



Report of the ACL/AM/(h)(2) Provision Component for Revising Territorial BMUS Lists

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Data Limited Stocks and Application of the “(h)(2)” Provision

Annual catch limits (ACLs) have been effective management tools for preventing overfishing in many fisheries. However, ACL-based management has been difficult in certain data limited fisheries, including those that lack information on stock biomass and those in which there is limited ability to monitor and enforce fishery removals. To address these concerns, the National Marine Fisheries Service (NMFS) amended the National Standard 1 guidelines in 2016 to clarify that, for certain stocks, including those for which data are not available either to set reference points or manage stocks based on maximum sustainable yield (MSY) or proxies, “alternative approaches” for satisfying statutory requirements other than those set forth in the National Standard 1 guidelines can apply. NMFS is developing additional guidance to assist with the implementation of alternative approaches; this draft guidance is summarized below.

An alternative approach that may be practicable in the Pacific Islands Region (PIR) is to use a “rate-based” approach. The key difference between the weight/numbers-based ACLs that have historically been used in the PIR and rate-based ACLs is the metric being monitored and used for triggering AMs (i.e., rate vs. an amount of fish). In the rate-based approach, a metric, such as the mean size of fish in the data, is used to estimate a fishing mortality rate (F) and the maximum fishing mortality rate (MFMT). A lower mean size of fish is generally associated with a higher F, and a higher mean size of fish is associated with a lower F. The mean size is also biologically relevant as an indicator of the percentage of mature fish and the spawning potential ratio (SPR).

The use of either metric would be closely related to the reference points associated with the established status determination criteria (SDC) for that stock. The SDC control rules would also be amended to allow for the application of the results of new stock assessments. Once a reference point is established, a control rule could express what change in fishing effort is needed to maintain the indicator near the reference point. Such compensatory mechanisms a control rule is conceptually the same as rules currently used to modify standard (i.e., MSY-based) catch limits and should be predetermined and agreed upon in order to maintain the integrity of the rule.

The decision to use a rate-based ACL for a data limited stock should be based on whether:

1. The stock qualifies for use of the (h)(2) flexibilities for data limited stocks (see section on the Flexibility in the Application of Annual Catch Limits to Data Limited Stocks below);
2. There are sufficient data to estimate the current average fishing mortality rate, or a proxy for F, at MFMT; and
3. It is possible to manage with/enforce a rate-based approach.

If these conditions are met, then the Western Pacific Regional Fishery Management Council (Council) could consider a rate-based ACL as an alternative to the standard approach (i.e. weight/numbers). Such a recommendation would need to be proposed as a Fishery Management

Plan (FMP) amendment with a robust record documenting the rationale for the proposed approach and its consistency with the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and other applicable laws.

Key Points and Considerations

- When an approved alternative approach is used in place of a standard-approach ACL, it must satisfy the ACL requirement under the MSA.
- Regional councils must document their rationale for any alternative approaches in an FMP or FMP amendment, which NMFS would review for consistency with the MSA.
- If an alternative ACL is approved, there is no need (nor reasonable expectation) to then convert that alternative back into an amount of fish.
- The choice of data limited methods should be based on what aspect of the fishery can be measured.
- The type of information provided by PIFSC as the best scientific information available (BSIA) in stock assessments would be used as a basis for rate-based ACLs, as is done for standard-approach ACLs. The upcoming stock assessments may use different methods for different species, so the type of specified ACLs may differ among species within the territorial BMUS lists.
- Noting that the National Standard 1 guidelines require an alternative approach to be contained within the FMP, if it is anticipated that regional councils will need to make a determination of which approach to use within a short time-frame, such as when new data become available, then it may be appropriate to consider establishing a framework within the FMP to allow for such determinations.
- Translating the change in percent effort into a particular or a suite of effort controls needs specific thought and attention, and is often best designed using simulation testing.
- Strong buffers should be used in data limited situations due to increased uncertainty.
- Catch-scalar methods (i.e., setting catch based on a percent of previous catches) have been shown to lead to poor management results, and are a less preferable management option compared to rate-based ACLs.

