

MEMORANDUM OF UNDERSTANDING

between

THE INTER-AMERICAN TROPICAL TUNA COMMISSION (IATTC) AND THE TECHNICAL UNIVERSITY OF DENMARK (DTU)

The Inter-American Tropical Tuna Commission (IATTC), an intergovernmental organization established by a 1949 Convention and functioning under the 2003 Antigua Convention, is the regional fisheries management organization (RFMO) responsible for the long-term conservation and sustainable use of tuna and tuna-like species and associated species belonging to the same ecosystems in the Convention area;

And

The Technical University of Denmark (DTU), National Institute of Aquatic Resources (or "DTU Aqua") public body incorporated under Danish Law, with its registered office at Anker Engelunds Vej 101, Kgs. Lyngby 2800, Denmark, business reg. no. DK-30060946;

Taking into account the provisions of the Antigua Convention regarding cooperation between the Commission and other entities when needed for the performance of its functions and the achievement of its objectives;

Considering that the IATTC approved at its 97th Meeting (Extraordinary) the development of an assessment for skipjack tuna, as recommended by its Scientific Advisory Committee;

Conscious of the significant support and the contribution that DTU may provide to this assessment, through the appropriate collaborative arrangements between their respective staff;

Convinced that this collaboration (the "Project") is consistent with their respective missions and will contribute to further them,

Hereby execute the following Memorandum of Understanding ("MOU").

1. **Purpose:**

The objective of the MOU is to facilitate and enable a collaboration between IATTC and DTU ("the Parties", collectively, "the Party" individually) in relation to the Project, through the appropriate support provided by DTU staff, as described in the Terms of Reference (TORs) in exchange for the financial

support provided by the IATTC to cover all corresponding expenses, such as salaries and travel costs.

2. **Terms of Reference:**

The terms of reference ("TOR") of the Project are described in Appendix 1 of the MOU.

3. **Obligations of the Parties:**

- a. The IATTC shall cover the expenses incurred by DTU and its staff as detailed in the budget and payment plan described in *Appendix 2* of the MOU.
- b. DTU will provide the support consistent with the terms of reference (*Appendix 1*), including through participation in good faith in the completion of the Project by applying best practice for scientific work within the budget limits set forth in appendix 2 of the MOU.
- c. DTU shall make all due diligence to ensure that the tasks assigned to its staff under the TORs are completed satisfactorily and on time. DTU shall not be held liable if this contribution does not lead to specific results with regards to the skipjack tuna assessment.
- d. Without prejudice to the status and immunities of IATTC, each Party hereto agrees to be responsible and assume liability for its own wrongful or negligent acts or omissions, or those of its officers, agents or employees. Each Party agrees to maintain reasonable coverage for such liabilities either through commercial insurance or a reasonable self-insurance mechanism, and the nature of such insurance coverage or self-insurance mechanism will be reasonably provided to the other Party upon request. As between the Parties, no Party shall be liable for any loss, cost, damage, claim or other charge that arises out of or is caused by the actions of any other Party, employees or agents.
- e. All public statements and publications by any Party regarding activities undertaken jointly under this MOU shall expressly acknowledge this MOU and must be agreed by the Parties in writing. However, each Party shall be allowed to publish its own scientific results subject to the duty of confidentiality or intellectual property rights belonging to the other Party.
- f. All information and data utilized in in the Project shall be subject to the confidentiality provisions in the Antigua Convention and the confidentiality rules adopted by the Commission. Any information and data provided to DTU staff as part of this Project is to be used only for the purpose of this project during the period of this project.

4. **Coordination:** The liaisons and leaders of the Project are:

- Dr. Mark Maunder, for IATTC;
- Anna Rindorf, for DTU.

5. **Settlement of disputes:**

- a. Any dispute relating to the interpretation or application of this Memorandum, shall be resolved amicably through direct consultations between the Parties.
- b. In the event that a dispute is not resolved through such consultations, within a reasonable period of time, it shall be submitted to mediation by a mediator appointed by mutual agreement between the Parties.

