

APPENDIX A-2

**ICHTHYOPLANKTON ASSESSMENT MODEL RESPONSE TO
NMFS COMMENTS FOR THE BIENVILLE OFFSHORE
ENERGY TERMINAL DEEPWATER
PORT LICENSE APPLICATION**

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A-2.0 ICHTHYOPLANKTON ASSESSMENT MODEL RESPONSE TO NMFS COMMENTS FOR THE BIENVILLE OFFSHORE ENERGY TERMINAL DEEPWATER PORT LICENSE APPLICATION

A-2.1 Introduction

On November 17, 2005, a draft edition of Appendix A-1 was presented to the National Oceanic and Atmospheric Association's National Marine Fisheries Service (NMFS) for unofficial consultation. Based on that consultation, the current appendix was written, and is intended to address the comments made by NMFS. This appendix provides densities of ichthyoplankton and estimates of impingement and entrainment for the BOET vicinity based on the data of the Southeast Area Monitoring and Assessment Program (SEAMAP).

The data presented result from the following changes to the Appendix A-1 analysis:

- The SEAMAP polygon was rotated to better align the data set to reflect characteristics of the BOET vicinity.
- Winter data were generated by the use of summer data, in accordance with USCG and MARAD (2004) and as described in Section A-2.4.2.

A full report and discussion similar to Appendix A-1 is not provided, rather only the results of the revised polygon and its comparison to the original. The data files for the results from the BOET/NMFS SEAMAP polygon are presented following this discussion. These data indicate that the change in orientation has resulted in a decrease in number and pounds of equivalent age-1 fish entrained by the Project annually, except for Gulf menhaden, which increased in both cases. This increase has been partially attributed to the manner in which individuals are processed by the model.

A-2.2 Ichthyoplankton Data Selection and Management

A-2.2.1 The SEAMAP Boundary Polygon

The SEAMAP data for this analysis were obtained from sampling sites located shown in Figure A-2-1. This change from the Hanisko approach orients the polygon along the water depth contours that are similar to those in the BOET vicinity. This final polygon was bordered north

and south by latitudes 29.83° N and 28.82° N, and east and west by longitudes 87.21° W and 88.79° W.

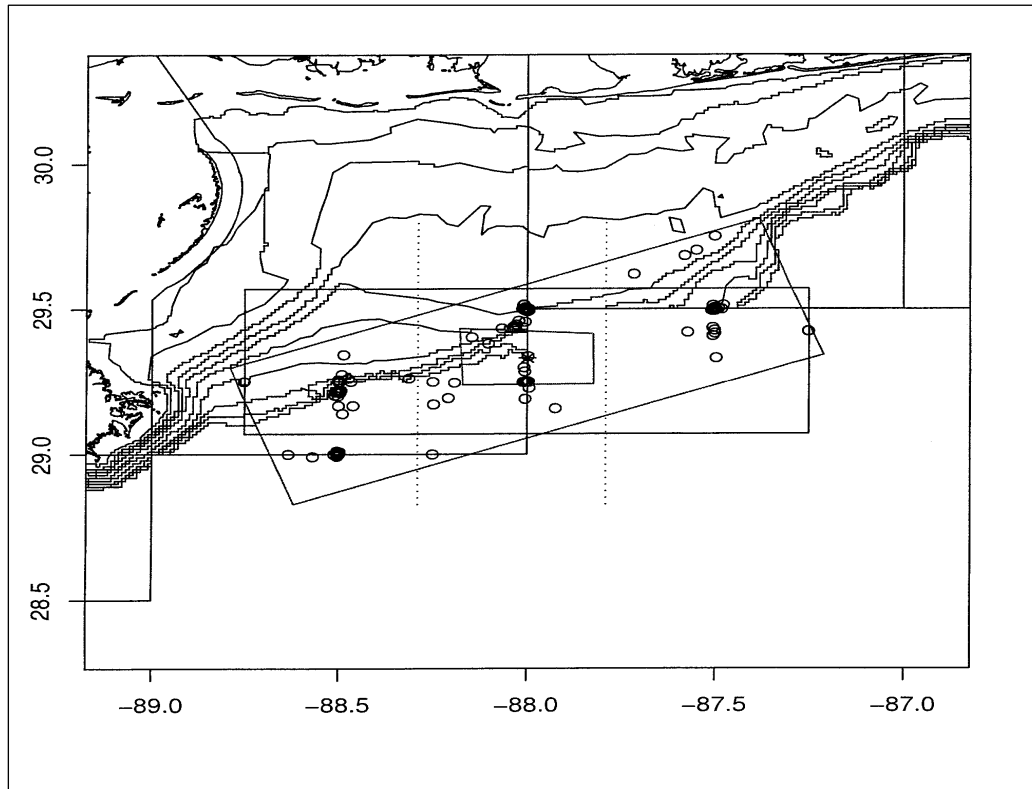


Figure A-2-1. Proposed Bienville Offshore Energy Terminal/National Marine Fisheries Service Polygon

Note: The bold-bordered polygon denotes the area within which the proposed Terminal will be located. The three large squares separated by dashed vertical lines denote 30-minute SEAMAP sampling blocks. Circles show the location of the ichthyoplankton sampling sites. Depth contours are in 5-fathom increments.

A-2.2.2 SEAMAP Analyses

A detailed description of methods for analyzing the SEAMAP ichthyoplankton data is provided in USCG and MARAD 2004. These descriptions identify the three SEAMAP data files (STATCARD, ICHSTRWK, ICHSARWK) that are used together to estimate fish larvae and egg densities, and the relevant fields within each data file. The results in this report use the file named “Ichthyoplankton_09_02_2004_ascii.zip” as provided by David Hanisko, NMFS, Pascagoula Laboratory, Mississippi. This file was updated and corrected on December 23, 2004.

The STATCARD describes when and where sampling operations took place. The ICHSTRWK is the data file which contains gear code information, volumes filtered and all of the egg data, whereas the ICHSARWK dataset provides data about individual taxa. As described in

Attachment 1 of Appendix A-1, STATCARD and ICHSTRWK can be merged based upon three fields (cruise number, vessel, Pascagoula Station Number). The sample number field is required to merge these data with the ICHSARWK data file.

These descriptions include a section called “Analysis Constraints” that, in this case, describes the rectangle drawn around the proposed Project site, as shown in Figure A-2-1. Samples taken within the rectangle are judged to be representative of the ichthyoplankton densities that might be encountered at BOET. These data are presented in the table titled “SEAMAP Catch Per Unit Effort for NMFS Polygon, located in Attachment 1. The data set contained 156 larvae samples and 94 egg samples.

A-2.3 Ichthyoplankton Densities

The BOET/NMFS polygon contained a density of fish larvae averaging 2.410 larvae/m³ (95% CI: 1.728 to 3.092), with the density of fish eggs averaging 1.210 eggs/m³ and the 95% confidence interval (CI) ranging from 0.797 to 1.623. Table A-2-1 summarizes the larval fish taxa represented by 1 percent or more of the total larval fish density.

A-2.4 Calculation of Potential Entrainment Estimates

A-2.4.1 Annual Estimates

The potential entrainment of larvae and eggs was obtained by multiplying the observed densities, times the daily maximum intake volume, times the days of exposure. Net extrusion effects were accounted for by multiplying the observed densities by a factor of 3. Seasonal considerations were not taken into account for larvae and eggs in the BOET/NMFS polygon, following USCG and MARAD (2004). The mean annual estimate for fish larvae considered all taxa combined. The estimated number of eggs and larvae entrained and impinged are shown in Table A-2-2.

These estimates include three assumptions in addition to the net extrusion adjustment factor. These additional assumptions include (1) that the depth-integrated samples reflect the densities that will be encountered at the depth of the intake location, (2) that the densities obtained from the summer-fall collections are representative of the average density over the whole year, and (3) that exposure would occur over the entire year. None of these assumptions are expected to be necessarily true, and assumption (2) is likely not true.

A-2.4.2 Larval and Egg Estimates for Species of Concern

Consistent with USCG and MARAD (2004), as amended by USCG and MARAD (2005), the key fish species of concern were red drum (*Sciaenops ocellatus*), red snapper (*Lutjanus campechanus*), Gulf menhaden (*Brevoortia patronus*), and bay anchovy (*Anchoa mitchilli*).

SEAMAP data are routinely collected over a 6-month period (June through November) of each year. This period incorporates the spawning season for many but not all species. Spawning months for the four taxa of concern are shown in Table A-2-3. Spawning of red drum and red snapper occur during the June–November SEAMAP sampling period. Spawning of clupeids and engraulids occurs over a greater portion of the year. This requires some means of extrapolation of data collected during June–November to the period December–May.

Table A-2-1. Larval Fish Taxa Represented by 1 Percent or More of the Total Larval Fish Density

Name	Mean Density (number per cubic meter)	Percent Total Density
Menhaden Genus		
<i>Brevoortia</i> spp.	0.30609	12.75
Anchovy Family		
Engraulidae	0.27033	11.26
Codlet Genus		
<i>Bregmaceros</i> spp.	0.26255	10.93
Lizardfish Family		
Synodontidae	0.16626	6.92
Goby Family		
Gobiidae	0.16419	6.84
Lanternfish Genus		
<i>Diaphus</i> ssp.	0.14822	6.17
Cusk-Eel Family		
Ophidiidae	0.08026	3.34
Sole Genus		
Unid. Fish	0.07547	3.14
<i>Symphurus</i> spp.	0.07076	2.95
Spot		
<i>Leiostomus xanthurus</i>	0.06838	2.85
Wrasse Family		
Labridae	0.06160	2.57
Lefteye Flounder Genus		
<i>Syacium</i> spp.	0.04626	1.93
Lanternfish Family		
Myctophidae	0.03941	1.64
Lefteye Flounder Family		
Bothidae	0.03147	1.31
Bristlemouths		
Gonostomatidae	0.02462	1.03
Sum	1.81586	75.62
Total larval density	2.41015	

Source: Adapted from Attachment 1.

Table A-2-2. Estimated Annual Entrainment of Fish Eggs and Larvae

	Lower 95% CI	Mean	Upper 95% CI
Fish eggs	419,555,118	636,965,738	854,376,357
Fish larvae	909,650,244	1,268,667,296	1,627,684,348

CI = Confidence interval.

Table A-2-3. Seasonal Patterns for the Four Species of Concern

Species	Seasonal Occurrence and Peak Months	Duration of Exposure (months)
Engraulidae	Jan, Feb, MAR, APR, MAY, JUN, JUL, AUG, SEP , Oct, Nov, Dec	12 ^a
Clupeiformes	Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec	12 ^a
Red snapper	JUN, JUL, AUG, Sep	4 ^b
Red drum	SEP, OCT	2 ^c

Notes: Abbreviations represent the month of the year that larvae occur. Bold abbreviations represent seasonal peaks in abundance based on referenced citations.

