

Documents for the MARAM/DAFF International Fisheries Stock Assessment Review Workshop, 2014

Final

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Hake

Primary

MARAM/IWS/DEC14/Hake/P1: Butterworth, D.S and Rademeyer R.A. An outline of the primary objective for hake discussions during the 2014 International Stock Assessment Review Workshop. 3pp.

MARAM/IWS/DEC14/Hake/P2: Rademeyer, R.A. and Butterworth, D.S. 2014. Specifications of the South African hake 2014 reference case assessment. 26pp.

MARAM/IWS/DEC14/Hake/P3: Rademeyer, R.A. 2013. An initial attempt at a spatially structured stock assessment for the South African hake resource including explicit movement. Document MARAM/IWS/DEC13/Hake/P9.46pp.

MARAM/IWS/DEC14/Hake/P4: Kirchner, C., Kaigne, P. and Kathena, J. Evaluation of the status of the Namibian hake resource (*Merluccius spp.*) using statistical catch-at-age analysis. 56pp. PUBLICATION

MARAM/IWS/DEC14/Hake/P5: Rademeyer, R.A. 2014. An initial attempt at a spatially structured stock assessment for the South African hake resource including movement based on a gravity model. 38pp.

MARAM/IWS/DEC14/Hake/P6: Bergh, M. Extensions of Ecofish stock structure hypotheses for *Merluccius paradoxus*, and a comment on the relative plausibility for P1, P2a and P2b. 3pp.

MARAM/IWS/DEC14/Hake/P7: Henriques, R., Mathee, C. and von der Heyden, S. 2014. Assessment of the genetic population structure of the Cape Hakes (*Merluccius capensis* and *M. paradoxus*) around southern Africa. RESTRICTED (rhenriques@sun.ac.za)

MARAM/IWS/DEC14/Hake/P8: Ross-Gillespie, A. and Butterworth, D.S. Modelling cannibalism and inter-species predation for Cape hake *Merluccius capensis* and *M. paradoxus*: an update to MARAM IWS/DEC13/ECOFISH/P10. 25pp.

MARAM/IWS/DEC14/Hake/P9: Report on the Benguela Current Commission – ECOFISH WP1-WP2 Hake Biology workshop. 12-13 November 2014. 22pp.

MARAM/IWS/DEC14/Hake/P10: Butterworth, D.S. and Rademeyer, R.A. First cut at broad model specifications for the development of transboundary hake stock assessments. 4pp.

Background

MARAM/IWS/DEC14/Hake/BG1: Allison, C., de Moor, C.L. and Punt, A.E. 2014. North Pacific Minke whale implementation simulation trial specifications. 49pp.

MARAM/IWS/DEC14/Hake/BG2: DAFF. Report of the Benguela Current Commission ECOFISH WP1-WP2 Hake Stock Structure Workshop, 26-28 March 2014. 23 pp.

MARAM/IWS/DEC14/Hake/BG3: Rademeyer, R.A. and Butterworth, D.S. 2014. Results leading to a proposal for a reference set of operating models for testing the 2014 OMP revision for the South African hake resource. Document FISHERIES/2014/MAR/SWG-DEM/14. 14pp.

