Addendum to SEDAR41-DW17: Estimates of Historic Red Snapper in the South Atlantic Using the FHWAR Census Method

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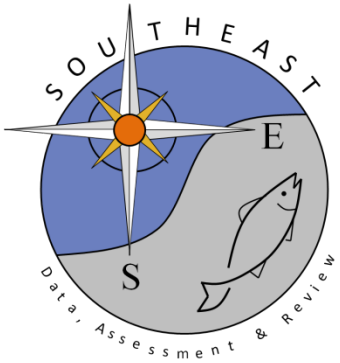

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SEDAR41- DW17 Estimates of Historic Recreational Landings of Red Snapper in the South Atlantic Using the FHWAR Census Method

Addendum

FHWAR Method

The two key components from the FHWAR surveys used in this census method are the estimates of U.S. saltwater anglers and the estimates of U.S. saltwater fishing days. The first objective was to determine the total saltwater anglers and saltwater days from the South Atlantic (SA) by using the summary information of U.S. anglers and U.S. saltwater anglers from the FHWAR surveys. The ratio of U.S saltwater anglers to the total U.S anglers was applied to the total number of anglers for the SA to yield the total saltwater anglers for SA. The same method was used to calculate the total saltwater days for the SA from the FHWAR surveys from 1955-1985. The FHWAR surveys for the South Atlantic included the entire state of Florida, east and west coasts. In order to address the management boundaries for red snapper, the saltwater angler days for Florida's west coast (FLW) were separated from the SA saltwater angler days using the ratio of the MRFSS total angler trips for FLW to the MRFSS total angler trips for NC to FLW. The mean ratio from 1984-1986 was applied to the total saltwater days for the SA from 1955-1985 to remove FLW effort.

Similar to the SWAS, there was a 12-month recall period for respondents participating in the FHWAR surveys from 1955 – 1985. As part of the 1991 FWHAR, a study was conducted to compare the 12- month recall period to a four-month period. This study revealed that the level of recall bias varies for different types of fishing participation and expenditure (FHWAR, 1991).

Consequently, it was necessary to account for possible reporting bias and adjust the angling effort (saltwater days) in the FHWAR Surveys 1955-1985. In the case of red snapper in the South Atlantic, the total saltwater days for the SA 1955-1985 were adjusted for recall bias in the FHWAR surveys using the MRFSS and Southeast Region Headboat Survey (SRHS) total angler trips and days, respectively for the US East Coast (NC-FLE) in 1985 divided by the total saltwater days from the 1985 FHWAR Survey. This multiplier was then applied to the total SA saltwater days from 1955-1985 to adjust for recall bias. Using the adjusted saltwater days for SA from 1955 – 1985, the next step in this process was estimating landings of red snapper. This was accomplished by calculating the mean CPUE for red snapper in the South Atlantic from the MRFSS (APAIS adjusted) and SRHS landings estimates for 1981 to 1985. This mean CPUE was then applied to the adjusted saltwater days for the SA from 1955-1985 to estimate the historical landings of red snapper for those years (Table 3). Linear interpolation was used to estimate landings for years that the FHWAR surveys were not conducted during 1955-1980. Since historical recreational landings for red snapper were only lacking prior to 1981, the 1985 estimated landings using the FHWAR census method were excluded (Table 4).

Conclusions

The FHWAR method utilizes a combination of information including U.S. angler population estimates and angling effort estimates from 1955 – 1985 FHWAR, along with estimates of recreational effort and landings from the MRFSS and SRHS 1981 – 1985. The FWHAR method also used both sources of information to adjust for recall bias, an issue that must be addressed when considering using either the SWAS or the FHWAR Surveys for historical recreational landings. By using data from FHWAR and the MRFSS to calibrate this adjustment, the effect of the 12-month angler recall period is reduced. The historical landings of red snapper that were calculated using this method show a gradual increase from 1955 to 1980, which reflects an evolving recreational fishery and technological advancements (Figure 1).

Table 3. Estimated red snapper landings using the FHWAR census method, 1955-1980.

Year	Total U.S. Saltwater Days	Adjusted Saltwater Days - South Atlantic	Avg CPUE MRFSS & SRHS 81-83	Historic Catch (number)	CV
1955	4,820,112	2,022,131	0.0181	36,536	0.65
1960	7,038,690	2,952,867	0.0181	53,353	0.65
1965	10,225,693	4,289,877	0.0181	77,510	0.65
1970	10,525,159	4,415,509	0.0181	79,780	0.65
1975	15,726,330	6,597,502	0.0181	119,204	0.65
1980	16,613,593	6,969,725	0.0181	125,929	0.65

Table 4. Estimated recreational red snapper landings (number) in the South Atlantic using FHWAR census method (1955-1980) and combined MRFSS\MRIP and SRHS (1981-2014).

Year	Number	Year	Number
1955	36,536	1985	339,307
1956	39,899	1986	117,361
1957	43,263	1987	72,369
1958	46,626	1988	117,348
1959	49,989	1989	120,600
1960	53,353	1990	33,011
1961	58,184	1991	48,574
1962	63,015	1992	57,209
1963	67,847	1993	18,673
1964	72,678	1994	26,538
1965	77,510	1995	22,308
1966	77,964	1996	14,885
1967	78,418	1997	40,008
1968	78,872	1998	17,756
1969	79,326	1999	46,415
1970	79,780	2000	53,784
1971	87,665	2001	43,615
1972	95,549	2002	47,993
1973	103,434	2003	31,683
1974	111,319	2004	39,756
1975	119,204	2005	38,350
1976	120,549	2006	32,714
1977	121,894	2007	24,535
1978	123,239	2008	100,581
1979	124,584	2009	76,173
1980	125,929	2010	539
1981	129,177	2011	1,359
1982	55,847	2012	17,851
1983	99,167	2013	9,108
1984	243,693	2014	34,090