Acceptable Biological Catch, Annual Catch Limits and Accountability Measures

The 2016 final rule of the National Standard 1 revisions includes a provision that gives the regional councils flexibility in the application of annual catch limits for data limited stocks (81 FR 71858, October 18, 2016). The Council's 2011 omnibus Fishery Ecosystem Plan (FEP) amendment established the ACL and accountability measure (AM) specification process in the Western Pacific region. The Council, in consultation with its Scientific and Statistical Committee (SSC), must assign its management unit species (MUS) into various tiers depending on the type, quantity and quality of data available for each species. The tiered system of acceptable biological catch (ABC) control rules that the SSC uses to determine the appropriate ABC under the ACL mechanism described in the FEP requires weight based metrics in the assessment that generates the OFL and succeeding harvest limits. *Under the proposed action to revise the territorial BMUS lists, the Council would consider establishing an alternative control for rate-based ACLs consistent with regulations at 50 CFR 600.310(h)(2) and applicable guidance from NMFS.*

Stock Exempted from Annual Catch Limits and Accountability Measures

In 2016, the revised National Standard 1 guidelines described the stocks that are exempt from ACLs and AMs, which are generally species that have a life cycle less than one year or if the Secretary of Commerce (i.e., through NMFS) has determined the fishery is subject to overfishing (50 CFR 600.310(h)(1)(i)). Stock and/or stock complexes that are subject to management under an international agreement are also exempt from ACLs and AMs (50 CFR 600.310(h)(1)(ii)).

Flexibility in the Application of Annual Catch Limits to Data Limited Stocks

The revised National Standard 1 guidelines describe the circumstances under which a stock is considered data limited, causing the standard approaches to specification of reference points and management measures to be limited. These are:

1. Stocks that are managed and conserved under the Endangered Species Act;
2. Stocks that are harvested in aquaculture operations;
3. Stocks that have unusual life history characteristics; and
4. Stocks for which data are not available either to set reference points based on MSY or MSY proxies, or manage to the reference points based on MSY or MSY proxies.

Some stocks in the Western Pacific region fall into the fourth category. Despite the ability to determine an estimate of annual catch through the creel surveys and commercial receipt books, these estimates typically have interannual variabilities and associated uncertainties. In the 2019 territorial BMUS stock assessment, the estimates of coefficients of variation for 2017 ranged from 9.5% to 83% depending on the territory (Langseth et al. 2019). Using this catch information in a data-intensive model to generate an MSY estimate as the basis for the OFL results in an ineffective management structure that impedes the development of better approaches to manage the highly variable fishery. The data collection system is also not designed to manage the stock relative to MSY reference points. Although it is possible to come up with an in-season expansion estimate of catch to monitor against the ACL, this usually comes with high variability because there are not enough creel survey interviews to overcome inherent variability in catch estimates. Estimates of catch for small time increments (e.g., months or weeks) are also not regularly available, so it is not possible to accurately project when catch would reach an ACL nor when an in-season fishery closure would be necessary. Federal management measures to limit catch in territorial bottomfish fisheries are also likely to be ineffective due to the geographic distribution of habitat relative to jurisdictional boundaries. For example, over 70 percent of BMUS essential fish habitat in both Guam and American Samoa occurs in territorial waters. NMFS does not have authority to limit fishing in these waters, which means the territorial BMUS cannot effectively be managed using ACLs based on catch in pounds or numbers.

In order to properly guide the utilization of this National Standard 1 provision, NMFS developed technical guidance associated with managing with data limited stocks in federal fishery management plans under ACLs and recommendations for implementing 50 CFR 600.310(h)(2) flexibilities for data limited stocks. The guidance defines the circumstances that would allow the use of the flexibility provision of National Standard 1 and provides recommendations to ensure that there is a sufficient buffer to account for uncertainties and progress towards better data and management for data limited stocks.