- MARAM/IWS/DEC14/Hake/BG4: Rademeyer, R.A., Durholtz, D. and Singh, L. South African hake resource – collation of some biological information. 7pp.
- MARAM/IWS/DEC14/Hake/BG5: Fairweather, T.P. Hake catch and abundance estimates by latitudinal stratum on the west coast, South Africa. 2pp.
- MARAM/IWS/DEC14/Hake/BG6: Thygesen, U.H., Kristensen, K., Jansen, T., Beyer, J.E *et al.* Intercalibration of survey trawl gear using paired hauls. 12pp.
- MARAM/IWS/DEC14/Hake/BG7: Kainge, P., Kjesbu, O.S., Thorsen, A., Salvanes, A. G. *Merluccius capensis* spawn in Namibian waters, but do *M. paradoxus*? 14pp. PUBLICATION
- MARAM/IWS/DEC14/Hake/BG8: Sundby, S., Boyd, A.J., Hutchings, L. O’Toole, M.J., Thorisson, K. and Thorsen, A. 2001. Interaction between Cape hake spawning and the circulation in the northern Benguela upwelling ecosystem. *South African Journal of Marine Science*. 23: 317-336. 20pp. PUBLICATION
- MARAM/IWS/DEC14/Hake/BG9: Reimer, L.W. 1993. Parasites of *Merluccius capensis* and *M. paradoxus* from the coast of Namibia. *Applied Parasitology*, 34 (1993), 143-150. 8pp. PUBLICATION
- MARAM/IWS/DEC14/Hake/BG10: Rademeyer, R.A. An updated reference case for the South African hake resource. Document FISHERIES/2014/APR/SWQ-DEM/HASTT/02. 11pp.
- MARAM/IWS/DEC14/Hake/BG11: Rademeyer, R. A. Hake Candidate Management Procedures Testing Methodology. FISHERIES/2014/JULY/SWG-DEM/22. 11pp.
- MARAM/IWS/DEC14/Hake/BG12: Rademeyer R.A. and Butterworth, D.S. Final CMP Projections for the South African hake resource. FISHERIES/2014/OCT/SWG-DEM/52. 18pp.
- MARAM/IWS/DEC14/Hake/BG13: Rademeyer R.A. and Butterworth, D.S. Responses to previous panel recommendations on hake research. 11pp.
- MARAM/IWS/DEC14/Hake/BG14: Wieland, K., Durholtz, M.D., Fairweather, T.P., Glazer, J. and Leslie, R.W. Presence-absence relationship with bottom temperature for deep water hake (*Merluccius paradoxus*) on the west coast of South Africa and its potential for adjusting survey indices. 20pp.
- MARAM/IWS/DEC14/Hake/BG15a: Report of the second part of the phase II workshop on assessment modelling of hake in ECOFISH. 26-28 May 2014. 4pp.
- MARAM/IWS/DEC14/Hake/BG15b: Annex A-F. Phase II workshop on assessment modelling of hake in ECOFISH. 26-28 May 2014. 10pp.
- MARAM/IWS/DEC14/Hake/BG16: Singh, L. and Glazer, J. Summary of background documents. 3pp.

Working paper

- MARAM/IWS/DEC14/Hake/WP1: Smith, M. Length-frequency distributions for *M. paradoxus* on the south coast using SADSTIA observer data (2006- Sept 2014). 4pp.
- MARAM/IWS/DEC14/Hake/WP2: Henriques, R., Mathee, C. and von der Heyden, S. Assessment of the genetic population structure of the Cape Hakes (*Merluccius capensis* and *M. paradoxus*) around southern Africa. 7pp. **RESTRICTED** (rhenriques@sun.ac.za)
- MARAM/IWS/DEC14/Hake/WP3: Fairweather, T.P Missing 40-60cm *M. paradoxus* on the south coast in survey data. 2pp.
- MARAM/IWS/DEC14/Hake/WP4: Fairweather, T.P Investigation of 1998-2012 Africana survey data. 7pp.

Slides

- Durholtz, D. Introduction to ECOFISH. 18 slides.
- Nielsen, A. and Berg, C. Progress on length based SAM. 24 slides.

Sardine

Primary

MARAM/IWS/DEC14/Sardine/P1: Ross-Gillespie A and Butterworth DS. 2014. Does parasite infection definitely increase for sardine aged 2 and above on the south coast? Department of Agriculture, Forestry and Fisheries Report No. FISHERIES/2014/JUL/SWG-PEL/42. 5pp.

MARAM/IWS/DEC14/Sardine/P2: de Moor CL, Butterworth DS, van der Lingen CD and Coetzee JC. Alternative hypotheses of two mixing stocks of South African sardine: Initial testing. 20pp.

MARAM/IWS/DEC14/Sardine/P3: de Moor CL, Butterworth DS and van der Lingen CD. Key Issues for Discussion Regarding Prioritisation of Future Sardine Research

MARAM/IWS/DEC14/Sardine/P4: de Moor CL. Alternative hypotheses of two mixing stocks of South African sardine: Some projections assuming no future catch. 28pp.

MARAM/IWS/DEC14/Sardine/P5: de Moor CL. Movement estimated by the alternative hypotheses of two mixing stocks of South African sardine. 4pp.

Background

MARAM/IWS/DEC14/Sardine/BG1: de Moor CL and Butterworth DS. Overview of Background Documents. 1pp.

