**A brief note on future seabird risk assessment research**

**New Zealand**

**July 2013**

***for ERSWG 10 Agenda Item 4.1.3***

**Executive Summary**

An approach to undertaking a global risk assessment for seabirds is proposed. Specific comment on the approach is sought from Commission members at the 10th meeting of the Ecologically Related Species Working Group (ERSWG10). New Zealand intends that the proposal will also be discussed at upcoming relevant WCPFC, SPRFMO and CCAMLR meetings.

**Introduction**

At the Ninth Meeting of the Ecologically Related Species Working Group (ERSWG) of the Commission for the Conservation of Southern Bluefin Tuna (CCSBT)[[1]](#footnote-1) a method for completing an ecological risk assessment for seabirds was discussed (Waugh et al. 2012). ERSWG 9 concluded that the analyses were useful, and such outputs could help the Commission determine where to implement risk reduction techniques. It was noted that such analyses could identify areas and species of greatest interest for risk reduction, but also highlighted where data gaps occurred.

During the intersessional period, New Zealand has updated the analysis of risk of seabird interactions with surface longline fisheries for southern bluefin tuna (SBT) using fishing data from the Commission, and biological and spatial data indicative of the distributions of a suite of albatross and petrel species known or likely to be caught in CCSBT fisheries (CCSBT-ERS/1308/18). The analysis adapted methods developed in other regions and applied to assess risk of incidental mortality of highly migratory top predator species in other Regional Fisheries Management Organisations. At the same time New Zealand has continued to refine approaches to ecological risk assessment for seabirds (Richard and Abraham 2013a, Richard and Abraham 2013b).

A key gap in analyses to date is that mortalities are known or assumed to occur outside the area addressed by the particular risk assessment. The proposed research seeks to address this gap and in doing so better inform priority actions and international co-operation on addressing the adverse impacts of seabird / fishery interactions.

**Future seabird risk assessment research**

Threat status is generally well known for seabirds, e.g. using rankings developed by the International Union for Conservation of Nature (IUCN). Risk status within particular areas may also be well known, e.g. seabird populations within the New Zealand EEZ). A risk assessment for CCSBT fisheries has recently been completed (CCSBT-ERS/1308/18). However, a key gap in the CCSBT analyses and others conducted to date is that mortalities are known or assumed to occur outside the area addressed by these extant risk assessments.

This can mean prioritisation of research, mitigation and management is not necessarily addressed to the highest priority issues. It can also mean that issues requiring international co-ordination are not afforded appropriate priority. An area of obvious interest for ERSWG is to support the development of appropriate compatible mitigation measures across regional fisheries management organisations (RFMOs) so as to simplify at sea mitigation for fishers.

New Zealand proposes undertaking a global risk assessment for albatrosses and petrels. Such an undertaking will require considerable international collaboration and co-operation. To begin this process New Zealand is sharing the proposal with the relevant science processes in key RFMOs to which it is a party.

A draft research project proposal, to begin in late 2013, is outlined in Annex I. One of the key issues in completing a global risk assessment for seabirds is the availability of key data sets. An indication of key data required is provided in the research proposal (Annex I).

New Zealand seeks specific comment on the proposed approach to a global risk assessment for seabirds, indications on the availability of key data and proposals for collaboration. New Zealand intends also taking this proposal to upcoming meetings of SPRFMO, WCPFC and CCAMLR science groups for their input.

**References**

Richard Y.; Abraham, E.R. (2013a). Application of Potential Biological Removal methods to seabird populations. *New Zealand Aquatic Environment and Biodiversity* Report No. 108. 30p.

Richard Y.; Abraham, E.R. (2013b). Risk of commercial fisheries to New Zealand seabird populations. *New Zealand Aquatic Environment and Biodiversity Report* No. 109. 58p.

Waugh, SM., Filippi, D., Sharp, B., Weimerskirch, H. 2012. Ecological Risk Assessment for seabird interactions in surface longline fisheries managed under the Convention for the Conservation of Southern Bluefin Tuna. Ecologically Related Species Working Group, Meeting paper. New Zealand. CCSBT-ERS/1203/09 (Rev.1).

**Annex I – Draft New Zealand research proposal**

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| **Project Title:** | Global seabird risk assessment (for NZ species) |
| **Project Code:** | PRO2013-13 |
| **Start Date:** | Late 2013 |
| **Completion Date:** | 30 June 2014 |

**Management Objectives from the relevant fisheries plan(s) (if applicable):**

Draft National Fisheries Plan for Inshore Finfish: Objective – Minimise adverse effects of fishing on the aquatic environment, including biological diversity.

National Fisheries Plan for Deepwater and Middle-Depth Fisheries: Objective MO 2.5 – Manage deepwater and middle-depth fisheries to avoid or minimise adverse effects on the long-term viability of endangered, threatened and protected species.

National Fisheries Plan for Deepwater and Middle-Depth Fisheries: Objective MO 2.6 – Manage deepwater and middle-depth fisheries to avoid or minimise adverse effects on biological diversity.

