

INTERNATIONAL COMMISSION FOR THE
CONSERVATION OF ATLANTIC TUNAS



COMMISSION INTERNATIONALE POUR LA
CONSERVATION DES THONIDES DE L'ATLANTIQUE

COMISION INTERNACIONAL PARA LA
CONSERVACION DEL ATUN ATLANTICO

Madrid, a 1 de febrero de 2023

CIRCULAR ICCAT # 0757 / 2023

**ASUNTO: TALLER SOBRE MÉTODOS DE EVALUACIÓN CON DATOS LIMITADOS PARA
LOS PEQUEÑOS TÚNIDOS** (*Madrid, España, 9-12 de mayo de 2023*)

Tras la adopción por parte de la Comisión del calendario de reuniones del SCRS para 2023, me complace informarles de que el taller sobre métodos con datos limitados para la evaluación de los pequeños túnidos ha sido programado del 9 al 12 de mayo de 2023. Este taller presencial se celebrará en la Secretaría de ICCAT en Madrid (España). El Dr. Luis Gustavo Cardoso (Brasil) ha sido nombrado experto invitado a este taller. Ofrecerá una visión general de los fundamentos y supuestos de los métodos de evaluación de stocks con datos limitados que pueden aplicarse a los pequeños túnidos, y formará a los participantes en la aplicación práctica de un método de evaluación de stock basado en capturas y basado en tallas en el marco de evaluación de stock con datos limitados.

Debido a la naturaleza técnica del taller, y para permitir que el experto invitado proporcione los niveles necesarios de asistencia individual a los participantes, solo se permitirá asistir al taller a un número limitado de científicos nacionales (entre 8 y 10 como máximo, en función del presupuesto y la logística disponibles), aunque se buscará el equilibrio geográfico en cuanto al origen del candidato en la medida de lo posible.

Todos los participantes deben tener al menos un conocimiento práctico mínimo de los métodos de evaluación de stock y del software R, y ser capaces de mantener una conversación fluida en inglés. En consecuencia, se establecerá un proceso de selección, liderado por el presidente del SCRS, el relator de pequeños túnidos y la Secretaría, para elegir a los mejores candidatos, en el que se tendrán en cuenta las capacidades técnicas y la experiencia de los candidatos, su dominio del inglés, así como su participación regular en los trabajos y reuniones del Grupo de especies de pequeños túnidos del SCRS. Por lo tanto, se ruega a los candidatos que **presenten sus candidaturas a la Secretaría** (info@iccat.int y miguel.santos@iccat.int) a más tardar el **24 de febrero de 2023**. Existe financiación disponible para cubrir los gastos de viaje y alojamiento de los candidatos seleccionados.

Me complace facilitarle información adicional para los posibles candidatos (se adjunta solo en inglés), con información general sobre el tema del taller, los objetivos, el orden del día y el calendario. Le agradecería que distribuyera esta convocatoria entre los científicos que podrían estar interesados en participar en el taller. Esta convocatoria también se publicará en breve en el [sitio de reuniones actuales de ICCAT](#).

Le saluda atentamente,

Secretario ejecutivo



Camille Jean Pierre Manel

DISTRIBUCIÓN:

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Documentación adjunta: Información adicional para los candidatos.



Workshop on Data Limited Assessment Methods for Small Tunas
(Madrid, Spain – 9-12 May 2023)

1. Background

Developing any harvest strategy for managing a fishery depends on assessing the stock status and population dynamics, which depends on data availability (Dowling *et al.*, 2015). Several small-tunas stocks present limitations on the available data to conduct a comprehensive quantitative, model-based stock assessment to estimate the time series of biomass and fishing mortality relative to their reference points. Nevertheless, even with limited data, some aspects of stock status can be inferred. Data-limited assessment methods are increasingly used for management purposes to report on the regional status of fisheries across many stocks and to assess the status of individual data-limited stocks as inputs to management decisions (Dowling *et al.*, 2019; Chrysafi and Kuparinen, 2016). These methods rely on removal time series and/or length composition's time series or snapshots, but all depend on a good understanding of the species' life history parameters.

