SEDAR10-DW-31 Age Composition Data from samples collected in the U. S. South Atlantic – Beaufort Laboratory

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NMFS Beaufort aged 3,246 of 3,484 (93%) gag collected from commercial and recreational (Headboat, charter boat, and private boat) fisheries operating from 1976 – 2004. Gag ages ranged from 0 to 30 years in the South Atlantic. See Table 1 for sample sizes by year and fishery. See Table 2 for frequency of number of samples per age by year and fishery.

In an analysis of cohort strength of the 1979-1986 Headboat samples (entire coast), and 1999-2003 primarily Florida commercial, we found strong year classes from 1974, 1978, 1981, and 1996 (Figure JP1).

Issue 1: Samples from 1976-1991 were almost exclusively from the Headboat fishery and 85% of the samples were from East coast of Florida. Can these data be used to represent the commercial fisheries in the entire region?

Issue 2: Samples from 1992-2004 were predominately from the commercial fishery (79%) and East coast Florida (75%). Can these data be used to represent the recreational fisheries of the entire region?

Issue 3: Are the age samples random and in proportion to the length samples? Analysis of the Headboat length samples from the 1980s Florida compared to the age samples from those years and area so show the samples to be in proportion to each other (Figure JP1). An analysis of commercial length samples to age samples needs to be done, but is beyond the scope of the Life History Work Group at the SEDAR10 Data Workshop.

(South Atlantic, SCDNR, SEDAR10-DW15)
► SCDNR fish dep. survey considered random. Mostly closed season sampling (no size limit) targeting historical outer shelf areas (com co-op)
► 2004, 2005 disproportionate number of fish in 600 - 700 mm size classes (smaller fish) than past. North Carolina fisherman source.
► ALL--Recommend continued length freq comparisons (via TIP, headboat etc.) to otolith samples to ID potential variation in (sampling induced) age selection within a fishery …Work to improve representational sampling

Age patterns (Gulf)
► 1991-05 continuous, mostly com.

- ► Stronger year classes evident, 85, 89, 93, 96, 99,.. 2000?
- ► Age increases (as does size at age), rec HL, com HL to com LL (consistency in patterns between major sectors)
- ► Size at age, 79-89 vs 91-05 (rec). Smaller size at age in earlier time period (but no size limits in earlier time period).

Gag ages ranged from 1 to 31 years in the Gulf. Ages indicated differences by fishing mode with the commercial long-line contributing the oldest individuals followed by the commercial hand-line and recreational fishery.

Age patterns (South Atlantic, SCDNR)
- ► 2-3 years every 10 years; no continuous series for year class progression.
- ► Age at length..Fishery dep shows smaller size at age 79-82 vs 94-95 (under age 12). In 2004-2005, similar results to 94-95. Size limits may be an effect in 94-95 but not 04-05 due to permitted undersized sampling.
- ► Patterns of fish indep. data are very similar
- ► Age range:

Growth

- ► Size-selective modified VB; 1st cut in both Gulf and SA. Appears to correct for selection of larger-fish-at age up to age 4
- ► However, Pre and post size limit (Beaufort) VB were similar for Fla data.
- ► Recommend looking at gear/region contrasts (for WFS) this week.
- ► Recommend further growth functions be fit as needed for model (by region/strata)

There have been several growth studies on gag in the Gulf of Mexico and South Atlantic. The updated data sets provide increased sample sizes for improved temporal coverage and contrasts. Growth models can be influenced by the use of size-biased samples, for example, due to minimum size-limits. Thus a modified VB function accounting for size selection was used for first cut model fits of Gulf (PC) and South Atlantic (Beaufort) data. The sub-group recommended that in the future, growth parameters be fit with the available age data as needed for the assessment models (by region/strata).

Von Bertalanffy Growth Parameters for gag

Survey type	data from	L_{inf} (mmTL)	k (yr^{-1})	t_o (yr)	n	Method
Atlantic						
SC-DNR/MARMAP (PID=50)	1979-82	1096	0.196	-1.01	507	Raw data - count
SC-DNR/MARMAP (PID=50)	1994-95	1115	0.200	-1.62	2268	Raw data - count
SC-DNR/MARMAP (PID=50)	1996-05	1210	0.180	-1.57	1770	Raw data - count
SC-DNR/MARMAP (PID=50)	2004-05	1212	0.186	-1.37	1504	Raw data - count
MARMAP survey (PID=05)	1976-1985	1142	0.166	-1.04	54	Raw data - count
MARMAP survey (PID=05)	1986-1995	no age data available				
MARMAP survey (PID=05)	1996-2005	1074	0.246	-0.77	57	Raw data - count
NMFS-Headboat -east coast FL	1976-1991	1114	0.19	-1.02	1301	Inverse weighted - biol.age (fractional)
NMFS-Headboat - Carolinas	1976-1991	1139	0.18	-0.74	227	Inverse weighted - biol.age (fractional)
NMFS - Commercial-E.coast FL	1992-2004	1094	0.21	-1.18	962	Inverse weighted - biol.age (fractional)
NMFS - Recr.-E.coast FL	1992-2004	1173	0.16	-2.37	302	Inverse weighted - biol.age (fractional)
NMFS - Comm. Carolinas	1992-2004	1247	0.15	-1.25	378	Inverse weighted - biol.age (fractional)
Gulf						
Gulf Comm.& recr. &FI	1991-2005	1310	0.14	-0.37	16,147	Raw data - biol. age (fractional age) - Modified for size limit
Gulf Comm.& recr. &FI	1991-2005	1358	0.12	-1.31	16,147	Raw data - biol. age (fractional age)
Gulf Recr.	1979-1989	1338	0.1	-1.86	743	Raw data - calander age (year)
Combined data	1996-2005	1184	0.196	-1.34	1827	