

GROUND FISH MANAGEMENT TEAM REPORT ON HARVEST SPECIFICATIONS FOR 2023-2024 INCLUDING FINAL OVERFISHING LIMITS AND ACCEPTABLE BIOLOGICAL CATCHES

Based on the information provided in [Agenda Item E.3.a, GMT Report 2](#) and guidance from the National Marine Fisheries Service (NMFS), the Pacific Fishery Management Council (Council) may decide to re-evaluate select species within the current stock complexes. The Groundfish Management Team (GMT) provides information on potential pathways to address those species.

Additionally, GMT discussion on mortality and overfishing limit contributions for species within stock complexes ([Agenda Item E.3.a, GMT Report 2](#)) identified larger concerns around current stock complex compositions. The GMT does not currently have the time nor workload capacity to address these issues, nor do we think they need to be resolved during the 2023-2024 biennial process. However, we raise these items for the Council's future consideration.

Definition of Complexes

The revised National Standard 1 guidelines¹ and [Amendment 23](#) to the Groundfish Fishery Management Plan (FMP) incorporated a framework for managing stock complexes, which are aggregations of stocks managed in a single unit under harvest specifications. Stocks managed in a complex should be sufficiently alike in geographic distributions, life histories, and vulnerabilities to the fishery such that the impacts of management actions on the stocks are similar. At the time a stock complex is established, the FMP should provide a full and explicit description of the proportional composition of each stock in the stock complex, to the extent possible. Stocks may be grouped into complexes for various reasons, including where stocks in a multispecies fishery cannot be targeted independently of one another and maximum sustainable yield (MSY) cannot be defined on a stock-by-stock basis, where insufficient data exist to measure their status relative to status determination criteria (SDC), or where it is not feasible for fishermen to distinguish individual stocks among their catch. The vulnerability of stocks should be evaluated when determining if a particular stock complex should be established or reorganized, or if a particular stock should be included in a complex. Vulnerability is a function of the stock's productivity and its susceptibility to the fishery and is discussed more below.

Current Stock Complexes

The groundfish stock complexes that are currently used in management were created prior to the National Standard 1 revision, and are an evolution of what used to be a "Sebastes" complex in the 1990s, which means that many of the guidelines outlined above were not considered during their creation. As a result, current complexes do not have practicable indicator stocks, which are stocks with measurable status determination criteria that can be used to help manage and evaluate more poorly known stocks that are in a stock complex, because many of the complexes have a mixture of vulnerability scores and overfishing limit (OFL) contribution proportions. The GMT views the use of stock complexes as integral to the management process because there are too many species to manage individually, many minor stocks have too little information to inform stock status, and

¹ <http://www.gpo.gov/fdsys/pkg/CFR-2010-title50-vol8/pdf/CFR-2010-title50-vol8-sec600-310.pdf>

efficiencies need to be created while mitigating risk of overfishing. However, the GMT does recognize that there is room for improvement in how we organize groundfish stocks into complexes, and, given the showcase on this issue, the GMT would support a comprehensive approach that takes into account all of the complexities and facets, outside of the 2023-2024 biennial process. If full restructuring to align complexes to the National Standard 1 guidelines is undertaken, then indicator species, as well as potential inflator stocks, should be addressed and are discussed more below.

Pathways to Address Species within Complexes Needing Action as Part of the 2023-2024 Biennial Process

If the Council identifies that changes are needed as part of the 2023-2024 biennial process, the GMT sees two possible pathways, described below.

Pathway A - Remove Species from Complex

One option would be to remove a species from its complex and set a species-specific OFL, acceptable biological catch (ABC), and annual catch limit (ACL). Those harvest specifications would also need to be calculated for the species remaining within the complex. Subsequent steps would need to be taken to determine the species-specific off the top deductions, sharing between and within sectors, and individual fishing quota (IFQ) allocations (where applicable). The Council used this pathway previously with black rockfish and chilipepper rockfish. Developing those species-specific values, as well as the value for the remainder of the complex, may be challenging. Management measures would then need to be developed to keep mortality within that new species-specific ACL. Similarly, the remainder of the complex may need new management measures to keep mortality within its new ACL. The GMT sees this as the more complicated pathway due to the many steps involved. The workload associated with this pathway should be considered carefully and in relation to all of the other components involved in the biennial process. Alternatively, this pathway could move forward along with the additional complex considerations discussed below outside of the 2023-2024 biennial process.

