

Tables

[SAW53 Editor's Note:

The SARC-53 review panel did accept the work presented on TORs 1-4 (which primarily gives an update on fishing patterns, landings and survey data. Tables B1-B23 and Figures B1-B66 are associated with TORs 1-4.

The SARC-53 review panel did not accept new assessment models (or results from those new models) that were prepared by the SAW53 Working Group. Tables B24-B33 and Figures B67-B110 are associated with the new models and results. They are included in this report to demonstrate the work that was done by the SAW Working Group for the December 2011 peer review. However, those Tables and Figures are not intended to be used for management at this time.]

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Table B1. Black sea bass northern stock commercial and recreational landings (MT) and commercial and recreational discard losses, 1968-2010. (1982 and 1986 rec landings adjusted)

Year	Landings		Discard losses		Total MT
	Com	Rec	Com	Rec	
1968	1,079.0	1,108.5	64.3	66.0	2,317.8
1969	1,097.0	1,127.0	65.3	67.1	2,356.5
1970	970.0	996.5	57.8	59.4	2,083.6
1971	566.0	581.5	33.7	34.6	1,215.8
1972	727.0	746.9	43.3	44.5	1,561.7
1973	1,115.0	1,145.5	66.4	68.2	2,395.1
1974	1,023.0	1,051.0	60.9	62.6	2,197.5
1975	1,680.0	1,725.9	100.1	102.8	3,608.8
1976	1,557.0	1,599.5	92.7	95.3	3,344.5
1977	1,985.0	2,039.2	118.2	121.5	4,263.9
1978	1,662.0	1,707.4	99.0	101.7	3,570.1
1979	1,241.0	1,274.9	73.9	75.9	2,665.8
1980	977.0	1,003.7	58.2	59.8	2,098.7
1981	1,129.0	558.2	67.2	33.3	1,787.7
1982	1,177.1	1,213.4	70.1	268.0	2,728.6
1983	1,513.2	1,868.6	90.1	111.3	3,583.2
1984	1,519.4	601.5	104.5	33.0	2,258.4
1985	1,074.8	957.6	88.9	43.9	2,165.1
1986	1,508.5	1,829.5	100.7	98.6	3,537.3
1987	1,635.3	880.4	97.7	34.3	2,647.7
1988	1,424.0	1,299.2	101.8	92.3	2,917.4
1989	1,104.5	1,487.8	82.1	37.6	2,712.1
1990	1,401.6	1,255.9	52.8	94.4	2,804.6
1991	1,189.6	1,885.1	19.1	94.2	3,188.0
1992	1,264.3	1,187.9	91.2	83.4	2,626.9
1993	1,352.6	2,193.8	179.2	63.2	3,788.9
1994	848.4	1,332.7	33.8	80.7	2,295.5
1995	889.1	2,815.4	35.7	129.2	3,869.3
1996	1,448.4	1,809.0	482.7	92.0	3,832.0
1997	1,197.9	1,931.8	31.2	115.2	3,276.1
1998	1,171.2	519.0	135.8	86.6	1,912.6
1999	1,305.1	745.5	36.2	115.2	2,202.0
2000	1,205.5	1,804.3	41.7	277.4	3,328.8
2001	1,298.5	1,545.3	187.3	309.0	3,340.1
2002	1,587.4	1,982.9	24.3	390.7	3,985.2
2003	1,359.2	1,498.5	58.3	313.9	3,229.9
2004	1,405.5	761.6	369.9	142.3	2,679.3
2005	1,298.0	852.2	29.4	149.9	2,329.5
2006	1,285.4	897.7	16.1	173.2	2,372.4
2007	1,036.9	1,011.2	57.3	220.3	2,325.7
2008	875.1	712.7	36.7	252.0	1,876.6
2009	523.2	1,049.2	164.8	228.2	1,965.4
2010	751.4	1,351.1	110.1	231.4	2,444.0

Table B2. Black sea bass length measurements from Jan-June (spring) and July to December (fall) commercial sampling.

Lengths measured

Spring

	Unclass.	Jumbo	Large	Medium	Small	Ex-small
1984	669	592	3326	2777	2209	0
1985	157	710	3143	1471	1921	1062
1986	113	672	3551	2509	2507	231
1987	310	170	3211	1168	898	389
1988	799	341	2389	1449	1293	0
1989	202	132	2066	1341	1604	161
1990	181	260	2798	2537	3075	194
1991	226	0	2106	452	568	0
1992	33	89	786	827	894	99
1993	75	74	1534	1816	1927	0
1994	188	0	1307	1150	1471	0
1995	482	98	938	906	562	0
1996	24	107	1175	984	905	163
1997	384	0	1454	1432	1485	0
1998	0	152	1491	1559	1217	0
1999	221	103	949	1268	1157	0
2000	0	198	628	610	632	0
2001	169	0	1037	1278	956	0
2002	101	365	1384	648	285	0
2003	231	603	1153	537	200	0
2004	56	240	942	845	0	0

Fall

	Unclass.	Jumbo	Large	Medium	Small	Ex-small
1984	329		182	0	200	
1985	164		0	156	567	
1986	108	95	175	131	300	100
1987	216	43	200	53	41	51
1988	106	0	20	13	52	
1989	38	13	48	39	84	
1990	168	0	10	0	328	
1991	117	67	105	12	130	4
1992	37	0	31	142	280	
1993	0	0	37	0	56	
1994	0	3	42	38	67	
1995	0	0	151	215	476	
1996	495	10	491	408	1099	
1997	0	17	183	325	355	
1998	69	15	18	362	668	
1999	0	35	275	612	752	
2000	0	0	0	185	621	
2001	0	0	127	309	500	
2002	0	243	281	401	300	
2003	50	350	544	613	99	
2004	209	207	184	409	104	

Table B3. Number of black sea bass commercial samples from otter trawls and by half-year from NMFS samples.

Otter Trawl								
Jan-June	ex-small	small	medium	large	ex-large	unclass	total	
1984		4	10	5	2	4	25	
1985	2	3	4	5	3	1	18	
1986		5	5	4	1	2	17	
1987		2	2	4		2	10	
1988		1	2	2		5	10	
1989		2	2	2		2	8	
1990		4	3	2			9	
1991								
1992	1	1	2	1			5	
1993			2	1			3	
1994			2	1			3	
1995			2	1			3	
1996		3	5	1			9	
1997		7	6	4		3	20	
1998		7	8	6	2		23	
1999		9	11	3	1		24	
2000		3	4	4	1		12	
2001		8	14	6		2	30	
2002		1	7	6	4	1	19	
2003		1	4	3	2	5	15	
2004			7	4	1	2	14	
2005		2	9	9	8	2	30	
2006		1	3	8	8	3	23	
2007		4	14	12	5	1	36	
2008		5	13	12	8	2	40	
2009	2	3	8	10	5	3	31	
2010	2	2	9	6	5	2	26	
							463	

Otter Trawl								
July-Dec	ex-small	small	medium	large	ex-large	unclass	total	
1984				2		1	3	
1985		1					1	
1986	1		1	2	1	1	6	
1987				1		1	2	
1988						1	1	
1989								
1990		1	1				2	
1991								
1992								
1993								
1994								
1995		1	1	1			3	
1996		2		1		5	8	
1997			1	1			2	
1998								
1999				3	2		5	
2000								
2001			1				1	
2002								
2003			1	3	5	1	10	
2004				1	4	3	8	
2005			2	5	8	1	16	
2006			4	1	8		13	
2007		1	1	1	4	1	8	
2008				2	6	3	11	
2009			3	3	4	2	12	
2010			1	2	7		10	
							122	

Table B4. Number of black sea bass commercial samples from fish pots and by half-year from NMFS samples.