MARAM/IWS/DEC14/Sardine/BG2: de Moor CL, Butterworth DS, Coetzee JC and van der Lingen CD. Progress report on recommendations from the International review panel report for the 2013 International Fisheries Stock Assessment Workshop: Sardine. 5pp.

MARAM/IWS/DEC14/Sardine/BG3: de Moor CL. 2014. Model Projections from November 2003. Department of Agriculture, Forestry and Fisheries Report No. FISHERIES/2014/MAR/SWG-PEL/11. 5pp.

MARAM/IWS/DEC14/Sardine/BG4: de Moor CL and Butterworth DS. 2014. Autocorrelated sardine movement. Department of Agriculture, Forestry and Fisheries Report No. FISHERIES/2014/MAR/SWG-PEL/21. 5pp.

MARAM/IWS/DEC14/Sardine/BG5: de Moor CL, Coetzee JC and Butterworth DS. 2014. Initial exploration of available data to estimate sardine recruitment on the south coast. Department of Agriculture, Forestry and Fisheries Report No. FISHERIES/2014/FEB/SWG-PEL/01. 5pp.

MARAM/IWS/DEC/Sardine/BG6a: de Moor CL, and Butterworth DS. Assessing the South African sardine resource: two stocks rather than one? 30pp. In Review.

MARAM/IWS/DEC/Sardine/BG6b: de Moor CL, and Butterworth DS. Assessing the South African sardine resource: two stocks rather than one? 25pp. Supplementary Material. In Review.

MARAM/IWS/DEC14/Sardine/BG7: Coetzee JC. 2014. Potential indicators of the effective spawning biomass derived from the proportion of eggs transported to or retained in either a west coast or south coast nursery area. Department of Agriculture, Forestry and Fisheries Report No. FISHERIES/2014/OCT/SWG-PEL/49. 9pp.

MARAM/IWS/DEC14/Sardine/BG8: Miller DCM, Moloney CL, van der Lingen CD, Lett C, Mullon C and Field JG. 2006. Modelling the effects of physical-biological interactions and spatial variability in spawning and nursery areas on transport and retention of sardine *Sardinops sagax* eggs and larvae in the southern Benguela ecosystem. *Journal of Marine Systems* 61:212-229. PUBLICATION

MARAM/IWS/DEC14/Sardine/BG9: van der Lingen CD and Hendricks M. 2014. Update on “tetracotyle” type metacarcariae infection data and implications for sardine movement. Department of Agriculture, Forestry and Fisheries Report No. FISHERIES/2014/MAR/SWG-PEL/08. 8pp

MARAM/IWS/DEC14/Sardine/BG10: van der Lingen CD, Weston LF, Reed CC, Hendricks M and Winker H. 2014. Updated GLM analyses of parasite data corroborate the sardine multi-stock hypothesis. Department of Agriculture, Forestry and Fisheries Report No. FISHERIES/2014/APR/SWG-PEL/27. 4pp.

MARAM/IWS/DEC14/Sardine/BG11: van der Lingen CD and Winker H. 2014. Increasing prevalence of infection with increasing fish size for southern stock sardine is not a model artefact. Department of Agriculture, Forestry and Fisheries Report No. FISHERIES/2014/MAY/SWG-PEL/30. 3pp.

MARAM/IWS/DEC14/Sardine/BG12: van der Lingen CD. Research on the genetics of South African sardine *Sardinops sagax*. 3pp.

MARAM/IWS/DEC14/Sardine/BG13: van der Lingen CD. Demographic effects on sardine reproduction. 8pp.

Slides

de Moor, C.L. An overview of the key issues to be discussed relating to South African Sardine. 32 slides.

Penguin

A series

MARAM/IWS/DEC14/Peng/A1: Hagen, C. *et al.* Evaluating the state of knowledge on fishing exclusions around major African Penguin colonies. 12pp.

MARAM/IWS/DEC14/Peng/A2: Bergh, M. *et al.* Annex 1: An examination of the island closure related models produced by the MARAM group. 13pp.

