A Review of Gray Snapper Size at Maturity

Sept. 2019 SSC Agenda Item XV:
Scope of Work: Gray Snapper Operational Assessment

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Two Issues with SEDAR 51 conclusions:

1. Interpretation of estimated size of maturity relative to past studies.

2. The decision to use a size of maturity larger than the estimated size.

Taken from SEDAR51 DW-06

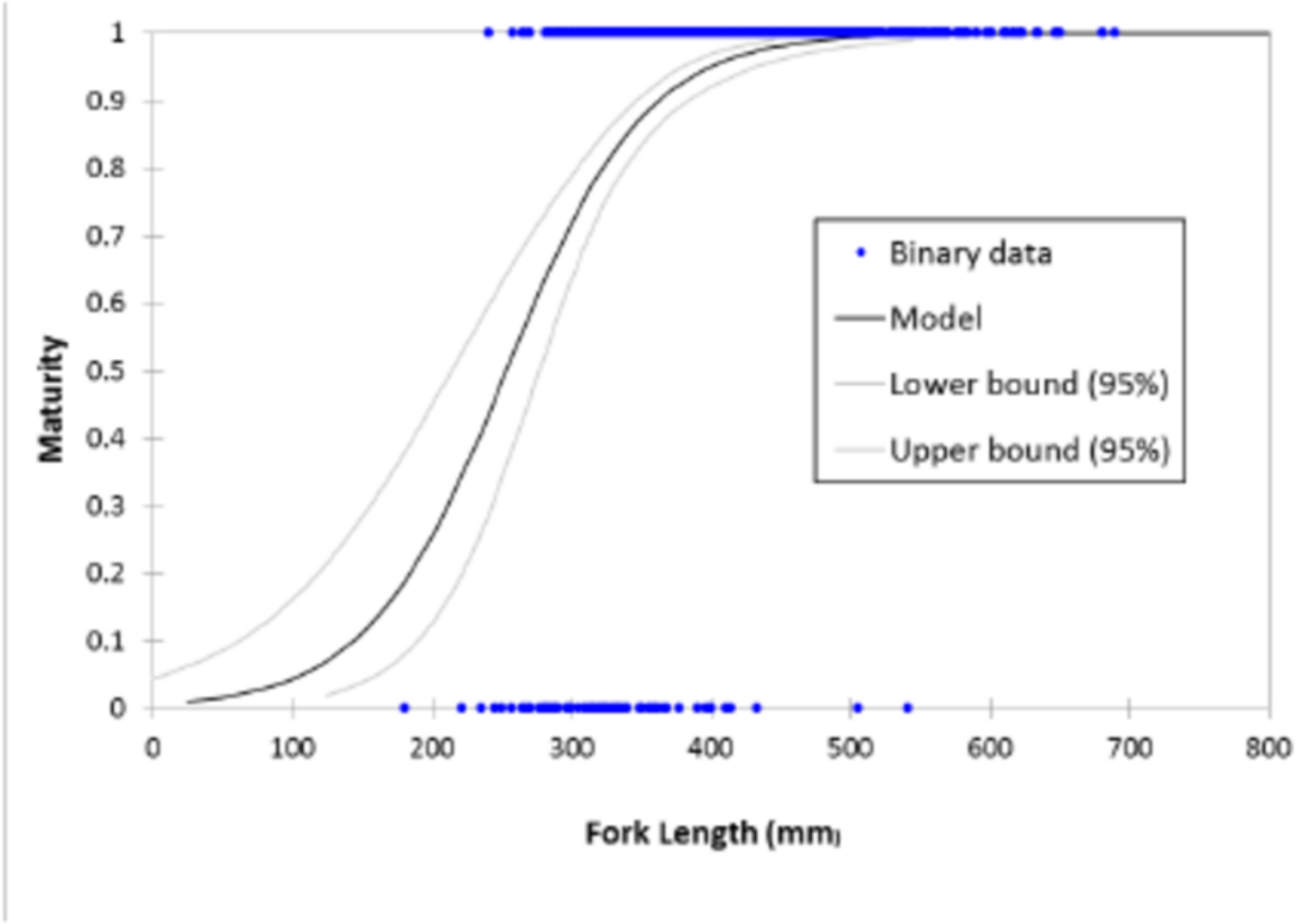

Figure 4. Logistic regression of female gray snapper maturity by fork length. The blue circles denote

From Final Stock Assessment Report, Pages 24-25.

"Maturity was determined from histological analysis of female gray snapper. Age and size at 50% maturity was calculated to be 2.3 years or 253mm FL respectively with 90% maturity occurring at 5.2 years or 362mm FL (Figure 2.18.11; SEDAR51-DW-06). SEDAR51-RD-11 estimated maturity to occur between 239-288mm FL, which brackets the most recent calculation of length at 50% maturity."

<u>DG comment:</u> *I find the last sentence above to be misleading. SEDAR51-RD-11 found that 90% maturity occurred at approximately 241 mm FL, whereas the 288 mm FL size of maturity referenced above occurred at the 100% level of maturity. Consequently, a more valid comparison would show that the estimated 253 mm FL size at 50% maturity was outside the range(larger) than previous studies. Interestingly, while the RD-11 study did not explicitly specify a 50% size of maturity, they did say that most fish were mature at 198 mm SL ≈ 239 mm FL. The smallest mature fish in that study was approximately 171 mm FL.*

From Final Stock Assessment Report, Pages 24-25 (cont'd).

