

DRAFT 2021 OFL CV Decision Criteria Table for Scup

Decision Criteria	Summary of Decision Criteria Considerations	Assigned OFL CV Bin (60/100/150)
Data quality	<p>Surveys</p> <ul style="list-style-type: none"> • Synoptic surveys over the stock area include the NEFSC spring and autumn bottom trawl surveys, but these surveys show large interannual fluctuations that reflect availability rather than abundance in any single year. • Surveys generally rarely catch fish age three and older, although older ages are present in commercial and recreational catch at ages. Other surveys do not cover the stock area, and most catch few fish over age 2. <p>Landings and discards</p> <ul style="list-style-type: none"> • Commercial landings have been well sampled for length and age since 1995. • Commercial discards have been fairly well sampled since 2000, although discard observations are highly variable and skewed. • New MRIP data were used to estimate recreational landings and discards. • About 44% of the total catch in weight is based on new MRIP estimates. • Length sampling of recreational landings has generally been adequate since 1988. • Recreational discard is low. 	
Model appropriateness and identification process	<ul style="list-style-type: none"> • The assessment model is based on a complex statistical catch-at-age model (ASAP SCAA). • Catch is modelled as four fleets (commercial and recreational landings and discards). • Life history does not require special model efforts. • About 25 different configurations were explored in earlier benchmark. • The effect of new MRIP estimates on continued validity of prior sensitivity analyses depends on the magnitude of the change. Because proportion of landings attributable to new MRIP estimates is relatively low, we could expect sensitivity analyses to remain valid. • Biological reference points were updated in the latest assessment. 	
Retrospective analysis	<ul style="list-style-type: none"> • Retrospective patterns were minor: F overestimated by 20% and underestimated SSB by 14% over the last seven terminal years. • Adjusted 2019 estimates were within the model estimate 90% confidence intervals. • General trends in retrospective patterns for SSB, R, and F have been consistent for the past 10 years. 	
Comparison with empirical measures or simpler analyses	<ul style="list-style-type: none"> • Age structure in fishery and survey catches has been expanding since the 1990s. • Aggregate survey indices are near time series highs. 	

	<ul style="list-style-type: none"> • Several large recruitment events likely gave rise to survey index highs. • Given the potential effects of availability in any given year, swept area estimates of biomass are less reliable than for some other stocks. 	
Ecosystem factors accounted	<ul style="list-style-type: none"> • No ecosystem factors were considered in the assessment, but mean weights at age and maturity have been declining. • Previous assessments examined thermal habitat models to evaluate factors affecting availability, but no strong effects were observed. 	
Trend in recruitment	<ul style="list-style-type: none"> • Although the year classes in 2014 and (especially) 2015 were above average, the 2016 – 2019 year classes were below average. • OFL projections were sampled from estimated recruitment for 1984-2019. 	
Prediction error	<ul style="list-style-type: none"> • No estimate of prediction error is feasible at this point, given the inclusion of revised MRIP data in the updated assessment and attendant effects on biomass estimates. However, the updated MRIP data lead to relatively little changes in estimates of F and SSB of Scup, so prediction error is unlikely to increase. 	
Assessment accuracy under different fishing pressures	<ul style="list-style-type: none"> • Fishing mortality declined by more than four-fold over the assessment series, while SSB increased more than ten-fold. • Fishing mortality in the past 17 years has been low, but increases in SSB, R, C, and survey indices are consistent. 	
Simulation analysis/MSE	<ul style="list-style-type: none"> • No formal MSE-type analyses have been conducted for this stock. 	

Draft Narrative

There is high data quality, as well as consistency of signals, from surveys, catch-at-age, and model results; the data agree with theory throughout. There is also a relatively low effect of revised MRIP estimates; only minor retrospective patterns in the statistical catch-at-age model, and the unlikelihood that additional adjustments (e.g., for ecological factors or below-average recruitment in the past three years) would increase uncertainty. Several surveys show declines or low abundance in early years to record lows in the mid-1990s and increases in abundance thereafter. Age structure in surveys shows a decline or low abundance of older ages in survey catches in early years and increases in abundance of older ages in recent years. Age structure in commercial landings-at-age and recreational landings-at-age show similar trends of increasing abundance of older ages in the stock. Several large recruitment events have been indicated by survey indices. In combination, these trends are consistent with lower fishing mortality rates in recent years, and increasing stock abundance as indicated by model results. Although up to 44% of the catch weight is attributable to the recreational fishery, the increase in recreational catch related to new MRIP estimates is relatively low in comparison to other stocks. There has been no obvious trend in recent recruitment over the past decade, although a declining trend in recruitment is beginning to emerge, so adjustment of projected recruitment currently appears unwarranted. There is no discernable impact of thermal habitat on interannual variation in availability, so adjustment of survey indices to account for thermal habitat effects also appears unwarranted.