The technical guidance describes the key factors for a data limited stock: 1) the stock lacks biological information to determine weight/numbers-based reference points (e.g., MSY or its proxies); and 2) the stock cannot effectively be managed under a weight/numbers-based ACL pursuant to the standard approach. The first factor is affected by the absence of reliable removal or life history data and the high intrinsic variability in the data, including incomplete removal series. The most recent stock assessment model assumes total removals, which is not attainable for the Pacific Island region due to lack of reliable data collection in remote areas like the Manua Islands in American Samoa or Tinian and Rota in the CNMI. The assumption of a representative value for total removals can easily be violated with the limitations in the current data collection system, resulting in high uncertainties as mentioned above.

The second factor is affected by the lack of a mechanism to immediately close the fishery associated with the absence of in-season monitoring to inform when a fishery closure should occur relative to the ACL. Even if the fishery is closed in federal waters, it is likely that the fishery would still continue to operate normally in territorial and state waters due to lack of enforcement capability to control catch outside federal jurisdiction. A majority of fish harvested in the U.S. territories are caught by fishers that are non-commercial in nature, making it difficult to track fish flow and ensure all fishing access points are covered by the data collection system.

The current state of the data collection system and management structure meets the data limited conditions such that the stocks of the Pacific Islands region are eligible for invoking the 50 CFR 600.310(h)(2) provision that allows the Council to propose alternative approaches for satisfying the requirements of MSA other than those set forth by the National Standard 1 guidelines (81 FR 71858, October 18, 2016). Therefore, the Council is documenting its rationale for proposing the implementation of the alternative approach through this omnibus FEP amendment that establishes the alternative approach using a rate-based limit.

General Procedure for Setting Annual Specifications

The alternative approach would follow the general ACL mechanism and process described in Amendment 2 to the American Samoa and Mariana Archipelago FEPs and the final implementing regulations at 50 CFR §665.4 (76 FR 37285, June 27, 2011). The process starts with the generation of a stock assessment that utilizes the rate-based reference point. The rate-based reference point for the alternative approach is further described in the Territorial BMUS Revision SDC Report.

The stock assessment would provide an estimate of the sustainable fishing level that would prevent overfishing from occurring, which would be equivalent to the overfishing limit in an MSY-based system. The assessment would also generate a probability of overfishing (P^*) based on the change in effort levels required to prevent overfishing.

The Council developed a tiered system of control rules to guide the specification of ACLs and AM (WPRFMC 2011). These data are categorized into the different tiers in the control rule ranging from Tier 1 (i.e., most information available, typically a stock assessment) to Tier 5 (i.e., catch-only information). A Tier 6 ABC control rule was developed for the proposed rate-based alternative approach. The five tiers under the existing ABC control rule all utilize weight-based harvest limits, whereas Tier 6 utilizes a different control rule geared toward data limited stocks.

Simulation testing should be conducted to determine the percent change in fishing effort that would be used as the framework for the control rule.

Calculating Acceptable Biological Catch

The 2011 omnibus amendment to the FEP established the ACL specification mechanism for all MUS in the Pacific Islands (WPRFMC 2011). The ACL mechanism includes the control rules for setting ABCs and specification of ACLs, including an option for setting ACTs. Stocks are designated at various tiers depending on the quality of the data and inherently the type of assessments that would be developed. Tier 1–5 are all catch-based, and therefore MSY-based, control rules that also utilize catch estimates in the accountability measures. Tier 6 establishes the control rule for the rate-based alternative approach. The rate-based approach is an input-control mechanism rather than the output control like weight-based ACLs. The difference between Tier 6 and Tier 2, which utilizes rate-based approaches like Yield-per-Recruit (Y/R) and Spawning-per-Recruit (SPR) expressed as F_{30} and F_{60} , is that Tier 6 rate metrics are derived from length estimates rather than removals from fish harvest.

