GROUNDFISH MANAGEMENT TEAM REPORT ON RISK MANAGEMENT FRAMEWORK

The Groundfish Management Team (GMT) views risk management as an important issue for West Coast fisheries. At a high level, the overarching goal of this effort is exploring options for implementing the biological conservation mandates of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) while better serving the needs of fishing industry and fishing communities.

Summary
In this report the GMT offers some framing thoughts on risk management; summarizes, comments on, and adds to the risk management ideas proposed to date; and recommends that the Pacific Fishery Management Council (Council) create two working groups to further explore those ideas. One working group would address reference points and risk assessment, and the second one would cover ideas related to Council allocation framework and management measure structures.

Background
Risk management, broadly speaking, refers to making decisions under uncertainty. We define risk here as the probability of an undesirable outcome happening (Francis and Shotton, 1997). In the case of fisheries, risk management involves making policy decisions to achieve multiple, often conflicting management objectives, both biological and socio-economic, without perfect knowledge as to the outcomes of the policy alternatives under consideration. Top-level, legally mandated strategic objectives are preventing overfishing while achieving optimum yield. There are two main types of risk that must be balanced by fisheries managers: risk to the resource (biological risk) and risk to industry and fishing communities (socio-economic risk), recognizing that risk to industry is not independent of risk to the resource. We note that resource considerations include habitat, protected species, ecosystem function, intrinsic value, etc., but limit this discussion to stock considerations (e.g., biomass relative to biomass reference points).

An undesirable biological outcome is defined in the MSA: we wish to avoid being in an overfished state, or, to put it in MSA language, to avoid jeopardizing the capacity of a stock to produce the maximum sustainable yield (MSY) on a continuing basis (overfishing). This has been operationalized to mean keeping the stock above the minimum stock size threshold (MSST), which is the level below which recruitment is being impaired.

Unlike the undesirable biological outcomes we wish to avoid, undesirable socio-economic outcomes are not clearly defined in the MSA or the Pacific Coast Groundfish Fishery Management Plan (FMP), and the scientific uncertainty associated with their evaluation is rarely quantified. The MSA requires us to consider equitability (NS 4), efficiency in the utilization of fishery resources

(NS 5), and minimizing adverse effects of management measures on fishing communities (NS 8). Because ex-vessel revenue is readily available, most economic impact analyses of management alternatives (on commercial sectors) use this metric and the things that can be readily calculated from it to represent all aspects of adverse socio-economic impacts. However, to more accurately weigh risk to the resource against risk to fleets and fishing communities, we need to be specific about the socio-economic outcomes we wish to avoid. For example, these outcomes could include participants exiting the fleet or fleet consolidation, processing plant loss and consolidation, loss of income and welfare loss for recreational anglers and for-hire businesses, loss of sales and employment for fishing communities, and welfare losses to consumers from higher seafood prices. Once those are defined, their likelihoods and relative severities can be evaluated. The GMT notes that recent Council initiatives in gathering better socio-economic fisheries data and improving our use of socio-economic information in Council decision-making should improve our understanding, measurement, and incorporation of socio-economic risk. These initiatives include Special Project 2, the recent economics workshop, and the Pacific Fishing Effort Mapping Project.

Not all management goals can be realized simultaneously. There is a trade-off between year-to-year quota stability and the magnitude of long-term yields. Low constant quotas would provide stability but miss out on potential increases in optimal yield based on year-to-year variation in the stock if quotas are set too low. The trade-off between stability and yield-maximization should be acknowledged and could be further explored under this risk management agenda item.

Another important factor that needs to be considered is the timeframe over which we are considering risk as well as weighing short-term against long-term risks. For example, exceeding the fishing mortality rate that produces MSY in a single year, especially if that exceedance is small and/or the stock is at high abundance, carries very little risk of pushing the stock into an overfished condition, whereas fishing at that rate for several years carries larger risk to the stock. Similarly, higher catch levels may reduce short-term risk to industry, but this needs to be weighed against increased risk to the stock, which may necessitate lower catch levels in the future and result in short-term and potentially long-term negative socio-economic outcomes (fish now versus fish later).

