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First steps for mitigating bycatch of Pink-footed Shearwaters *Ardenna creatopus*: Identifying overlap of foraging areas and fisheries in Chile

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SUMMARY

The Pink-footed Shearwater, *Ardenna creatopus*, is listed as in danger of extinction by Chile and under Annex 1 of ACAP, with an estimated global population of approximately 56,000 individuals. Incidental bycatch of this species in fisheries is thought to be an important cause in population decline (i.e. annual estimated mortality of >1000 adults).

This species is an endemic breeder in Chile, nesting only on the Juan Fernandez Archipelago (JFI; 30% of global population), and Isla Mocha (70% of global population). Using miniature GPS and satellite transmitters, we determined foraging areas of Pink-footed Shearwaters during the chick-rearing period in 2002 (JFI) and 2015-2016 (Isla Mocha). We overlaid shearwater tracking data with data from the Instituto de Fomento Pesquero (IFOP) on fishing effort in Chile (type of fishery, number sets per day, location of sets, and target species) to identify fisheries and fishing zones with the greatest potential for Pink-footed Shearwater bycatch.

During the 2002-2006 (N = 28 birds total) and 2015 (N = 18 birds) breeding periods, foraging areas were associated with the continental shelf and shelf-break, generally less than 30 km offshore. All foraging trips occurred between 31.5 and 40.0 degrees south, and birds remained in Chile territorial waters 100% of the time. We identified two primary foraging hotspots, one offshore near Talcahuano, Chile (approximately 36-37.5° south), and

one offshore north of Valdivia, Chile (approximately 39-39.5° south). Birds tracked from the Juan Fernández Archipelago foraged in the Talcahuano hotspot but did not visit the southerly hotspot near Valdivia. Birds tracked from Isla Mocha used both areas, with a greater proportion of birds using the Valdivia hotspot than the Talcahuano hotspot. Other major areas of use were around the respective breeding colonies from which the birds were tracked.

Overlay of these data with fisheries data is currently in progress. Preliminary results indicate extensive overlap of Pink-footed Shearwater foraging grounds with industrial and artisanal purse-seine fisheries within Chile, representing a significant risk of bycatch. Further work could be initiated to track Pink-footed Shearwaters during other life-stages (i.e. pre-breeding and incubation), and would enhance collaborative efforts with fisheries managers and fishers concerned with mitigating bycatch.