"Despite the 50% maturity metric, if female gonadosomatic index is observed within size it is evident that a significant contribution to the spawning stock is not achieved until 300mm FL (SEDAR51 DW-06). Consequently, the 300mm FL mark is a more accurate estimate of maturity for gray snapper. The LHW group noted there were few fish sampled below 300 mm FL and suggested that additional data points be added to the GSI using macroscopically sexed fish from the FWRI-FIM and PCLAB datasets (Figure 2.18.12). The addition of these fish did not change the conclusion that fish below 300 mm FL contribute little reproductively."

Taken from SEDAR51 DW-06

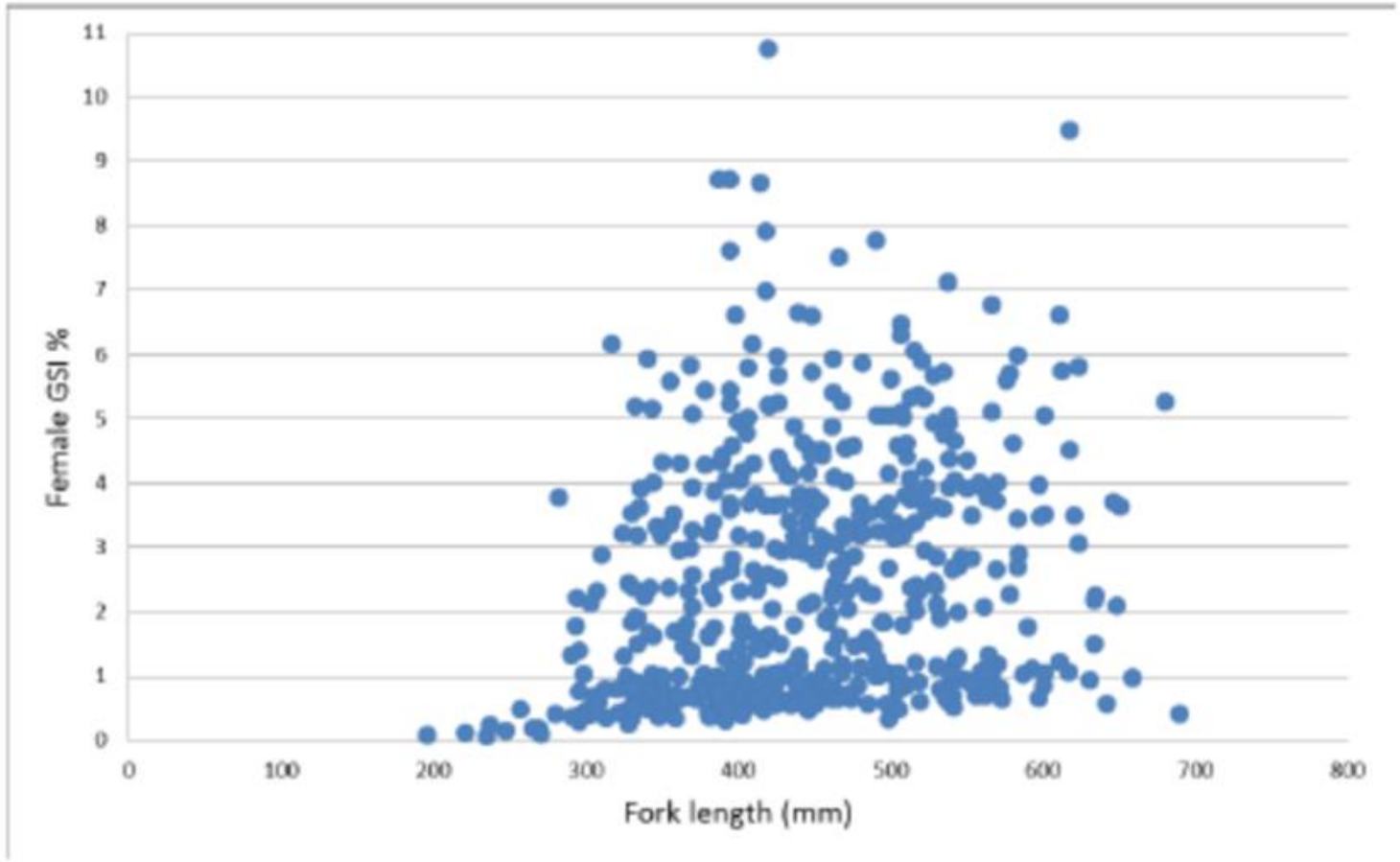

Figure 5. Female gonadosomatic index (GSI) by fork length. GSI is the percentage of gonad weight relative to body weight (total weight minus gonad weight). One outlier not shown (GSI = 27%).

<u>DG Comment:</u> *The use of the more subjective 300 mm FL size of maturity is a 19% increase over the actual estimated value (note: 253 mm ≈ 10 inches and 300 mm ≈ 11.8 inches). This difference in modeled size of maturity, especially with such disparate sizes of maturity, might have a substantial influence on the outcome of the assessment. Surprisingly, in SEDAR 51 no sensitivity runs were conducted with alternate sizes of maturity.*

Current Gray Snapper Scope of Work Operational Assessment relative to size at maturity

Use the female weight-length relationship to calculate spawning stock biomass, with the size at which 50% of individuals are sexually mature set at XXX mm FL.

Proposed Gray Snapper Scope of Work Operational Assessment relative to size at maturity (Suggested changes in above wording in bold.)

Use the female weight-length relationship to calculate spawning stock biomass, with Use the size at which 50% of individuals are sexually mature set at **253 mm FL as an alternate base case for maturity in addition to the 300 mm FL size of maturity base case used in SEDAR 51.**