Fish Pot							
Jan-June	ex-small	small	medium	large	ex-large	unclass	total
1984		4	2				6
1985							
1986		3					3
1987			1			1	2
1988						2	2
1989							
1990							
1991		2	2	2			6
1992				1			1
1993							
1994							
1995						3	3
1996		3	3	3	1		10
1997		6	7	5	1		19
1998		5	5	3	2		15
1999		3	2				5
2000		3	4	1	1		9
2001		2		1			3
2002		1					1
2003		1	2				3
2004				1	1		2
2005		1	2				3
2006		1	6	5	3	2	17
2007		1	9	7	4		21
2008		4	12	8	2	2	28
2009		1	8	1	2	1	13
2010		1	8	2			11
							183

Fish Pot							
July-Dec	ex-small	small	medium	large	ex-large	unclass	total
1984		2					2
1985		5	1			1	7
1986		3					3
1987						1	1
1988							
1989							
1990							
1991		1					1
1992							
1993							
1994							
1995		2	2	2			6
1996		7	5	5	1		18
1997		3	3	1	1		8
1998		7	5	1			13
1999		8	10	3			21
2000		6	2				8
2001		5	2	2			9
2002		3	3	2	2		10
2003		1	5	2	1	1	10
2004		1	4		1	3	9
2005			6	4		1	11
2006		2	15	7	2	1	27
2007		1	15	11	6	1	34
2008		9	9	4	4	3	29
2009		4	4	2	1	1	12
2010		3	2	1	1		7
							246

Table B5. Number of black sea bass commercial samples for other gears and by half-year from NMFS samples.

Other gear							
Jan-June	ex-small	small	medium	large	ex-large	unclass	total
1984							
1985							
1986			1	1			2
1987							
1988							
1989							
1990							
1991							
1992							
1993							
1994							
1995							
1996							
1997							
1998							
1999						2	2
2000		1			1		2
2001				1			1
2002		1		1			2
2003				2	5		7
2004			1		1		2
2005					1		1
2006					4	1	5
2007			2	1	2	4	9
2008							
2009			2	2	1		5
2010			1		1		2
							40

Other Gear							
Jul-Dec	ex-small	small	medium	large	ex-large	unclass	total
1984							
1985							
1986							
1987							
1988							
1989							
1990							
1991							
1992							
1993							
1994							
1995							
1996		1					1
1997							
1998							
1999							
2000			1				1
2001				1	1		3
2002			1	1	1		3
2003				1			1
2004				1			1
2005			1	2		1	4
2006		2	1	4	4	1	12
2007		3	3	3	3	4	16
2008			2	1	1		4
2009		1	2	3	3	2	11
2010			1				1
							55

Table B6. Number of black sea bass commercial samples from otter trawl by half-year from NCDMF samples.

NC Otter trawl							
1st half							
	3356	3355	3353	3351	3352	3350	
1984	3	14	1			3	21
1985	11	10		1		8	30
1986	9	16		1		4	30
1987	10	7				1	18
1988	4	21	3			4	32
1989	5	29				2	36
1990	1	33	2	2		5	43
1991	2	14	5	1		8	30
1992	2	10		1		2	15
1993	2	29	2			2	35
1994	3	30	2	1		5	41
1995		18	3	1		4	26
1996	2	16	5	1		2	26
1997		3	1				4
1998		6	4	1		1	12
1999		2	3	2	1	7	15
							414

NC Otter trawl							
2nd half							
	3356	3355	3353	3351	3352	3350	
1984	1	4	2			7	14
1985	2	5	3			10	20
1986	2	14	1	1		7	25
1987	9	8	1	1		3	22
1988	1	12	3			2	18
1989	4	7	2	1		4	18
1990	1	11	2	2		11	27
1991	1	19	4			7	31
1992	1	6	7	1		2	17
1993		11	5	2			18
1994	1	11	4	2		1	19
1995	2	2	2	1			7
1996						1	1
1997	1	2					3
1998		1	1	1		8	11
1999		2	2	2	1		7
							258

Table B7. Black sea bass commercial landings mean length (cm), 1984-2010.

	Mean Length	CV
1984	27.05	0.20
1985	27.56	0.22
1986	25.47	0.24
1987	26.24	0.21
1988	25.57	0.22
1989	26.99	0.22
1990	26.40	0.19
1991	25.18	0.20
1992	25.39	0.18
1993	25.69	0.18
1994	25.59	0.18
1995	27.20	0.17
1996	26.59	0.19
1997	27.84	0.17
1998	29.74	0.16
1999	31.43	0.17
2000	32.47	0.18
2001	32.79	0.15
2002	33.92	0.15
2003	33.33	0.22
2004	34.15	0.16
2005	35.24	0.19
2006	34.99	0.19
2007	34.24	0.18
2008	32.98	0.16
2009	33.65	0.16
2010	34.04	0.17

Table B8. Black sea bass commercial discard estimates (MT) (prior to discard mortality). Trawl data based on SBRM method (1989-2010) includes CV.

	Otter trawl	CV	Fish Pot	Hand line	Total
1984	103.9		4.3	0.3	108.4
1985	88.1		3.3	1.5	92.9
1986	99.5		6.9	0.9	107.3
1987	96.5		7.4	0.6	104.5
1988	100.4		7.8	1.2	109.5
1989	80.9	0.37	6.9	1.1	88.9
1990	51.0	0.38	10.3	1.5	62.7
1991	17.1	0.28	11.8	1.8	30.7
1992	89.4	0.40	10.5	1.5	101.5
1993	177.9	0.94	7.9	1.1	186.9
1994	33.1	0.52	4.3	0.5	37.8
1995	34.2	0.44	8.2	1.3	43.7
1996	480.8	0.87	8.3	4.3	493.4
1997	27.2	1.93	25.2	1.7	54.1
1998	124.2	0.39	74.8	2.5	201.6
1999	22.6	0.30	83.6	7.5	113.6
2000	24.9	0.29	104.3	7.2	136.5
2001	170.1	0.30	108.7	5.9	284.6
2002	10.0	0.51	89.9	5.5	105.4
2003	46.6	0.49	70.0	8.1	124.7
2004	359.5	0.26	65.1	4.4	429.0
2005	22.3	0.28	43.8	3.5	69.6
2006	10.5	0.39	32.2	5.2	47.8
2007	51.7	0.36	31.6	5.8	89.1
2008	32.2	0.31	25.8	4.2	62.3
2009	160.7	0.36	23.0	4.2	187.9
2010	105.4	0.17	27.7	3.6	136.7

Table B9. Sample size (number of black sea bass measured) from otter trawl trips and fish pot trips.

