

Questions to IWS 2019 Panel with respect to penguins, together with brief summaries of the documents provided

- Q1) Do the estimation models of PENG/P4 based on fits to responses for individual penguins produce negatively biased estimates of the standard error of the parameter related to the impact on penguins of fishing in the neighbourhood of island colonies?
- Q2) Has adequate adjustment been made for the non-independence of data in the individual-penguin-based estimation models of PENG/P4?
- Q3) What can be concluded from the simulation studies presented for various estimation models for the parameter estimating the impact on penguins of fishing in the neighbourhood of islands; are further analyses of this type needed; if so, please provide suggestions as to their specification in general terms?
- Q4) Particularly in the context of responses to the preceding questions, comment on the reliability of results presented for the impact on penguins of fishing in the neighbourhood of the South Coast colonies at Bird and St Croix islands.

A brief description of each document is provided in red italics (unless the title already provides sufficient indication), with the particular aim of linking the documents to the key questions to the Panel. The number in [] refers to the relevant question.

Primary Documents

MARAM/IWS/2019/PENG/P1. Questions to IWS 2019 Panel with respect to penguins, together with brief summaries of the documents provided

MARAM/IWS/2019/PENG/P2. Ross-Gillespie A, Butterworth DS. 2019. Updated GLMM results for the South Coast penguin colony foraging data (Fisheries document FISHERIES/2019/NOV/SWG-PEL/27rev)

*Applies the current DEA Pelagic Working Group standard fixed effects model approach to estimate the effects on penguins of fishing in the neighbourhood of the Bird and St Croix islands, based on annual averages of penguin response variables from **foraging** data [Q4]*

MARAM/IWS/2019/PENG/P3. Ross-Gillespie A, Butterworth DS. 2019. Results for GLMM analyses of the South Coast penguin colony chick condition data (Fisheries document FISHERIES/2019/NOV/SWG-PEL/33)

*Applies the current DEA Pelagic Working Group standard fixed effects model approach to estimate the effects on penguins of fishing in the neighbourhood of the Bird and St Croix islands, based on annual averages of penguin response variables from **chick condition** data [Q4]*

MARAM/IWS/2019/PENG/P4. Sherley RB, Barham BJ, Barham PJ, Campbell KJ, Crawford RJM, de Blocq A, Grigg J, Le Guen C, Hagen C, Makhado AB, McInnes A, Meyer A, Morris T, Pichegru L, Steinfurth A, Upfold L, van Onselen M, Visagie J, Weller F, Winker H. 2019. A Bayesian approach to understand the overall effect of purse-seine fishing closures around African penguin colonies (Fisheries document FISHERIES/2019/NOV/SWG-PEL/32rev)

A Bayesian approach based on models using individual penguin response variable data to estimate the effects on penguins of fishing in the neighbourhood of the island colonies from response variables measured during island closure experiments [Q1, Q2, Q4]

Note:

- a) Only the **methodologies** to estimate the effects on penguins of fishing in the neighbourhood of the island colonies which are presented in this document, and the results of their application to data from the Bird and St Croix colonies will be discussed.
- b) This paper is not available for posting on the Workshop website, so will be circulated by email to those indicating that they wish to attend the Penguin discussion sessions

MARAM/IWS/2019/PENG/P5. Ross-Gillespie A, Butterworth DS. 2019. Is pseudo-replication biasing results from analyses from the island closure experiment which model individual penguin responses directly? (Fisheries document FISHERIES/2019/NOV/SWG-PEL/34rev)

A simulation study contrasting the statistical properties of estimators the effects on penguins of fishing in the neighbourhood of the island colonies from island closure experiments based on individual penguin responses and annual averages of those responses [Q1, Q2, Q3]

MARAM/IWS/2019/PENG/P6. Winker H, Sherley RB. 2019. Brief reply to Butterworth and Ross-Gillespie: "Is pseudo-replication biasing results from analyses from the island closure experiment which model individual penguin responses directly?" (Fisheries document FISHERIES/2019/NOV/SWG-PEL/37rev.)

[Q1, Q2, Q3]

MARAM/IWS/2019/PENG/P7. Butterworth DS and Ross-Gillespie A. 2019. Response to MARAM/IWS/2019/PENG/P6

Note that this corrects a key error in MARAM/IWS/2019/PENG/P5 [Q1, Q2, Q3]

Background Document

MARAM/IWS/2019/PENG/BG1. Coetzee JC 2019. The experimental closure to purse-seine fishing around some African Penguin breeding colonies

A summarised historical account of the development and progress of the experiment to close the neighbourhoods around certain islands with penguin breeding colonies to purse-seine fishing in certain years in an attempt to better determine whether such fishing has a negative impact on penguins [Q1, Q2, Q3, Q4]