Review of the Dusky Update Assessment – 2016

Review by Liz Brooks (Liz.Brooks@noaa.gov)   31 August 2016

Summary:

In my evaluation of this update report, I find that all ToR have been addressed. This was a very comprehensive update, with a good summary of the data inputs, model configuration, base run and sensitivity results and projections. I respond to the ToR below, and offer some specific comments on each ToR. My comments are in blue font for ease in distinguishing them from the ToR.

Specific comments on each ToR:

1. Evaluate whether the assessment updated all data inputs (to 2015) used in the SEDAR 21 base run and the four plausible states of nature identified in the SEDAR 21 peer review.
2. Evaluate whether the assessment documented any changes or corrections made to the input datasets, if applicable, and provided updated input data tables.

These two ToR are most easily addressed together. Updated data sets included the 5 indices of relative abundance (VIMS, LPS, BLLOP, NELL, and PLLOP), and the 3 relative effort series (BLL, REC, PLL). Length/age composition for informing selectivity and life history data were not updated. I consider this appropriate, as the selectivity and life history data were entered into the model as constants, not estimated as parameters, and there is no intent to change settings for fixed parameters from the values approved in SEDAR 21. Adding the additional years of data the relative effort series and then restandardizing was done, and the new results were plotted with the results from SEDAR 21. For the LPS index, there were substantial differences in the updated index in 1988 and 1993 (Fig 2.3), although I did not see any explanation or hypotheses offered to explain the difference in these 2 years. The LPS collects fisheries dependent data through interviews of rod and reel anglers, and it is difficult to imagine why adding a few years of data at the end of the time series would cause differences to the early part of the series. Those years did not appear to influence the model fit, but it is still an unexpected result for the index and I would recommend trying to understand what was different—though I fully recognize that sometimes it is not possible to track down such details (and if that is the case, it could simply be stated that an effort was made to understand the differences but no explanation was found). Updated input data tables were provided.

3. Evaluate whether the assessment documented any changes or corrections made to the modeling approach and justified those changes, if appropriate.

No changes to the modeling approach were identified.

4. Evaluate whether the age-structured catch-free production model used was configured properly and used consistent with the approach and structure used in SEDAR 21.

Given the nature of the data for dusky shark, I feel that the catch free model was configured properly and is consistent with SEDAR 21. There were several improvements introduced between the 2005 assessment and SEDAR 21, and these were maintained with this 2016 update. All sensitivity cases identified at SEDAR 21 were also updated and projected, so I feel that this ToR was met. I note that no recruitment deviations were estimated for the stock recruit curve, meaning that the Beverton-Holt function was fit exactly. As there are no recruitment indices, it is not expected that recruitment deviations could be estimated. Furthermore, one would not expect a lot of process error for this life history type. Nevertheless, it was noted that the estimate of pup survival was higher than the prior, and the resulting productivity was higher than typically expected for this lifehistory (p25). While this observation led to sensitivity analysis with alternative natural mortality scenarios (which are good hypotheses), it may also be that the pup survival rate estimate is confounded with a small but inestimable amount of process error in the S-R relationship. I note that there are sensitivity analyses to bound higher and lower productivity rates, so this is simply an observation on my part, and I am not recommending any additional runs.

5. Evaluate whether the assessment provided updated parameter estimates and measures of uncertainty, updated estimates of stock status and management benchmarks (*e.g.,Fcurrent/FMSY, SSBcurrent/SSBMSY, SSBcurrent/SSBMSST, MFMT*), and updated projections of future stock status, as conducted in SEDAR 21.

Updated parameter estimates with uncertainty were provided in Table 3.1, estimated stock status and uncertainty are in Table 3.5, and management benchmark estimates and uncertainty are in Table 3.6. It would be useful to see the uncertainty in the estimates of the time series of derived parameters (Tables 3.3, 3.4, and 3.7). Also, it was mentioned that the catch scalar was highly uncertain, but it would be good to know what the CV was on that parameter.

6. Considering that this assessment was an update and that, consequently, the data input streams, the stock assessment model, and the methods used to project stock status were constrained to be the same as those used in the previous SEDAR 21 benchmark stock assessment:

a. Are the relative biomass and exploitation rate estimates reliable and consistent with input data and biological characteristics of this stock and useful to support inferences on the status of the stock?

The fits to the indices, and the estimates of additional variance for each index appear reasonable. The trends in the predicted indices, predicted relative abundance, and relative SSF are consistent with a low productivity stock. The exploitation rates are

consistent with the input relative effort series. The input data were deemed acceptable during the last peer review, and I find nothing new to suggest otherwise; thus, the assessment model estimates are reliable and support inference on status of the stock.

b. Are the conclusions on overfished and overfishing status justified?

The range of management reference points are consistent with a stock with low productivity and long generation times. Taken with (a) above, I find that conclusions regarding overfished and overfishing status are justified.

c. Are the results obtained from stock projections useful and robust to support inferences of probable future conditions?

The assumptions made for the stock projections are consistent with the assessment approach, and all sensitivity cases were updated and summarized to bound the possible range of rebuilding scenarios. There is consistency in the projection results, namely that rebuilding will take a very long time, and this conclusion can be considered robust because the base model and all sensitivity cases suggest time horizons of 2086-2200 (Table 3.8). I believe the projection work fulfilled expectations for an update.

7. Did the stock assessment update report include all the information required to evaluate the work undertaken?

I can find no omissions in this update, but note several uncertainty estimates under ToR 5 that would be of interest. Overall, I found this to be a very comprehensive update assessment.