	Otter Trawls	Fish Pots
1989	477	
1990		
1991		
1992		
1993		46
1994	26	158
1995	89	
1996	514	
1997	304	
1998	509	
1999	13	
2000	116	
2001	297	
2002	156	
2003	1200	64
2004	2349	254
2005	1051	14
2006	605	
2007	903	172
2008	982	320
2009	2154	
2010	2092	1084

Table B10. Black sea bass recreational landings (AB1), proportional standard error and sample sizes. Note that the 1982 and 1986 landings are unadjusted values.

	Total Num (000s)	PSE	Number fish Inspected
1981	1886.7	15.7	744
1982	<i>10045.9</i>	35.5	1153
1983	4968.4	17.5	1330
1984	1700.1	12.9	1354
1985	3377.1	11.8	1863
1986	<i>21732.6</i>	21.6	2913
1987	2875.6	13.9	1759
1988	3058.8	15.3	2033
1989	4221.1	6.6	4202
1990	3879.8	8.4	3109
1991	5226.3	8.0	3569
1992	3535.3	7.6	4011
1993	5994.4	19.5	2470
1994	3422.2	11.8	2989
1995	6742.8	14.5	2535
1996	3619.4	10.9	2734
1997	4736.2	9.4	2690
1998	1147.0	12.5	2353
1999	1361.6	15.3	2102
2000	3631.5	10.7	3022
2001	2845.8	7.2	3651
2002	3372.1	7.0	3456
2003	3258.7	5.5	4137
2004	1750.7	9.2	3609
2005	1255.1	11.6	4057
2006	1484.9	11.5	3244
2007	1738.0	13.7	3691
2008	1107.8	10.9	3566
2009	1603.2	11.2	3223
2010	1897.3	13.0	4113

Table B11. Black sea bass recreational discards (B2) totals, ME to northern NC, 1981-2010.

	Total	
	Num(000s)	PSE
1981	1,760	29.08
1982	1,338	17.85
1983	2,653	20.69
1984	1,610	20.69
1985	2,651	11.59
1986	7,175	12.88
1987	2,117	13.61
1988	5,014	10.64
1989	2,129	7.31
1990	5,246	7.77
1991	5,610	6.21
1992	4,304	8.74
1993	3,223	11.16
1994	3,970	7.16
1995	7,565	7.28
1996	4,549	8.28
1997	6,010	7.74
1998	3,900	8.68
1999	5,751	7.90
2000	13,208	6.09
2001	10,886	4.27
2002	11,304	5.63
2003	8,877	4.72
2004	5,853	6.78
2005	5,667	7.51
2006	6,895	7.50
2007	8,576	6.41
2008	9,730	7.27
2009	7,753	7.32
2010	7,327	9.08

Table B12. Lengths measurements of discarded black sea bass.

	ALS tags	NJ Tags	NJ Volunteers	MRFSS Party/Charter	New York Party/Charter	Total
1984	9					9
1985	59					59
1986	41					41
1987	23					23
1988	45					45
1989	20					20
1990	22					22
1991	98					98
1992	43					43
1993	45					45
1994	39					39
1995	35	253			232	520
1996	14	8			175	197
1997	40	528			325	893
1998	52	492			63	607
1999	125	17			224	366
2000	194					194
2001	392	1265				1657
2002	337	482				819
2003	248	184				432
2004	308					308
2005	263			4348		4611
2006	230			5255		5485
2007	202			7799		8001
2008	988		413	7614		9015
2009	967		315	8332		9614
2010	680		242	8963		9885

Table B13. Black sea bass commercial landings at age, 1984-2010.

000s

	0	1	2	3	4	5	6	7	8	9
1984	0.0	84.5	1327.0	2255.8	1249.8	87.9	36.0	5.1	7.9	0.0
1985	0.0	17.2	862.5	1386.4	863.3	94.4	39.3	16.5	10.2	0.3
1986	0.0	185.8	3896.5	1098.7	258.9	50.6	78.5	5.4	19.6	15.3
1987	0.0	26.3	3194.0	2131.5	345.3	74.3	56.6	4.4	9.0	0.0
1988	0.0	108.9	2363.7	2228.5	563.1	166.9	39.2	0.0	10.3	1.7
1989	0.0	9.7	1892.1	1146.6	424.5	44.1	56.8	3.3	9.8	1.6
1990	0.0	67.4	2297.3	2252.7	261.3	59.4	27.6	23.5	1.9	0.7
1991	0.0	56.7	3273.4	922.1	403.0	123.1	15.8	3.2	0.0	0.0
1992	0.0	28.6	2749.6	1958.4	281.9	48.5	13.1	2.2	1.3	0.0
1993	0.0	57.4	1814.7	2957.6	399.2	48.7	21.8	5.8	1.0	0.0
1994	0.0	44.5	1149.7	1425.1	655.4	80.4	17.5	4.2	0.4	0.2
1995	0.0	203.3	1794.0	770.1	128.9	39.0	11.3	1.4	0.0	0.0
1996	0.0	296.7	2470.1	1717.2	347.5	189.1	49.6	11.9	1.3	0.3
1997	0.0	65.8	1508.2	1561.0	458.1	64.9	24.2	7.3	1.2	0.3
1998	0.0	63.3	1080.8	1173.3	596.2	41.9	32.9	6.7	6.3	0.7
1999	0.0	27.1	664.4	1215.6	614.7	187.9	71.5	20.6	3.5	1.2
2000	0.0	140.3	466.1	796.2	610.5	264.3	42.9	6.7	2.7	2.8
2001	0.0	3.8	411.8	1522.9	443.4	85.1	36.9	2.4	9.9	2.7
2002	0.0	14.2	239.1	1512.9	895.3	51.4	21.1	7.9	1.2	12.0
2003	0.0	5.1	218.4	805.3	654.0	366.5	91.6	13.1	0.0	0.0
2004	0.0	0.0	207.7	969.6	501.1	573.7	49.5	5.2	7.9	0.0
2005	0.0	0.0	316.4	375.2	760.3	196.5	232.7	18.1	3.3	0.0
2006	0.0	1.3	349.3	373.6	591.3	419.3	139.9	13.8	3.6	1.8
2007	0.0	27.3	239.0	613.2	446.2	125.5	113.5	86.2	7.0	1.3
2008	0.0	0.3	183.2	1028.9	260.3	93.0	38.8	10.8	5.5	1.0
2009	0.0	0.3	101.7	408.7	305.3	56.2	38.4	8.1	6.1	1.4
2010	0.0	0.0	41.8	529.3	444.6	209.8	60.6	10.9	3.8	2.0

Table B14. Black sea bass commercial discards at age, 1989, 1994-2010.