Sources: ^a Ditty et al. 1988, ^b Schrippa and Legault 1999, and ^c Comyns (1997).

USCG and MARAD (2004), as amended by USCG and MARAD (2005) developed an approach to the problem based on monthly abundance data (all months except for March) collected by Ditty (1986) in offshore Louisiana. This approach used the Ditty (1986) data to develop a seasonal multiplier that could be applied to the June–November SEAMAP data to estimate abundance for December–May. Ditty’s (1986) average larval density from December–May (Table A-2-4) was divided by his average larval density for June through November (Table A-2-5) to yield a comparative ratio for the two periods for each species (Table A-2-6). Larval density estimates recorded in the SEAMAP data were then multiplied times the ratio to estimate larval densities during the unsampled December–May period (Table A-2-7). Total larval entrainment for each period was then calculated by multiplying adjusted (times 3) larval density (Table A-2-7) times the maximum daily intake volume of approximately 127 mgd (480,747 m³) times the number of days in each period (Table A-2-8). Entrainment for each period was then summed to yield total annual entrainment for each species of concern (Table A-2-9).

Because eggs were not identified to species, species-specific egg entrainment was determined by first calculating the ratio of total eggs to total larvae for the SEAMAP database (Table A-2-10). Respective densities were adjusted by a multiple of 3, then multiplied times the maximum daily intake volume, then multiplied times the number of days in the June–November sampling period (183 days). This yielded estimates of larvae and egg entrainment for the average, upper confidence limit (UCL), and lower confidence limit (LCL) cases from which egg/larvae ratios were determined. Egg/larvae ratios were multiplied times annual larval entrainment for each species and each entrainment scenario (average, UCL, LCL) to yield the projected egg entrainment for each species of interest (Table A-2-11).

Table A-2-4. Reported Average Monthly Densities (number/100 m³), December–May

Common Name	Scientific Name	Dec	Jan	Feb	Apr	May	Average
Bay anchovy	Engraulidae	4.0	1.6	2.9	193.8	74.3	55.32
Gulf menhaden	Clupeidae	2.7	67.1	41.0	0.0	0.0	22.16
Red drum	<i>Sciaenops ocellatus</i>	0.0	0.0	0.0	0.0	0.0	0.00
Red snapper	<i>Lutjanus campechanus</i>	0.0	0.0	0.0	0.0	0.0	0.00

Source: Ditty 1986.

Table A-2-5. Reported Average Monthly Densities (number/100 m³), June–November

Common Name	Scientific Name	Jun	Jul	Aug	Sep	Oct	Nov	Average
Bay anchovy	Engraulidae	598.1	213.4	3.0	27.6	3.3	0.8	141.03
Gulf menhaden	Clupeidae	0.0	0.0	0.0	0.8	1.4	7.3	1.58
Red drum	<i>Sciaenops ocellatus</i>	0.0	0.0	0.0	12.8	6.3	0.0	3.18
Red snapper	<i>Lutjanus campechanus</i>	0.0	1.0	1.0	1.0	1.0	0.0	0.67

Source: Ditty 1986.

Table A-2-6. Ratios of December–May to June–November

Common Name	Scientific Name	Ratio
Bay anchovy	Engraulidae	0.3922
Gulf menhaden	Clupeidae	13.9958
Red drum	<i>Sciaenops ocellatus</i>	0.0000
Red snapper	<i>Lutjanus campechanus</i>	0.0000

Source: Ditty 1986.

Table A-2-7. Larval Density Estimates (number/m³) for the Two Periods

Species	Associated Taxa In SEAMAP Data	June–November			December–May		
		LCL	Mean	UCL	LCL	Mean	UCL
Bay anchovy	All anchovies	0.42894	0.85344	1.26209	0.16825	0.33476	0.49505
Gulf menhaden	<i>Brevoortia patronus</i>	0.01387	0.97278	2.72842	0.19408	13.61487	38.18640
Red drum	<i>Sciaenops ocellatus</i>	0.00015	0.00223	0.00432	0	0	0
Red snapper	<i>Lutjanus campechanus</i>	0.00127	0.00399	0.00672	0	0	0

LCL = Lower confidence limit.

UCL = Upper confidence limit.

Table A-2-8. Larval Entrainment (number) for the Two Periods

Species	Associated Taxa In SEAMAP Data	June–November			December–May		
		LCL	Mean	UCL	LCL	Mean	UCL
Bay anchovy	All anchovies	37,736,659	75,082,756	111,034,177	14,721,232	29,290,103	43,314,906
Gulf menhaden	<i>Brevoortia patronus</i>	1,220,006	85,582,274	240,037,416	16,981,648	1,191,246,184	3,341,155,139
Red drum	<i>Sciaenops ocellatus</i>	13,421	196,072	379,714	0	0	0
Red snapper	<i>Lutjanus campechanus</i>	112,063	350,979	590,798	0	0	0

Note: Values are derived by multiplying the densities in Table A-2-7 times the daily intake volume (480,747 m³).

LCL = Lower confidence limit.

UCL = Upper confidence limit.

Table A-2-9. Annual Larval Entrainment (number)

Species	Associated Taxa In SEAMAP Data	Annual		
		LCL	Mean	UCL
Bay anchovy	All anchovies	52,457,891	104,372,859	154,349,083
Gulf menhaden	<i>Brevoortia patronus</i>	18,201,655	1,276,828,458	3,581,192,554
Red drum	<i>Sciaenops ocellatus</i>	13,421	196,072	379,714
Red snapper	<i>Lutjanus campechanus</i>	112,063	350,979	590,798

Note: Values are calculated by the sum of both periods from Table A-2-8.

LCL = Lower confidence limit.

UCL = Upper confidence limit.

Table A-2-10. Total Larval and Egg Density Estimates (number/m³)

Stage	Multiple	June–November		
		LCL	Mean	UCL
Larvae	Density	1.728	2.410	3.092
	x 3	5.184	7.230	9.276
	x 480,747 m ³ /day	2,492,192	3,475,801	4,459,409
	x Days in period	456,071,218	636,071,548	816,071,878
Eggs	Density	0.797	1.210	1.623
	x 3	2.391	3.630	4.869
	x 480,747 m ³ /day	1,149,466	1,745,112	2,340,757
	x Days in period	209,202,826	317,610,313	426,017,800
Egg/larvae ratio		0.4587	0.4993	0.5220

LCL = Lower confidence limit.

UCL = Upper confidence limit.

Table A-2-11. Projected Egg Entrainment (number) by Species

Species	Associated Taxa In SEAMAP Data	Annual		
		LCL	Mean	UCL
Bay anchovy	All anchovies	24,062,775	52,116,616	80,575,570
Gulf menhaden	<i>Brevoortia patronus</i>	8,349,217	637,560,173	1,869,506,613
Red drum	<i>Sciaenops ocellatus</i>	6,157	97,905	198,224
Red snapper	<i>Lutjanus campechanus</i>	51,404	175,255	308,417

Note: Values are derived by multiplying larval entrainment by species from Table A-2-9 times the egg/to larvae ratio for each entrainment scenario from Table A-2-10.

LCL = Lower confidence limit.

UCL = Upper confidence limit.

A-2.4.3 Calculation of Key Species Entrainment Estimates

Estimating densities for specific species of concern from higher taxonomic levels was accomplished by the methods described in USCG and MARAD (2005), as reported in Appendix A-1.

A-2.5 Ichthyoplankton Assessment Model Methods

The model involves calculating age-1 equivalents and equivalent yield for the taxa of concern based on the entrainment estimates and life history characteristics of the taxa. The description of the model presented in Appendix A-1 was followed for the BOET/NMFS polygon analysis.

A-2.5.1 Life History Tables

Calculations of both age-1 equivalents and equivalent yield use stage-specific mortality rates to project the number of entrained eggs and larvae that otherwise would have been expected to survive to age 1 or would have been caught in a commercial or recreational fishery, as reported in Appendix A-1. Tables showing the determination of age-1 equivalents and the equivalent yield analyses are found in Attachments 2 and 3, respectively.

A-2.5.2 Sensitivity Analyses

To address variability in recruitment, low and high ranges of mortality and entrainment were compared to assess differences in extreme ranges in entrainment loss relative to the base

scenario, as per USCG and MARAD (2005) as reported in Appendix A-1. Results of the sensitivity analysis for the BOET/NMFS model are reported below.

A-2.6 Model Results

The following section shows a summary of the age-1 equivalent results and of the equivalent yield analysis for the species of concern. Each scenario shown indicates the likelihood of occurrence, the estimate of age-1 equivalents lost, and the number of pounds that the lost age-1 equivalents would equate to.

A-2.6.1 Red Drum

Using the average entrainment estimates and base case life history values, it is estimated that 196,072 red drum larvae (see Table A-2-9) and 97,905 eggs (see Table A-2-11) would be entrained. This level of entrainment would account for a mean loss of 184 age-1 equivalents, equal to 654 pounds of fish. As shown in Table A-2-12, the loss of age-1 equivalents ranges from 1 to 2,302 (3 to 8,198 pounds).

Table A-2-12. Summary of Sensitivity Analysis for Red Drum

Estimate	Likelihood of Occurrence	Number of Age-1 Fish Lost	Total Biomass of Age-1 Fish Lost (pounds)
Basic life history/average entrainment	Average	184	654
Base life history (low larval mortality)/average entrainment	Likely	890	3,171
Base life history (high larval mortality)/average entrainment	Likely	37	133
Basic life history/UCL entrainment	Likely	358	1,276
Basic life history/LCL entrainment	Likely	12	44
Low stage mortality/UCL entrainment	Unlikely	2,302	8,198
High stage mortality/LCL entrainment	Unlikely	1	3

LCL = Lower confidence limit.

UCL = Upper confidence limit.

A-2.6.2 Red Snapper

Assuming mean density, total entrainment was estimated at 350,979 red snapper larvae (see Table A-2-9) and 175,255 eggs (see Table A-2-11). Total entrainment of red snapper would account for a mean loss of 147 age-1 equivalents, which in turn would be equivalent to 174

pounds of fish. The losses of red snapper range from 2 to 9,579 individuals (2 to 11,322 pounds) (Table A-2-13).