National Fisheries Plan for Highly Migratory Species: Objective 7 – Implement an ecosystem approach to fisheries management, taking into account associated and dependent species.

7.2 Minimise unwanted bycatch and maximise survival of incidental catches of protected species in HMS fisheries, using a risk management approach.

7.3 Increase the level and quality of information available on the capture of protected species.

Draft National Plan of Action to reduce the incidental catch of seabirds in New Zealand Fisheries (NPOA – Seabirds). The level of risk arising from commercial fisheries activities inside the EEZ should be considered in the context of global fisheries risk to the same populations (paragraph 28). See also:

* Long-term objective – New Zealand seabirds thrive without pressure from fishing related mortalities, New Zealand fishers avoid or mitigate against seabird captures and New Zealand fisheries are globally recognised as seabird friendly.
* Biological risk objective – Incidental mortality of seabirds in New Zealand fisheries is at or below a level that allows for the maintenance at a favourable conservation status or recovery to a more favourable conservation status for all New Zealand seabird populations.
* Research and development objective – The testing and refinement of existing mitigation measures and the development of new mitigation measures results in more practical and effective mitigation options that fishers readily employ.

**Operational-level Management Objective(s):**

Provide a global risk assessment (i.e. including from fisheries occurring outside New Zealand waters) of direct commercial fisheries-related risk to seabird populations breeding in New Zealand (for example; white-capped albatrosses, black petrels, sooty shearwaters, etc).

**Management need:**

New Zealand’s updated NPOA-seabirds, especially the Biological Risk Objective, requires an understanding of the risk faced by individual seabird species from New Zealand commercial fisheries in the context of other threats, including risk from other fisheries overseas, to be able to judge whether incidental mortality in New Zealand fisheries is at a level that will provide for a favourable conservation status. Observed population trends for New Zealand populations can be interpreted better in the context of an improved understanding of global fisheries risk.

**Information need:**

The methodological framework employed by the recently updated level-2 risk assessment for seabirds, is generally accepted as the best available approach to estimate direct fisheries risk to seabird populations in a spatially and temporally explicit way, and to subsequently disaggregate and assign risk between fisheries and fishing methods, or in space and time. The existing level-2 risk assessment only addresses risk arising from commercial fisheries within the NZ EEZ; however some wide-ranging NZ-breeding seabird populations are known to also encounter substantial commercial fisheries risk outside the EEZ. Full understanding of risks to seabird populations, and by extension evaluation of what proportion of that risk is attributable by New Zealand fisheries, requires an extension of the analysis to include fisheries interactions outside the EEZ. In the absence of reliable observer coverage for global fisheries, a coarse-scale approximation of global risk is achievable by: i) accessing available global fisheries databases and global seabird distributions and applying the seasonally-explicit spatial overlap framework developed initially for the NZ EEZ risk assessment (as was done in 2012 for CCSBT fisheries; see Waugh et al. 2012); ii) evaluating relative risks inside vs. outside the New Zealand EEZ; iii) comparing the coarse scale results with corresponding fine-scale results from the existing L2RA inside the NZ EEZ, and iv) scaling the global relative risk estimates accordingly.

**Overall Research Objective:**

1. To generate comprehensive, seasonally- and spatially-explicit estimates of risk posed to New Zealand breeding seabirds from commercial fisheries at a global scale.

**Specific Research Objectives:**

1. Evaluate relative exposure to commercial fisheries at a global scale for New Zealand seabird populations applying a seasonally-disaggregated spatial overlap approach (i.e. accessing global seabird spatio-temporal distribution data and compiling comprehensive global fisheries effort databases) for different categories of fishing effort.
2. Apply estimates of population PBR (from the updated NZ-EEZ seabird risk assessment, including uncertainty) and species- or guild-specific estimates of seabird Vulnerability (i.e. as estimated in the updated NZ-EEZ seabird risk assessment, modified to the extent possible by data indicative of relative seabird bycatch rates in comparable fishing effort inside vs. outside the New Zealand EEZ, including uncertainty) to estimate global fisheries risk for New Zealand seabird populations.
3. For each New Zealand seabird population estimate what proportion of global fisheries risk is attributable to mortalities occurring inside vs. outside the NZ-EEZ, and what proportion is likely to be unaccounted for in the analysis (e.g. due to incomplete global fisheries data or risk from IUU fishing).
4. For that portion of species risk outside the NZ-EEZ, summarize the source of that risk to the extent possible, for example by RFMO (or other relevant management agency), and by fishery group, geographic area, season, vessel size, and other relevant categories.

**Rationale:**

The methodological framework employed by the recently updated level-2 risk assessment for seabirds, L2RA, is generally accepted as the best available approach to understanding and disaggregating the risk of direct fishing-related mortality. However, it is known that there is substantial mortality of NZ-breeding seabirds outside the EEZ and the risk ratios from the L2RA must be interpreted with those mortalities in mind. An ad hoc approach is possible when ex-EEZ fatalities are known, but there are many seabird species for which the ex-EEZ fatalities are known very poorly. This project would apply the seasonally-explicit spatial overlap approach employed by the updated NZ L2RA to inform estimates of global fisheries risk to seabird populations breeding in New Zealand (building on a similar analysis completed in 2012 for CCSBT fisheries; see Waugh et al. 2012).