Pathway B - Implement Management Measures to Reduce Mortality

An alternative option would be to keep the species within the complex but implement species-specific management measures to keep mortality within the species-specific OFL, ABC, and ACL contribution to the complex. Measures could include: setting a harvest guideline (HG) for the individual species or developing commercial trip limits and/or recreational bag limits in order to limit mortality and reduce the likelihood of removals exceeding the species-specific ACL contribution to the complex. The Council has used this pathway previously with blackgill rockfish in the shelf rockfish complex south of 40° 10' N lat. by setting an HG equal to the ACL contribution to then use for trawl/non-trawl allocations. Additionally, the California Department of Fish and Wildlife (CDFW) has implemented a sub-bag limit in the recreational fishery and a sub-trip limit for the commercial fishery for vermilion/sunset rockfish south of 40° 10' N lat. to reduce impacts to that species within the complex, based on recent mortality exceeding the species-specific OFL contribution. The GMT sees this as being the simpler pathway for inclusion in the 2023-2024 biennial process.

Further Considerations for Stock Complexes, Outside of the 2023-2024 Biennial Process

Our discussion about complexes containing species whose annual mortality has exceeded the species-specific OFL contribution led to the need to consider how to address stock complex issues that are outside of the scope of the biennial process. We provide information on those topics for future consideration by the Council at this time, since they relate to the broader complex discussion. We reiterate, **the GMT is not recommending that the below be included as part of the 2023-2024 biennial process, but rather be considered during future workload planning and prioritization.**

Update Productivity and Susceptibility Analysis

The Productivity and Susceptibility Analysis (PSA) conducted in 2011 is a risk assessment approach consisting of 10 productivity and 12 susceptibility attributes, each scored on a three-point scale of high (3.0), medium (2.0), or low (1.0), that are summarized to provide an indicator of the vulnerability of a species or stock. A table with the current productivity, susceptibility, and vulnerability scores for all species and details on the methodology can be found in the annual [Stock Assessment and Fishery Evaluation document](#) and in [Cope et al. \(2011\)](#).

The productivity attributes consist of life history characteristics that are thought to correlate with the stock's potential population growth rate. The susceptibility attributes measure a stock's current and potential exposure to a fishery by considering the overlap between the stock and fishing activity, market desirability, degree of management focus, impact to habitat, etc. The attributes were assigned different weights depending on the scorers' view of how important each is to the species and circumstances in the fishery.

The interpretation of susceptibility scores should acknowledge that several of the susceptibility attributes are directly or indirectly affected by management. This means that scores can vary under different management scenarios and depending on the question being asked. For example, the susceptibility of many rockfish decreased substantially when the Council enacted the Rockfish Conservation Areas (RCA). Due to many changes in the management of groundfish fisheries since the 2011 analysis (e.g., Individual Fishing Quota fishery, RCA changes), and the ongoing non-trawl sector area management agenda item, **the GMT believes that the susceptibility scores and inflator stocks should be updated once the non-trawl agenda item is completed, based on fishery conditions and regulations at that time.**

Indicator Stocks

The Magnuson-Stevens Act National Standard 1 Guidelines² were revised in 2016 to, among other objectives, encourage the use of indicator stocks when organizing stock complexes. According to these revised guidelines, stock complexes may be comprised of:

- one or more indicator stocks, each of which has SDCs and ACLs, and several other stocks;
- several stocks without an indicator stock, with SDCs and an ACL for the complex as a whole; or

² Guidelines on stocks and stock complexes can be found at § 660.310 (d) (2) (i).

- one of more indicator stocks, each of which has SDCs and management objectives, with an ACL for the complex as a whole.

