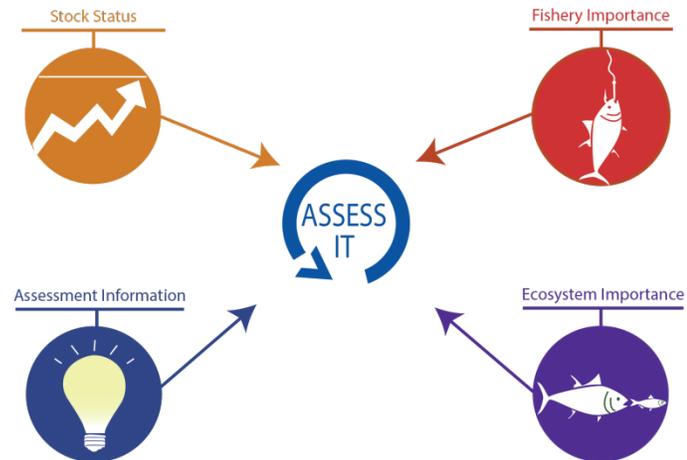


Stock Assessment Prioritization for West Coast Groundfish

Fish stock assessments provide the quantitative scientific information required by resource managers to determine stock status and set annual catch limits to prevent overfishing. Well-established procedures for assessments have been developed to utilize data from fishery catch monitoring, fishery-independent surveys of abundance, biological studies, and other sources to produce the highly focused deliverables required by the Magnuson-Stevens Act (MSA). These data collection and analysis activities constitute a significant portion of the budget for the National Marine Fisheries Service (NMFS), but resources are insufficient to assess all managed stocks each year (nor is this a realistic target). It is therefore important to provide a transparent, quantitative, and objective process for determining what appropriate assessment targets are, and how to best meet those targets by determining priorities for assessment.



A document recently published by NMFS (<http://goo.gl/IVsvw7>) describes a national framework for prioritization of stock assessments. Although fish stock assessment prioritization will take place under the guidance of this national framework, the process will be implemented on a regional level coordinating with existing regional processes and planning bodies. For West Coast Groundfish, the prioritization process described under the national framework is quite similar to the existing process used to determine biennial assessment priorities; many of the same criteria are considered. Some minor changes to the process for groundfish have been made relative to the description in the national document to better adapt the process to existing PFMC procedures.

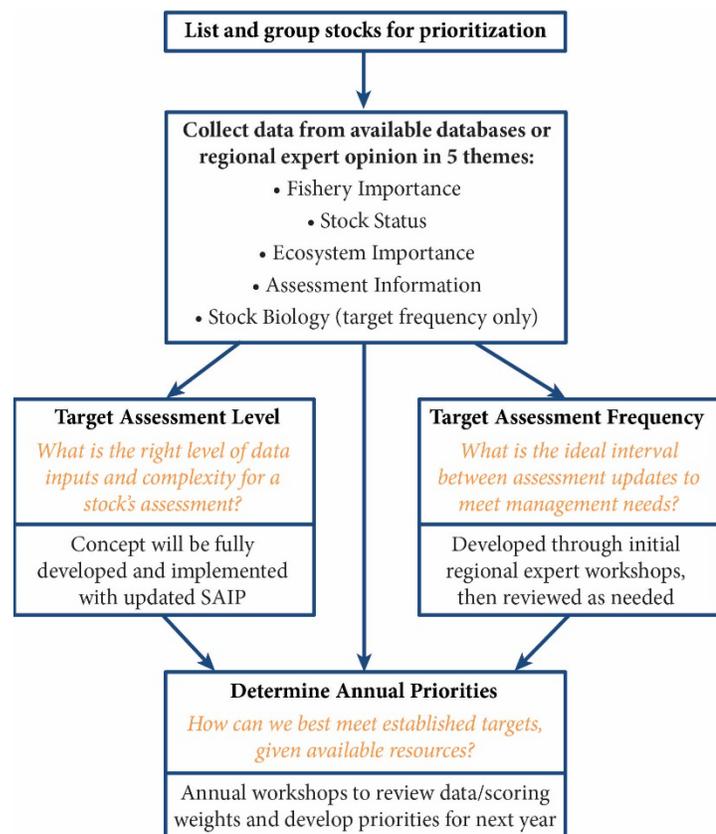
What Is Meant By Assessment Prioritization?

