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Supporting material for the independent scientific review of the estimation of fisheries production potential and total catch indices, and their adequacy for their proposed use within the NAFO Roadmap

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Introduction

The Roadmap is the template being followed by NAFO to develop and implement an ecosystem-based fisheries management approach (Koen-Alonso et al., 2019). The three tier structure proposed in the Roadmap to define sustainable catch levels was already identified in the initial conceptualization of the Roadmap in 2010 (NAFO, 2010), and the work towards developing Ecosystem Production Potential (EPP) models and their derived metrics and indicators, including Fisheries Production Potential (FPP) and Total Catch Indices (TCIs), has been ongoing since.

The development of EPP models and derived metrics has involved incremental progress over time. In addition to the work on the models themselves, this process also required the identification of functional ecosystem units to define appropriate areas for the estimation of EPP, as well as other complementary research that was relevant to different aspects of the process.

The independent scientific review is focused on the current version of the EPP model, TCIs, and their intended application as described in the SCR Document 22/002. However, having access to documents that represent stepping stones leading to the current version under review may also be useful. These documents provide both, supporting material for the review, as well as a window to how the process evolved, and can provide insights on how the thinking around these concepts matured over time.

Annotated list of selected documents illustrating the evolution of the EPP-related work

While there was progress made on EPP-related work almost every year since 2010, the goal of the compilation presented in Table 1 is to illustrate the evolution of the development process. Most selected documents are reports of the Scientific Council (SC) Working Group on Ecosystem Science and Assessment (WGESA)¹, SC itself, or relevant SC Research (SCR) documents. The compiled selection is focused on the EPP-related work, but some references describing the Roadmap are also included.

¹ This SC working group was originally named Working Group on Ecosystem Approaches to Fisheries Management (WGEAFM). The name was changed in 2013 to avoid confusions with a newly created joint Commission-Scientific Council (COM-SC) Working Group on the Ecosystem Approach Framework to Fisheries Management (WGEAFFM).



For each entry in Table 1, a brief note describing the relevant content for the review is provided. In the case of WGESA and SC reports, given the size of these documents and the diversity of topics they include, the page numbers where the relevant information can be found are also indicated. All documents are freely available online, and the corresponding links are included in Table 1.

Table 1. Annotated list of selected documents that illustrate the development of EPP-related work, including EPP modelling, estimation of FPP, and identification of TCIs.

Year	Document	Notes	Link
2010	WGEAFM Vigo Report (SCS Doc. 10/19)	<i>Page 75.</i> Initial conceptualization of the Roadmap.	https://www.nafo.int/Portals/0/PDFs/sc/2010/scs10-19.pdf
2010	Pepin et al. (SCR Doc. 10/72)	Preliminary delineation of ecoregions in NL Shelves.	https://www.nafo.int/Portals/0/PDFs/sc/2010/scr10-072.pdf
2010	Pérez-Rodriguez et al. (SCR Doc. 10/ 073)	Preliminary delineation of ecoregions in Flemish Cap.	https://www.nafo.int/Portals/0/PDFs/sc/2010/scr10-072.pdf
2013	Koen-Alonso et al. (SCR Doc. 13/075)	Implementation of EPP model (v1).	https://www.nafo.int/Portals/0/PDFs/sc/2013/scr13-075.pdf
2013	WGESA Report (SCS Doc. 13/024)	<i>Page 110.</i> Description and initial results for EPP model (v1). <i>Page 124.</i> Initial estimation of food consumption envelope and comparison with EPP estimates (see Table 3.2.1.1).	https://www.nafo.int/Portals/0/PDFs/sc/2013/scs13-24.pdf
2014	Pepin et al. (SCR Doc. 14/069)	Identification of EPUs and other spatial scales for ecosystem analyses.	https://www.nafo.int/Portals/0/PDFs/sc/2014/scr14-069.pdf
2014	WGESA Report (SCS Doc. 14/023)	<i>Page 39.</i> Updated EPP model and first guidelines for total catches.	https://www.nafo.int/Portals/0/PDFs/sc/2014/scs14-23.pdf
2015	SC June Report SCS Doc. 15/12)	<i>Page 54.</i> First formal reporting by SC on spatial scales for ecosystem management and guidelines for total catches.	https://www.nafo.int/Portals/0/PDFs/sc/2015/scs15-12.pdf
2015	WGESA Report (SCS Doc. 15/19)	<i>Page 85.</i> Introduction of the EPP model (v2) and update on guidelines for total catches.	https://www.nafo.int/Portals/0/PDFs/sc/2015/scs15-19.pdf
2016	SC June Report (SCS Doc. 16/14 Rev)	<i>Page 65.</i> Formal reporting by SC on the updated EPP model (v2) and guidelines for total catches.	https://www.nafo.int/Portals/0/PDFs/sc/2016/scs16-14.pdf

Year	Document	Notes	Link
2017	WGESA Report (SCS Doc. 17/21)	<i>Page 134.</i> Updated guidelines for total catches considering partitioning of catches for key species into planktivore and piscivore functional guilds. Also includes revised penalties for productivity state, and 25 th percentile of adjusted FPP as indicator.	https://www.nafo.int/Portals/0/PDFs/sc/2017/scs17-21.pdf
2019	Koen-Alonso et al. (Marine Policy 100:342-352)	Consolidated description of the Roadmap and its development within NAFO.	https://www.sciencedirect.com/science/article/pii/S0308597X18305694 This paper is open access
2019	WGESA Report (SCS Doc. 19/25)	<i>Page 2.</i> Consolidation of the EPP/TCI work to date aimed at summarizing progress and to address key managers' concerns.	https://www.nafo.int/Portals/0/PDFs/sc/2019/scs19-25.pdf
2020	SC June Report (SCS Doc. 20/14 Rev.)	<i>Page 32.</i> Formal recommendation by SC to implement TCI-based measures as part of the implementation of the Roadmap.	https://www.nafo.int/Portals/0/PDFs/sc/2020/scs20-14REV.pdf?ver=fPZCrVp8GjUnjL0j9tZzw%3d%3d

References

- Koen-Alonso, M., Pepin, P., Fogarty, M. J., Kenny, A., and Kenchington, E. 2019. The Northwest Atlantic Fisheries Organization Roadmap for the development and implementation of an Ecosystem Approach to Fisheries: structure, state of development, and challenges. *Marine Policy*, 100: 342-352.
- NAFO 2010. Report of the NAFO Scientific Council Working Group on Ecosystem Approaches to Fisheries Management (WGEAFM). NAFO SCS Document, 10/019: 101pp.