Table A-2-13. Summary of Sensitivity Analysis for Red Snapper

Estimate	Likelihood of Occurrence	Number of Age-1 Fish Lost	Total Biomass of Age-1 Fish Lost (pounds)
Basic life history/average entrainment	Average	147	174
Base life history (low larval mortality)/average entrainment	Likely	804	950
Base life history high larval mortality)/average entrainment	Likely	22	26
Basic life history/UCL entrainment	Likely	250	295
Basic life history/LCL entrainment	Likely	46	55
Low stage mortality/UCL entrainment	Unlikely	9,579	11,322
High stage mortality/LCL entrainment	Unlikely	2	2

LCL = Lower confidence limit.

UCL = Upper confidence limit.

A-2.6.3 Gulf Menhaden

For the mean entrainment base mortality case, total larval entrainment was estimated at 1,276,828,458 Gulf menhaden larvae (Table A-2-9) and 637,560,173 eggs (Table A-2-11). The mean loss of Gulf menhaden would be 1,196,407 age-1 equivalents or 610,782 pounds. The range of loss extends from 6,914 to 7,704,124 age-1 equivalents, or 548 to 109,456 pounds of fish (Table A-2-14).

Table A-2-14. Summary of Sensitivity Analysis for Gulf Menhaden

Estimate	Likelihood of Occurrence	Number of Age-1 Fish Lost	Total Biomass of Age-1 Fish Lost (pounds)
Basic life history/average entrainment	Average	1,196,407	94,851
Base life history (low larval mortality)/average entrainment	Likely	2,879,546	228,290
Base life history high larval mortality)/average entrainment	Likely	551,634	43,733
Basic life history/UCL entrainment	Likely	3,365,706	266,833
Basic life history/LCL entrainment	Likely	16,964	1,345
Low stage mortality/UCL entrainment	Unlikely	7,704,124	610,782
High stage mortality/LCL entrainment	Unlikely	6,914	548

LCL = Lower confidence limit.

UCL = Upper confidence limit.

A-2.6.4 Anchovy

As anchovies are not fished, the number of age-1 equivalents lost is provided, while the equivalent yield lost is not. Total entrainment of anchovies was estimated to be 104,372,859 larvae (Table A-2-9) and 52,116,616 eggs (Table A-2-11). In terms of age-1 equivalents, the expected loss to the system would be 58,335 fish, with a range from 1,588 to 379,260 (Table A-2-15).

Table A-2-15. Summary of Sensitivity Analysis for Anchovies

Estimate	Likelihood of Occurrence	Number of Age-1 Fish Lost
Basic life history/average entrainment	Average	58,335
Base life history (low larval mortality)/average entrainment	Likely	254,280
Base life history high larval mortality)/average entrainment	Likely	24,860
Basic life history/UCL entrainment	Likely	86,718
Basic life history/LCL entrainment	Likely	29,044
Low stage mortality/UCL entrainment	Unlikely	379,260
High stage mortality/LCL entrainment	Unlikely	1,588

LCL = Lower confidence limit.

UCL = Upper confidence limit.

A-2.7 Comparison of the BOET and BOET/NMFS Polygons

The change from the original BOET polygon to the revised BOET/NMFS polygon correlates with a general decrease in the densities and numbers of fish eggs and larvae surrounding BOET. While the density of fish larvae in the BOET/NMFS experiences a small increase (approximately one percent) from the original BOET polygon, the density of fish eggs has a dramatic decrease (approximately 53 percent). In addition, three of the four species of concern have a significant decrease in the number of age-1 equivalents lost when compared to the original BOET polygon.

The exception to the general decrease in densities and entrainment in the BOET/NMFS polygon, with regard to the key species, is the Gulf menhaden, which experiences and increase of 360 percent over the original BOET polygon—a difference of 936,273 individuals. This is due to the higher abundance of the *Brevoortia* species recorded within the polygon as there were no larvae specifically identified as *Brevoortia patronus* in the data representing the BOET/NMFS polygon data. Table A-2-16 lists the differences.

Table A-2-16. Comparison of Ichthyoplankton Densities and Entrainment between the Original BOET Polygon and the Revised BOET/NMFS Polygon

	BOET/NMFS Polygon	BOET Polygon	Percent Increase/Decrease from BOET
Egg samples collected in the BOET vicinity	94	49	+91.84%
Larvae samples collected in the BOET vicinity	156	314	-50.32%
Egg density per million gallons of seawater	4,580	9,783	-53.18%
Larval density per million gallons of seawater	9,122	9,028	+1.04%
Annual egg entrainment	636,965,738	1,359,087,153	-53.13%
Annual larval entrainment	1,268,667,296	1,256,369,307	+0.98%
Gulf menhaden age-1 equivalents lost (lbs)	1,196,407	260,134	+359.92%
Gulf menhaden equivalent yield lost annually (lbs)	94,851	20,623	+359.93%
Red snapper age-1 equivalents lost (lbs)	147	235	-37.45%
Red snapper equivalent yield lost annually (lbs)	174	277	-37.18%
Red drum age-1 equivalents lost (lbs)	184	659	-72.08%
Red drum equivalent yield lost annually (lbs)	654	2,346	-72.12%
Bay anchovy age-1 equivalents lost (lbs)	58,335	84,510	-30.97%

Note: All values are from the base life history/average entrainment scenarios.

A-2.8 Literature Cited

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- Schirripa, M. J. and C. M. Legault. 1999. Status of the red snapper in U.S. waters of the Gulf of Mexico: updated through 1998. Southeast Fisheries Science Center, Sustainable Fisheries Division Contribution: SFD-99/00-75. 86 p. + Appendices.

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USCG and MARAD. 2005. Draft Environmental Impact Statement for the Pearl Crossing LNG Project. Docket No. USCG-2004-18474. April 2005.

APPENDIX A-2

ATTACHMENT 1

**SUMMER SEAMAP POLYGON DATA RESULTING
FROM NOAA COMMENTS**

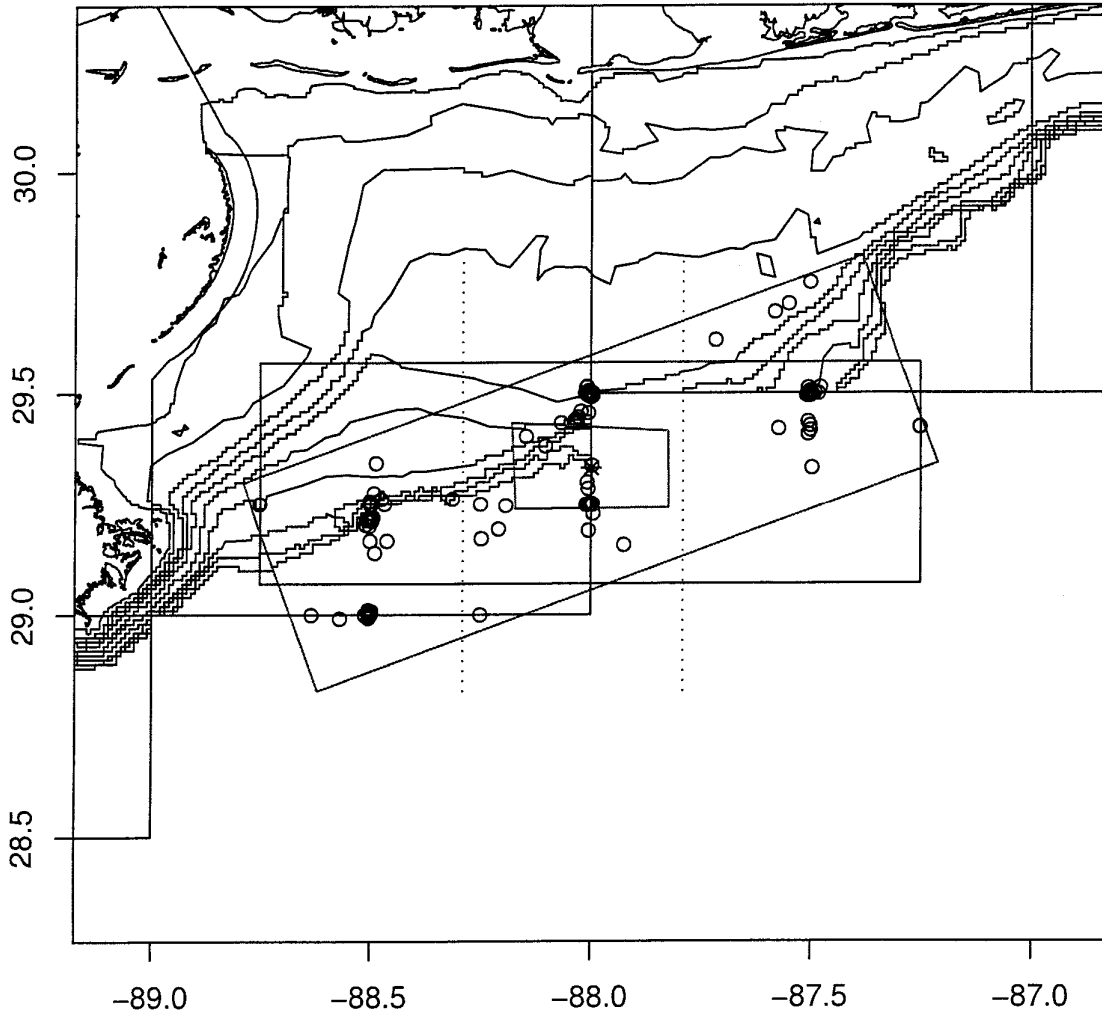


Figure 1. The Proposed BOET/NMFS Polygon. The bold-bordered polygon denotes the area within which the proposed Terminal will be located. The three large squares separated by dashed vertical lines denote 30 minute SEAMAP sampling blocks. Circles show the location of the ichthyoplankton sampling sites. Depth contours are in 5-fathom increments.