With those considerations in mind, the two primary problems identified for the 'Risk Management' agenda item in Attachment 1 are 'Instability in harvest specifications and fishing opportunities' and 'Underutilization of the resource, specifically due to constraining or choke stocks.' The GMT agrees that these are major challenges facing West Coast fisheries and would like the Risk Management problem statement to also consider additional points. Collectively, the following encompass the items to inform a future problem statement for this action:

- Instability in harvest specifications and fishing opportunities,
- Underutilization of the resource, specifically due to constraining or choke stocks,
- Socio-economic/fishery stability, considering long term versus short term stability
    - The need to identify specific socio-economic outcomes we wish to avoid
- Trade-offs in risk to the resource versus risk to fishing communities; trade-offs between increasing stability versus increasing opportunity
- Analytical capacity / capacity of the management system overall
- Time frame over which we are considering risk, short-term vs long-term

Instability

Large swings in catch advice are disruptive, and stability is a legitimate management objective. From the GMT's perspective, dampening the effects of swings in catch advice is a promising way to tackle instability, and we summarize ideas described in Attachment 1 and the Washington Department of Fish and Wildlife (WDFW) Report 1 that can address this in Table 1 below. We note that stability is most often invoked when the annual catch limit (ACL) is set to decrease; increases are rarely met with the same caution – though the 2025 rougheye/blackspotted rockfish assessment is an example of when an increase was met with caution as well. If stability in fishery harvest limits is valued, it should consistently apply in both directions.

Underattainment

Many stocks managed in the groundfish FMP are underattained (i.e., mortality is consistently and notably below the ACL), but this is not always a management concern in and of itself. When underattainment is not due to management, those root causes generally cannot be addressed within the management process (such as with ACLs, allocations, and associated management measures). In those cases, underattainment of these stocks could be more related to market demand rather than management, meaning underattainment may not be a problem that could be addressed under this agenda item. However, when a stock is underattained while also constraining one or more sectors, there is a management problem. In this case, the reasons for the underattainment and potential solutions should be identified. In some cases, underattainment of constraining stocks points to a problem with the allocation structure, including the inability to move unused allocation to where it can be harvested. Underattainment can also be driven by vessel-level risk management, where individual vessels are avoiding constraining stocks. In this case, the avoiding sector's (or vessel's) unused allocation functions as insurance against encounter risk and outright reallocation would reduce "insurance" quota, increasing the risk of ending a vessel's fishing activity for the year. Ideas have been proposed in the literature and elsewhere for addressing this kind of situation, and many involve the use of risk pools in some fashion (Townsend and Walker, 2022; Holland and Jannot, 2012). We do not go into details in this report about what this could look like but note that greater flexibility to move unused allocation within or between sectors (not permanent reallocation) could provide a solution and should be further evaluated under the trawl follow-on action.

Table 1. Summary of ideas described in Attachment 1 and WDFW Report 1, with additions from the GMT. For each idea (Item), we identify the problem the item is meant to address, make notes on prioritization and process for addressing it, and provide general comments. Green shading indicates a Policy Workshop grouping. Blue shading indicates a Management Measures workshop grouping.

Item	Target Problem(s)	GMT Priority	Where/How to Address	Comments
Alternative Stock Assessment Methods	Stability, capacity	Medium	Could be addressed by Science Centers through ongoing development of alternative stock assessment methods/tracks	Explore conceptually through research track assessments – give research STATs maximum flexibility to explore methods, maintaining science/policy separation, though scope does not need to include or be limited to ensemble models

