Documents for the MARAM/DFFE International Fisheries Stock Assessment Review Workshop, 2022

General:

General 1: Announcement. MARAM/IWS/2022/General/1. 1 pp.

General 2: Schedule. MARAM/IWS/2022/General/2. 1 pp.

General 3: Document list (final). MARAM/IWS/2022/General/3. 7 pp.

General 4: Questions to the panel. MARAM/IWS/2022/General/4. 2 pp.

General 5: Presentation of the Panel Report. MARAM/IWS/2022/General/5. 26 slides

General 6: IWS 2022 Final Panel Report. MARAM/IWS/2022/General/6. 12 pp.

Hake: Longline versus trawling

Primary papers

HAKE/P1: Bergh, M. Summary of the spatial competition issue for trawling vs longlining and questions for the IWS panel. MARAM/IWS/2022/Hake/P1. 2 pp.

HAKE/P2: Bergh, M. Evidence of spatial competition between hake deep-sea trawls and longline sets, an overview. MARAM/IWS/2022/Hake/P2. 8 pp.

HAKE/P3: Bergh, M. 2022. Trends in the spatial distribution of hake long line fishing effort. DFFE Fisheries Branch document FISHERIES/2022/AUG/SWG-DEM/10REV. MARAM/IWS/2022/Hake/P3. 19 pp.

HAKE/P4: Bergh, M. 2022. The relationship between the number of trawls and long line sets at different spatio-temporal resolutions. DFFE Fisheries Branch document FISHERIES/2022/OCT/SWG-DEM/42. MARAM/IWS/2022/Hake/P4. 16 pp.

HAKE/P11: South African Hake Longline Association. 2022. Spatial expansion of the hake longline fishery for hake and the possible implications on the understanding of the stock dynamics.
MARAM/IWS/2022/Hake/P11. 6 pp.

Background documents

HAKE/BG1: Bergh, M. 2022. Economic and other impacts of proposed changes to hake sectoral allocations. DFFE Fisheries Branch document FISHERIES/2022/APR/SWG-DEM/07. MARAM/IWS/2022/Hake/BG1. 64 pp.

Slides and presentations

1. Bergh, M. (OLSPS Marine). Introduction to hake trawl vs longlining issue and documents. 10 slides.
2. Bergh, M. (OLSPS Marine). Document P3: Trends in the spatial distribution of hake long line fishing effort. 10 slides.
3. Bergh, M. (OLSPS Marine). Document P4: The relationship between the number of trawls and long line sets at different spatio-temporal resolutions. 13 slides.

Hake: Shared stock

Primary papers

HAKE/P5: Butterworth, D.S. and Ross-Gillespie, A. 2022. A summary of key issues relating to MSC queries about the assessment of deep-water hake (*M. paradoxus*) as a stock shared between South Africa and Namibia. MARAM/IWS/2022/Hake/P5. 8 pp.

HAKE/P6: Butterworth, D.S. and Ross-Gillespie, A. 2020. On the robustness of the SA hake OMP2018 to an increased Namibian catch of *M. paradoxus.* Fisheries Branch document FISHERIES/2020/MAR/SWG-DEM/02. MARAM/IWS/2022/Hake/P6. 11 pp.

HAKE/P7: Butterworth, D.S. and Ross-Gillespie, A. 2020. Simple variants of the SA hake Reference Case Operating Model (assessment) to take account of Namibian catches of *M. paradoxus.* Fisheries Branch document FISHERIES/2020/MAR/SWG-DEM/03. MARAM/IWS/2022/Hake/P7. 11 pp.

HAKE/P8: Butterworth, D.S. and Ross-Gillespie, A. 2020. A further variant of the South African hake 2019 Reference Case assessment model that includes the Namibian *M. paradoxus* survey abundance series as well as historical Namibian catches. Fisheries Branch document FISHERIES/2020/AUG/SWG-DEM/11. MARAM/IWS/2022/Hake/P8. 4 pp.

HAKE/P9: Punt, A.E. 2020. Review of two analyses related to the robustness of the management procedure for South African hake to assumptions related to a stock distribution for *M. paradoxus* that extends into Namibia. Fisheries Branch document FISHERIES/2020/MAR/SWG-DEM/04. MARAM/IWS/2022/Hake/P9. 3 pp.

HAKE/P10: Wilberg, M.J. 2020. Review of the potential implications of a shared M. paradoxus stock between South Africa and Namibia on the performance of OMP2018. Fisheries Branch document FISHERIES/2020/MAR/SWG-DEM/05. MARAM/IWS/2022/Hake/P10. 2 pp.