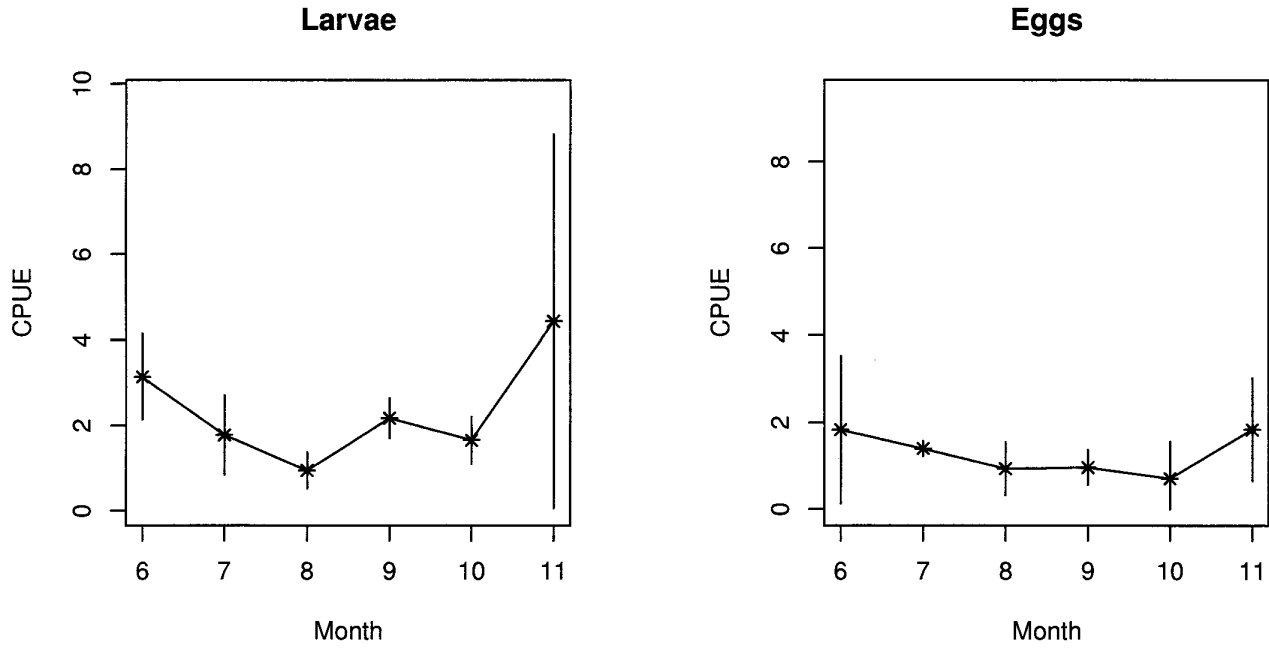


Figure 2. Monthly Density (\pm 95% CI) of fish eggs and larvae at the BOET/NOAA Polygon. Numbers in parentheses indicate sample size.

	setName	meancat	se	lcl	ucl	gmeancat	gmcount	gmse	gmlcl	gmucl
1	6	3.139	0.501	2.138	4.141	2.424	28	0.460	1.505	3.344
11	7	1.778	0.466	0.847	2.709	1.580	8	0.458	0.663	2.496
12	8	0.943	0.213	0.517	1.370	0.744	21	0.121	0.503	0.985
13	9	2.174	0.234	1.705	2.643	1.847	56	0.199	1.450	2.245
14	10	1.658	0.276	1.106	2.209	1.272	21	0.224	0.824	1.720
15	11	4.432	2.193	0.046	8.818	2.619	22	1.065	0.488	4.750
7	0	2.410	0.341	1.728	3.092	1.743	156	0.167	1.410	2.076

Table 1: Monthly Fish Larvae Statistics

	MO	eggcpue	se	egglen	lcl	ucl
1	6	1.832	0.851	17	0.130	3.535
2	7	1.398		1		
3	8	0.931	0.307	9	0.318	1.545
4	9	0.958	0.205	43	0.549	1.368
5	10	0.704	0.429	11	0.000	1.561
6	11	1.836	0.595	13	0.646	3.026
11	0	1.210	0.207	94	0.797	1.623

Table 2: Number Eggs per cubic meter

SEAMAP Catch Per Unit Effort for NOAA Polygon

TAXA	BIOCODE	CPUE	LCL	UCL
UNID.FISH	10000000	0.075467911	0.028395796	0.122540027
SALMONIFORMES	12000000	0.000244003	0	0.000502964
CLUPEIFORMES	12100000	0.005806557	0.001565769	0.010047345
CLUPEIDAE	12105000	0.005617812	0	0.012896525
BREVOORTIA	121050300	0.306088269	0	0.876254194
ETRUMEUTERES	121051602	0.010562215	0	0.030157342
HARENGUJAGUAN	121052004	0.008314137	0.002643815	0.013984459
OPISTHOGLINU	121053002	0.014771325	0	0.030858685
SARDINEAURITA	121053801	9.91E-05	0	0.000212889
ENGRAULIDAE	121060000	0.270333384	0.138924384	0.401742383
ANCHOA	121060100	0.002314983	0	0.005097876
ENGRAULEURYST	121060201	0.000327148	0	0.000880023
ARGENTINIDAE	121110000	0.000372511	0	0.000786633
BATHYLAGIDAE	121120000	9.93E-05	0	0.000215821
BATHYLAGUS	121120100	0.000174972	5.55E-06	0.000344396
GONOSTOMATIDA	121140000	0.02461977	0	0.050611065
CYCLOTHONE	121140200	0.008343005	0.005000755	0.011685255
DIPLOPHTAENIA	121140302	1.08E-05	0	3.23E-05
GONOSTOMA	121140400	0.0003921	8.67E-05	0.000697458
MAUROLIMUELLE	121140801	0.016867096	0.009232438	0.024501754
POLLICHMAULI	121140901	0.000377412	1.72E-05	0.000737625
VALENCITRIPUN	121141101	2.00E-05	0	6.01E-05
VINCIGUERRIA	121141700	0.00212672	0.000646535	0.003606904
VINCIGUNIMBAR	121141701	0.001841622	0.001128006	0.002555239
VINCIGUPOWERI	121141702	2.11E-05	0	6.33E-05
VINCIGUATTENU	121141703	0.000575899	0.000300305	0.000851492
STERNOPTYCHID	121150000	0.00161134	0.000891227	0.002331452
ARGYROPELECUS	121150100	9.84E-05	1.05E-05	0.000186227
STERNOPTYX	121150300	0.000186509	0	0.000426646
STOMIIDAE	121160000	0.000323691	3.83E-06	0.000643554
CHAULIODONTID	121170000	0.000209169	0	0.000482168
CHAULIODUS	121170100	0.000206229	0	0.00051986
CHAULIOSLOANI	121170102	0.000192205	0	0.000463245
MELANOSTOMIID	121190000	8.02E-05	0	0.000212257
MELANOSTOMIAS	121190300	3.64E-05	0	0.000109266
ELOPIDAE	124010000	0.000367758	0	0.00085259
ELOPS SAURUS	124010101	3.19E-05	0	9.57E-05
CHLOROPHTHALM	129020000	8.94E-05	0	0.00020342
CHLOROPAGASSI	129020101	0.000148317	0	0.000413231
SCOPELARCHIDA	129030000	0.000521261	0.000177012	0.00086551
SYNODONTIDAE	129040000	0.166257548	0.102497053	0.230018044
TRACHINMYOPS	129040101	0.000337954	0	0.00093201
SYNODUSFOETEN	129040302	0.002852411	0	0.007838353
PARALEPIDIDAE	129050000	0.019721415	0.010752098	0.028690731
LESTIDIATLANT	129050301	0.00010819	0	0.00032457
SUDIS	129050600	2.18E-05	0	6.54E-05
SUDIS HYALIN	129050602	7.28E-05	0	0.000218531
MYCTOPHIFORME	131000000	0.000154883	0	0.000396351
MYCTOPHIDAE	131010000	0.039405176	0.026302	0.052508353
DIAPHUS	131010200	0.148218699	0.094827459	0.201609939
NOTOLYCVALDIV	131010301	0.00204118	0.000968661	0.003113699

SEAMAP Catch Per Unit Effort for NOAA Polygon

TAXA	BIOCODE	CPUE	LCL	UCL
LAMPADENA	131010400	0.000289264	0	0.000737671
LAMPANYCTUS	131010500	0.002434	0.001295426	0.003572574
MYCTOPHUM	131010600	0.007707683	0.002250149	0.013165218
CERATOSCOPELU	131010900	0.004251452	0.002036746	0.006466157
CERATOSMADERE	131010902	0.000497821	0	0.001044297
HYGOPHUM	131011000	0.004722719	0.002407584	0.007037854
HYGOPHUREINHA	131011002	0.000248222	4.54E-05	0.000451092
CENTROBNIGROO	131011101	0.000174235	6.92E-06	0.000341554
GONICHTCOCCOI	131011201	0.000113333	0	0.000270466
BENTHOSEMA	131012200	0.001699041	0.000748966	0.002649116
BENTHOSSUBORB	131012202	9.13E-05	0	0.000273943
DIOGENICHTHYS	131012300	0.000135037	0	0.000326121
DIOGENIATLANT	131012301	0.000893581	0.000425287	0.001361874
EVERMANNELLID	132040000	2.64E-05	0	7.91E-05
ANGUILLIFORME	143000000	0.020705963	0.008120273	0.033291653
MURAENIDAE	143060000	0.000706491	0.000232666	0.001180315
MORINGUIDAE	143080000	0.002302407	0.00098118	0.003623634
NEOCONGMUCRON	143081601	7.82E-05	0	0.000234522
NETTASTOMATID	143110000	0.00358716	0.001865779	0.00530854
CONGRIDAE	143130000	0.020877949	0.012452472	0.029303426
OPHICHTHIDAE	143150000	0.023161866	0.01238067	0.033943062
BASCANIBASCAN	143150101	8.43E-05	0	0.000253036
OPHICHTGOMESI	143150401	0.001424607	0.000791861	0.002057353
OPHICHTREX	143150407	0.001220401	0	0.002841358
APLATOPCHAULI	143150601	0.000135471	0	0.000312758
PHAENOMLONGIS	143150701	5.50E-05	0	0.000133657
LETHARCHUS	143151100	4.86E-05	0	0.000145688
LETHARCVELIFE	143151101	1.60E-05	0	4.80E-05
LETHARCALICUL	143151102	7.45E-05	0	0.000223614
CALLECHMURAEN	143151301	6.82E-05	0	0.000204583
CALLECHGUINIE	143151302	4.61E-05	0	0.000138351
MYROPHIPUNCTA	143151902	0.005457021	0.001120041	0.009794001
PSEUDOMYROPHI	143152000	0.000583036	0	0.001274882
PSEUDOMFUGESA	143152002	0.002433732	9.76E-05	0.004769886
APTERICANSP	143152101	3.45E-05	0	0.000103391
EXOCOETIDAE	147040000	0.000563181	0.000184986	0.000941377
HEMIRAMPHIDAE	147070000	4.01E-05	0	0.000120192
GADIFORMES	148000000	0.00294907	0.001081244	0.004816896
GADIDAE	148010000	0.000454619	1.07E-05	0.000898561
UROPHYCIS	148010100	0.001875967	0.000106663	0.00364527
MORIDAE	148020000	0.000416618	0	0.001165898
BREGMACEROTID	148030000	0.000324255	0	0.000736467
BREGMACEROS	148030100	0.262548114	0.193809254	0.331286974
BREGMACCANTOR	148030104	0.006495048	0	0.01894428
STEINDAARGENT	148041501	0.000429645	0	0.001003809
MACROURIDAE	148060000	0.000231542	3.99E-05	0.000423197
FISTULARIIDAE	151020000	0.000118708	0	0.000356125
SYNGNATHIDAE	151060000	7.83E-05	0	0.000205838
HIPPOCAMPUS	151060600	6.35E-05	0	0.000190404
MELAMPHAIDAE	160030000	0.000917934	0.000124987	0.001710882
MELAMPHSIMUS	160030108	0.000118829	0	0.000267743

