

SEDAR 103

US Caribbean Application of Alternate Assessment Methods Development Workshop Summary



17 – 21 August 2026 | Miami, FL

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SEDAR 103 Objective:

The SEDAR 103 US Caribbean Application of Alternate Assessment Methods was conceptualized by the Toolbox Working Group of the Caribbean Strategic Planning project. That Working Group was part of a multi-year SEFSC-led activity to identify optimal data collection strategies and facilitate the development of stock assessment strategies for application in the US Caribbean. Analysts in the US Caribbean have traditionally applied single-species stage structured stock assessment models which have often resulted in failure to determine stock status due to data limitations. The Working Group recognized that those approaches strain the SEFSC's ability to provide management advice for many of the federally managed species and that US Caribbean fisheries may be better suited to ecosystem and data-limited modeling tools. SEDAR 103 establishes a formal panel of experts to critically evaluate alternative approaches to stage structured single-species assessments with respect to data availability in the region while ensuring compliance with legal mandates. This collaborative process will result in recommendations to advance the development and implementation of alternative assessment methods and provide results from methods that could most easily be applied given currently available data.

Background and Problem Description:

The US Caribbean faces a number of challenges in the application of traditional stage structured single-species stock assessment methods, including: a high diversity of federally managed species, the prevalence of multi-species fisheries, and common data limitations. Previous stock assessment attempts have frequently failed to determine stock status. This has often been due to insufficient data with which to develop models that are robust to key assumptions and uncertainties. In the absence of sufficient information to effectively utilize traditional stock assessment methods, catch limits in the US Caribbean have largely been managed using constant catch based on historical landings. In light of these challenges, previous initiatives explored data availability and gaps and the potential use of data-limited assessment tools. Efforts have included the Caribbean Data Review Procedural Workshop (2009), Exploring Tools for Managing Data-Poor Stocks Workshop (2011), Fishery-Independent Surveys Workshop (2014), SEDAR 46: US Caribbean Data-Limited Assessment (2016), SEFSC Data Triage project (2022), and Caribbean Strategic Planning project (2023). However, further investigation remained necessary to determine the ideal applications of those tools to management. Many of those prior efforts stalled due to lack of Caribbean focused staff. That constraint was resolved in 2021 with the creation of the Caribbean Fisheries Branch. Currently, only six of 77 island-specific finfish, conch, and lobster stock complexes have annual catch limits that are derived from a population dynamics model.

With decades of committed effort to produce science-based catch advice in the region, and given increasingly limited resources for conducting science and assessments, it is clear that existing SEFSC capacity cannot keep pace with the analytical demands for single-species and island-based management. It is necessary to consider more holistic management approaches to address the large number of species that remain unassessed. Furthermore, the recent scientific advances of ecosystem-based fisheries management offer an opportunity to bridge the gap between scientists and stakeholders and have spurred increased consideration of the human dimensions of fisheries management. The purpose of SEDAR 103 is to provide a suite of ecosystem analysis/modeling and data-limited assessment tools, as well as review the utility of additional frameworks for risk, susceptibility, the effectiveness of management procedures, and quantifying local ecological knowledge for consideration in the application to US Caribbean fisheries management.

Workshop Process:

Panelists with extensive stock and ecosystem assessment experience from the Caribbean Fishery Management Council, NOAA Fisheries Headquarters, the Southeast Regional Office, five NOAA Fisheries Science Centers, Territorial and Commonwealth agencies, and research partners convened to present and discuss potential analytical methods. By examining local data availability alongside global best practices, panelists identified feasible tools for immediate implementation or future adoption under improved data scenarios. Table 1 contains panel decisions and recommendations for the reviewed stock and ecosystem analytical methods. Table 2 contains panel recommendations and takeaways for additional frameworks to accompany analytical approaches as discussed during the SEDAR 103 Development Workshop. Select analytical methods will be tested in follow-up application webinars using standardized datasets for recreationally and commercially important US Caribbean species. Participants will reconvene at a future workshop to critically evaluate results of the application webinars and develop recommendations for practical, efficient stock and ecosystem assessment methods applicable for Caribbean Fishery Management Council decision making.

