

Review: Effectiveness of the Great Australian Bight Marine Park in protecting the Australian sea lion (*Neophoca cinerea*) from by-catch mortality in shark gill-nets.

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I enjoyed reading the report and trust that it will be very useful for managers of the GABMP. The park is clearly not meeting its objectives relating to Australian sea lion (ASL).

The study could be improved in a number of ways, including:

- Using Mark-Recapture to estimate the number of pups
- Gathering data on survival and reproductive rates for ASL
- Gathering more detailed fishing effort data (recording degrees and minutes of latitude, and length of net)
- Estimating CVs for the bycatch estimates
- Increasing the level of observer coverage to achieve a CV of 30% or better
- Including density dependence and Allee effect in the modelling exercise

It would be useful to calculate PBRs (Potential Biological Removals, developed by US National Marine Fisheries Service) in addition to the modelling exercise.

There were a few minor presentation issues (e.g. highest catch rate 19.7% on page 27, 17.9% everywhere else).

The authors are obviously aware of many of the issues above, as several are mentioned (or alluded to) in the report. e.g. The need for a rigorous program for monitoring pup abundance, the implications of density dependence and Allee effect for the PVA predictions.

The suggestions for improvements above notwithstanding, this was a very useful study. It is clear that the GABMP is not protecting ASL from bycatch in gillnets and that the ASL populations are too small to withstand the level of bycatch detected by the observer programme. The conclusion that bycatch of up to 5% would reduce growth rates and up to 10% would cause population declines is consistent with other studies on marine mammal bycatch. A comparison with the PBR approach would help here. Using the default values for pinnipeds would show that much larger populations are required to sustain the levels of bycatch in and adjacent to the GABMP. This would be a conservative conclusion in that sealions tend to have a lower potential for population growth than other pinnipeds.