*Objective 1*

This objective will require that seasonally explicit global seabird distribution maps be accessed and/or compiled for those New Zealand populations with ranges that extend outside the NZ-EEZ and are deemed to be of priority for management (with a target species list to be agreed in consultation with MPI). Some such distributions are presently available (e.g. BirdLife International 2010); this analysis should also utilise the most up-to-date data from the BirdLife Global Procellariiform Tracking Database and final outputs of MPI contract SEA2011-14. Corresponding maps of global fishing effort will need to be compiled from relevant global databases (e.g. UN-FAO, CCSBT, WCPFC, SPRFMO, CCAMLR) at a common spatial and temporal resolution, and summarized into relevant fishery groups by vessel characteristics known to affect seabird vulnerability. To the extent possible fishery groups should mirror those applied by Richard et al. (2013), to optimise comparability with the results of that study, but the format and availability of information characterising fishing vessels in global databases may require that a coarser level of resolution be adopted when defining fishery groups or that additional groups be generated (e.g. to represent different levels of mitigation uptake by global fishery fleets). Outputs from this objective will include annual and seasonally disaggregated indices and maps of spatial overlap between birds and fishing effort for each species and fishery group.

*Objective 2*

Estimates of population-level PBR (Potential Biological Removals) will be applied from Richard and Abraham (2013). In the absence of reliable observer data indicative of seabird bycatch rates in global and high-seas fisheries databases, species- or guild-specific estimates of *Vulnerability* for each fishery group will need to draw heavily upon the empirical results of Richard et al. (2013) but will require careful modification to reflect differences in the way that fishery groups have been defined, and/or known or likely differences in bycatch rates between otherwise comparable fishery groups operating inside vs. outside the NZ-EEZ (i.e. reflecting differences in mitigation or fisher behaviour to avoid seabird captures). The latter process will likely require subjective interpolation of a matrix of fishery-groups x species in which only some cells can be populated (on either an absolute or relative scale) using empirical data; this process will need to proceed by carefully applying available global fisheries observer data, individual studies of mitigation effectiveness, and expert judgment (as proposed in the method description of Sharp et al. 2011) in comparison with the more empirical results of Richard et al. (2013) within the NZ-EEZ.

*Objective 3*

Once global fisheries risk has been estimated for each species in Objective 2, subsequent disaggregation of that risk into its constituent parts will be useful to help prioritise effective management action. Disaggregation should distinguish between commercial fisheries risk from inside the NZ-EEZ vs outside the NZ-EEZ and also address at least on a subjective level what level of fisheries risk is likely to remain un-quantified outside the scope of this assessment, e.g. from effort not included in global databases or from IUU fishing.

*Objective 4*

A strength of this risk assessment framework is that population-level risk can be disaggregated to its constituent parts, allowing subsequent research or management interventions to be targeted where risk is highest. Inside the NZ-EEZ the outputs of Richard et al. (2013) are used in this way. Identifying which global fisheries, methods, geographic areas etc. are the source of greatest risk outside the NZ-EEZ will inform similar prioritisation of our efforts to address global fisheries risk to seabirds. The extent to which risk disaggregation is possible will depend on the nature and structure of data contained in global fishing effort databases.

**References**

BirdLife International. 2010. Distribution maps of the Threatened and Near Threatened Birds of the World. BirdLife International, Cambridge, UK.

Richard, Y., and Abraham, E. R. 2013. Application of Potential Biological Removal methods to seabird populations. Final Research Report for research projects IPA2009/19 and IPA2009/20. Unpublished report held by Ministry for Primary Industries, Wellington. 32p.

Richard, Y., Abraham, E. R., and Filippi, D. 2013. Assessment of the risk of commercial fisheries to New Zealand seabirds, 2006-07 to 2010-11. Final Research Report for research projects IPA2009/19 and IPA2009/20. Unpublished report held by Ministry for Primary Industries, Wellington. 56p.

Sharp, B. R., Waugh, S. M., and Walker, N. A. 2011. A risk assessment framework for incidental seabird mortality associated with commercial fishing in the New Zealand EEZ. Unpublished report held by the Ministry for Primary Industries, Wellington.

Waugh, S., FIllipi, D., Sharp, B., and Weimerskirch, H. 2012. Ecological Risk Assessment for seabird interactions in surface longline fisheries managed under the Convention for the Conservation of Southern Bluefin Tuna. 38pp. CCSBT-ERS/1203/09 (Rev.1). Commission for the Conservation of Southern Bluefin Tuna, Canberra.

1. Note that all references to the Commission can be read as references to the Extended Commission. [↑](#footnote-ref-1)