Development of an ageing error matrix for U.S. gray triggerfish *(Balistes capriscus)*

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SEDAR41-DW47

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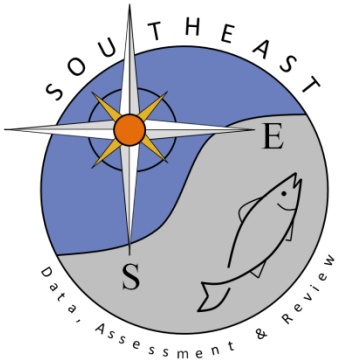

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Development of an ageing error matrix for U.S. gray triggerfish

(Balistes capriscus)

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July 20, 2015

Introduction

Ageing error has recently been incorporated in SEDAR assessed species in the U.S. south Atlantic to provide an estimate of uncertainty among ages. Inclusion of ageing error in a catch-at-age type stock assessment tends to accentuate recruitment estimates, as compared to the same estimates without ageing error. Other estimates from a stock assessment are affected as well, but the direction and magnitude of change is often unpredictable due to other data sources and factors in the model. This analysis computes an ageing error matrix for gray triggerfish in the U.S. south Atlantic.

Methods

A random set of 1,383 gray triggerfish spines were exchanged between two National Marine Fisheries Service (NMFS) staff in Beaufort, North Carolina.

This set age readings were then compared in a pairwise fashion. Average percent error among the two readers was 7.5 %. Figures 1 suggests strong agreement to age 7.

Methods described in Punt et al. (2008) and AGEMAT software were used to compute an ageing error matrix for gray triggerfish. No attempt was made to account for bias since the true age of the sample was unknown. Punt et al. (2008) suggests excluding the top 1% of older aged samples due to small sample sizes. For gray triggerfish, 10 samples (0.7%) were excluded. The input data used to develop the ageing error matrix are provided in Appendix 1.