SEAMAP Catch Per Unit Effort for NOAA Polygon

TAXA	BIOCODE	CPUE	LCL	UCL
HOLOCENTRIDAE	161110000	1.93E-05	0	5.78E-05
ANTIGONIA	162030100	8.01E-05	0	0.000240385
MUGILIDAE	165010000	0.00125199	0.000357221	0.002146759
MUGIL	165010800	0.002028072	0.000151426	0.003904717
MUGIL CUREMA	165010802	0.00069829	0	0.001467672
ATHERINIDAE	165020000	6.82E-05	0	0.000204583
SPHYRAENA	165030100	0.001001757	0.000451182	0.001552331
SCORPAENIFORM	168000000	0.002688604	0	0.006738758
SCORPAENIDAE	168010000	0.018482094	0.01140648	0.025557708
TRIGLIDAE	168020000	0.004486446	0.002432014	0.006540878
PRIONOTUS	168020500	0.003997166	0.002285997	0.005708335
PERCIFORMES	170000000	0.008540626	0.004966832	0.012114419
SERRANIDAE	170020000	0.021869164	0.014406818	0.02933151
DIPLECTRUM	170020900	0.005078647	0.001165403	0.00899189
SERRANUS	170024200	0.00142454	0.000528142	0.002320939
CENTROPRISTIS	170024800	0.001708897	0.000403152	0.003014643
CENTROPSTRIAT	170024806	5.05E-05	0	0.000151423
HEMANTHIAS	170025000	0.000846427	0	0.002030081
HEMANTHVIVANU	170025001	0.000151278	0	0.000390433
HEMANTHLEPTUS	170025002	8.50E-05	0	0.000207865
HEMANTHAUREOR	170025003	0.00013388	0	0.000332199
SERRANIPUMILI	170025401	0.000483938	5.47E-05	0.000913191
LIOPROPOMA	170025600	0.000110522	0	0.000331565
ANTHIAS	170026000	0.000652459	0.000119	0.001185918
ANTHIASNICHOL	170026002	0.003185196	0	0.007092571
PSEUDOGREGOR	170026101	8.62E-05	0	0.000207969
GRAMMISTIDAE	170030000	0.000888562	0.000165328	0.001611796
RYPTICUS	170030100	1.94E-05	0	5.83E-05
PRIACANTHIDAE	170050000	0.000407227	7.90E-06	0.000806559
APOGONIDAE	170060000	0.000651889	7.47E-05	0.001229074
APOGON	170060200	0.000337361	2.81E-05	0.00064663
SYNAGROPS	170060700	0.000276565	4.23E-05	0.000510783
HOWELLA	170061000	0.000226297	1.65E-05	0.000436097
MALACANTHIDAE	170070000	0.000244746	0	0.000559272
POMATOMIDAE	170080000	8.78E-05	0	0.000263435
POMATOMSALTAT	170080101	0.00120656	0.000156216	0.002256905
ECHENEIDAE	170090000	3.96E-05	0	0.000118708
RACHYCECANADU	170100101	4.48E-05	0	0.000134481
CARANGIDAE	170110000	0.009017777	0.003228658	0.014806896
CARANX	170110800	0.002264964	0.000592613	0.003937316
CARANX CRYOS	170110803	0.001349555	0.000603769	0.002095341
CHLOROSCHRYSU	170110902	0.008035274	0	0.016482218
DECAPTERUS	170111200	0.000263435	0	0.000790306
DECAPTEPUNCTA	170111202	0.003751063	0.001998542	0.005503584
ELAGATIBIPINN	170111301	0.000249288	0	0.000747863
SELAR CRUMEN	170112801	0.003864395	0.000956651	0.006772139
SELENE VOMER	170113003	0.000697942	0.000312723	0.001083162
SELENE SETAPI	170113004	4.82E-05	0	0.00011735
SERIOLA	170113100	0.000156971	0	0.000328883
TRACHURLATHAM	170113802	4.86E-05	0	0.000145688
BRAMIDAE	170120000	4.69E-05	0	0.000112958

SEAMAP Catch Per Unit Effort for NOAA Polygon

TAXA	BIOCODE	CPUE	LCL	UCL
CORYPHAENIDAE	170130000	2.48E-05	0	7.43E-05
CORYPHAHIPPUR	170130202	0.000311025	0	0.000649676
LUTJANIDAE	170150000	0.004459342	0.002429477	0.006489207
ETELIS	170150500	3.29E-05	0	9.86E-05
LUTJANUS	170151100	0.000573919	5.44E-05	0.001093413
LUTJANUCAMPEC	170151107	0.000200388	0	0.000404196
LUTJANUGRISEU	170151109	8.01E-05	0	0.000240385
PRISTIPAQUILO	170151802	0.000808843	0.000228077	0.00138961
RHOMBOPAUORU	170152001	0.002453415	0.001047052	0.003859777
ACANTHURUS	170160100	0.000142413	0	0.00037208
GERREIDAE	170180000	0.000239016	0	0.000487966
HAEMULIDAE	170190000	3.29E-05	0	9.86E-05
SCIAENIDAE	170200000	0.012136758	0	0.024859176
BAIRDIECHRYSO	170200502	0.00010175	0	0.00030525
CYNOSCION	170200900	2.39E-05	0	7.18E-05
CYNOSCIARENAR	170200901	0.001498374	0	0.003837116
CYNOSCINOTHUS	170200904	0.000934755	0	0.00240564
CYNOSCIREGALI	170200907	0.001646671	0	0.004940014
LARIMUSFASCIA	170201604	8.60E-05	0	0.000213743
LEIOSTOXANTHU	170201701	0.068037982	0	0.173003643
MENTICIRRHUS	170201800	0.000191432	0	0.000390889
MICROPOGONIAS	170201900	0.003426172	0	0.010278515
MICROPOUNDULA	170201902	0.021608769	0.007557621	0.035659917
SCIAENOOCCELLA	170203701	0.000629589	3.50E-05	0.001224166
SPARIDAE	170210000	0.001872159	0	0.00420777
MULLIDAE	170220000	0.000322535	2.93E-05	0.000615808
KYPHOSUS	170240300	1.60E-05	0	4.80E-05
POMACENTRIDAE	170270000	0.000252829	0	0.000633308
LABRIDAE	170280000	0.061595348	0.030934437	0.09225626
POMACANTHIDAE	170290000	2.29E-05	0	6.87E-05
SCARIDAE	170300000	0.001382626	0.000696669	0.002068584
SPARISOMA	170301200	6.44E-05	0	0.000163363
OPISTOGNATHID	170310000	0.000380065	0	0.00087455
PERCOPHIDIDAE	170320000	4.51E-05	0	0.000135428
BEMBROPS	170320200	0.00082228	0.000147835	0.001496725
URANOSCOPIDAE	170340000	0.0002853	0	0.00070733
CHIASMODONTID	170350000	9.43E-05	0	0.000282805
BLENNIIDAE	170360000	0.002030611	0.000669046	0.003392177
HYPISOBLHENTZI	170360401	0.000252797	0	0.000569756
HYPLEURGEMINA	170360701	9.71E-05	0	0.000252591
BROTULA	170390300	0.002310389	0.000743676	0.003877103
CALLIONYMIDAE	170420000	0.001793691	0	0.003928516
CALLIONYMUS	170420100	0.000970415	0	0.002500145
SCOMBRIDAE	170440000	0.006257323	0.000495869	0.012018776
AUXIS	170440100	0.011381245	0.005195519	0.017566971
EUTHYNNALLETT	170440201	0.003275315	0.00125558	0.00529505
KATSUWOPELAMI	170440301	0.000542063	0.000132899	0.000951228
THUNNUS	170440400	0.001590267	0.000765435	0.002415098
THUNNUSATLANT	170440403	6.52E-05	0	0.000140411
THUNNUSTHYNNU	170440405	2.22E-05	0	6.65E-05
SCOMBERCAVALL	170440801	0.00191858	0	0.003910405