000s	0	1	2	3	4	5	6	7	8	9
1984	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1985	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1986	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1987	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1988	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1989	0.0	422.2	737.8	74.0	1.5	0.0	0.0	0.0	0.0	0.0
1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1991	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1992	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1993	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1994	31.5	243.8	134.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1995	43.1	115.0	100.9	22.8	0.0	0.0	0.0	0.0	0.0	0.0
1996	207.1	2217.5	1817.5	55.8	0.0	0.0	0.0	0.0	0.0	0.0
1997	0.0	25.3	149.1	11.8	0.3	0.0	0.0	0.0	0.0	0.0
1998	0.0	0.1	698.5	27.0	20.3	1.7	0.0	1.5	0.0	1.5
1999	0.0	0.0	69.1	83.1	34.2	0.0	0.0	0.0	0.0	0.0
2000	0.0	50.0	117.4	32.7	8.3	0.4	0.0	0.0	0.0	0.0
2001	1.9	170.7	625.2	161.1	40.3	4.8	3.8	0.0	0.8	0.0
2002	86.8	28.3	101.8	9.3	5.7	0.0	0.6	0.6	0.0	0.0
2003	1.9	34.9	43.1	21.1	19.7	6.7	6.6	1.3	0.0	0.0
2004	4.2	127.3	181.5	218.8	103.4	91.9	27.6	3.4	1.1	0.0
2005	3.1	0.8	22.2	9.1	21.2	4.3	4.8	0.3	0.0	0.0
2006	0.0	3.4	7.5	3.3	5.1	3.7	2.3	0.2	0.0	0.0
2007	0.0	33.4	113.4	31.2	10.7	5.0	6.7	0.5	0.0	0.0
2008	2.2	30.2	54.0	21.8	4.4	1.0	1.4	2.3	0.2	0.0
2009	3.8	81.9	230.5	118.7	56.3	12.4	15.5	3.5	1.3	0.6
2010	0.3	8.9	55.5	90.7	51.2	24.0	12.7	1.3	1.8	0.0

Table B15. Black sea bass recreational landings at age, 1984-2010.

000s

	0	1	2	3	4	5	6	7	8	9
1984	0.0	269.7	588.0	552.3	126.8	30.4	23.6	0.5	0.9	0.0
1985	10.4	515.3	1623.7	735.3	340.0	67.1	36.9	5.9	1.3	0.0
1986	0.0	790.4	4437.6	1235.6	259.2	56.6	86.9	8.9	11.3	16.9
1987	0.0	158.4	1489.6	946.0	96.0	33.9	91.1	11.2	15.0	0.0
1988	0.0	237.5	1097.7	1064.6	417.6	110.7	36.6	0.0	12.8	0.0
1989	2.8	139.9	2499.9	1254.0	259.1	15.4	44.8	2.0	3.2	0.0
1990	0.0	535.4	1499.5	1474.3	259.3	57.0	17.7	10.0	0.0	0.0
1991	2.5	208.1	3152.7	1196.4	474.2	109.5	32.1	17.7	2.4	4.9
1992	0.0	124.7	1699.8	1168.4	379.6	86.9	37.7	7.9	1.8	0.0
1993	1.3	359.4	3502.0	1447.2	536.7	61.7	59.2	12.2	7.6	0.0
1994	10.7	418.6	1494.9	859.4	430.4	147.1	37.5	10.2	0.0	0.0
1995	90.1	2100.8	2895.2	1067.2	231.2	179.4	31.3	8.0	0.0	0.0
1996	8.5	562.4	1841.0	509.4	481.5	152.3	47.2	5.3	0.0	2.1
1997	0.4	168.1	2117.6	1486.4	670.3	182.7	68.1	27.8	0.0	0.0
1998	0.0	29.3	339.5	399.2	279.9	32.3	28.6	11.2	6.0	0.0
1999	0.0	37.8	303.0	525.2	306.9	115.6	33.8	1.1	0.0	0.0
2000	0.4	464.4	786.1	1161.6	795.3	309.6	60.3	14.3	9.9	5.9
2001	0.0	5.9	740.4	1617.1	331.3	63.8	58.5	7.8	4.7	0.9
2002	0.0	29.4	287.0	1989.0	924.0	50.4	38.1	14.9	0.8	3.4
2003	0.0	10.7	311.5	1359.1	962.7	490.1	79.4	11.9	0.6	0.0
2004	0.0	1.2	139.9	878.5	245.9	346.5	18.8	3.4	2.7	0.0
2005	0.0	0.3	289.6	327.3	423.3	125.4	68.2	6.3	1.2	0.0
2006	0.0	3.6	106.1	401.9	483.5	393.5	63.5	3.7	3.2	0.3
2007	0.0	4.6	58.9	733.4	565.9	126.2	128.3	105.0	6.5	1.5
2008	0.0	11.6	138.5	561.0	223.5	88.7	43.7	14.1	6.2	0.5
2009	0.0	4.5	165.6	733.4	489.5	138.3	37.7	10.4	8.7	1.9
2010	0.6	10.9	172.6	873.1	555.4	213.0	38.6	6.8	0.0	0.2

Table B16. Black sea bass recreational discards at age, 1984-2010.

000s

	0	1	2	3	4	5	6
1984	24.8	142.4	33.4	40.9	0.0	0.0	0.0
1985	4.7	221.0	156.5	6.1	0.0	0.0	0.0
1986	40.6	731.0	284.3	0.0	0.0	0.0	0.0
1987	21.2	160.3	131.6	4.4	0.0	0.0	0.0
1988	12.5	494.4	234.3	0.0	0.0	0.0	0.0
1989	0.0	158.2	154.7	6.3	0.0	0.0	0.0
1990	67.3	446.6	220.5	52.5	0.0	0.0	0.0
1991	46.7	325.9	441.3	21.1	0.0	0.0	0.0
1992	9.0	268.1	356.1	12.6	0.0	0.0	0.0
1993	28.0	246.5	208.1	0.9	0.0	0.0	0.0
1994	3.6	376.0	68.8	147.2	0.0	0.0	0.0
1995	2.2	1,085.9	46.7	0.0	0.0	0.0	0.0
1996	7.0	405.7	269.7	0.0	0.0	0.0	0.0
1997	0.0	328.8	572.1	0.7	0.0	0.0	0.0
1998	0.5	323.2	261.2	0.0	0.0	0.0	0.0
1999	0.7	803.5	58.4	0.0	0.0	0.0	0.0
2000	21.5	1,636.3	303.5	20.0	0.0	0.0	0.0
2001	1.2	776.5	768.6	86.6	0.0	0.0	0.0
2002	0.8	562.6	916.4	215.8	3.7	0.0	0.0
2003	0.5	439.4	655.8	229.7	6.0	0.0	0.0
2004	8.3	612.5	203.9	50.2	2.8	0.4	0.0
2005	35.2	477.0	258.9	77.4	1.1	0.0	0.0
2006	29.7	632.3	291.7	60.9	18.5	1.1	0.0
2007	44.9	594.3	613.5	31.7	1.3	0.7	0.0
2008	144.0	871.0	417.0	27.4	0.0	0.0	0.0
2009	50.2	517.0	514.0	76.2	4.8	0.8	0.0
2010	69.9	450.1	378.5	183.9	16.2	0.5	0.0

Table B17. Black sea bass total catch at age, 1984-2010.

