WCPFC PROJECTS 117 & 118:

THE DEVELOPMENT OF BIOLOGICAL SAMPLING PLANS FOR TUNA & BILLFISH INCLUDING PROJECTS 125 & 126

SC21-SA-WP-15

SPC-OFP

BACKGROUND

- WCPFC SC19 and SC20 recommended the development of biological sampling plans for tuna, billfish and shark species.

- Noting the reliance on observers to collect biological samples , and some of the recognised gaps across size and spatial strata, such plans will need to be highly collaborative across WCPFC participants.

- The SSP held an online meeting in October 2024 with interested parties to discuss the potential approaches that could be taken for developing a biological sampling plan for WCPO tuna, billfish and shark species, and to agree on the necessary specifics and potential priorities.

SAMPLING PLAN GUIDANCE

- Design of biological sampling plans should take an iterative approach, focused initially on relatively simple power analyses building on the approach used for North Pacific billfish species (Kinney et al., 2023) and focussed primarily on estimation of growth curves, with consideration of maturity.

- The method be developed initially for two tuna species with differing life history and fisheries characteristics, including selectivity shapes for key fisheries.

- An initial sampling plan be presented at WCFPC SC21.

- Defining the priority hypotheses regarding life history parameters should be continued over a longer period of time, to inform sampling plans tailored to the specific needs of each species

SAMPLING PLAN

- Power Analyses

  - Skipjack and Bigeye (two contrasting life-histories)

  - Evaluate Proportion Sampling, Fixed Sampling, Random Sampling

  - Operating models derived from recent stock assessments for skipjack and bigeye

  - Compared selectivities as a function of length or age

- Proportional Sampling performed markedly better than Fixed Sampling for both skipjack and bigeye, regardless of whether selectivities are a function of length or age.

  - This suggests that the size composition of catches are sufficiently representative of the population.

  - This result is consistent with other analyses examining this question (e.g. Kinney et al 2023)

- Note this analyses did not include the domestic fisheries of the WPEA

SAMPLING PLAN

- Calculate overall size composition from available samples based on the last 5 years (2019 –2023, to allow sufficient time for submission of longline size data).

- A target sample size of 300 for each spatial strata of interest (e.g. assessment region). The target number of samples in each length class should be spit 50:50 between the two sexes. For length classes with a target sample size of one, we recommend that this be assigned to either sex at random.

- This should allow sufficient samples to explore spatial variation at a broad-scale, and also collect information that should be helpful to design sampling plans to test more detailed hypotheses in the future.

- Within each area, we recommend that the target sample size be distributed amongst the corresponding fleets broadly in proportion to their catch (for the period 2019 –2023).

SAMPLING PLAN

- The sampling plan will allow targets by fleet and region to be calculated

- Practical implementation will require greater participation than Pacific Island Regional Fisheries Observers

Billfishes

- The principals of the sampling plan for tuna are applicable for billfishes

- Work has commenced to refresh existing and train new samplers in the techniques for sampling billfishes. Resources will be necessary to ensure a sufficient number of samplers are trained to undertake the work on billfishes

Sharks

- Existing sample holdings for sharks are low

- There will be challenges to meet sampling needs given the CMMs for sharks

RECOMMENDATION

- SSP seeks SC guidance on the next steps they require to proceed to implementing proportional sampling across WCPFC stocks (tunas and billfishes)

- SSP seeks guidance on whether to continue developing designs for sharks noting the past difficulties in collecting from these species and the restrictions that current CMMs impose.