SEAMAP Catch Per Unit Effort for NOAA Polygon

TAXA	BIOCODE	CPUE	LCL	UCL
SCOMBERMACULA	170440803	0.001605658	0	0.003473715
GEMPYLIDAE	170450000	5.92E-05	0	0.000147507
NEOEPINAMERIC	170450201	0.000330031	0	0.000676226
NEALOTUTRIPES	170450401	6.11E-05	0	0.00018315
NESIARCNASUTU	170451201	2.33E-05	0	6.99E-05
TRICHIURIDAE	170460000	0.000363666	0	0.000762489
LEPIDOPCAUDAT	170460201	0.000177213	0	0.000359278
TRICHIULEPTUR	170460402	0.008316123	0.004352882	0.012279364
BENTHODTENUIS	170460503	1.43E-05	0	4.28E-05
DIPLOSPMULTIS	170460701	0.000346419	2.87E-05	0.000664173
TETRAGONURIDA	170500000	9.43E-05	0	0.000282805
STROMATEIDAE	170510000	0.003414843	0.000589661	0.006240024
CUBICEPS	170510100	0.003901567	0.002395677	0.005407456
CUBICEPPAUCIR	170510102	6.46E-05	0	0.000193761
PSENES	170510200	0.000547512	0.000104316	0.000990708
PEPRILUS	170511100	0.002160414	0.000520112	0.003800716
PEPRILUBURTI	170511103	0.015455415	0.007289112	0.023621717
PEPRILUPARU	170511105	0.000800039	8.96E-05	0.001510436
ARIOMMA	170530100	0.00137902	0.000369412	0.002388629
GOBIIDAE	170550000	0.164188212	0.127918426	0.200457997
MICRODESMIDAE	170700000	0.003876773	0.001797864	0.005955682
MICRODESMUS	170700100	0.000234025	0	0.000571722
ACROPOMATIDAE	170740000	0.001125402	0	0.002331783
EPIGONIDAE	170760000	1.93E-05	0	5.78E-05
OPHIDIIFORMES	171000000	5.21E-05	0	0.000156348
OPHIDIIDAE	171010000	0.0802614	0.056520695	0.104002106
CARAPIDAE	171020000	0.000431773	4.57E-05	0.000817855
CARAPUS	171020100	0.000588178	0.000186304	0.000990053
CARAPUSBERMUD	171020101	0.000550881	0	0.001103577
ECHIODODAWSON	171020201	4.86E-05	0	0.000145688
PLEURONECTIFO	183000000	0.005043245	2.23E-05	0.010064213
BOTHIDAE	183010000	0.031473108	0.018658401	0.044287815
CITHARICHTHYS	183010300	0.013985203	0.006203907	0.021766499
CITHARICORNUT	183010303	0.000237195	0	0.000512233
CITHARISPILOP	183010305	0.002208947	0.000212653	0.00420524
CITHARIGYMNOR	183010306	0.000147019	0	0.000325829
CYCLOPSETTA	183010400	0.000553779	9.84E-05	0.001009176
ETROPUS	183010600	0.020437332	0.00182518	0.039049484
ETROPUSCROSSO	183010602	0.01819393	0.004685414	0.031702445
SYACIUM	183011000	0.04626016	0.026654371	0.065865949
SYACIUMPAPILL	183011003	0.018403716	0.008835397	0.027972035
ENGYOPHSENTA	183011401	0.000983072	0.000381057	0.001585087
MONOLENE	183011600	0.000292678	0	0.000779509
TRICHOPSETTA	183011800	5.53E-05	0	0.000165782
BOTHUS	183012200	0.005362386	0.003113809	0.007610962
BOTHUS OCELLA	183012203	2.11E-05	0	6.33E-05
PARALICHTHYS	183012400	4.82E-05	0	0.000144592
SOLEIDAE	183040000	0.000172655	0	0.000381069
CYNOGLOSSIDAE	183050000	0.006101978	0	0.016031573
SYMPHURUS	183050700	0.070764283	0.048696618	0.092831948
SYMPHURPLAGIU	183050707	0.000939955	0	0.002327711

SEAMAP Catch Per Unit Effort for NOAA Polygon

TAXA	BIOCODE	CPUE	LCL	UCL
TETRAODONTIFO	189000000	0.000628897	8.09E-06	0.001249701
BALISTIDAE	189030000	0.000672449	0.000171699	0.001173199
BALISTECAPRIS	189030502	1.84E-05	0	5.53E-05
MONACANTHIDAE	189040000	0.000203193	0	0.000467334
MONACANHISPID	189040204	3.98E-05	0	0.000119446
STEPHANOLEPIS	189040300	3.98E-05	0	0.000119446
ALUTERUS	189040400	0.000218571	0	0.000536132
TETRAODONTIDA	189080000	0.000982824	0.000367251	0.001598396
SPHOEROIDES	189080600	0.001192636	0.000459439	0.001925834
LOPHIIFORMES	195000000	0.000182143	0	0.000429529
LOPHIUSAMERIC	195010202	3.17E-05	0	9.52E-05
CERATIIDAE	195130000	0.000198929	0	0.000472261
ARGENTINOIDEI	999010100	3.21E-05	0	9.62E-05
CERATIOIDEI	999010200	0.005270595	0.003713361	0.006827828
BLENNIOIDEI	999010300	9.33E-05	0	0.000224988
LABROIDEI	999010400	6.68E-05	0	0.000200321
SCOMBROIDEI	999010600	2.33E-05	0	6.99E-05
STROMATEOIDEI	999010700	1.08E-05	0	3.23E-05
EPINEPHELINAE	999020100	0.000866659	0	0.001736519
MYROPHINAE	999020200	0.001318606	0	0.003572177
GRAMMISTINAE	999020400	0.00043772	4.54E-05	0.000830086
SERRANINAE	999021200	4.51E-05	0	0.000135428
MELANOSTOMIIN	999021600	0.000177355	0	0.000368978
CERATIOIDEA	999030001	0.000351633	0	0.00075249
TOTAL	0	2.401153199	1.092685192	4.057761687

APPENDIX A-2

ATTACHMENT 2

**AGE-1 EQUIVALENT ANALYSIS RESULTING
FROM NOAA COMMENTS**

Table 1. Age-1 equivalents for red drum (*Sciaenops ocellatus*) using base mortality estimates.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	0.49840	1	0.4984	0	0.4984	0.6075	0.7558
Larvae	0.25000	20	5.0000	0	5.0000	0.0067	0.0134
Juvenile 1	0.13650	12	1.6380	0	1.6380	0.1944	0.3255
Juvenile 2	0.00540	166	0.8964	0	0.8964	0.4080	0.5796
Juvenile 3	0.00180	166	0.2988	0	0.2988	0.7417	0.8517
	Total =	365		Total =	8.3316		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	6,157	97,905	198,224	3.00E-04	2	29	59
Larvae	13,421	196,072	379,714	7.87E-04	11	154	299
Juvenile 1							
Juvenile 2							
Juvenile 3							
				Total =	12	184	358

Table 2. Age-1 equivalents for red drum (*Sciaenops ocellatus*) using low mortality estimates across all life stages.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	0.49840	1	0.4984	0	0.4984	0.6075	0.7558
Larvae	0.17000	20	3.4000	0	3.4000	0.0334	0.0646
Juvenile 1	0.13400	12	1.6080	0	1.6080	0.2003	0.3337
Juvenile 2	0.00478	166	0.7942	0	0.7942	0.4520	0.6225
Juvenile 3	0.00090	166	0.1494	0	0.1494	0.8612	0.9254
	Total =	365		Total =	6.4500		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	6,157	97,905	198,224	1.97E-03	12	193	390
Larvae	13,421	196,072	379,714	5.04E-03	68	987	1,912
Juvenile 1							
Juvenile 2							
Juvenile 3							
				Total =	80	1,180	2,302

Table 3. Age-1 equivalents for red drum (*Sciaenops ocellatus*) using high mortality estimates across all life stages.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	0.4984	1	0.4984	0	0.4984	0.6075	0.75583
Larvae	0.33	20	6.6000	0	6.6000	0.0014	0.00272
Juvenile 1	0.139	20	2.7800	0	2.7800	0.0620	0.11683
Juvenile 2	0.00609	162	0.9866	0	0.9866	0.3728	0.54318
Juvenile 3	0.0018	162	0.2916	0	0.2916	0.7471	0.85522
	Total =	365		Total =	11.1566		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	6,157	97,905	198,224	0.000018	0	2	4
Larvae	13,421	196,072	379,714	0.000047	1	9	18
Juvenile 1							
Juvenile 2							
Juvenile 3							
				Total =	1	11	21

Table 4. Age-1 equivalents for red drum (*Sciaenops ocellatus*) using low larval mortality rates and base mortality estimates across all other stages.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	0.49840	1	0.4984	0	0.4984	0.6075	0.7558
Larvae	0.17000	20	3.4000	0	3.4000	0.0334	0.0646
Juvenile 1	0.13650	12	1.6380	0	1.6380	0.1944	0.3255
Juvenile 2	0.00540	166	0.8964	0	0.8964	0.4080	0.5796
Juvenile 3	0.00180	166	0.2988	0	0.2988	0.7417	0.8517
	Total =	365		Total =	6.7316		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	6,157	97,905	198,224	1.48E-03	9	145	294
Larvae	13,421	196,072	379,714	3.80E-03	51	745	1,443
Juvenile 1							
Juvenile 2							
Juvenile 3							
				Total =	60	890	1,737

Table 5. Age-1 equivalents for red drum (*Sciaenops ocellatus*) using high larval mortality rates and base mortality estimates across all other stages.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	0.49840	1	0.4984	0	0.4984	0.6075	0.7558
Larvae	0.33	20	6.6000	0	6.6000	0.0014	0.0027
Juvenile 1	0.13650	12	1.6380	0	1.6380	0.1944	0.3255
Juvenile 2	0.00540	166	0.8964	0	0.8964	0.4080	0.5796
Juvenile 3	0.00180	166	0.2988	0	0.2988	0.7417	0.8517
	Total =	365		Total =	9.9316		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	6,157	97,905	198,224	6.05E-05	0	6	12
Larvae	13,421	196,072	379,714	1.60E-04	2	31	61
Juvenile 1							
Juvenile 2							
Juvenile 3							
				Total =	3	37	73

Table 6. Age-1 equivalents for red snapper (*Lutjanus campechanus*) using base mortality estimates across all life stages.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	0.49840	1	0.4984	0	0.4984	0.6075	0.75583
Larvae	0.20500	28	5.7400	0	5.7400	0.0032	0.00641
Juvenile 1	0.10000	24	2.4000	0	2.4000	0.0907	0.16635
Juvenile 3	0.00160	312	0.5001	0	0.5001	0.6064	0.75502
	Total =	365		Total =	9.138536		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	51,404	175,255	308,417	0.000134	7	23	41
Larvae	112,063	350,979	590,798	0.000353	40	124	208
Juvenile 1				0.100880			
Juvenile 3				0.755017			
				Total =	46	147	250

Table 7. Age-1 equivalents for red snapper (*Lutjanus campechanus*) using low mortality estimates across all life stages.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	0.49840	1	0.4984	0	0.4984	0.6075	0.75583
Larvae	0.15500	26	4.0300	0	4.0300	0.0178	0.03493
Juvenile 1	0.04500	10	0.4500	0	0.4500	0.6376	0.77872
Juvenile 3	0.00163	307	0.5004	0	0.5004	0.6063	0.75489
	Total =	344		Total =	5.47881		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	51,404	175,255	308,417	0.005194	267	910	1,602
Larvae	112,063	350,979	590,798	0.013502	1,513	4,739	7,977
Juvenile 1				0.472125			
Juvenile 3				0.754889			
				Total =	1,780	5,649	9,579

Table 8. Age-1 equivalents for red snapper (*Lutjanus campechanus*) using high mortality estimates across all life stages.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	0.49840	1	0.4984	0	0.4984	0.6075	0.75583
Larvae	0.25500	30	7.6500	0	7.6500	0.0005	0.00095
Juvenile 1	0.12000	31	3.7200	0	3.7200	0.0242	0.04732
Juvenile 3	0.00154	324	0.5000	0	0.5000	0.6065	0.75508
	Total =	386		Total =	12.3683968		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	51,404	175,255	308,417	0.000005	0	1	2
Larvae	112,063	350,979	590,798	0.000014	2	5	8
Juvenile 1				0.028702			
Juvenile 3				0.755083			
				Total =	2	6	10

