Scope of work	The project is divided into stages, as follows: Year 2024 1. Review and identify a list of necessary features for software to do tuna stock assessments and identify existing software platforms that have these features or capacity to develop these. 2. Conduct two workshops with selected experts from other tuna RFMOs and/or with relevant expertise. The first workshop can be remote (prior to SC20) and the second one potentially in person (post SC20). The main goal will be to communicate the scoping project, upcoming model explorations, and succession plans for MFCL and Stock Synthesis, to seek advice from the scientific community, and to seek collaboration with tRFMOs and various research labs. 3. Explore the new RTMB programming environment and how it could be used in future tuna assessments. Specifically, how to modularize and organize code in RTMB models, on one hand code that is specific to one assessment and on the other hand code that is shared between assessments. 4. Establish collaboration with NOAA scientists to explore the feasibility of enhancing the tagging module in Stock Synthesis, making it more similar to the tagging module in MFCL. Year 2025 5. Provide support to the stock assessment team transitioning the 2025 swordfish assessment from MFCL to Stock Synthesis. Also, coordinate with the 2024/2025 striped marlin assessment team to start preparing for the transition of that assessment to Stock Synthesis in 2029. 6. Compare a variety of software platforms using a simplified single-region WCPO yellowfin tuna dataset. The comparison will evaluate available features, run time speed, auxiliary tools, time and skills required to develop and diagnose models, and other characteristics. 7. Prepare —alternative workplans and budget scenarios for the larger implementing (main) project to go beyond scoping. The scoping project will be expected to transition into the main implementing project based on the discussions at SC21, budget considerations, and funding availability. It is expected that the work leading up SC21 will inform the implementing workplan options and budget estimations. ~~the launch of a 'main project' that can be conducted alongside or after the scoping project. The preparation involves establishing TORs and estimating the resources required to design, develop, and test a new software platform for tuna assessments. The software development will borrow selected core features from previous platforms and combine with new features that are essential for future tuna assessments. The main project will also involve simulation studies to evaluate estimation performance and provide support to the stock assessors involved in transitioning assessments from MFCL to the new sof~~ 8. Communicate with tuna RFMOs and other research labs to establish which RFMOs and labs are willing and able to commit scientist time to collaborate on specific tasks of the scoping project, as well as the upcoming main project. 9. Communicate with tuna RFMOs and the FIMS project team to evaluate whether joint software development by tuna RFMOs could produce FIMS code modules, with the aim to develop future tuna assessment models using

	FIMS modules. ~~Conduct a simulation scoping study to evaluate the degree of bias incurred in management advice due to length-based processes in time and space not being accurately modelled by age-structured models. This would identify whether moving to a length- or length-age structure brings sufficient benefits. This work could take advantage of the approaches used for existing simulation frameworks, such as the NOAA/NIWA spatial simulation study of Indian Ocean yellowfin tuna. Development of a simulation framework could additionally be used to progress current MFCL assessments by evaluating alternative spatial structures or the impacts of increasing/reducing model complexity on the estimation of management quantities of interest. However, these additional uses for a simulation framework are outside the scope of the current ToR.~~ ~~If a length-age-structured model is deemed appropriate, evaluate the utility of existing length-based models (e.g. including, but not limited to, GADGET, CASAL2, spatial L-SCALA) as the basis for a future assessment platform, likely to be based in TMB, and recommend an approach.~~ ~~Undertake the development of the new assessment software in TMB, including identification of those necessary to mirror the functionality in MFCL in any new software, and existing MFCL code that can be ported across to a new framework. This may include porting the existing MFCL software to the TMB platform to ensure an equivalent model exists on which to build the additional length-structure components, and testing for equivalence using the existing C++ code.~~ ~~Throughout, generate collaborative opportunities to work with other agencies on developing a new TMB model, ensuring a diverse user base.~~ Year 2026 To be decided, based on discussions at SC21 and findings from stages 1 through 9. ~~This is anticipated to be a multi-year endeavour. As a result, the current ToR focuses on the first and second scoping stages of the project, as well as stage 5. Based upon the findings of that study, further project ToRs would be developed to progress the work. Findings would be reported to SC each year.~~