Background documents

HAKE/BG3: Ross-Gillespie, A. 2022. Update to the hake Reference Case Operating Model with corrected longline data, and 2021 commercial and 2022 survey data. Fisheries Branch document FISHERIES/2022/OCT/SWG-DEM/35rev. MARAM/IWS/2022/Hake/BG3. 15 pp.

HAKE/BG4: Ross-Gillespie, A., and Butterworth, D.S. 2022. Road map for the 2022 hake OMP revision. Fisheries Branch document FISHERIES/2022/OCT/SWG-DEM/30rev. MARAM/IWS/2022/Hake/BG4. 11 pp.

HAKE/BG5: Hake assessment document from Namibia. 2022. MARAM/IWS/2022/Hake/BG5. MARAM/IWS/2022/Hake/BG5. 28 pp.

Slides and presentations

1. Butterworth, D.S. and Ross-Gillespie, A. Hake shared stock. 11 slides.
2. Durholtz, D. An overview of the SA hake fishery. 11 slides.

Working papers

HAKE/WP1: Species proportion in hake catches. MARAM/IWS/2022/Hake/WP1. 1 pp.
HAKE/WP2: Relative abundance series plots. MARAM/IWS/2022/Hake/WP2. 2 pp.
HAKE/WP3: Ross-Gillespie, A. Summary of Namibian data provided on 29 November 2022. MARAM/IWS/2022/Hake/WP3. 1 pp.

Sardine

Primary papers

SARDINE/P1: List of key questions for the panel regarding sardine, together with brief summaries of the documents provided. MARAM/IWS/2022/Sardine/P1. 2 pp.
SARDINE/P2: Teske, P.R., Emami-Khoyi, A., Golla, T.R., Sandoval-Castillo, J., Lamont, T., Chiazzari, B., McQuaid, C.D., Beheregaray, L.B. and van der Lingen C.D. 2021. The sardine run in southeastern Africa is a mass migration into an ecological trap. MARAM/IWS/2022/Sardine/P2. 9 pp.
SARDINE/P3: de Moor, C.L., van der Lingen, C.D. and Teske, P.R. 2022. A new hypothesis for South African sardine stock structure. DFFE Fisheries Branch document FISHERIES/2022/MAY/SWG-PEL/11Rev. MARAM/IWS/2022/Sardine/P3. 8 pp.
SARDINE/P4: de Moor, C.L. 2022. An initial simple model of the revised stock structure hypothesis for South African sardine. MARAM/IWS/2022/Sardine/P4. 28 pp.

Background Documents

SARDINE/BG1: Coetzee, J.C., de Moor, C.L., van der Lingen, C.D. and Butterworth, D.S. 2022. A summary of the sardine (and anchovy) fishery. MARAM/IWS/2022/Sardine/BG1. 19 pp.
SARDINE/BG2: Butterworth, D.S., van der Lingen, C.D., Coetzee, J and de Moor, C.L. 2016. The present agreed hypothesis for South African sardine stock structure. DFFE Fisheries Branch document FISHERIES/2016/NOV/SWG-PEL/69. MARAM/IWS/2022/Sardine/BG2. 3 pp.
SARDINE/BG3: de Moor, C.L., Butterworth, D.S. and van der Lingen, C.D. 2017. The quantitative use of parasite data in multistock modelling of South African sardine (*Sardinops sagax*). MARAM/IWS/2022/Sardine/BG3. 9 pp.
SARDINE/BG4: de Moor, C.L. 2021. Updated assessment of the South African sardine resource using data from 1984-2020. MARAM/IWS/2022/Sardine/BG4. 35 pp.
SARDINE/BG5: van der Lingen, C.D. 2022. A synthesis of studies of South African sardine population structure. DFFE Fisheries Branch document FISHERIES/2022/JUN/SWG-PEL/16. MARAM/IWS/2022/Sardine/BG5. 5 pp.

Slides and presentations

1. de Moor, C. and Coetzee, J. An Introduction to the South African Sardine Resource and Fishery. 19 pp.
2. Teske, P. Population genomic structure in Sardinops sagax. 12 pp.
3. de Moor, C.L, van der Lingen, C.D. and Teske, P. A new hypothesis for South African sardine stock structure. 7 pp.
4. de Moor, C. An Initial Simple Model of the Revised Stock Structure Hypothesis for South African Sardine. 21 pp.