Table 9. Age-1 equivalents for red snapper (*Lutjanus campechanus*) using low larval mortality rates and base mortality estimates across all other stages.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	0.49840	1	0.4984	0	0.4984	0.6075	0.75583
Larvae	0.15500	26	4.0300	0	4.0300	0.0178	0.03493
Juvenile 1	0.10000	24	2.4000	0	2.4000	0.0907	0.16635
Juvenile 3	0.00160	312	0.5001	0	0.5001	0.6064	0.75502
	Total =	363		Total =	7.428536		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	51,404	175,255	308,417	0.000739	38	130	228
Larvae	112,063	350,979	590,798	0.001922	215	674	1,135
Juvenile 1				0.100880			
Juvenile 3				0.755017			
				Total =	253	804	1,363

Table 10. Age-1 equivalents for red snapper (*Lutjanus campechanus*) using high larval mortality rates and base mortality estimates across all other stages.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	0.49840	1	0.4984	0	0.4984	0.6075	0.75583
Larvae	0.25500	30	7.6500	0	7.6500	0.0005	0.00095
Juvenile 1	0.10000	24	2.4000	0	2.4000	0.0907	0.16635
Juvenile 3	0.00160	312	0.5001	0	0.5001	0.6064	0.75502
	Total =	367		Total =	11.048536		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	51,404	175,255	308,417	0.000020	1	3	6
Larvae	112,063	350,979	590,798	0.000052	6	18	31
Juvenile 1				0.100880			
Juvenile 3				0.755017			
				Total =	7	22	37

Table 11. Age-1 equivalents for bay anchovy (*Anchoa sp.*) using base mortality estimates across all life stages.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	1.044	1	1.0440	0	1.0440	0.3520	0.52076
Larvae	0.2059	34	7.0006	0	7.0006	0.0009	0.00182
Juvenile	0.004	330	1.3035	0	1.3035	0.2716	
	Total =	365		Total =	9.3481		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	24,062,775	52,116,616	80,575,570	0.000129	3,101	6,717	10,385
Larvae	52,457,891	104,372,859	154,349,083	0.000495	25,943	51,618	76,333
Juvenile							
				Total =	29,044	58,335	86,718

Table 12. Age-1 equivalents for bay anchovy (*Anchoa sp.*) using low mortality estimates across all life stages.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	0.69	1	0.6900	0	0.6900	0.5016	0.66807
Larvae	0.1804	30.63	5.5257	0	5.5257	0.0040	0.00793
Juvenile	0.004	333.4	1.3336	0	1.3336	0.2635	
	Total =	365.03		Total =	7.549252		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	24,062,775	52,116,616	80,575,570	0.000701	16,874	36,548	56,505
Larvae	52,457,891	104,372,859	154,349,083	0.002091	109,693	218,251	322,754
Juvenile							
				Total =	126,567	254,799	379,260

Table 13. Age-1 equivalents for bay anchovy (*Anchoa sp.*) using high mortality estimate across all life stages.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	1.94	1	1.9400	0	1.9400	0.1437	0.25130
Larvae	0.231	34	7.8540	0	7.8540	0.0004	0.00078
Juvenile	0.01	330	3.3000	0	3.3000	0.0369	
	Total =	365		Total =	13.094		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	24,062,775	52,116,616	80,575,570	0.000004	87	188	290
Larvae	52,457,891	104,372,859	154,349,083	0.000029	1,502	2,988	4,418
Juvenile							
				Total =	1,588	3,175	4,708

Table 14. Age-1 equivalents for bay anchovy (*Anchoa sp.*) using low larval mortality rates and base mortality estimates across all other stages.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	1.044	1	1.0440	0	1.0440	0.3520	0.52076
Larvae	0.1804	30.63	5.5257	0	5.5257	0.0040	0.00793
Juvenile	0.004	330	1.3035	0	1.3035	0.2716	
	Total =	361.63		Total =	7.873152		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	24,062,775	52,116,616	80,575,570	0.000563	13,556	29,360	45,392
Larvae	52,457,891	104,372,859	154,349,083	0.002155	113,045	224,920	332,617
Juvenile							
				Total =	126,601	254,280	378,009

Table 15. Age-1 equivalents for bay anchovy (*Anchoa sp.*) using low larval mortality rates and base mortality estimates across all other stages.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	1.044	1	1.0440	0	1.0440	0.3520	0.52076
Larvae	0.231	34	7.8540	0	7.8540	0.0004	0.00078
Juvenile	0.004	330	1.3035	0	1.3035	0.2716	
	Total =	365		Total =	10.2015		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	24,062,775	52,116,616	80,575,570	0.000055	1,321	2,861	4,424
Larvae	52,457,891	104,372,859	154,349,083	0.000211	11,057	21,999	32,532
Juvenile							
				Total =	12,378	24,860	36,956

Table 16. Age-1 equivalents for Gulf menhaden (*Brevoortia patronus*) using base mortality estimates across all life stages.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	1.044	1.75	1.8270	0	1.8270	0.1609	0.27719
YSL	0.059	65	3.8350	0	3.8350	0.0216	0.04229
Juvenile	0.013	298.3	3.8779	0	3.8779	0.0207	
	Total =	365.05		Total =	9.5399		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	8,349,217	637,560,173	1,869,506,613	0.000124	1,035	79,001	231,653
YSL	18,201,655	1,276,828,458	3,581,192,554	0.000875	15,929	1,117,406	3,134,053
Juvenile							
				Total =	16,964	1,196,407	3,365,706

Table 17. Age-1 equivalents for Gulf menhaden (*Brevoortia patronus*) using low mortality estimates across all life stages.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	1.044	1.50	1.5660	0	1.5660	0.2089	0.34557
YSL	0.0488	60	2.9280	0	2.9280	0.0535	0.10157
Juvenile	0.013	303.5	3.9455	0	3.9455	0.0193	
	Total =	365		Total =	8.4395		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	8,349,217	637,560,173	1,869,506,613	0.000358	2,986	228,003	668,568
YSL	18,201,655	1,276,828,458	3,581,192,554	0.001965	35,759	2,508,437	7,035,555
Juvenile							
				Total =	38,745	2,736,440	7,704,124

Table 18. Age-1 equivalents for Gulf menhaden (*Brevoortia patronus*) using high mortality estimates across all life stages.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	6.210	2.00	12.4200	0	12.4200	0.0000	0.00001
YSL	0.077	60	4.6200	0	4.6200	0.0099	0.01951
Juvenile	0.013	303	3.9390	0	3.9390	0.0195	
	Total =	365		Total =	20.979		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	8,349,217	637,560,173	1,869,506,613	0.000000	0	1	3
YSL	18,201,655	1,276,828,458	3,581,192,554	0.000380	6,914	485,041	1,360,420
Juvenile							
				Total =	6,914	485,041	1,360,423

Table 19. Age-1 equivalents for Gulf menhaden (*Brevoortia patronus*) using low larval mortality rates and base mortality estimates across all other stages.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	1.044	1.75	1.8270	0	1.8270	0.1609	0.27719
YSL	0.049	60.000	2.9280	0	2.9280	0.0535	0.10157
Juvenile	0.013	298.3	3.8779	0	3.8779	0.0207	
	Total =	360.05		Total =	8.6329		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	8,349,217	637,560,173	1,869,506,613	0.000307	2,562	195,676	573,777
YSL	18,201,655	1,276,828,458	3,581,192,554	0.002102	38,260	2,683,871	7,527,603
Juvenile							
				Total =	40,822	2,879,546	8,101,380

Table 20. Age-1 equivalents for Gulf menhaden (*Brevoortia patronus*) using high larval mortality rates and base mortality estimates across all other stages.

Stage	Instantaneous Mortality	Duration (Days)	Natural Mortality per Stage	Fishing Mortality per Stage	Total Mortality per Stage	Fraction Surviving	Correction
Egg	1.044	1.75	1.8270	0	1.8270	0.1609	0.27719
YSL	0.077	60.000	4.6200	0	4.6200	0.0099	0.01951
Juvenile	0.013	298.3	3.8779	0	3.8779	0.0207	
	Total =	360.05		Total =	10.3249		

Stage	Number Potentially Entrained			Fraction Surviving to Age 1+	Number Surviving to Age 1+		
	LCL	Mean	UCL		LCL	Mean	UCL
Egg	8,349,217	637,560,173	1,869,506,613	0.000057	472	36,034	105,661
YSL	18,201,655	1,276,828,458	3,581,192,554	0.000404	7,350	515,601	1,446,134
Juvenile							
				Total =	7,822	551,634	1,551,795

APPENDIX A-2

ATTACHMENT 3

**EQUIVALENT YIELD ANALYSIS RESULTING
FROM NOAA COMMENTS**

Topic Report 3 - Biological Resources

Table 1. Base Life History Table and Average Entrainment Estimate for Red Drum (*Sciaenops ocellatus*).

Life History Stage or Age	Natural Mortality per Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 Fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish in the Absence of the OR3						
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Lost to Natural Mortality	Weight of Fish That Might Have Remained in the Population at End of Year
Egg	0.4984	0	0	0.50	0.61	0.76	97,905	0.00030	29	NA	NA	NA	NA	NA	NA	NA	NA
Larvae	5.0000	0	0	5.00	0.01	0.01	196,072	0.00079	154	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 1	1.6380	0	0	1.64	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 2	0.8964	0	0	0.90	0.41	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 3	0.2988	0	0	0.30	0.74	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.27	0.621	0	0.89	0.41	NA	NA	NA	NA	2,59458	76	33	184	196	85	196	196
2	0.19	1.149	0	1.34	0.26	NA	NA	NA	NA	6,88424	48	8	75	329	54	136	136
3	0.16	0.324	0	0.48	0.62	NA	NA	NA	NA	10,23435	5	3	12	20	52	125	125
4	0.16	0.190	0	0.35	0.70	NA	NA	NA	NA	11,45316	2	2	9	12	19	98	98
5	0.15	0.036	0	0.19	0.83	NA	NA	NA	NA	12,62000	0	0	7	9	4	15	90
6	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	13,72648	1	1	6	7	10	12	76
7	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	14,76732	1	1	4	6	8	10	63
8	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	15,73977	0	0	3	4	7	8	52
9	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	16,64306	0	0	3	3	6	7	42
10	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	17,47794	0	0	2	3	5	5	34
11	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	18,24628	0	0	2	2	4	4	28
12	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	18,95076	0	0	1	2	3	4	22
13	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	19,59460	0	0	1	1	2	3	18
14	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	20,18136	0	0	1	1	2	2	14
15	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	20,71480	0	0	1	1	2	2	11
16	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	21,19871	0	0	1	1	1	1	9
17	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	21,63685	0	0	0	0	1	1	7
18	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	22,03290	0	0	0	0	1	1	6
19	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	22,39038	0	0	0	0	1	1	4
20	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	22,71262	0	0	0	0	1	1	3
Total =										184	134	50	184	654	261	261	3

Mean Weight (pounds) 4.89

22.71

Total Weight Lost To Fishing Mortality 919
To Natural Mortality 654
261

Topic Report 3 - Biological Resources

Table 2. Base Life History Table and LCL Entrapment Estimate for Red Drum (*Sciaenops ocellatus*).

