PROTECTED SPECIES SCIENCE INFORMATION

1. Introduction

This paper provides an overview of protected species science information from New Zealand sources for the ORH AEEF 2013. There is a wide range of additional New Zealand and international literature that will be available for the AEEF but is not specifically mentioned in this document.

2. Protected Fishes, Sharks and Reptiles

- **Observer Data Report**
  - Protected fishes catch from from MPI observer data for each of the four orange roughy fisheries from 2007-08 to 2011-12 is presented in Tables 5, 6, 14, 15, 23, 24, 32, 33 of the Observer Data Report.
  - No protected fishes were observed in the catches of the four orange roughy fisheries.
  - No reptiles were observed in the catches of the four orange roughy fisheries

- **Anderson (2011)**
  - Appendix 3 of Anderson (2011) estimates a catch of 2t of basking shark from all commercial orange roughy returns from 2005-06 to 2008-09.
  - There is no information on the location of the basking shark catch.

- **Rowe (2009, 2010) and Ramm (2010, 2012a, 2012b)**
  - These five reports give protected fish and reptile catches from Conservation Services Programme (CSP) Observer Reports for the years 2006-07 to 2010-11 respectively.
  - In each report, Appendix 3 gives catches by method and Appendix 5 gives catches by fishery management area (FMA)

3. Marine Mammals

- Abraham & Thompson (2013) gives estimates of the catch of protected seabirds and marine mammals for each of the four orange roughy fisheries.
- Thompson et al. (2013) will provide ETP Species capture information for each of the selected orange roughy fisheries featuring in the AEEF.

4. Seabirds

- Richard & Abraham (2013a and 2013b) Estimate the risk to New Zealand seabird species from commercial fisheries; Richard & Abraham (2013c) Applies Potential Biological Removal methods to seabird populations.
- Rowe (2010b) is a Level 1 Seabird Risk Assessment

5. Protected Corals Catch

- **Deepwater Group (2013) Observer Data Report**
  - Protected coral catch from from MPI observer data for each of the four orange roughy fisheries from 2007-08 to 2011-12 is presented in Tables 2, 11, 20, and 29 of the Observer Data Report.
  - A range of protected coral species is incidentally caught in all four of the target ORH fisheries.

- **Anderson (2011)**
  - Appendix 1 of Anderson (2011) indicates that coral catch in the orange roughy fishery is almost invariably discarded.

- **Tracey et al. (2011a)**
  - Observer data was used to identify areas and fisheries where there were incidental catches of corals in commercial trawl nets. Most observer coral records were from fishing effort in 800–1200 m depths, with over 80% of records from tows that targeted orange roughy, oreo dories, and black cardinalfish.
  - Overall, 19% of observed deepwater tows for these target species had coral catch records. The corals were widespread in their geographic distribution though there were some between-group regional distribution differences.
  - Specific fishing grounds for orange roughy and oreo species could be identified from the location of the observed coral catches.
  - Observer identification of protected corals to the lowest taxonomic level was relatively poor, but much improved to a higher taxonomic level except for Gorgonian corals.

- **Consalvey et al. (2006)**
  - Black corals have a wide distribution by depth and latitude.
  - Occurrence of bubblegum corals increased northwards and east of New Zealand.
  - Precious corals were not common and occurred mainly in the north (esp. Kermadec).
  - Red corals had a wide distribution.
  - The known distribution of corals may be an artefact of sampling effort as the distribution is similar to the recent distribution of the orange roughy fishery.

- **Tracey et al. (2011b)**
  - Boosted regression tree analysis was used to identify which environmental variables best described the distribution of 5 habitat forming corals in the New Zealand region.
  - Depth and seamount distribution were important factors in describing observed coral distribution.

- **Baird et al. (2012)**
  - Investigated the distribution of protected corals in New Zealand using boosted regression tree analysis according to a set of 10 environmental variables.
  - The areas where corals were predicted to most frequently occur were generally deeper waters and areas of high relief.
  - Most of the known coral distributions were predicted by the models but some deepwater and steep relief areas where corals are known to occur were not predicted by the models.
  - By grouping corals, some details and differences were lost.
  - Generally the areas predicted to have the greatest probability of coral occurrence were outside the main fisheries areas, except for some deepwater fisheries that occurred on areas of steeper relief.
  - The fisheries that pose the most risk to protected corals are the deepwater trawl fisheries for species such as orange roughy, oreo species, black cardinalfish, and alfonsino.

- **Tracey et al. (2007)**
  - Using microscopic, SEM and lead-210 sampling methods, the estimated age of *Lepidisis* spp. was up to 58 years old and a *Keratoisis* spp. colony was up to 38 yrs old.