	000s									
	0	1	2	3	4	5	6	7	8	9
1984	24.8	496.7	1948.4	2849.0	1376.7	118.3	59.6	5.7	8.7	0.0
1985	15.1	753.5	2642.7	2127.8	1203.4	161.5	76.2	22.4	11.5	0.3
1986	40.6	1707.2	8618.4	2334.2	518.0	107.3	165.4	14.3	30.9	32.2
1987	21.2	345.0	4815.2	3081.9	441.3	108.1	147.7	15.6	24.0	0.0
1988	12.5	840.8	3695.7	3293.0	980.6	277.6	75.8	0.0	23.0	1.7
1989	2.8	730.0	5284.5	2481.0	685.1	59.5	101.6	5.3	13.0	1.6
1990	67.3	1049.5	4017.3	3779.4	520.6	116.4	45.3	33.5	1.9	0.7
1991	49.2	590.8	6867.4	2139.7	877.2	232.6	47.9	20.8	2.4	4.9
1992	9.0	421.3	4805.5	3139.3	661.4	135.3	50.8	10.1	3.1	0.0
1993	29.3	663.3	5524.8	4405.7	935.9	110.4	81.0	17.9	8.6	0.0
1994	45.8	1082.9	2847.8	2431.6	1085.8	227.5	55.0	14.4	0.4	0.2
1995	135.4	3505.2	4836.8	1860.1	360.1	218.4	42.6	9.3	0.0	0.0
1996	222.5	3482.2	6398.3	2282.4	829.0	341.4	96.7	17.1	1.3	2.4
1997	0.4	588.0	4346.9	3059.9	1128.7	247.6	92.3	35.1	1.2	0.3
1998	0.5	416.0	2380.0	1599.6	896.4	76.0	61.4	19.4	12.3	2.1
1999	0.7	868.3	1094.9	1823.9	955.8	303.5	105.2	21.7	3.5	1.2
2000	21.8	2291.1	1673.1	2010.5	1414.1	574.3	103.2	21.0	12.6	8.7
2001	3.0	956.9	2545.9	3387.7	815.1	153.7	99.2	10.3	15.4	3.6
2002	87.7	634.6	1544.3	3727.1	1828.8	101.8	59.7	23.4	2.1	15.4
2003	2.4	490.0	1228.8	2415.3	1642.4	863.2	177.6	26.3	0.6	0.0
2004	12.4	741.0	732.9	2117.2	853.2	1012.5	95.9	11.9	11.8	0.0
2005	38.2	478.2	887.0	789.0	1205.9	326.1	305.7	24.7	4.5	0.0
2006	29.7	640.7	754.6	839.7	1098.4	817.6	205.7	17.7	6.8	2.1
2007	44.9	659.7	1024.7	1409.5	1024.0	257.5	248.4	191.7	13.5	2.8
2008	146.3	913.0	792.7	1639.1	488.3	182.7	83.9	27.2	11.9	1.6
2009	54.0	603.8	1011.8	1337.1	855.9	207.6	91.6	22.0	16.1	3.9
2010	70.8	470.0	648.4	1677.0	1067.4	447.4	111.9	19.0	5.6	2.3

Table B18. Black sea bass mean catch weights at age (kg), 1968-2010. 1968-1983 weights at age the average of 1984-1986.

year	0	1	2	3	4	5	6	7+
1968	0.01	0.08	0.17	0.32	0.54	0.89	1.34	2.43
1969	0.01	0.08	0.17	0.32	0.54	0.89	1.34	2.43
1970	0.01	0.08	0.17	0.32	0.54	0.89	1.34	2.43
1971	0.01	0.08	0.17	0.32	0.54	0.89	1.34	2.43
1972	0.01	0.08	0.17	0.32	0.54	0.89	1.34	2.43
1973	0.01	0.08	0.17	0.32	0.54	0.89	1.34	2.43
1974	0.01	0.08	0.17	0.32	0.54	0.89	1.34	2.43
1975	0.01	0.08	0.17	0.32	0.54	0.89	1.34	2.43
1976	0.01	0.08	0.17	0.32	0.54	0.89	1.34	2.43
1977	0.01	0.08	0.17	0.32	0.54	0.89	1.34	2.43
1978	0.01	0.08	0.17	0.32	0.54	0.89	1.34	2.43
1979	0.01	0.08	0.17	0.32	0.54	0.89	1.34	2.43
1980	0.01	0.08	0.17	0.32	0.54	0.89	1.34	2.43
1981	0.01	0.08	0.17	0.32	0.54	0.89	1.34	2.43
1982	0.01	0.08	0.17	0.32	0.54	0.89	1.34	2.43
1983	0.01	0.08	0.17	0.32	0.54	0.89	1.34	2.43
1984	0.01	0.10	0.17	0.30	0.45	0.82	1.33	2.29
1985	0.01	0.07	0.16	0.27	0.51	0.84	1.37	2.10
1986	0.01	0.08	0.18	0.40	0.66	1.00	1.34	2.89
1987	0.03	0.08	0.17	0.34	0.57	0.92	1.58	2.02
1988	0.01	0.10	0.18	0.32	0.49	0.62	1.38	1.93
1989	0.01	0.03	0.18	0.35	0.58	0.86	1.37	2.54
1990	0.02	0.09	0.17	0.33	0.60	0.81	1.20	2.22
1991	0.03	0.08	0.17	0.36	0.54	0.66	1.16	1.84
1992	0.01	0.08	0.18	0.31	0.58	0.90	1.05	2.02
1993	0.02	0.11	0.21	0.29	0.59	0.88	1.15	1.94
1994	0.02	0.08	0.20	0.28	0.40	0.86	0.99	1.77
1995	0.05	0.12	0.24	0.45	0.76	1.01	1.21	1.69
1996	0.05	0.11	0.19	0.34	0.66	0.70	1.08	1.61
1997	0.06	0.15	0.23	0.37	0.61	0.84	0.94	1.37
1998	0.03	0.18	0.21	0.40	0.54	1.09	1.13	1.94
1999	0.03	0.14	0.28	0.41	0.59	0.85	0.92	1.78
2000	0.05	0.18	0.30	0.47	0.68	0.82	1.60	2.08
2001	0.02	0.08	0.26	0.48	0.67	1.12	1.47	1.94
2002	0.01	0.16	0.31	0.44	0.75	1.25	1.44	2.40
2003	0.03	0.14	0.36	0.49	0.63	0.84	1.40	2.13
2004	0.03	0.11	0.32	0.47	0.67	0.73	1.72	2.18
2005	0.02	0.12	0.35	0.47	0.60	0.85	1.29	2.17
2006	0.04	0.12	0.32	0.49	0.61	0.70	1.38	1.92
2007	0.04	0.15	0.27	0.48	0.64	0.88	1.06	1.79
2008	0.04	0.14	0.32	0.45	0.70	0.82	1.11	1.78
2009	0.04	0.11	0.27	0.47	0.66	0.83	1.20	1.83
2010	0.05	0.14	0.35	0.46	0.60	0.79	1.33	1.83

