# Stock-specific Objectives and HCRs for Redfish

**AGC Request:** Potential ‘Straw-Man’ Stock-Specific Objectives and Harvest Control Rules (HCR)for DFO toutilize or otherwise amend, for tabling to respective advisory committees in accordance with a timeline to be articulated by February 28, 2023.

These illustrationsare drawn from existing approaches to various domestic, transboundary and straddling redfish stocks off Eastern Canada, and are intended exclusively to facilitate discussion by the respective advisory committees and should in no way be interpreted as confirmed fishery objectives and harvest decision rules. It is important to note that departmental activities and timelines are subject to resource availability, other priority items and in some instances, other management organizations (i.e. North Atlantic Fisheries Organization - NAFO).

## Units 1 and 2

The following high-level stock-specific and fishery objectives and HCRs are informed by the most recent available Management Strategy Evaluation (MSE) conducted in 2018, as well as by applicable elements of objectives and HCRs from other redfish stocks. However, it should be noted that the Redfish Unit 1 + 2 MSE (2018) was completed in 2018, but the Objectives/HCRs were not officially adopted by the Redfish Advisory Committee (RAC) for the following reasons:

* + MSE (2018) is based on limited fisheries data from index and experimental fisheries due to moratorium since 1995.
  + Operational models were developed before the fish were recruited, so the stock dynamics may have changed and this MSE may not be applicable, new Science needed.
  + S. mentella status changed to Healthy Zone from when the 2018 MSE was completed ([Science Advisory Report 2020/19](https://statics.teams.cdn.office.net/evergreen-assets/safelinks/1/atp-safelinks.html)).

Further, no empirically-derived Reference Points have been discussed at the RAC, and certain reference points remain to be established.

**Illustrative Stock and Fishery Objectives**

Stock Objectives:

* Increase the spawning stock biomass (SSB) of *S. mentella* and *S. fasciatus* above the Limit Reference Point (LRP) and into the Healthy Zone (i.e., above the Upper Stock Reference (USR) point).
* Maintain SSB of *S. mentella* and *S. fasciatus* above the Critical Zone, and in the Healthy Zone (i.e., above USR).
* Avoid a decline in biomass below an established reference point.

Fishery Objectives:

* Mitigate steep declines in biomass.
* Avoid large inter-annual fluctuation in TACs.
* Maximize the duration of high annual catch.

**Illustrative Harvest Control Rules**

The following Harvest Control Rules are based on the best available guidance from the Precautionary Approach (PA) decision-making framework for implementing harvest strategies where one does not currently exist ([Annex 1b](https://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/precaution-eng.htm)). It should be noted that empirically-based models and stock-specific HCRs have not been developed for Unit 1 + 2, and therefore the empirical values symbolized in the variables below cannot be defined at this time.

A placeholder HCR for Unit I + 2 Redfish could resemble:

* When the stock biomass is in the Healthy zone (i.e., above USR), TAC would be set to a maximum exploitation rate [x]%, which is less than Fmsy.
* When the stock biomass is in the Healthy Zone (i.e., above USR) and the stock biomass exceeds an established reference point, TAC can increase above the Healthy Zone maximum exploitation rate [x]% to an increased maximum upper limit of [y]%.
* When biomass is in the Cautious Zone (i.e., < USR but > LRP) the TAC would be set to a lower maximum exploitation rate than when in the Healthy Zone.
  + Furthermore, the exploitation rate would be progressively lowered as the stock trend declines within the Healthy Zone.
  + e.g., TAC is set to a maximum exploitation rate of [x]% when biomass is near the upper portion of the USR threshold.
  + If biomass declines (or is on a declining trajectory), TAC could be lowered to [y]% as biomass declines towards the middle range of USR, and further reduced to [z]% when at the lower range within USR.
* When biomass is in the Critical zone (i.e., below LRP), exploitation rate would be kept to an absolute minimum (or no directed fishing), with TAC set to a low maximum exploitation rate that is consistent with the rebuilding of the stock and permits growth of the stock (conservation considerations prevail).
  + e.g., TAC is set to a maximum exploitation rate of [x]% when biomass is below LRP
* When biomass is in the Critical zone, bycatch of Unit 1 and 2 redfish should be restricted to unavoidable by-catch in fisheries directing for other species.

**Potential Stakeholder Consultation Timelines:**

Stakeholders will be consulted on the proposed hypothetical HCRs and fishery objectives through the Redfish Advisory Committee (RAC). Timelines for when a RAC meeting to discuss management measures, including HCRs and fishery objectives, are subject to the timing of an access and allocation decision and further consultations to finalize RAC membership. It is anticipated this discussion will take place in late 2024. For Unit 2 specifically, these HCRs will need to be brought to the Canada France Advisory Committee following domestic consultations, given the shared management of this stock.