Working papers

SARDINE/WP1: van der Lingen, C.D. 2022. The South African sardine boom in the early 2000s coincided with anomalously warm SSTs off the west coast. MARAM/IWS/2022/Sardine/WP1. 3 pp.
SARDINE/WP2: de Moor, C.L. 2022. Further results from an initial simple model of the revised stock structure hypothesis for South African sardine. MARAM/IWS/2022/Sardine/WP2. 13 pp.
SARDINE/WP3: de Moor, C.L. 2022. Diagrams to compare models of the previous and revised sardine stock structure hypotheses for South African sardine. MARAM/IWS/2022/Sardine/WP3. 2 pp.
SARDINE/WP4: Coetzee, J. 2022. Sardine length frequencies from November Hydro-acoustic surveys. MARAM/IWS/2022/Sardine/WP4. 2 pp.
SARDINE/WP5: Coetzee, J., Merkle, D., Hutchings, L., van der Lingen, C.D., van den Berg, M. and Durholtz, M.D. 2010. The 2005 KwaZulu-Natal sardine run survey sheds new light on the ecology of small pelagic fish off the east coast of South Africa. MARAM/IWS/2022/Sardine/WP5. 24 pp.

SARDINE/WP6: van der Lingen, C.D. Sardine genomics and parasite update. MARAM/IWS/2022/Sardine/WP6. 12 pp.

SARDINE/WP7: van der Lingen, C.D., Hendricks, M., Durholtz, D., Wessels, G. and Mtengwane, C. 2010. Biological characteristics of sardine caught by the beach-seine fishery during the KwaZulu-Natal sardine run. MARAM/IWS/2022/Sardine/WP7. 22 pp.

West Coast Rock Lobster

Primary papers

WCRL/P1: Johnston, S.J. and Butterworth, D.S. A summary of key issues relating to the estimation of poaching trends for west coast rock lobster *Jasus lalandii*. MARAM/IWS/2022/WCRL/P1. 14 pp.

WCRL/P2: Johnston, S.J. and Butterworth, D.S. A summary of key issues relating to the fitting of FIMS data for west coast rock lobster *Jasus lalandii*. MARAM/IWS/2022/WCRL/P2. 19 pp.

WCRL/P3: Johnston, S.J. List of key questions for the panel regarding west coast rock lobster, together with brief summaries of the documents provided. MARAM/IWS/2022/WCRL/P3. 3 pp.

Background documents

WCRL/BG1: Brandao, A. and Butterworth, D.S. Updating compliance poaching trends for west coast rock lobster from modelling the "old" and "new" databases simultaneously. DFFE Fisheries Branch document FISHERIES/2022/JUN/SWG/WCRL/09. MARAM/IWS/2022/WCRL/BG1. 14 pp.

WCRL/BG2: Louw, S., Okes, N. and Burgener, M. Estimating poached west coast rock lobster exports from South Africa to international destinations (2000-2021). DFFE Fisheries Branch document FISHERIES/2022/JUL/SWG/WCRL/22. MARAM/IWS/2022/WCRL/BG2. 10 pp.

WCRL/BG3: Johnston, S.J. and Butterworth, D.S. Overall poaching time series for west coast rock lobster, resulting from combining estimates of illegally exported and locally sold lobsters and compliance time series as at June 2. DFFE Fisheries Branch document FISHERIES/2022/JUN/SWG/WCRL/13. MARAM/IWS/2022/WCRL/BG3. 15 pp.

WCRL/BG4: Johnston, S.J. and Butterworth, D.S. Further 2022 poaching trends for west coast rock lobster. DFFE Fisheries Branch document FISHERIES/2022/JUL/SWG/WCRL/18. MARAM/IWS/2022/WCRL/BG4. 11 pp.

WCRL/BG5: Johnston, S.J. and Butterworth, D.S. Updated 2022 assessments of the west coast rock lobster resource. DFFE Fisheries Branch document FISHERIES/2022/AUG/SWG/WCRL/23. MARAM/IWS/2022/WCRL/BG5. 28 pp.

WCRL/BG6: Johnston, S.J. and Butterworth, D.S. Initial 2022 projections of the west coast rock lobster resource. DFFE Fisheries Branch document FISHERIES/2022/AUG/SWG/WCRL/25. MARAM/IWS/2022/WCRL/BG6. 7 pp.

WCRL/BG7: Johnston, S.J. and Butterworth, D.S. Further assessment results for the 2022 updated assessment of west coast rock lobster. DFFE Fisheries Branch document FISHERIES/2022/AUG/SWG/WCRL/24. MARAM/IWS/2022/WCRL/BG7. 8 pp.

WCRL/BG8: Johnston, S.J. Excerpts from the 2018 and 2019 IWS panel recommendations relating to compliance poaching data for west coast rock lobster. MARAM/IWS/2022/WCRL/BG8. 5 pp.

WCRL/BG9: Johnston, S.J. and Butterworth, D.S. The size-structured (length-based) stock assessment methodology applied to west coast rock lobster. MARAM/IWS/2022/WCRL/BG9. 15 pp.

Slides and presentations

1. Johnston, S.J. The west coast rock lobster fishery: A brief historical summary and introduction to matters to be discussed. 24 slides.