Tier 6: Data Limited Rate-Based Approach to Setting ABCs

The minimum average length for a representative sample of a fish stock that is associated with that stock having a 50 percent probability that overfishing is occurring (L_{OFL}) is generated through the stock assessment. L_{ABC} is reduced from L_{OFL} using a predetermined range set by the SSC based on the ratio of F for the mean length estimate (F_{MLE}) over F that reduces spawning biomass per recruit to 30% of the unfished value (F_{30}). The closer the F_{MLE}/F_{30} value is to 1, the lower the P^* . The range is determined through simulation testing that the SSC would review. See Figure 1 for more details on the ranges. The SSC would review the outcome of the assessment and apply the control rules. There is no P^* analysis required as for stocks of Tier 1–3. Each P^* level would have a corresponding L_{F30} that would serve as the minimum size at the chosen L_{ABC} .

Specifying Annual Catch Limits

The ACL specification process under Tier 6 would involve method 4 (see Figure 1). Similar to the general ACL specification process, the Council could review the L_{ABC} and apply a buffer to account for other sources of uncertainty (i.e., only management uncertainty in this particular case) to specify the L_{ACL} . Tier 6 focuses only on the management uncertainty because of the data limited nature of the stock where the efficacy of implementing proper management for these stocks would rely on effective monitoring, compliance, and enforcement. The scoring would follow the structured Social, Economic, Ecological and Management (SEEM) Uncertainty Analysis process developed by Hospital et al. (2019) but with focus only on the management dimension.

Specifying Accountability Measures

The Tier 6 control rule utilize rates that have an inherent lag effect compared to the control rules from Tier 1–3 that utilize catch-based AMs where the catch is known (especially if in-season AMs are used) and can be monitored against the ACL. Since the F would be based on length, the Council and NMFS would monitor the SPR derived from annual average length and F compared to that length with the SPR_{TARGET} . At the end of each fishing year, PIFSC would calculate the

annual average length, F, and SPR. Tier 6 would likely utilize method 4 for the specification of AMs (Figure 1).

Length-based control rules are sensitive to annual changes in length, which can be affected by selectivity and changes in effort. Recognizing the variabilities associated with the approach, a three year running average of the SPRs would be used similar to the catch-based approach that typically utilizes a post-season overage adjustment. The three-year average SPR would be compared to the SPR_{TARGET} determined by the SSC. NMFS technical guidance recommends a range of SPR between 0.3 to 0.4, which would also ultimately be determined by the SSC.

The AMs are designed to be a stacked set of management measures that could bring the SPR above the SPR_{TARGET} within a single fishing year as necessary. The management measure(s) applied to the following fishing year would depend on how much less the three-year average SPR is relative to the SPR_{TARGET} . All provisions are geared to reduce F and prevent overfishing from occurring.

There are various management measures (i.e., seasonal and area closures, bag limits, gear restrictions, minimum size and slot limits, etc.) that could be applied to reduce catch rates within the territorial BMUS fisheries. However, minimum size is one measure likely not appropriate to employ for bottomfish. Doing so would likely lead to substantial mortality for regulatory discards as a result of barotrauma in deepwater snappers.

Given the data limited nature of the territorial BMUS fisheries, the proposed AMs are a suite of non-prescriptive measures that can be applied after a thorough review of the biological reference points. To aid in the decision making process, AMs should be considered as part of the assessment. Reviewing a suite of AMs through a scientific process (i.e., WPSAR, MSE, etc.) that is then vetted through the Council process (i.e., public, advisory panel, SSC, and Council review) would offer flexibility in the tools managers could use to more efficiently implement AMs to support increasing biomass with minimal consequences to fishery development.

The Council could use the following conservation and management measures (identified under method 4 in Figure 1) to implement AMs that ensure biomass and fishing effort are at sustainable levels.

Slots, minimum size, bag limits, areas closures, trip limits, gear restrictions, and other possible measures (with the ability to phase-in or cascade) are management measures that would require further analyses to better understand the impact on the stock and its biological reference points. For example, if the resulting F leads to an SPR below the SPR_{TARGET} , a process would be initiated for the Council's Fishery Ecosystem Plan Teams to develop options that would then be vetted through the Council and its advisory bodies before being submitted to NMFS Office of Sustainable Fisheries for final approval.

By keeping method 4 non-prescriptive with various options, the Council and NMFS could explore the best approach or suite of approaches given the needs of the fishery at the time. Additionally, once stock assessments become available, a variety of options would be readily available to monitor and augment the estimate of F.

