SEDAR 54 HMS Sandbar Shark

Standard Assessment Terms of Reference

December 2016

1. Conduct a stock assessment of Sandbar Shark using Stock Synthesis (SS) with data through 2015 using the same data inputs used in the SEDAR 21 benchmark assessment model to the fullest extent appropriate. Document any differences between SS and the previous model.

2. Evaluate the input data listed below compared to the SEDAR 21 assessment model data and document any changes or deviations with respect to those data:

   - Updated life history information (age and growth and reproductive parameters)
   - The relative abundance indices vetted in SEDAR 21 and used in the baseline scenario
   - Updated commercial and recreational discard information
   - Updated length composition information
   - Any new data sources that may have become available since SEDAR 21 was conducted and that may be used with SS

   Provide updated input data tables, as appropriate, including any catch (e.g., commercial, recreational, discards) in both weight and number.

3. Provide model parameter estimates and their variances, model uncertainties, diagnostics to determine model performance, including fit to data and convergence, and estimates of stock status and management benchmarks. Provide criteria used to identify the base model run and conduct model sensitivity analysis to address uncertainty in data inputs and model configuration, including model runs that represent plausible alternate states of nature previously identified and vetted in SEDAR 21, as well as other model uncertainties identified during the assessment

4. Project future stock conditions regardless of the status of the stock. Develop new rebuilding schedules only if there is new and unexpected information about the status of the stock. Stock projections shall be developed in accordance with the following:

   A) If the stock is overfished and no new rebuilding schedule is warranted, then utilize projections to evaluate current rebuilding plan (started in 2005, projected to end in 2070):
      - F resulting in 50% and 70% probability of rebuilding by 2070
      - Fixed level or removals (TAC) allowing rebuilding of stock by 2070 with 50% and 70% probability

   B) If the stock is overfished and a new rebuilding schedule is warranted, then utilize projections to determine:
      - Provide the estimated generation time for the stock.

- Year in which F=0 results in a 70% probability of rebuilding (Year $F=0_{p70}$)
- Target rebuilding year (Year $F=0_{p70}$ + 1 generation time) (Year$_{rebuild}$)
- F resulting in 50% and 70% probability of rebuilding by Year$_{rebuild}$
- Fixed level or removals (TAC) allowing rebuilding of stock with 50% and 70% probability

C) Otherwise, utilize a P* approach to determine:
- The F needed and corresponding removals associated with a 70% probability of overfishing not occurring (P* = 0.3)

D) If data or other issues preclude classic projections (i.e. A, B or C above), explore alternate projection models to provide management advice.

5. Develop a stock assessment report to address these TORs and fully document the input data, methods, and results.