Working papers

WCRL/WP1: Johnston, S.J. West coast rock lobster: sensitivities to poaching "marriage" model for the South. MARAM/IWS/2022/WCRL/WP1. 3 pp.
WCRL/WP2: Johnston, S.J. West coast rock lobster: A8+ FIMS selectivity functions. MARAM/IWS/2022/WCRL/WP2. 1 pp.

Squid

Primary papers

SQUID/P1: Durholtz, M.D. and Glazer, J.P. Squid: summary of resource and fishery, and on improving the assessment model. MARAM/IWS/2022/Squid/P1. 6 pp.
SQUID/P2: Glazer, J.P. 2019. Updated assessment of the squid resource, *Loligo reynaudii*. FISHERIES/2019/MAR/SWG-SQ/06. MARAM/IWS/2022/Squid/P2. 19 pp.

SQUID/P3: Anon. 2022. Squid assessment discussion points. MARAM/IWS/2022/Squid/P3. 2 pp.

Background documents

SQUID/BG1: Hampton, I., Soule, M.A. and Mwicigi, J. 2022. Summary of acoustic work to assess the biomass of the aggregated chokka squid on its inshore spawning grounds on the south-east coast of South Africa in the season closed for fishing. MARAM/IWS/2022/Squid/BG1. 5 pp.

Slides and presentations

1. Glazer, J.P. and Durholtz, D. Background information to the South African Squid Resource *Loligo reynaudi*. 9 slides

Working papers

SQUID/WP1: Soule, M.A. and Hampton, I. Acoustic survey of chokka squid on inshore spawning grounds between Seal point and Maitlands in the November 2020 closed season from Research Inflatable Abyss. MARAM/IWS/2022/Squid/WP1. 11 pp

SQUID/WP2: Soule, M.A. and Hampton, I. Acoustic survey of squid in inshore spawning grounds between Storms River Mouth and Port Alfred from R.V. Ellen Khuzwayo and Research Inflatable Abyss between 31 October and 20 November 2021. MARAM/IWS/2022/Squid/WP2. 39 pp.

Sole

Primary papers

SOLE/P1: Butterworth, D.S., Glazer, J.P and Durholtz, D.D. 2022. The sole assessment enigma. MARAM/IWS/2022/Sole/P1. 1 pp.

SOLE/P2: Glazer, J.P., Butterworth, D.S. and Fairweather, T.P. 2022 sole dynamic Schaefer production model results. DFFE Fisheries Branch document FISHERIES/2022/NOV/SWG-DEM/40rev. MARAM/IWS/2022/Sole/P2. 12 pp.

Slides and presentations

1. Glazer, J.P. and Durholtz, D. The South African Sole Resource *Austroglossus pectoralis.* 7 slides.

Working papers

1. **SOLE/WP1:** Sole survey abundance. MARAM/IWS/2022/Sole/WP1. 1 pp.
2. **SOLE/WP2:** Fairweather, T.P. Agulhas sole: Abundance estimates within the sole grounds, survey length frequency by strata, commercial CPUE and CAL, and updated graph for model fit. MARAM/IWS/2022/Sole/WP2. 13 pp.

Reference points

Primary papers

RefPts/P1: Comments on where next on fishery "REFERENCE POINTS"/MANAGEMENT. MARAM/IWS/2022/REFPTS/P1. 7 pp.

RefPts/P2: Further comments related to fishery "REFERENCE POINTS"/MANAGEMENT. MARAM/IWS/2022/REFPTS/P2. 7 pp.

Background documents

RefPts/BG1: Evaluating the effectiveness of Fish Stocks rebuilding plans in the United States. MARAM/IWS/2022/REFPTS/BG1. 292 pp.

Slides and presentations

1. Sissenwine, M. Have fishery scientists and managers gotten too far out over their skis? 9 slides
2. Taylor, N. Probability and Reference Points in Practice: aspirations, uses, abuses, and general confusion. 10 slides
3. Parma, A. Non-stationarity issues in assessment and management: Some dos and don'ts. 6 slides.

Working papers

RefPts/WP1: Butterworth, D.S. A comment on addressing climate change using MSE. MARAM/IWS/2022/REFPTS/WP1. 1 pp.

RefPts/WP2: Punt, A.E. Including ecosystem information in assessments and management advice. MARAM/IWS/2022/REFPTS/WP2. 45 pp.

RefPts/WP3: Gaichas, S. Adapting Fisheries Management to a Changing Ecosystem. MARAM/IWS/2022/REFPTS/WP3. 1 pp.

RefPts/WP4: Ianelli, J. Perspectives on ways complex ecosystem projections can be applied in real-world fisheries management cases. MARAM/IWS/2022/REFPTS/WP4. 50 pp.