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Update on flesh-footed shearwater tracking and potential areas of bycatch risk

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Summary

Flesh-footed shearwaters are one of the many species of seabirds breeding in New Zealand which are known to be vulnerable to bycatch in longline fisheries. Adult flesh-footed shearwaters migrate to the North Pacific during the non-breeding season.

Historically, our knowledge on the distribution of flesh-footed shearwaters has been based on tracking of breeding adult birds which, on completion of breeding, migrate rapidly across equatorial waters into the North Pacific mostly north of 23 º North. This information was presented to SC12 during earlier reviews of the WCPFC seabird Conservation and Management Measure.

We report *initial* results from the first successful satellite tracking of *juvenile* flesh-footed shearwaters during May-June 2023. The results show a striking difference in the behaviour of juvenile birds compared to adults and are consistent with results for earlier attempts to track juvenile birds. The juvenile birds moved rapidly north into equatorial waters but then continued to spend multiple weeks in the equatorial zone. At the time of preparation of this paper none have continued their northwards migrations into more northerly areas of the North Pacific. Based on these initial results, this places these birds in a zone of the WCPFC area where no seabird bycatch mitigation is required under CMM2018-03.

This tracking study is ongoing and we plan to present full results, including an assessment of the overlap of juvenile flesh-footed shearwaters with fishing effort, to SC20.

Background

As previously presented to SC12 in WCPFC-SC12-2016/ EB-WP-09-Rev1, New Zealand has the highest global diversity of albatross and petrel species. Fisheries bycatch remains the greatest single threat to such vulnerable seabirds (Dias *et al.* 2019). Addressing fisheries bycatch risks to these species is a high priority for New Zealand.

WCPFC-SC12-2016/ EB-WP-09-Rev1 identified New Zealand breeding seabird species that are known to be at a particularly high risk to fisheries bycatch and that forage north of 30 º South in the WCPFC area where there are weaker requirements for the use of seabird bycatch mitigation measures in CMM 2018-03.

Under CMM 2018-03 there is no requirement to use seabird mitigaton in the tropical area between 25 º South and 23 º North, and only one mitigation method is required between 25º and 30° South.

This paper provides updated information for one of these species, the flesh-footed shearwater (*Ardenna carneipes*). The most recent seabird risk assessment for commercial fisheries in New Zealand identified flesh-footed shearwater as the seventh most at risk species out of 71 seabirds assessed (Edwards *et al.* 2023). Longline fisheries, both demersal and pelagic, accounted for the majority of estimated bycatch within New Zealand waters.

Methods

Our knowledge of the distribution of flesh-footed shearwater has been based mostly on the tracking of breeding *adult* birds. This is the case for many albatross and petrel species, due to the logistical challenges of deploying and retrieving tags on juvenile birds which do not return to breeding colonies for several years. The deployment of miniaturised satellite transmitting tags has enabled the collection of such data in recent years. Juvenile birds were first tracked with such devices in 2019, but tags failed within the first few weeks (Crowe & Bell 2019). This study represents the first successful tracking of juvenile flesh-footed shearwaters breeding in New Zealand.

Nine Lotek Sunbird Argos PTT tags were deployed on juvenile birds at the Ohinau Island breeding colony in the Norh-East of New Zealand between 5-8 May 2023, immediately prior to fledging (10-21 May). The tags were either mounted to tail (n = 4) or back feathers (n = 5) using Tesa tape. As the tags are solar-powered, they can theoretically continue to function indefinitely, but we do not expect the attachment and function of tags to exceed approximately one year. Further details of the wider monitoring of this population is provided by Burgin & Ray (2022).

Results

Previous tracking of adult birds, as summarised in WCPFC-SC12-2016/ EB-WP-09-Rev1, had shown that, upon completion of breeding and associated foraging in the waters of the southern South Pacific, birds migrated rapidly across equatorial waters in the northern North Pacific, mostly north of 23 º North.

The initial movement of the tracked juvenile flesh-footed shearwaters in our current study over the period of tag deployment from 5-8 May to 30 June 2023 is shown in Figure 1. In sharp contrast to our knowledge of adult distribution, our tracking effort shows that juvenile birds spend multiple weeks in equatorial waters following departure from the breeding colony on fledging. Indeed none of the tracked birds indicate the likelihood of immediate movement further north to waters north of 23 º North. These results are consistent with the previous attempt to satellite track juvenile birds, when birds were seen heading to tropical waters, but in that case tags failed quickly and we were not able to determine how long birds stayed in the equatorial area.

Whilst this paper represents only the initial findings from our juvenile tracking study, the results represent important new information on where flesh-footed shearwaters may overlap with longline fisheries and face the risk of bycatch.

