulence the use of line shooters for deep setting should not be accepted as an effective deterrent to seabirds.

v. It is recommended that the WCPFC revise CMM 2007-04 by deleting deep setting line shooter from the list of accepted seabird bycatch mitigation measures in Table 1 of that measure.

30. D. Wilson spoke briefly to "Progress in development and testing of an underwater bait setter for pelagic longline fisheries" (EB-IP-07). He noted that it has the potential to

- eliminate mortality of surface-seizing seabirds (eg albatrosses)
- reduce or eliminate mortality of diving seabirds (eg petrels, shearwaters)
- eliminate bait loss to seabirds
- allow fishing at any time day/night, potentially without tori line
- remove threat of seasonal closures
- allow use of line weighting options more acceptable to fishers
- undertake tamper-resistant data gathering on SD cards
- reduce need for observers to monitor mitigation measures

31. Preliminary trials are encouraging, compared to hand setting. There is slightly improved bait retention, and similar setting speed. It is currently testing in a bird "hot spot" in a pelagic longline fishery in Uruguay, with further work planned in Australia later in 2010 and early 2011. Australia will report progress to SC7 in 2011.

Discussion

32. CCMs thanked scientists for their research on seabirds, including work on seabird interactions, hot spot identification and spatial risk assessment. It was noted that CCMs have slowly adapted the binding technical specifications of the seabird measure in their national policies and the operation of their fleets, both in areas with historical seabird interactions, and other localities. They welcomed research and trials of existing or alternative seabird mitigation measures by CCMs, particularly those that illustrate decreases in interaction rates without impacts on or reduction in the catches of target species. Discussion was held on various methods of line weighting, and the impact on the sink rate of bait.

33. The importance of line-weighting research was addressed, and the need for additional research on the effectiveness of line shooters highlighted, in particular effectiveness across different fisheries sectors. Initial trials of line shooters have been aimed at improving the design and operation of the system, with anecdotal evidence indicating it can eliminate bycatch in some situations; conversely, it was also pointed out that if incorrectly applied line

shooters will have the opposite effect of that intended. Discussion was held regarding the utility of deep-setting line shooters in reducing seabird interactions, with differing views expressed regarding their efficacy. It was noted that the deep-setting line shooters in combination with weighted hooks are very effective in the Hawaiian LL fishery, and that different situations may demand different remedies. Some CCMs suggested that a review of the requirement that line shooters be used may be needed by TCC. A CMM suggested the line shooters no longer be included as a mitigation option. However, the United States noted that the Hawaii LL fisheries are required by regulation to use line shooters.

34. The potential burdens on fishermen from increase of observer coverage were noted, and the possibility that catch rate or fishing operations may be affected.

35. CCMs suggested consideration be given to monitoring and mitigation measures in relation to flag vessels, to ensure that those flags likely to contribute most to risk are adequately monitored.

Outcome (e.g. summary of relevant discussion, resolution, etc):

SC6 Recommendations: Seabirds

1. The SC noted that extensive research is currently underway aimed at providing a scientific basis for additional changes to CMM 2007-04. The SC agreed that minor proposed amendments to CMM 2007-04, as recommended by the SC, should not be incorporated into the CMM until such time as there are sufficient changes to warrant revision.

On the use of weighted branch lines:

2. The SC agreed that line weighting of pelagic longlines is likely to be one of the most effective mitigation measures in reducing or eliminating seabird interactions with baited hooks, and that further research be undertaken to refine the 'weighted branch lines' specifications contained in CMM 2007-04.

On the use of dead baits versus live baits:

3. The SC noted the findings in EB-WP-06, carried out in the southern hemisphere, that indicate the use of live bait in pelagic longline fisheries may increase seabird mortality above that associated with the use of dead bait, based on the slower sink rates of live bait.

4. The SC agreed that the use of live bait should be discouraged in fisheries operating in areas of high seabird abundance that do not already use live bait.

5. The SC recommended that additional research be undertaken to confirm the findings presented in EB-WP-06, and to include different line weighting regimes, in areas north of 23 degrees North and in areas south of 30 degrees South for consideration by the SC. Seabird interaction rates for these experiments should also be undertaken.

On the use of blue-dyed bait:

6. The SC noted recent research suggests that blue-dyed squid bait may be more likely to decrease seabird bycatch in pelagic longline fisheries than other blue-dyed baits such as fish.

7. The SC recommended that additional research be carried out on the efficacy of blue-dyed squid bait over other blue-dyed baits, including during both setting and hauling, for consideration by the SC.

On the location of the southern latitudinal boundary:

8. The SC noted that the purpose of the Productivity-Susceptibility Analysis in EB-IP-01, was to determine the probability of seabird-fisheries interactions and the risk of adverse effects of fishing-induced mortality on populations of seabirds. The results suggest that the southern boundary (30 degrees South) of the seabird mitigation measure (CMM 2007-04) may need to be moved further north to ensure adequate spatial protection for seabird high risk areas.

9. The SC recommended that SPC-OFP and ACAP provide advice on observer data and information on seabird distribution to the Secretariat after which a decision could be made on whether to proceed with a formal new analysis of risk levels of longline fishing to seabirds in the southern hemisphere. Members with observer programmes in this area should collaborate with SPC to assist in improving the data holdings for assessing risk levels of longline fishing to seabirds.

On the use of deep setting line shooter:

10. The SC noted the findings in EB-WP-07, carried out south of 25 degrees South, that suggest mainline deployed with a line shooter (as in deep setting) into propeller turbulence at the vessel stern slows the sink rates of baited hooks.

11. The SC recommended that testing of the deep setting line shooter be carried out north of 23 degrees North, to determine its utility in mitigating against seabird interactions and other at risk species (e.g. marine turtles, marine mammals, sharks) in that area.

12. The SC noted that there are currently no specifications for the use of deep settling line shooters in CMM 2007-04.

13. The SC recommended that the TCC consider the development of specifications for 'deep setting line shooter', for inclusion in CMM 2007-04.

On the format of Table 1 in CMM 2007-04:

14. The SC noted that there are clear operational differences of longline fleets and seabird species composition in the areas north of 23 degrees North and south of 30 degrees South.

15. The SC recommended that when CMM 2007-04 is next modified, the TCC should consider the utility of separating Table 1 into two separate tables, one each for the area north of 23 degrees North and the area south of 30 degrees South.

Outlook for Future ACAP Involvement:

Amendment of CMM 2007-04 will only be considered by the WCPFC-SC when substantive changes are being proposed. It is expected that substantial findings will come out of research being undertaken over the next year and that these may provide the substantive changes required by the SC. Consequently, continued participation by ACAP at these meetings should be reviewed, subject to the outcome/presentation of new research findings of relevance to CMM 2007-04.

Recommended Actions for ACAP:

Review the development of specifications for line shooters at the next WCPFC-TCC meeting. If necessary, prepare papers and/or attend this meeting.

Have relevant papers been forwarded to Secretariat: Yes