6. **Duration:** This MOU will remain into force for a period of 2 years, November 1, 2021 through October 31, 2023 (the "Term"). The Term of the MOU may be extended in writing signed by the Parties. Either Party may terminate the MOU during its Term for any reason by giving six (6) months advance written notice to the other Party or the Parties agree to engage in a reasonable negotiation regarding the winding up of the project.

IN WITNESS WHEREOF, the duly authorized representatives of the Parties have signed the MOU as of the date(s) set forth below.

For the IATTC

For the DTU

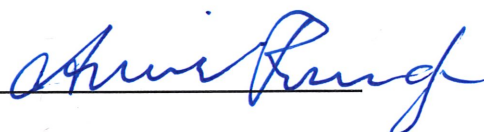
Signature: _____



**Jean-François Pulvenis
Director (ad interim)**

Date: 9 - IX - 2021

Signature: _____



**Name: Anna Rindorf
Professor, Head of Section**

Date:

10-10-2021

Appendix 1: Terms of reference of the collaboration project between the Inter-American Tropical Tuna Commission (IATTC) and the Technical University of Denmark (DTU)

The Project is for developing a tagging-based estimator for abundance and fishing mortality of skipjack in the eastern Pacific Ocean. The modeling approach combines an advection-diffusion model of the tagged population with a spatio-temporal model of the total stock abundance. It is to be programmed in TMB. It is understood that the methodology chosen will depend on research conducted throughout the project and challenges that arise. Therefore, DTU is expected to be adaptive and strive to develop the best model given the time available following the methodology outlined in IATTC DOCUMENT SAC-12-06 and improvements as appropriate.

The project will include development of a spatio-temporal model of Eastern Pacific skipjack tuna abundance that (i) is based on the advection-diffusion (AD) equation of tag movement, (ii) includes a likelihood function comparing observed and predicted tag recaptures (iii) includes relevant covariates, (iv) is implemented in Template Model Builder (TMB), and (v) compiled into a software package.

The project will start with the implementation of the AD component of the model using a subset of available data and simplified spatio-temporal dimensions as it is expected to be one of the main challenges of the project. Therefore, it is intended up to half of the allocated time (4-6 months) will be used before SAC 2022 in May 2022. The remaining 6-8 months of the contract will be spread over the remaining time until the end of the project in October 2023.

Timetable

Time	Task
Nov 2021	Project start, compile and clean data, set-up collaboration platforms and software package framework
Nov 2021 - April 2022	Develop minimum example of spatio-temporal model based on tag data, develop advection-diffusion component
May 2022	Report and discuss initial results and progress at SAC 2022

June 2022 - Nov 2023	Develop other model components and derive abundance index for EPO SKJ, sensitivity analyses
Dec 2022 - April 2023	Estimate reference points and stock status for EPO SKJ, explore time-variant parameters (e.g. selectivity, catchability) and other model extensions (e.g. additional covariates, size-specific processes)
May 2023	Present final results to SAC 2023
June 2023 - Oct 2023	Write and submit scientific manuscript to high ranking international journal Project end

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Appendix 2: Budget and payment plan

The total budget, except potential travel costs, is USD 112.275. This covers 12 months of salary for the post doc Tobias Mildenerger (USD 12x7485) and an overhead of 25%. The project will run through a period of two years. Costs will be invoiced on a quarterly basis and will not exceed the total costs.

The overhead covers: Office space, personal computer, server access, IT support, secretary support, infrastructure, and similar facilities.

DTU's payment terms are 30 calendar days from the date the invoice, provided, however that such invoice is correct.

For invoicing, the IATTC shall provide contact information for invoicing, number of bank account, SWIFT and IBAN to DTU at the time of entry into force of this Agreement.

DTU shall submit an invoice via e-mail

All enquiries pertaining to bookkeeping, e.g. reminders shall refer to the invoice number.