Prioritization IS:	Prioritization IS NOT:
<ul style="list-style-type: none"> • A way to ensure comprehensive, efficient and transparent decision-making for stock assessment planning • Advisory and non-binding; regions maintain flexibility to make departures from recommendations when necessary 	<ul style="list-style-type: none"> • Intended to reallocate resources between regions • A requirement to develop a regional Executive Committee
<ul style="list-style-type: none"> • Expected to evolve over time as implementation reveals improvements 	<ul style="list-style-type: none"> • A dramatically different way of doing business relative to current processes
<ul style="list-style-type: none"> • A way to identify data gaps and un-met needs 	<ul style="list-style-type: none"> • Going to automatically result in more assessments getting done each year

Stock assessment prioritization includes first-time assessments for previously unassessed stocks, updating existing assessments using established methods/data, and upgrading assessments to use new types of data/methods. All stocks managed under Federal Fishery Management Plans, as well as additional stocks that may be assessed using NMFS Science Center resources, are included in assessment prioritization. For stocks that have been previously assessed, the prioritization approach sets targets for assessment completeness (level) and frequency and then determines priorities relative to meeting those targets. For stocks that have only been previously assessed with data-poor methods, the system provides an opportunity to periodically examine their fishery importance, ecosystem importance, biological vulnerability to overfishing, preliminary information on fishery impact level (stock status), and data availability to determine which of them, if any, are both sufficiently at risk to warrant an assessment and have sufficient data to conduct a more data-rich assessment.

The prioritization process includes five steps conducted at the regional level and updated as needed:

1. Determine which stocks should be included, and how to best organize stocks into groups for prioritization (e.g. by FMP).
2. Collect information for stocks to develop scores for 12 prioritization factors (Table 1) in four themes: Fishery Importance, Stock Status, Ecosystem Importance, and Assessment Information; two additional factors on Stock Biology are used to help develop target frequency (Step 4). Information may be extracted from available databases or through workshops with regional experts, and scores should be updated annually/biennially to support development of the priority ranks described in Step 5.



3. Identify the current and **Target Assessment Level** describing the data completeness and model complexity required for each stock; initially this could be as simple as determining which previously unassessed stocks are in need of a first-time assessment.
4. Develop **Target Assessment Frequencies** based on a subset of the information collected in Step 2 to establish how often each stock needs to receive an updated assessment to maintain sufficient timeliness for status determinations and annual catch limit advice; re-examine as situations change.
5. Use factor scores developed in Step 2 and a region-specific factor weighting scheme to calculate prioritization ranks for each stock. These ranks serve as the starting position from which regional managers subsequently determine the final set of stocks to be assessed, after accounting for additional considerations. Ranks will be updated every two years to inform biennial selection of stocks for assessment.

Table 1. Summary of the 12 factors included in stock assessment prioritization.

Category	Factor	Source	Range
Fishery Importance	Commercial Fishery Importance	Landed ex-vessel revenue (transformed)	0-10
	Recreational Fishery Importance	Weighted landed catch (transformed)	0-10
	Importance to Subsistence	Tribal commercial revenue (transformed) + subsistence info from Habitat Prioritization	0-10
	Constituent Demand/Choke Stock	Constraining species + importance to sub-fleet or area	0-10
	Non-Catch Value	Currently: SCUBA/snorkel viewing	0-10
	Rebuilding Status	Assessed status & rebuilding projections	0-10
Stock Status	Relative Stock Abundance	Latest assessed depletion or PSA vulnerability score	1-10
	Relative Fishing Mortality	Groundfish mortality reports	1-10
Ecosystem Importance	Key Role in Ecosystem	LATER: Link to Climate Vulnerability Assessment scores	1-10
Assessment Information	Unexpected Changes in Stock Indicators	LATER (before June): Trend information from surveys of fisheries	0-10
	Relevant New Type of Information Available	Updated steepness prior; new availability of trend or comp data; ability to fix issues from prior asmt	0-10
	Years Assessment Overdue (relative to Target Frequency)	Assessment output & Fishery Importance scores	0-10

A stock's biennial assessment-priority score represents a combination of the 12 factors listed in Table 1. Stocks that are more overdue, more important and closer to reference points will have higher priority for assessment action. In addition, the recent assessment history and availability of new data affect whether the next assessment should be conducted as an update (using the same approach as previous assessments and simply incorporating new data points) or as a benchmark (introducing new methods or data types and requiring a more thorough investigation).