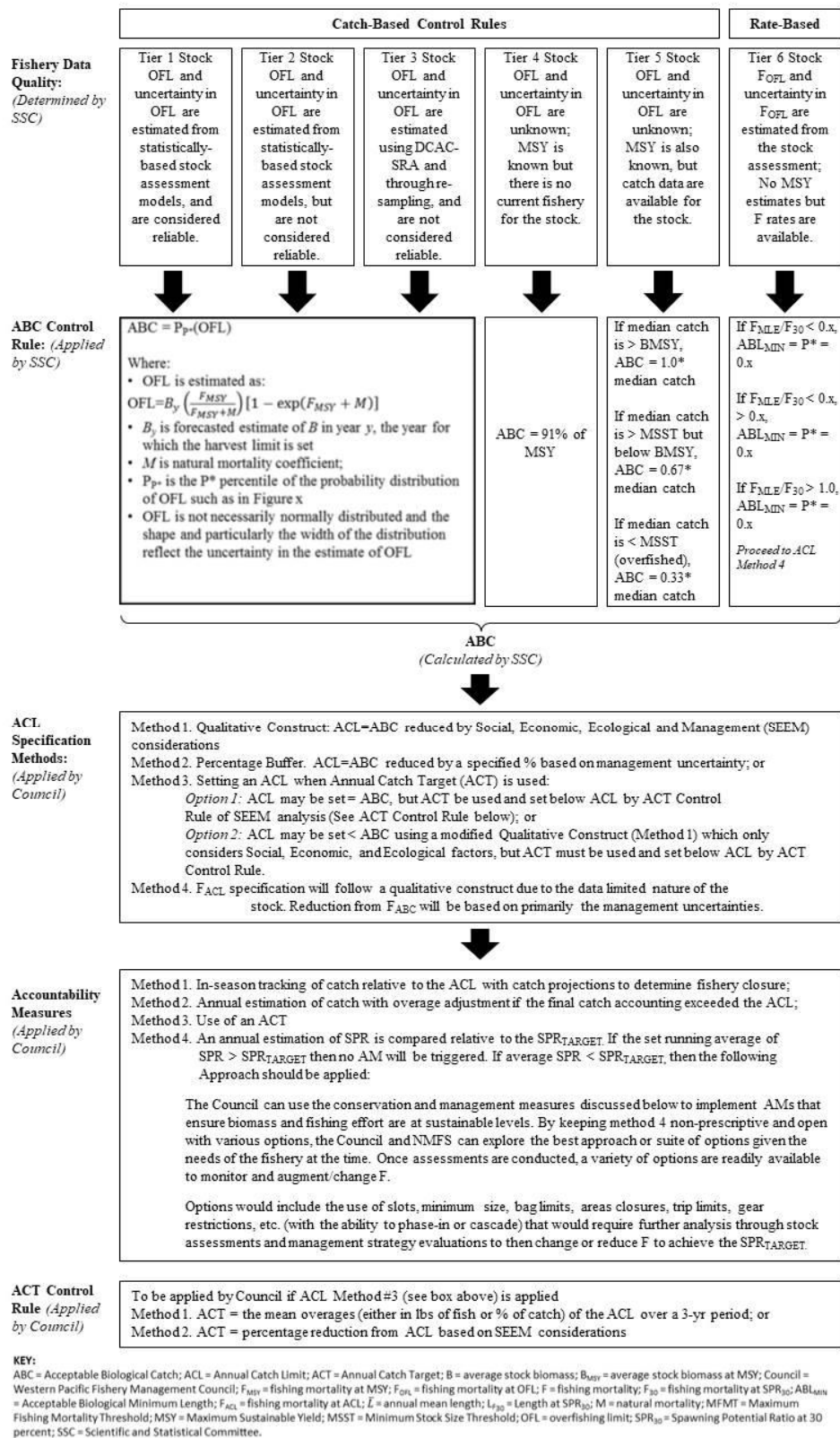


Figure 1. Schematic of proposed method for setting ABCs and specifying ACLs and AMs

References

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