An indicator stock is a stock with measurable SDCs that can be used as an indicator of fishing impacts on data-limited stocks that are in a stock complex. If an indicator stock is used to evaluate the status of a complex, it should be representative of the typical status of each stock within the complex, due to similarity in vulnerability. More than one indicator stock can be selected to provide more information about the status of the complex. If the stocks within a stock complex have a wide range of vulnerability, they should be reorganized into different stock complexes that have similar vulnerabilities; otherwise, the indicator stock(s) should be chosen to represent the more vulnerable stocks within the complex. In instances where an indicator stock(s) is less vulnerable than other members of the complex, management measures need to be more conservative so that the more vulnerable members of the complex are not at risk from the fishery. When indicator stock(s) are used, periodic re-evaluation of available quantitative or qualitative information (e.g., catch trends, changes in vulnerability, fish health indices) is needed to determine whether a stock is subject to overfishing, or is approaching (or in) an overfished condition.

Inflator Stocks

An inflator stock is defined as an underutilized stock that may be boosting the complex OFL and masking potential overfishing of other component stocks. Since the current complexes were not created with the revised National Standard 1 guidelines in mind, inflator stocks are likely common throughout currently-defined complexes. Stocks could potentially be screened to see if they are inflating the complex OFL by assessing their proportional OFL contribution and their OFL contribution attainment. However, care should be taken when assessing whether stocks are under attaining their contribution, because there are management measures that may limit access to those stocks (e.g., non-trawl RCA limiting yellowtail rockfish attainment). The GMT can identify potential inflator stocks if the Council moves forward with a comprehensive review of complexes.

Stocks Without Species-Specific OFL Contributions

There are a select number of species included within current stock complexes that lack species-specific OFL and ACL contributions. These species may lack OFL contributions due to infrequent observations in the fishery, potentially indicating limited occurrence in specific management areas. Some of these species could be considered for designation as an Ecosystem Component species (EC) within the groundfish FMP. EC species are not in the fishery and therefore not actively managed, nor are they targeted or generally retained for sale or personal use. However, there are also a subset of species without OFL contributions with non-negligible average annual and total removals since 2002. As an example, between 2002 and 2020, the total mortality of flathead sole was 656 mt, averaging 35 mt per year in the absence of a species-specific OFL contribution to the Other Flatfish complex. Future management of species without species-specific OFL contributions may benefit from scientific analysis to estimate OFL contributions based on existing category 3 stock assessment methods (SSS: Simple Stock Synthesis; DB-SRA: Depletion-Based Stock Reduction Analysis; or DCAC: Depletion-Corrected Average Catch). If sufficient data are available to support a category 3 stock assessment method, having species-specific OFL contributions can allow management to better understand the possible impacts of current removal levels to these stocks. Otherwise, an indicator stock or stocks of similar vulnerability within the complex could be used to help manage and evaluate these more poorly known stocks.

Table 1. Vulnerability scores, average annual mortality (mt), and total mortality (mt) between 2002 and 2020 for species without species-specific OFLs. Mortality data from the Groundfish Expanded Multi-year Mortality Report (GEMM). Stocks in bold indicate stocks where there have been non-negligible annual mortality between 2002 and 2020.

Species	Management Area	Vulnerability	2002-2020 Average Annual Mortality (mt)	Total Mortality 2002-2020 (mt)
Chameleon Rockfish	Minor shelf rockfish (North of 40°10' N. lat.)	2.03	0.00	0.00
Dusky Rockfish		1.99	0.00	0.02
Freckled Rockfish		1.44	0.00	0.00
Halfbanded Rockfish		1.26	0.01	0.16
Harlequin Rockfish		1.94	0.01	0.25
Pinkrose Rockfish		1.82	0.00	0.00
Pygmy Rockfish		1.42	0.18	3.34
Calico Rockfish	Minor nearshore rockfish (South of 40°10' N. lat.)	1.46	0.90	17.15
Chameleon Rockfish	Minor shelf rockfish (South of 40°10' N. lat.)	2.03	0.14	2.60
Freckled Rockfish		1.44	0.06	1.05
Halfbanded Rockfish		1.26	5.44	103.44
Mexican Rockfish		1.80	0.29	5.53
Pinkrose Rockfish		1.82	0.02	0.40
Pygmy Rockfish		1.42	0.00	0.02
Butter Sole	Other flatfish	1.18	2.22	42.11
Curlfin Sole		1.23	10.76	204.37
Flathead Sole		1.92	34.54	656.24

PFMC
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