Assessing stocks using only catch and life-history data started many years ago with the development of stock reduction analysis (SRA; Kimura *et al.*, 1984). Since then, SRA has been extended to estimate productivity and reconstruct historical abundance trends by making assumptions about final biomass relative to unfished or initial biomass (i.e., stock depletion; Thorson and Cope 2015). SRA has been further extended to incorporate stochastic variability in population dynamics (stochastic-SRA; Walters *et al.*, 2006), a flexible shape for the production function (depletion-based SRA; Dick and MacCall, 2011), prior information regarding resilience and population abundance at the start of the catch time series (catch – maximum sustainable yield, Catch-MSY; Martell and Froese, 2013), Bayesian approaches (C_{MSY}; Froese *et al.*, 2017), and age-structured population dynamics (simple Stock Synthesis, SSS; Cope, 2013). Despite these differences, this family of catch-only models shares a common dependence on prior assumptions about final stock depletion. Simulation testing has previously indicated that these methods perform well only when assumptions regarding final relative abundance are met (Wetzel and Punt, 2015). Unsurprisingly, because final stock depletion is a prior assumption, the methods perform differently under different stock depletion levels (i.e., highly depleted or slightly depleted stocks; Walters *et al.*, 2006) or different harvest history or catch trends.

For many small-scale data-limited fisheries, obtaining reliable time series on total historical catches is difficult, whereas sampling lengths from the catch is easier. Mean-length mortality estimators (Beverton and Holt, 1957) assume that fishing mortality directly influences the mean length of the catch under equilibrium conditions. This basic method has been extended by length-based spawning potential ratio (LBSPR; Hordyk *et al.*, 2015a), length-based integrated mixed effects (LIME; Rudd and Thorson, 2018), and length-based Bayesian approach (LBB; Froese *et al.*, 2018) models, among others. These allow estimating instantaneous fishing mortality (F) and spawning potential ratio (SPR) when basic biological parameters are known. In contrast with LBSPR and LBB, LIME does not assume equilibrium conditions. The mixed-effects aspect of LIME extends length-based methods by estimating changes in recruitment and separating them from fishing mortality over time (Rudd and Thorson, 2018).

Furthermore, when removals time series are available with current/updated length composition samples, it is possible to combine them and construct catch-length models using tools like the Data-limited Stock Synthesis tool (SS-DL tool, Cope, 2020). The SS-DL tool uses the age-structured population dynamic model Stock Synthesis (Methot and Wetzel, 2013) to implement several standard data-limited assessment methods in one modeling framework. The SS-DL allows flexible use of life history parameters and fishery data to build a population dynamics model to assess stock status and estimate management parameters. The SS-DL tool also allows building catch or length-based assessment models in an independent way.

A broad review of the available methods will be performed in the data-limited stock assessment workshop. One framework and three model types will be presented and practiced in deep. The Simple Stock Synthesis (SSS) model will be presented as a catch-based method, and the participants will be trained to apply it in a real data set as an example. The SSS presented the best performance in a study comparing several catch-

limit assessment methods in data-limited fisheries (Pons *et al.*, 2020). The LBSPR method will also be presented, and the participants will be trained to apply it in a real data set. Chong *et al.*, (2020) compared several length-based stock assessment methods and found the LBSPR one of the most consistent and accurate methods. In summary, participants will learn to employ catch-only, length-only, and catch-length models. They will get to use LBSPR and SS-DL to do them.

2. Objectives

The main objectives of the workshop are:

- To present the fundamentals and assumptions of different data-limited stock assessment methods;
- To train 8-10 national scientists from different CPCs on managing the related software and applying a catch-based and length-based assessment method;
- To train 8-10 national scientists from different CPCs on using a comprehensive stock assessment framework, the Stock Synthesis Data-limited tool;
- To apply practical examples for illustrating the data limited model building and tuning.

3. Expert tasks

- To present a broad overview view and the fundamentals and assumptions of data limited stock assessment methods that can be applied to the small tuna species;
- To train 8-10 national scientists in the practical application of a catch-based and a length-based stock assessment method;
- To train 8-10 national scientists in the practical application of the data-limited stock assessment framework;
- To apply the presented methods to real small tunas data sets as practical examples.

4. Workshop Agenda and Timetable

- Day 1: Overview of data limited stock assessment methods;
 - Detailed description of a catch based (Simple Stock Synthesis) and a length-based (LB spawning potential ratio) methods;
- Day 2: Detailed description of the Data-limited stock synthesis tool;
- Day 3: Hands on working with real data sets, running codes, fixing bugs, and fitting models;
- Day 4: Hands on working with real data sets, running codes, fixing bugs, and fitting models.

Workshop wrap-up

5. Number of participants

8-10 national scientists will participate in the workshop.*

1 expert

* All participants must have at least a minimum working knowledge of R software, and have the required packages installed on their computers before the workshop. A list and a manual on installing it will be provided within a month before the workshop.



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