Table 1. Method feasibility (within the given time frame), panel decision, and recommendation for analytical approaches to assessing US Caribbean stocks and ecosystems as discussed during the SEDAR 103 development workshop.

Stock and Ecosystem Analytical Approaches			
Method	Feasibility	Decision	Panel Recommendation
Trophic Declination and Trophic Indicators Approach	Feasible	Will Test	The method(s) should be applied to each island platform and should be considered part of a system of complementary approaches.
Trophic Food Web Approach	Not Feasible	Will Not Test	This method should be reconsidered in the future when data are more available and model best practices have been developed.
Global Index of Fishing Intensity (FI)	Not Feasible	Will Not Test	This method should be reconsidered in the future when data are more available and model best practices have been developed.
Use of Landings Data and Production Models (and Global Reef Production Values)	Feasible	Will Test	This method should be used to evaluate ecosystem caps for each island and/or to estimate ACLS for guilds/aggregate groups and it can be considered part of a system of complementary approaches.
Cumulative Biomass-Trophic Level Curves	Feasible	Will Test	This method should be used to evaluate ecosystem caps for each island and should be considered part of a system of complementary approaches. Considering resource limitations, this and other methods may be best used more frequently as a check-in while a full stock assessment is reserved for ~5 year increments.
Portfolio Analysis	Feasible	Will Test	This method should be used to track values, not used as a performance indicator. The results could be incorporated into an Ecosystem and Socioeconomic Profile (ESP) of the US Caribbean.
Operational Framework for Ecosystem-Based Fisheries Management using Multivariate Analyses	Feasible	Will Not Test	This method should be reconsidered in the future when data are more available and model best practices have been developed. Results from this analysis should be incorporated into the Ecosystem Status Report (ESR).
Integrated Trophic Frontier Framework	Feasible	May Test	This method should be piloted in STTJ as a case study since more than 80% of the landings are caught by trap gear and many species are caught simultaneously. This method may be tested depending on staff availability.
Age-Structured Model using Stock Assessment Continuum (SAC) Tool	Feasible	Will Test	This method will be applied using the SAC tool due to the added flexibility the tool provides.
Multi-Indicator Adaptive Assessment and Management Framework	Not Feasible	May Test	The desktop version of this method may be applied and tested for Queen Conch, depending on data availability. The full version of this method should be applied in the future when more data have been processed and the indicator and threshold development for the model are complete.
Occupancy Model Simulations	Not Feasible	Will Not Test	This model should be tested in the future when data are more available. The model requires frequent, repeated measurements via underwater camera surveys or eDNA monitoring to simulate and test occupancy model estimates of colonization and extirpation rates.
Absolute Abundance Estimator	Feasible	Will Test	This method should be applied to species with sufficient data and all assumptions are documented.
Length-Based Risk Assessment (LBRA)	Feasible	Will Test	Results of this method should be compared with stock assessment results using previously performed assessments (e.g., Yellowtail Snapper).

Table 2. Panel recommendations for the additional frameworks discussed during the SEDAR 103 development workshop.

Additional Frameworks	
Method	Panel Recommendation
Fisheries Social Ecological System (SES) Diagnostics	This framework should be used in future assessments. During the application webinars, the Method Champion(s) could develop TOR and create a path forward for how to incorporate this framework, including which data should be regularly routed and explored.
Risk Assessment Framework	This framework should be applied in future assessments. A pilot has been completed using the most recent ESR outputs and steps to incorporate this framework have already been developed. Therefore, no additional work during the application webinars is required.
SSMSE	This analysis should be used as a simulation to evaluate expected outcomes of alternate management approaches (i.e. is the model working correctly) in future assessments.
Productivity Susceptibility Analysis (PSA)	This analysis should be used routinely to identify and prioritize which species to assess. This method alone would not produce management advice and should be used in combination with other methods that directly inform management.
Management Strategy Evaluation (MSE)	The desktop version of this analysis should routinely be used as a simulation to evaluate the effectiveness of management procedures (i.e. how effective will management strategies be). It should be used as complimentary to a single species assessment method. A pilot has been successfully performed for Caribbean Spiny Lobster.