Process for less resource-intensive way to screen lower priority species	Capacity	Medium	Currently being addressed by Science Centers through alternative stock assessment methods	Could use indicators to flag species in need of more resource-intensive assessments
Re-evaluate OFL Harvest Policy/ Management targets and thresholds	Stability; risk trade-off	High	Could be addressed through a Harvest Policy Workshop; May need Management Strategy Evaluation	lowering biomass targets may lead to less long-term stability; constant catch rules would lead to more stability but lower long-term yields; this includes WDFW 'pretty good yield' topic
Multi-Year Catch Policy for determining overfishing	Stability; risk trade-off	High	Could be addressed through a Harvest Policy Workshop	Relatively low impact item, since it is retrospective only
Alternative Definition of Overfishing	Stability; risk trade-off	High	Could be addressed through a Harvest Policy Workshop; may need Management Strategy Evaluation	Operational definition of overfishing is in NS1, not the MSA. Exceeding F_{MSY} in a single year does not, in most cases, jeopardize the capacity of the stock to produce MSY
Re-evaluate the P*/Sigma Framework	Stability; risk trade-off	High	Could be addressed through a Harvest Policy Workshop; may need Management Strategy Evaluation	This is also the WDFW 'Incorporating risk-yield procedures into the FMP' topic
Formalize Risk Tables	Risk trade-off	Active Development	Currently required for 2027-28 assessments via TOR revisions at this meeting	If further formalization is desired, this would require an FMP amendment and standalone Council Agenda Item. The utilization of Risk Tables may also require further action, after development of the tool is finished.
ACL Projection Assumptions	Attainment	Active Development	Partially addressed via TOR revisions at this meeting, implementation may require further development	While the TOR does provide for the ability to produce results utilizing alternative catch streams, the use of these alternative streams may require further action.
Mixed-Stock Exception	Attainment / choke stocks	Low	Technical interactions are being addressed under stock complexes	Has high analytical burden; unlikely to be readily feasible; suggest this be considered after stock complexes and definitions are finalized

Trawl Follow-on	Attainment / choke stocks	High	Trawl follow-on is currently on the agenda for March 2027; these actions could be added to the follow-on list.	For lightning strike and incidentally caught species; part of trawl follow-on; opportunity for ideas that address economic performance directly; IFQ Risk pools, deemed value, vessel accumulation limits
Review Allocation and HG Frameworks (including At-Sea Set-Aside Management)	Attainment / choke stocks	High	Could be addressed through a Management Measures Workshop	Could include a holistic review of existing allocation frameworks and inter- and intra-sector accountability measures.
Multi-Year Avg. Catch Policy for Implementing Inseason AM	Stability/ attainment	High	Could be addressed through a Management Measures Workshop	In part, a discussion on expectations regarding allocation/HG exceedances for all sectors
If-Then Frameworks	Efficiency	Low	Consider building these into other items	
Structured way to evaluate economic vs. conservation trade-offs	Risk trade-off	High	Could be addressed in part in the Socioeconomic Working Group; defining undesirable socio-economic outcomes could be done during the Management Measures workshop	Taking into account uncertainty not only in biological but also socio-economic outcomes; this might necessitate going beyond single-species approaches, too. If quotas for one stock are reduced, there is some switching to other stocks which alters the socio-economic outcomes. This would also align well with an opportunity to better define undesirable socio-economic outcomes

Moving Forward/Implementation

The GMT supports having dedicated workshops and/or working group meetings to move the ideas listed in the table above forward and develop additional ideas. In our minds, portions of the table ideas fit into two broad categories suitable for workshops/working groups: 1) reference points and risk assessment (green highlight in table); and 2) Council allocation framework and management measure structures (blue highlight in table). The first category is very technical in nature and requires involvement by the Scientific and Statistical Committee and Science Centers as well as participation by industry. This category has a heavier analytical component, and its ideas could take longer to develop and test. The second category could benefit from heavy involvement by National Marine Fisheries Service West Coast Region policy representatives, the GMT, and the Groundfish Advisory Subpanel (GAP). Each category should have a dedicated working group, recognizing that some individuals would participate in both, and broad participation should be encouraged to the extent practicable. It would be beneficial to have economists participate in both working groups.

Recognizing time and budget constraints, the groups could meet via a series of webinars, with the understanding that individuals within the groups could be responsible for carrying out analyses in support of the groups' progress. Ideally, in-person meetings could be held to foster maximum engagement and productivity. The GMT requests Council Staff and Executive Director Burden discuss potential options for webinar and/or in-person workshops to best facilitate the goals and objectives of this item. Scheduling should be done to allow participation in both working groups, to the extent possible.

Bibliography & Related Reading

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