Table B19. Black sea bass mean catch weights at age (kg) 2006-2010, variance and CV

		Age								
		0	1	2	3	4	5	6	7	8
2006										
mean wt			0.15	0.34	0.57	0.65	0.66	1.61	1.89	
var			0.006	0.002	0.028	0.096	0.108	0.178	0.477	
CV			0.52	0.13	0.29	0.48	0.50	0.26	0.37	
2007										
mean wt			0.28	0.33	0.50	0.78	0.90	1.66	2.16	
var			0.00	0.01	0.02	0.11	0.07	0.24	0.41	
CV			0.19	0.30	0.29	0.44	0.30	0.29	0.30	
2008										
mean wt			0.14	0.39	0.49	1.00	1.54	1.99	1.96	2.98
var			0.001	0.008	0.025	0.016	0.036	0.068	0.184	0.008
CV			0.18	0.23	0.32	0.12	0.12	0.13	0.22	0.03
2009										
mean wt			0.15	0.37	0.52	0.60	0.73	1.19	1.40	
var			0.001	0.010	0.020	0.038	0.093	0.082	0.344	
CV			0.25	0.26	0.27	0.33	0.42	0.24	0.42	
2010										
mean wt		0.02	0.09	0.25	0.46	0.58	0.79	1.26	1.45	1.88
var		0.000	0.001	0.002	0.011	0.034	0.121	0.121	0.270	0.036
CV		0.00	0.36	0.18	0.23	0.32	0.44	0.28	0.36	0.10

Table B20. Model results for black sea bass maturity at age, female and sexes combined.

Female at age				
	estimate	SE	L95	U95
intercept	-1.372	0.121	-1.614	-1.130
age	1.150	0.054	1.042	1.258

All at age				
	estimate	SE	L95	U95
intercept	-2.578	0.101	-2.780	-2.376
age	1.572	0.048	1.476	1.668

Table B21. Black sea bass von Bertalanffy growth curves for all areas, north and south of Hudson Canyon.

	n=5484	lower		upper	
		SE	95%CI	95%CI	95%CI
Linf	65.12	1.44	62.30	67.93	
K	0.181	0.006	0.168	0.193	
to	0.146	0.017	0.112	0.180	

	n=4215	lower		upper	
		SE	95%CI	95%CI	95%CI
Linf	63.64	1.71	60.29	66.98	
K	0.183	0.008	0.167	0.199	
to	0.150	0.026	0.099	0.201	

	n=1269	lower		upper	
		SE	95%CI	95%CI	95%CI
Linf	65.19	2.30	60.69	69.70	
K	0.202	0.011	0.180	0.224	
to	0.190	0.019	0.154	0.227	

Table B22. Models and associated values for natural mortality evaluated for black sea bass. Lorenzen M scaled to constant used in model. M in assessment model extrapolated to age 0.5 = 0.87.

Age	Constant	Rule of Thumb¹	Rule of Thumb²	Hewitt & Hoenig¹	Hewitt & Hoenig²	Lorenzen	Lorenzen Scaled to Constant	Lorenzen Scaled to Rule of Thumb¹	Lorenzen Scaled to Hewitt & Hoenig¹	Lorenzen Scaled to Rule of Thumb²	Lorenzen Scaled to Hewitt & Hoenig²
1	0.40	0.33	0.25	0.47	0.35	0.87	0.65	0.56	0.78	0.50	0.62
2	0.40	0.33	0.25	0.47	0.35	0.69	0.49	0.44	0.62	0.36	0.46
3	0.40	0.33	0.25	0.47	0.35	0.60	0.41	0.38	0.53	0.29	0.38
4	0.40	0.33	0.25	0.47	0.35	0.52	0.36	0.33	0.47	0.24	0.33
5	0.40	0.33	0.25	0.47	0.35	0.47	0.33	0.30	0.42	0.21	0.29
6	0.40	0.33	0.25	0.47	0.35	0.42	0.31	0.27	0.37	0.18	0.25
7	0.40	0.33	0.25	0.47	0.35	0.39	0.29	0.25	0.35	0.16	0.23
8	0.40	0.33	0.25	0.47	0.35	0.37	0.27	0.24	0.34	0.15	0.21
9	0.40	0.33	0.25	0.47	0.35	0.36	0.26	0.23	0.33	0.15	0.21
10	0.40		0.25		0.35	0.33	0.25			0.13	0.19
11	0.40		0.25		0.35	0.32	0.24			0.12	0.17
12	0.40		0.25		0.35	0.30	0.23			0.11	0.16

¹Maximum age = 9

²Maximum age = 12

Table B23. Black sea bass mean stock weights at age (kg), 1968-2010. 1968-1983 weights at age the average of 1984-1986.

year	0	1	2	3	4	5	6	7+
1968	0.001	0.01	0.13	0.29	0.51	0.89	1.34	2.43
1969	0.001	0.01	0.13	0.29	0.51	0.89	1.34	2.43
1970	0.001	0.01	0.13	0.29	0.51	0.89	1.34	2.43
1971	0.001	0.01	0.13	0.29	0.51	0.89	1.34	2.43
1972	0.001	0.01	0.13	0.29	0.51	0.89	1.34	2.43
1973	0.001	0.01	0.13	0.29	0.51	0.89	1.34	2.43
1974	0.001	0.01	0.13	0.29	0.51	0.89	1.34	2.43
1975	0.001	0.01	0.13	0.29	0.51	0.89	1.34	2.43
1976	0.001	0.01	0.13	0.29	0.51	0.89	1.34	2.43
1977	0.001	0.01	0.13	0.29	0.51	0.89	1.34	2.43
1978	0.001	0.01	0.13	0.29	0.51	0.89	1.34	2.43
1979	0.001	0.01	0.13	0.29	0.51	0.89	1.34	2.43
1980	0.001	0.01	0.13	0.29	0.51	0.89	1.34	2.43
1981	0.001	0.01	0.13	0.29	0.51	0.89	1.34	2.43
1982	0.001	0.01	0.13	0.29	0.51	0.89	1.34	2.43
1983	0.001	0.01	0.13	0.29	0.51	0.89	1.34	2.43
1984	0.001	0.01	0.13	0.29	0.51	0.82	1.33	2.29
1985	0.001	0.01	0.14	0.28	0.46	0.84	1.37	2.10
1986	0.001	0.01	0.14	0.32	0.54	1.00	1.34	2.89
1987	0.001	0.01	0.15	0.32	0.54	0.92	1.58	2.02
1988	0.001	0.01	0.13	0.27	0.53	0.62	1.38	1.93
1989	0.001	0.01	0.13	0.25	0.46	0.86	1.37	2.54
1990	0.001	0.01	0.12	0.25	0.46	0.81	1.20	2.22
1991	0.001	0.01	0.12	0.27	0.46	0.66	1.16	1.84
1992	0.001	0.01	0.11	0.23	0.44	0.90	1.05	2.02
1993	0.001	0.01	0.12	0.23	0.39	0.88	1.15	1.94
1994	0.001	0.01	0.15	0.26	0.58	0.86	0.99	1.77
1995	0.001	0.01	0.17	0.32	0.64	1.01	1.21	1.69
1996	0.001	0.02	0.16	0.31	0.67	0.70	1.08	1.61
1997	0.001	0.02	0.15	0.32	0.50	0.84	0.94	1.37
1998	0.001	0.01	0.16	0.34	0.47	1.09	1.13	1.94
1999	0.001	0.01	0.18	0.37	0.55	0.85	0.92	1.78
2000	0.001	0.01	0.17	0.37	0.60	0.82	1.60	2.08
2001	0.001	0.01	0.18	0.36	0.68	1.12	1.47	1.94
2002	0.001	0.01	0.16	0.35	0.61	1.25	1.44	2.40
2003	0.001	0.01	0.17	0.33	0.58	0.84	1.40	2.13
2004	0.001	0.01	0.16	0.32	0.47	0.73	1.72	2.18
2005	0.001	0.01	0.17	0.35	0.52	0.85	1.29	2.17
2006	0.001	0.01	0.17	0.33	0.52	0.70	1.38	1.92
2007	0.001	0.01	0.17	0.34	0.60	0.88	1.06	1.79
2008	0.001	0.01	0.16	0.33	0.58	0.82	1.11	1.78
2009	0.001	0.01	0.15	0.33	0.55	0.83	1.20	1.83
2010	0.001	0.01	0.14	0.31	0.49	0.79	1.33	1.83