MARAM/IWS/DEC14/Peng/A3: Hagen, C. *et al.* Annex 2: An evaluation of the evidence of the impact of fishing closures around breeding colonies of African Penguins. 20pp. **RESTRICTED** (Christina.hagen@birdlife.org.za)

MARAM/IWS/DEC14/Peng/A4: Weller, F. and Jarre, A. Annex 3: Additional information on the Robben Island Penguin Pressure Model. 4pp. **RESTRICTED** (florian.g.weller@gmail.com)

MARAM/IWS/DEC14/Peng/A6: Hagen, C., Jarre, A., Sherley, R.B. and Steinfurth, A. Summary of responses to MARAM/IWS/DEC14/Peng/B2-11. 9pp.

MARAM/IWS/DEC14/Peng/A7: Hutchings *et al.* Comments on the “River model” (de Moor and Butterworth 2014): Bounding exploitation rate, estimating escapement for critically dependent predators, or understanding the interactions between anchovy and penguin demographics? 9pp.

MARAM/IWS/DEC14/Peng/A8: Weller F, Sherley RB, Wanless RM, Jarre A. 2014. Recent updates in response to comments regarding the published version of the Robben Island Penguin Pressure Model. 10 pp. **RESTRICTED** (florian.g.weller@gmail.com)

MARAM/IWS/DEC14/Peng/A9: Sherley, R.B., Steinfurth, A. and Hagen, C. Responses to MARAM/IWS/DEC14/Peng/B10. 23pp.

MARAM/IWS/DEC14/Peng/A10: Bergh, M. 2014. Further clarification of the biases in and interpretation of regressions where catch is a predictor of penguin response. 21 pp.

MARAM/IWS/DEC14/Peng/A10add: Revision of Appendix A of MARAM/IWS/DEC14/Peng/A10.

MARAM/IWS/DEC14/Peng/A12: Sherley, R.B., Steinfurth, A., Hagen, C., Cook, T., van der Merwe, L. Responses to preliminary questions from the Annual International Stock Assessment Workshop. 18pp.

B series

MARAM/IWS/DEC14/Peng/B1: Butterworth, D.S. An overview of the MARAM/IWS/DEC14/Peng/B series of documents. 3 pp.

- MARAM/IWS/DEC14/Peng/B2: Butterworth, D.S. A composite proposal related to the penguin colony closure programme. 7 pp.
- MARAM/IWS/DEC14/Peng/B3a: Robinson, W.M.L, Butterworth, D.S, and Plagányi, É.E. Quantifying the projected impact of the South African sardine fishery on the Robben Island penguin colony. 32pp.
- MARAM/IWS/DEC14/Peng/B3b: Robinson, W.M.L, Butterworth, D.S, and Plagányi, É.E. Quantifying the projected impact of the South African sardine fishery on the Robben Island penguin colony. Supplementary material. 46pp.
- MARAM/IWS/DEC14/Peng/B4: Robinson, W.M.L, Butterworth, D.S. and Furman, L.B. Analyses of the results from the island closure feasibility study for the Dassen/Robben and St Croix/Bird Island Pairs. 29pp.
- MARAM/IWS/DEC14/Peng/B5: de Moor, C.L and Butterworth, D.S. Application of the “River Model” to estimate the impact of fishing on the amount of anchovy available to west coast penguin colonies. 12pp.
- MARAM/IWS/DEC14/Peng/B6: Robinson, W.M.L. and Butterworth, D.S. An analysis of the small scale surveys of anchovy abundance around Robben and Dassen Islands from 2009 to 2013. 15pp.
- MARAM/IWS/DEC14/Peng/B7: Butterworth, D.S and Robinson, W.M.L. Comments on the Weller *et al.* Robben Island penguin model simulations, in particular as regards the impact on penguins of fishing restrictions around the island. 13 pp.
- MARAM/IWS/DEC14/Peng/B8: Butterworth, D.S and Robinson, W.M.L. On inconsistencies amongst the rationales offered by Sherley *et al.*, Weller *et al.* and Pichegru *et al.* regarding the impact of fishing restriction around islands on penguins. 3pp.
- MARAM/IWS/DEC14/Peng/B9: Butterworth, D.S, Moosa, N. and Johnston S.J. Do catch-based indices provide a reliable index of annual recruitment for the South African anchovy population? 21pp.
- MARAM/IWS/DEC14/Peng/B10: Butterworth, D.S. Responses to reservations raised concerning the GLM analyses of and inferences drawn from the results from the island closure feasibility study. 14pp.
- MARAM/IWS/DEC14/Peng/B11: Butterworth, D.S and Robinson, W.M.L. Responses to previous panel recommendations on penguin research. 13pp.
- MARAM/IWS/DEC14/Peng/B12: Butterworth, D.S, Moosa, N, Furman, L.B., Robinson, W.M.L. and Johnston, S.J. Updated analyses of the results from the Island Closure Feasibility Study for the Dassen/Robben and St Croix/Bird Island pairs given revised data and responses to matters raised in documents. 68pp.
- MARAM/IWS/DEC14/Peng/B13: Butterworth, D.S, and Robinson, W.M.L. Responses to matters raised in documents MARAM/IWS/DEC14/Peng/A1 and Peng/A2. 14pp.
- MARAM/IWS/DEC14/Peng/B14: Butterworth, D.S. Responses to matters raised in document MARAM/IWS/DEC14/Peng/A4. 2pp.
- MARAM/IWS/DEC14/Peng/B15: Butterworth, D.S and Ross-Gillespie, A. Taking account of sample size in the GLM analyses of the response variable data from the island closure feasibility study. 6pp
- MARAM/IWS/DEC14/Peng/B16: Butterworth, D.S, Moosa, N., Ross-Gillespie, A and Robinson, W.M.L. Responses to questions from the panel, 6 November 2014. 10pp.
- MARAM/IWS/DEC14/Peng/B17: Butterworth D.S. and Moosa, N. Corrections to updated analyses of the results from the Island Closure Feasibility Study for the Dassen/Robben Island pair given in Appendix A of MARAM/IWS/DEC14/Peng/B12. 10pp.
- C series*
- MARAM/IWS/DEC14/Peng/C1: Coetzee, J. The current set of available data for evaluation of the Island Closure Feasibility study. 15pp.
- MARAM/IWS/DEC14/Peng/C2: Coetzee, J. Proposed process to address differing views on analyses related to island closures to pelagic fishing and their impact on penguin recovery. 2pp.

