



Scoping the next stock assessment platform

Project 123 progress update and outline of options

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Overview

Introduction *background, project outline, existing software, new development*

Possible Tasks *migrate assessments to existing software, model exploration,
software development*

Timeline *PAW 2024, expert meeting 2024, workshops 2024–2026,
launching the main project*

Required Resources *collaboration with other tRFMOs,
SPC staff positions & consultants*

The need to migrate to new software

MULTIFAN-CL (MFCL) has been used in SPC tuna assessments since 1990s

MFCL team (Dave Fournier, John Hampton, Nick Davies) retiring in the 2020s

Development of new features is slowing down

Resources are being allocated to succession plans

Project outline

This scoping project is scheduled from 1 Feb 2024 to 31 Dec 2026. It will:

- Evaluate features and capabilities that will be important in future tuna assessments

- Explore fitting models to tuna data using existing software platforms

- Guide decisions on what kind of new software development will be required

- Establish collaboration with tRFMOs and research labs to achieve these goals

Stock assessment software

Existing software, ready for multi-region tuna assessments

- **Stock Synthesis** is used by IATTC, IOTC, and ICCAT
- **Gadget** has many features relevant for tuna assessments
- **Casal** has many features relevant for tuna assessments

These could be extended further as needs arise

Stock assessment software

Software that could be developed further:

- **sbt** is built around CKMR, currently for single-region assessments
- **ALSCL** is a state-space model that fits length comps, currently no catches
- **WHAM + Length** is a state-space that fits length comps, currently single-region
- **SAM + Length** is an early exploration of extending SAM to fit length comps
- **Stock Synthesis + Enhanced Tags** is a proposed enhancement of the tag module

Stock assessment software

Also relevant:

- **Stock Synthesis + CKMR** is an experimental add-on, not included in core software
- **FIMS**, NOAA project coordinating the development of a next-generation framework

Stock Synthesis

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Possible tasks for SPC to prioritize

Subject to SC advice:

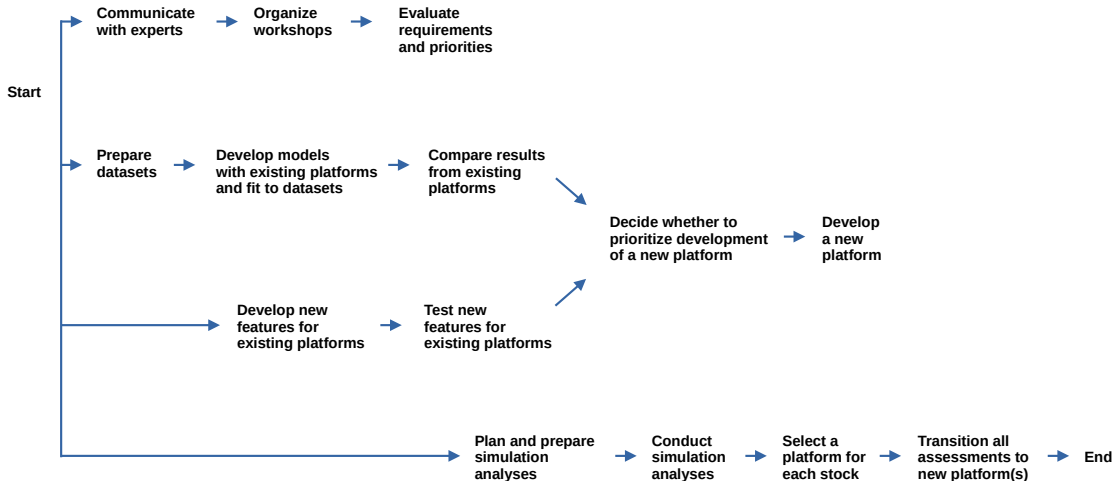
1. Move the **swordfish** assessment to Stock Synthesis
relatively simple compared to other SPC assessments
2. Move the **striped marlin** assessment to Stock Synthesis
also relatively simple

Possible tasks for SPC to prioritize

Subject to SC advice and funding approvals by WCPFC:

3. Conduct model exploration to fit Casal/Gadget/Stock Synthesis to albacore tuna . The South Pacific albacore assessment model is simpler than the other tuna species and therefore a candidate to be the first tuna stock assessment to consider for migration from MFCL. Also, for the next South Pacific albacore assesment there may be CKMR information available to incorporate in the assessment.
4. Conduct model exploration to fit Casal/Gadget/Stock Synthesis to the original five-region yellowfin tuna dataset. The yellowfin assessment is a good candidate to test the capabilities of these software platforms for tuna assessments involving multiple regions, tags, and a large number of fisheries. The yellowfin tuna assessment is similar to bigeye tuna but runs slightly faster, thanks to the simpler five-region structure that was adopted in the 2023 assessment.
5. Conduct model exploration to fit models using a variety of existing software to a simplified single-region yellowfin tuna dataset. Models of interest include ALSCL, Casal, Gadget, MECL, sht, Stock Synthesis, and WHAM. Length

Transition plan



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