Table B24. Components, number of residuals and residual mean square errors of ASAP model objective function.

Component	Num.resids	RMSE
_Catch_Fleet_1	43	0.364
Catch_Fleet_Total	43	0.364
_Discard_Fleet_1	0	0
Discard_Fleet_Total	0	0
_Index_1	30	0.428
_Index_2	22	1.27
_Index_3	22	2.94
_Index_4	27	2.67
_Index_5	27	2.63
_Index_6	43	2.34
_Index_7	16	2.3
Index_Total	187	2.23
Nyear1	7	0.341
Fmult_Year1	0	0
_Fmult_devs_Fleet_1	0	0
Fmult_devs_Total	0	0
Recruit_devs	43	0.542
Fleet_Sel_params	16	1.66
Index_Sel_params	16	0.383
q_year1	2	5.62
q_devs	0	0
SRR_steepness	0	0
SRR_unexpl_S	0	0

Table B25. Historic retrospective estimates of black sea bass fishing mortality.

	SCALE M=0.4 DPWG (model avg)	SCALE M=0.4 2008 (model avg)	SCALE M=0.4 2009 (model avg)	SCALE M=0.4 June update	M=0.4 Revised SCALE	M=0.4 ASAP	Lorenzen M ASAP
1968	0.62	0.59	0.58	0.57	0.46	0.30	0.30
1969	0.48	0.46	0.45	0.45	0.38	0.29	0.30
1970	0.46	0.44	0.43	0.43	0.37	0.25	0.25
1971	0.21	0.20	0.20	0.20	0.18	0.13	0.13
1972	0.24	0.23	0.23	0.23	0.21	0.15	0.15
1973	0.29	0.29	0.29	0.28	0.27	0.21	0.21
1974	0.28	0.28	0.28	0.28	0.24	0.19	0.19
1975	0.43	0.43	0.43	0.42	0.35	0.33	0.32
1976	0.50	0.50	0.51	0.48	0.34	0.34	0.34
1977	0.72	0.72	0.74	0.70	0.44	0.54	0.52
1978	0.66	0.64	0.65	0.62	0.31	0.57	0.55
1979	0.35	0.33	0.34	0.34	0.16	0.49	0.48
1980	0.36	0.33	0.34	0.34	0.17	0.39	0.38
1981	0.28	0.26	0.26	0.26	0.15	0.29	0.28
1982	0.83	0.79	0.79	0.79	0.54	0.41	0.41
1983	0.65	0.63	0.62	0.63	0.44	0.58	0.58
1984	0.49	0.48	0.48	0.48	0.37	0.41	0.41
1985	0.42	0.41	0.40	0.41	0.36	0.39	0.40
1986	1.21	1.27	1.26	1.25	1.34	0.49	0.50
1987	0.66	0.68	0.67	0.67	0.71	0.40	0.41
1988	0.91	0.92	0.90	0.90	0.93	0.49	0.50
1989	0.95	0.88	0.89	0.89	0.93	0.43	0.43
1990	1.02	0.94	0.96	0.95	1.03	0.47	0.47
1991	1.01	1.00	1.00	1.01	1.15	0.55	0.55
1992	0.78	0.73	0.75	0.75	0.75	0.40	0.40
1993	0.95	0.87	0.90	0.88	0.91	0.60	0.60
1994	0.52	0.51	0.52	0.51	0.53	0.52	0.52
1995	0.86	0.90	0.89	0.88	0.90	0.76	0.76
1996	1.19	1.07	1.15	1.14	1.10	0.96	0.97
1997	1.01	0.99	1.02	1.02	0.92	0.76	0.80
1998	0.62	0.58	0.62	0.61	0.56	0.52	0.57
1999	0.60	0.59	0.62	0.62	0.59	0.49	0.56
2000	0.93	0.93	0.97	0.98	1.01	0.56	0.65
2001	1.16	1.09	1.17	1.21	1.24	0.43	0.51
2002	1.02	0.98	1.03	1.03	0.72	0.34	0.41
2003	0.86	0.81	0.87	0.84	0.48	0.25	0.31
2004	0.80	0.56	0.68	0.65	0.35	0.19	0.24
2005	0.54	0.40	0.46	0.46	0.26	0.17	0.21
2006	0.50	0.39	0.45	0.46	0.26	0.19	0.22
2007	0.48	0.37	0.43	0.46	0.27	0.20	0.22
2008		0.28	0.35	0.39	0.24	0.15	0.17
2009			0.29	0.32	0.22	0.15	0.16
2010				0.41	0.30	0.17	0.18

Table B26. Black sea bass CVs used in stochastic biological reference points.

Catch, SSB, Jan 1 Mean Weights								
	True Age							
	0	1	2	3	4	5	6	7+
Input CV	0.301	0.301	0.222	0.281	0.336	0.356	0.214	0.332
Fishery Selectivity								
	True Age							
	0	1	2	3	4	5	6	7+
Input CV	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
Maturity at age								
	True Age							
	0	1	2	3	4	5	6	7+
Input CV	0.190	0.220	0.150	0.050	0.020	0.010	0.010	0.010
Natural Mortality								
	True Age							
	0	1	2	3	4	5	6	7+
Input CV	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300

Table B27. Black sea bass biological reference points and 2010 catch.