MARAM/IWS/DEC14/Peng/C3: Weller *et al.* 2014. A system dynamics approach to modeling multiple drivers of the African penguin population on Robben Island, South Africa. *Ecological Modelling* 277 (2014) 38-56. 19pp. PUBLICATION

MARAM/IWS/DEC14/Peng/C4: Coetzee, J. The current set of available data for evaluation of the Island Closure Feasibility study – Incorporating sample size and correcting the recruit survey time series. 15pp.

MARAM/IWS/DEC14/Peng/C5: van der Lingen, C.D. and van der Westhuizen, J.J. Comparing catches of anchovy and sardine around penguin breeding colonies at different spatial scales. 4pp.

Background

MARAM/IWS/DEC14/Peng/A11: Sherley, R.B., Winker, H., Altwegg, R., van der Lingen, C.D., Stephen C. Votier and Crawford, R.J.M. Influence of a fishery closure on penguin demographics. 32pp **RESTRICTED** (richard.sherley@gmail.com)

Working Papers

MARAM/IWS/DEC14/Peng/WP1: van der Lingen, C.D. and van der Westhuizen, J.J. Catches of sardine and anchovy around four penguin islands, 2009-2012. Document FISHERIES_2012_NOV_SWG-PEL_ICTT_10.

MARAM/IWS/DEC14/Peng/WP2: Sherley, R.B., Steinfurth, A. and Robinson, K.J. Information on the distribution of foraging distances of African penguins. 4pp. **RESTRICTED** (richard.sherley@gmail.com)

MARAM/IWS/DEC14/Peng/WP3: Butterworth, D.S. and Moosa, N. On the measurement error effect on estimates of the effect of fishing parameter λ . 4pp.

MARAM/IWS/DEC14/Peng/WP4: Sherley, R.B. Updated information on the foraging distances of African penguins by island and closure status 4pp. **RESTRICTED** (richard.sherley@gmail.com)

MARAM/IWS/DEC14/Peng/WP5: Butterworth, D.S. On the potential impact of any catch correlation with biomass on estimates of the effect of fishing parameter λ . 3pp.

MARAM/IWS/DEC14/Peng/WP6: Bergh, M. Biases in estimates of penguin response when there is perfect correlation between local pelagic biomass and global pelagic biomass estimates. 1pp.

Slides

Prochazka, K. Island closure feasibility study. 8 slides.