Next steps

We will continue to collect tracking data from these tagged juvenile flesh-footed shearwaters until tags fail or birds die. Ideally, up to one year of data will be collected under conditions of good tag performance and juvenile survival. We intend to then assess the fisheries effort overlap with these birds in order to better understand key fisheries bycatch risk areas. We intend to report results from these analyses to SC20.

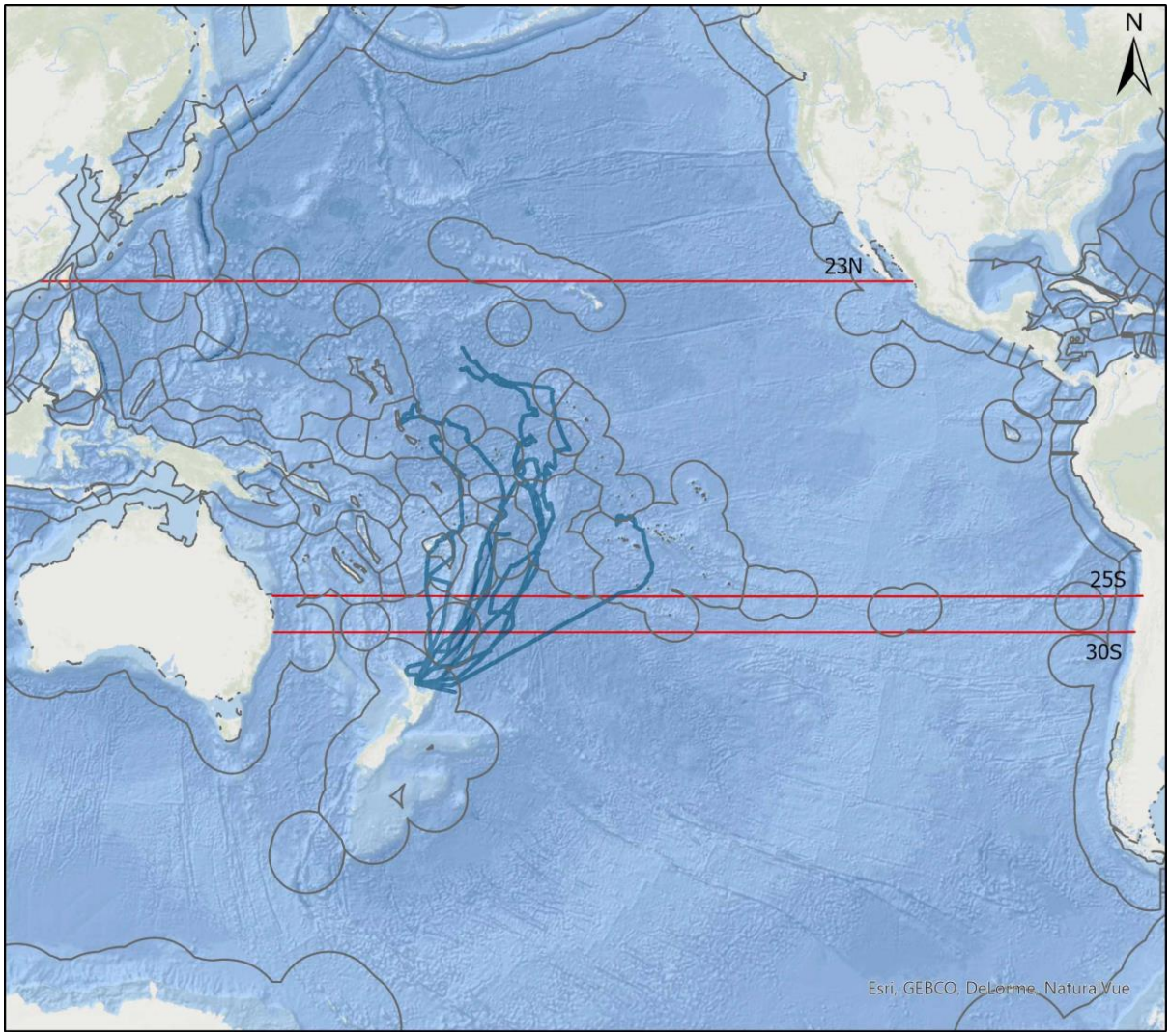

Figure 1. Juvenile flesh-footed shearwater tracks (dark blue) over the period from tagging on 5-8 May to 30 June 2023. Lines of latitude are shown for 30° South, 25° South and 23° North.

References

Burgin, D. & Ray, S. 2022. Flesh-footed shearwater population monitoring and estimates: 2021/22 season. POP2021-04 final report prepared by Wildlife Management International Limited for the Department of Conservation, Wellington. 24p.

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Edwards, C.T.T. *et al*. 2023. Update to the risk assessment for New Zealand seabirds. New Zealand Aquatic Environment and Biodiversity Report No. 314. 66 p.