Biological Reference Points	F40%	SSB40%	MSY	F2010	SSB2010	Catch2011
Existing BRPs and July 2011 Scale update	0.42	12,537 MT	3,903 MT	0.41	13,926 MT	2,960 MT
LOR M=0.40 from final base run (median SSB 2010)	DET: 0.252 AVG: 0.279 SD: 0.041 CV: 0.147 50%: 0.275 10%: 0.230 90%: 0.337	50%: 9,467 MT 10%: 8,004 MT 90%: 11,184 MT	50%: 3,087MT 10%: 2,593 MT 90%: 3,675 MT	avg 0.18 50%: 0.171 10%: 0.134 90%: 0.216	avg 10,843 MT 50%: 11,456MT 10%: 10,012 MT 90%: 13,082 MT	2,444 MT
Const M = 0.4. from alternate run	DET: 0.292 AVG: 0.323 SD: 0.050 CV: 0.155 50%: 0.316 10%: 0.262 90%: 0.390	50%: 8,128 MT 10%: 6,734 MT 90%: 9,870 MT	50%: 3,197 MT 10%: 2,628 MT 90%: 3,905 MT	avg 0.17 50%: 0.161 10%: 0.143 90%: 0.182	avg. 11,412 MT 50%: 11,863 MT 10%: 10,521 MT 90%: 13,369 MT	2,444 MT

Table B28. Black sea bass stock status (2010) compared to biological reference points.

Biological Reference Points	Status 2010	2010 % BRP
Existing BRPs and July 2011 Scale update	Not overfished No overfishing	111% of SSB40% 98% of F40%
LOR M=0.40 from final base run	Not overfished No overfishing	121% of SSB40% 62% of F40%
Const M = 0.4. from alternate run	Not overfished No overfishing	146% of SSB40% 59% of F40%

Table B29. Black sea bass projected catch (000s MT) for 2012-2015, under age varying M and 2011 recruitment from 2006-2010 average, at $F_{40\%}$.

Variable M
recruitment 2006-2010
SSB

	10% CI	Median	90% CI
2011	9.849	11.160	12.596
2012	8.883	9.905	10.960
2013	8.150	9.029	9.909
2014	7.843	8.712	9.663
2015	7.527	8.550	9.741

Catch	10% CI	Median	90% CI
2011	3.204	3.628	4.076
2012	2.783	3.093	3.401
2013	2.535	2.799	3.087
2014	2.509	2.779	3.075
2015	2.434	2.806	3.229

Total biomass	10% CI	Median	90% CI
2011	11.219	12.802	14.554
2012	10.170	11.363	12.653
2013	9.207	10.202	11.181
2014	8.851	9.766	10.722
2015	8.451	9.519	10.732

Mean biomass	10% CI	Median	90% CI
2011	10.796	12.162	13.643
2012	9.744	10.847	11.92
2013	9.086	10.028	11.009
2014	8.823	9.863	11.038
2015	8.529	9.767	11.246

Table B30. Black sea bass projected catch (000s MT) for 2012-2015, under constant M=0.4 and 2011 recruitment from 2006-2010 average at F_{40%}.

**Constant M
recruitment 2006-2010
SSB**

	10% CI	Median	90% CI
2011	9.950	11.177	12.499
2012	8.402	9.325	10.357
2013	7.409	8.184	9.070
2014	6.953	7.762	8.707
2015	6.574	7.588	8.831

Catch

	10% CI	Median	90% CI
2011	3.839	4.292	4.800
2012	3.109	3.444	3.827
2013	2.743	3.032	3.371
2014	2.701	3.003	3.351
2015	2.562	3.007	3.534

Total Biomass

	10% CI	Median	90% CI
2011	11.747	13.318	14.982
2012	9.981	11.101	12.369
2013	8.560	9.462	10.501
2014	8.049	8.881	9.818
2015	7.499	8.564	9.808

Mean Biomass

	10% CI	Median	90% CI
2011	10.961	12.266	13.719
2012	9.300	10.282	11.423
2013	8.402	9.253	10.251
2014	7.931	8.943	10.114
2015	7.553	8.798	10.370

Table B31. Black sea bass projected catch (000s MT) for 2012-2015, under age varying M and 2011 recruitment from 1984-2010 average at $F_{40\%}$.

Variable M
recruitment 1984-2010
SSB

	10% CI	Median	90% CI
2011	9.849	11.160	12.596
2012	8.893	9.910	10.960
2013	8.355	9.171	9.991
2014	8.141	8.931	9.804
2015	7.784	8.754	9.899

Catch

	10% CI	Median	90% CI
2011	3.205	3.628	4.076
2012	2.797	3.103	3.409
2013	2.591	2.840	3.109
2014	2.638	2.873	3.133
2015	2.520	2.878	3.286

Total biomass

	10% CI	Median	90% CI
2011	11.220	12.802	14.555
2012	10.184	11.372	12.659
2013	9.312	10.281	11.223
2014	9.196	10.011	10.865
2015	8.743	9.749	10.890

Mean Biomass

	10% CI	Median	90% CI
2011	10.802	12.165	13.646
2012	9.778	10.868	11.942
2013	9.397	10.256	11.134
2014	9.150	10.116	11.208
2015	8.792	9.982	11.422

Table B32. Black sea bass projected catch (000s MT) for 2012-2015, under constant M and 2011 recruitment from 1984-2010 average at $F_{40\%}$.

**Constant M
recruitment 1984-2010
SSB**

	10% CI	Median	90% CI
2011	9.950	11.177	12.499
2012	8.407	9.328	10.356
2013	7.523	8.228	9.057
2014	7.105	7.841	8.702
2015	6.678	7.651	8.854

Catch

	10% CI	Median	90% CI
2011	3.839	4.292	4.800
2012	3.119	3.451	3.824
2013	2.775	3.048	3.365
2014	2.777	3.040	3.351
2015	2.600	3.033	3.547

Total Biomass

	10% CI	Median	90% CI
2011	11.748	13.318	14.982
2012	9.988	11.102	12.364
2013	8.620	9.488	10.485
2014	8.241	8.966	9.787
2015	7.630	8.638	9.820

Mean Biomass

	10% CI	Median	90% CI
2011	10.962	12.270	13.718
2012	9.316	10.288	11.419
2013	8.564	9.327	10.223
2014	8.091	9.026	10.112
2015	7.659	8.865	10.409

Table B33. 2012 OFL (median and 80% CI) under two M options and two recruit series. 2011 catch assumed equal to ABC (2,041 MT).

	2012 OFL R=2006-2010	2012 OFL R=1984-2010
LOR M = 0.40 from final base run	50%: 3,093 MT 10%: 2,783 MT 90%: 3,401 MT	50%: 3,103 MT 10%: 2,797 MT 90%: 3,409 MT
Const M = 0.4. from alternate run	50%: 3,444 MT 10%: 3,109 MT 90%: 3,827 MT	50%: 3,451 MT 10%: 3,119MT 90%: 3,824 MT