The **Fishery Importance** theme contains several factors that are likely to contribute considerably to the final assessment-priority score. The first step in evaluating some of these will be the compiling of

relevant catch and value information. The National framework document, referenced above, identifies a method for converting amounts of commercial revenue into Fishery Importance ranks. However, some species which are very important for one fleet or in one area may have much lower ranks, based on overall catch or value, than reflects the degree to which some fishery sectors (and/or communities) are reliant upon them. The ***Constituent Demand/Choke Stock*** factor is envisioned as the place where the importance of such species can be emphasized within the prioritization process. NMFS will take the lead in assembling available data relevant to consideration of prioritization factors and will consult with experts (generally from within the Council family) throughout the process as scores are developed.

Target Assessment Level describes the appropriate level of modeling complexity and data inputs for a stock's assessment. High-level assessments include more factors and provide better forecasts for annual catch limits, but also typically need precise and accurate fishery-independent surveys and fish ages from the fishery and the surveys. These increased data requirements and costs should be reserved for specific situations, such as stocks with high fishery importance, high ecosystem importance, and biological factors that lead to high natural fluctuations. Stocks at moderate levels of importance or expected fluctuations can suffice with less data-rich assessments. Some stocks will be identified as sufficiently minor components of the fishery such that their assessments need not extend beyond baseline monitoring of catch and simple indicators. At all assessment levels, there should be consideration of environmental and ecosystem factors to help distinguish natural from fishery effects on the stocks. The process for setting target assessment levels will be more fully developed after completion of the update to the Stock Assessment Improvement Plan, currently underway.

Target Assessment Frequency defines the ideal interval between updates for a stock's assessments. It is driven by a stock's biology (intrinsic variability over time), as well as its importance to the fishery and ecosystem. The greatest fluctuations are expected for stocks with short life spans and high variability in productivity. Stocks with longer life spans tend to fluctuate less because of the many age classes in the population. High fluctuations create a greater need for frequent updates in annual catch limits. Stocks with high fishery and/or ecosystem importance need more frequent assessment updates to quickly provide access to increases in abundance while keeping the chance of overfishing at an acceptable level. Target update periods are expected to typically be 1-3 years, but some may range up to a maximum of 10 years. In addition to these prioritized assessments, simpler partial updates may be conducted for many stocks to account for actual recent catches when recalculating upcoming catch limits. These partial updates are generally encouraged whenever assessments are not updated biennially.

Factor Weighting is used within the prioritization process to assign region-specific relative weights to each factor, reflecting the relative importance within the. Factor weights will be the same for all stocks within an FMP and will be developed by regional NMFS and Fishery Management Council leaders (prototype weights will be provided, initially). This flexibility will allow the West Coast to tailor the contribution of each factor to the overall score developed for groundfish species, so as to reflect regional importance of each factor. The weighted sum of the relative factors scores are then ranked and used to guide decisions on assessment planning for the upcoming assessment cycle.

As implementation of prioritization moves forward, a portfolio of assessments is expected to evolve, with some activity directed towards first-time assessments (above the data-poor level), some towards baseline monitoring of low priority stocks, some towards high-quality assessments of high-priority stocks, and some towards more intensive investigation of ecosystem linkages, where needed. To maintain the pace of assessments currently required to meet management demands, it is expected

that, over time, most of a region's assessments will be completed as updates/operational assessments using previously reviewed, standardized methods.

Management strategy evaluations (MSEs) will be an important tool to refine the prioritization process. MSEs on a few representative stocks in each region can be used to simulate the whole data-assessment-management process. MSEs also provide a logical way to more completely include economic considerations into the prioritization process. Ideally, an economically-based prioritization system would evolve towards a portfolio analysis that accounts for the costs of various types of assessments as well as the marginal benefits from those assessments. This would help scientists and managers better understand the implications of stock variability, assessment imprecision, assessment frequency, and time lags between assessment and management implementation.