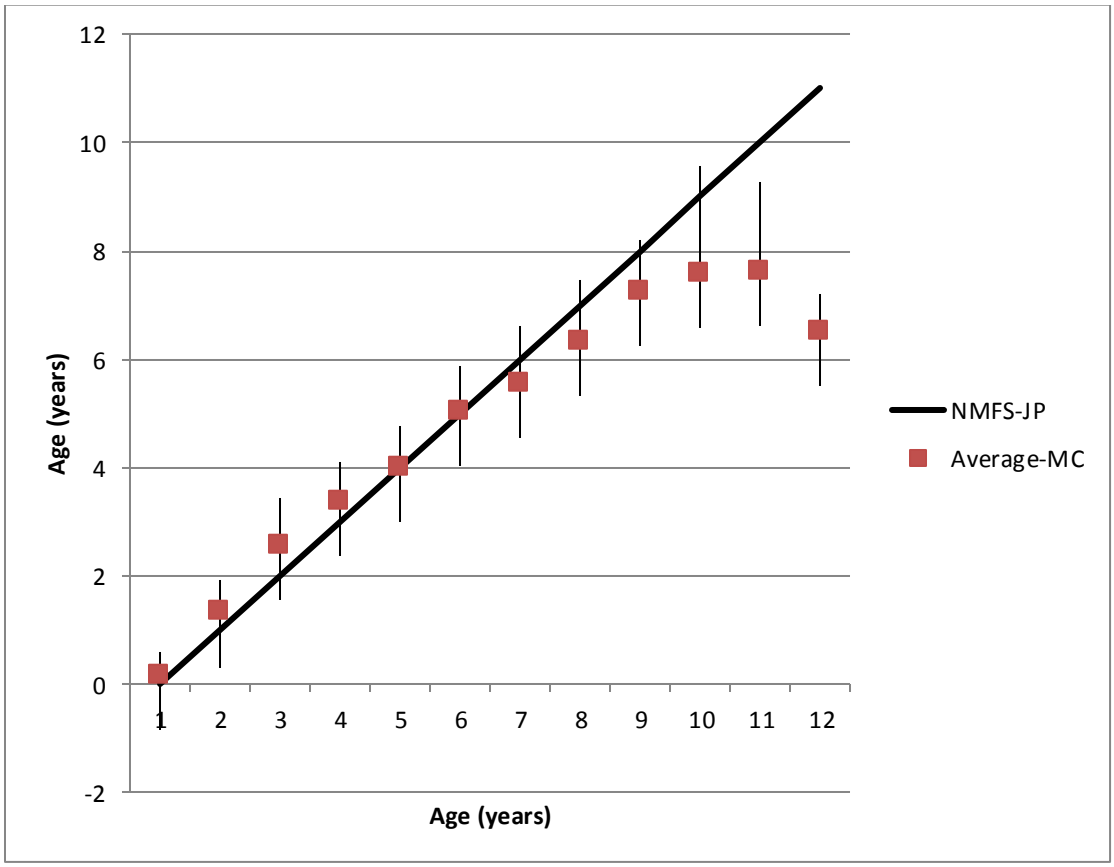
Results

The resulting ageing error matrix is in Table 1.

Table 1. Gray triggerfish ageing error matrix for use in SEDAR 41 Assessment Workshop.

	0	1	2	3	4	5	6	7	8	9	10
0	0.93	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.07	0.86	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.10	0.80	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.13	0.73	0.13	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.17	0.65	0.17	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.01	0.21	0.56	0.21	0.01	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.03	0.23	0.47	0.23	0.03	0.00	0.00
7	0.00	0.00	0.00	0.00	0.01	0.06	0.24	0.39	0.24	0.06	0.01
8	0.00	0.00	0.00	0.00	0.00	0.02	0.09	0.23	0.31	0.23	0.11
9	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.11	0.21	0.25	0.37
10	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.07	0.12	0.18	0.60

Figure 1. Gray triggerfish age comparison between two NMFS staff in Beaufort. Error bars represent ±1 S.D.



Appendix 1. Gray triggerfish ageing input file used in AGEMAT software to develop an ageing error matrix for SEDAR 41 assessment workshop.

```
# Threshold    200
#    19    20   447
# Maximum  number  of readers
   2
# Number of data sets
   1
# Number of points  per data set
   62
# Which  is the assumed  true readers per data set
  2
# Readers per data set:
 1  2
# minimum  and maximum  age of true reader
0   11
# Reference  age mode of the unique  comb of readings
  4
# Minus  groups
 0
# Plus  groups
 8
# Option for bias
 0    0
# Option for standard deviation
 2   -1
# Option for effective  sample  size
0
# Use Par File  (1=Yes)
0

# Min,  Max, Init,  Phase for sigma  and bias
  0.0  40.0  0.2  1
-10.0   1.0  0.1  1
  0.0  40.0  7.0  1

# Min,  Max, Phase for Probs
-20 20 2
```

Min, Max, Init, Phase for the slopes
-10 1.0 0.0 2

Data Set # 1 (AEP: the count of readings should be column 1)
5 0 0
1 0 1
1 1 0
52 1 1
17 1 2
2 1 3
1 1 4
8 2 1
69 2 2
46 2 3
13 2 4
3 2 5
1 2 6
18 3 2
160 3 3
71 3 4
17 3 5
3 3 6
5 4 2
70 4 3
200 4 4
55 4 5
12 4 6
1 4 7
1 5 2
7 5 3
52 5 4
147 5 5
54 5 6
5 5 7
1 5 8
1 5 10
6 6 3
19 6 4
50 6 5

64	6	6
18	6	7
3	6	8
2	6	9
2	7	4
19	7	5
24	7	6
24	7	7
5	7	8
3	7	9
1	7	10
1	8	5
6	8	6
10	8	7
11	8	8
2	8	9
2	9	5
1	9	7
1	9	8
2	9	9
1	9	10
1	10	5
1	10	7
1	10	8
2	10	9
1	11	6
1	11	7