Life History Stage or Age	Natural Mortality per Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrapped at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 Fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish In the Absence of the OR1						
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Lost to Natural Mortality	Weight of Fish That Might Have Remained in the Population at End of Year
Egg	0.4984	0	0	0.50	0.61	0.76	6,157	0.00080	2	NA	NA	NA	NA	NA	NA	NA	NA
Larvae	5.0000	0	0	5.00	0.01	0.01	13,421	0.00079	11	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 1	1.6380	0	0	1.64	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 2	0.8964	0	0	0.90	0.41	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 3	0.2988	0	0	0.30	0.74	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.27	0.621	0	0.89	0.41	NA	NA	NA	NA	2,59458	2	5	12	13	6	13	NA
2	0.19	1.149	0	1.34	0.26	NA	NA	NA	NA	6,88424	1	1	5	22	4	4	9
3	0.16	0.324	0	0.48	0.62	NA	NA	NA	NA	10,23435	0	0	1	4	2	2	8
4	0.16	0.190	0	0.35	0.70	NA	NA	NA	NA	11,45316	0	0	1	1	1	1	7
5	0.15	0.036	0	0.19	0.83	NA	NA	NA	NA	12,62000	0	0	1	0	0	1	6
6	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	13,72648	0	0	0	0	0	1	5
7	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	14,76752	0	0	0	0	0	1	4
8	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	15,73977	0	0	0	0	0	1	4
9	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	16,64306	0	0	0	0	0	0	3
10	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	17,47794	0	0	0	0	0	0	2
11	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	18,24628	0	0	0	0	0	0	2
12	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	18,95076	0	0	0	0	0	0	2
13	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	19,59460	0	0	0	0	0	0	1
14	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	20,18136	0	0	0	0	0	0	1
15	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	20,71480	0	0	0	0	0	0	1
16	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	21,19871	0	0	0	0	0	0	1
17	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	21,63685	0	0	0	0	0	0	0
18	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	22,03290	0	0	0	0	0	0	0
19	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	22,39038	0	0	0	0	0	0	0
20	0.14	0.117	0	0.26	0.77	NA	NA	NA	NA	22,71262	0	0	0	0	0	0	0
Total =										12	3	0	12	44	18	0	0

Mean Weight (pounds) 4.89 5.24 22.71

Total Weight Lost To Fishing Mortality 62
Total Weight Lost To Natural Mortality 44 18

Topic Report 3 - Biological Resources

Table 3. Base Life History Table and UCL Entrainment Estimate for Red Drum (*Sciaenops ocellatus*).

Life History Stage or Age	Natural Mortality per Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 Fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish in the Absence of the OR1							
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Lost to Natural Mortality	Weight of Fish That Might Have Remained in the Population at End of Year	
Egg	0.4984	0	1	0.50	0.61	0.76	198,224	0.00080	59	NA	NA	NA	NA	NA	NA	NA	NA	NA
Larvae	5.0000	0	1	5.00	0.01	0.01	379,714	0.00079	299	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 1	1.6380	0	1	1.64	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 2	0.8964	0	1	0.90	0.41	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 3	0.2988	0	1	0.30	0.74	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.27	0.621	1	0.89	0.41	NA	NA	NA	NA	2,59458	147	64	147	358	382	166	381	381
2	0.19	1.149	1	1.34	0.26	NA	NA	NA	NA	6,88424	93	15	39	147	641	106	265	265
3	0.16	0.324	1	0.48	0.62	NA	NA	NA	NA	10,23435	10	5	24	39	101	50	243	243
4	0.16	0.190	1	0.35	0.70	NA	NA	NA	NA	11,45316	4	3	17	24	44	37	192	192
5	0.15	0.036	1	0.19	0.83	NA	NA	NA	NA	12,62000	1	2	14	17	7	29	175	175
6	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	13,72648	1	2	11	14	20	24	148	148
7	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	14,76732	1	1	8	11	16	20	123	123
8	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	15,73977	1	1	6	8	13	16	101	101
9	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	16,64306	1	1	5	6	11	13	83	83
10	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	17,47794	1	1	4	5	9	11	67	67
11	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	18,24628	0	0	3	4	7	9	54	54
12	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	18,95076	0	0	2	3	6	7	44	44
13	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	19,59460	0	0	2	2	5	6	35	35
14	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	20,18136	0	0	1	2	4	4	28	28
15	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	20,71480	0	0	1	1	3	4	22	22
16	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	21,19871	0	0	1	1	2	3	17	17
17	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	21,63685	0	0	1	1	2	2	14	14
18	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	22,03290	0	0	0	0	1	1	11	11
19	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	22,39038	0	0	0	0	1	1	9	9
20	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	22,71262	0	0	0	0	1	1	7	7
Total =										358	97	0	358	1,276	509	1,276	509	7

Mean Weight (pounds) 4.89 5.24 22.71

Total Weight Lost To Fishing Mortality 1,792
Total Weight Lost To Natural Mortality 509

Topic Report 3 - Biological Resources

Table 4. Low Mortality Life History Table and Average Entrainment Estimate for Red Drum (*Sciaenops ocellatus*).

Life History Stage or Age	Natural Mortality per Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 Fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish in the Absence of the OR1						
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Lost to Natural Mortality	Weight of Fish That Might Have Remained in the Population at End of Year
Egg	0.4984	0	0	1	0.50	0.61	97,905	0.00197	193	NA	NA	NA	NA	NA	NA	NA	NA
Larvae	3.4000	0	0	1	3.40	0.03	196,072	0.00504	987	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 1	1.6080	0	0	1	1.61	0.20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 2	0.7942	0	0	1	0.79	0.45	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 3	0.1494	0	0	1	0.15	0.86	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.27	0.621	0	1	0.89	0.41	NA	NA	NA	2,59458	484	1,180	1,258	547	1,256	873	800
2	0.19	1.149	0	1	1.34	0.26	NA	NA	NA	6,88424	51	484	2,110	349	1,256	873	800
3	0.16	0.324	0	1	0.48	0.62	NA	NA	NA	10,23435	33	127	333	165	1,256	873	800
4	0.16	0.19	0	1	0.35	0.70	NA	NA	NA	11,45316	13	55	144	121	1,256	873	800
5	0.15	0.036	0	1	0.19	0.83	NA	NA	NA	12,62000	2	46	55	23	1,256	873	800
6	0.14	0.117	0	1	0.26	0.77	NA	NA	NA	13,72648	5	35	46	65	1,256	873	800
7	0.14	0.117	0	1	0.26	0.77	NA	NA	NA	14,76732	4	27	35	54	1,256	873	800
8	0.14	0.117	0	1	0.26	0.77	NA	NA	NA	15,73977	3	21	27	44	1,256	873	800
9	0.14	0.117	0	1	0.26	0.77	NA	NA	NA	16,64306	2	16	21	36	1,256	873	800
10	0.14	0.117	0	1	0.26	0.77	NA	NA	NA	17,47794	2	13	16	30	1,256	873	800
11	0.14	0.117	0	1	0.26	0.77	NA	NA	NA	18,24628	1	10	13	24	1,256	873	800
12	0.14	0.117	0	1	0.26	0.77	NA	NA	NA	18,95076	1	8	10	19	1,256	873	800
13	0.14	0.117	0	1	0.26	0.77	NA	NA	NA	19,59460	1	6	8	15	1,256	873	800
14	0.14	0.117	0	1	0.26	0.77	NA	NA	NA	20,18136	1	5	6	12	1,256	873	800
15	0.14	0.117	0	1	0.26	0.77	NA	NA	NA	20,71480	0	4	5	10	1,256	873	800
16	0.14	0.117	0	1	0.26	0.77	NA	NA	NA	21,19871	0	3	4	8	1,256	873	800
17	0.14	0.117	0	1	0.26	0.77	NA	NA	NA	21,63685	0	2	3	6	1,256	873	800
18	0.14	0.117	0	1	0.26	0.77	NA	NA	NA	22,03290	0	2	2	5	1,256	873	800
19	0.14	0.117	0	1	0.26	0.77	NA	NA	NA	22,39038	0	1	2	4	1,256	873	800
20	0.14	0.117	0	1	0.26	0.77	NA	NA	NA	22,71262	0	1	1	3	1,256	873	800
Total									1,180			1,180	4,202	1,677	4,202	1,677	22,712

Mean Weight (pounds) 4.89 5.24 22.71

Total Weight Lost To Fishing Mortality 5,901
Total Weight Lost To Natural Mortality 4,202 1,677

Topic Report 3 - Biological Resources

Table 5. Low Mortality History Table and LCL Entrainment Estimate for Red Drum (*Sciaenops ocellatus*).

Life History Stage or Age	Natural Mortality per Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 Fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish In the Absence of the OR1						
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Lost to Natural Mortality	Weight of Fish That Might Have Remained in the Population at End of Year
Egg	0.4984	0	1	0.50	0.61	0.76	6,157	0.00197	12	NA	NA	NA	NA	NA	NA	NA	NA
Larvae	3.4000	0	1	3.40	0.03	0.06	13,421	0.00504	68	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 1	1.6080	0	1	1.61	0.20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 2	0.7942	0	1	0.79	0.45	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 3	0.1494	0	1	0.15	0.86	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.27	0.621	1	0.89	0.41	NA	NA	NA	NA	2,59458	33	14	33	80	85	37	85
2	0.19	1.149	1	1.34	0.26	NA	NA	NA	NA	6,88424	21	3	9	33	143	24	59
3	0.16	0.324	1	0.48	0.62	NA	NA	NA	NA	10,23435	2	1	5	9	23	11	54
4	0.16	0.19	1	0.35	0.70	NA	NA	NA	NA	11,45316	1	1	4	5	10	8	43
5	0.15	0.036	1	0.19	0.83	NA	NA	NA	NA	12,62000	0	0	3	4	2	6	39
6	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	13,72648	0	0	2	3	4	5	33
7	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	14,76752	0	0	2	2	4	4	27
8	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	15,73977	0	0	1	2	3	4	22
9	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	16,64306	0	0	1	1	2	3	18
10	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	17,47794	0	0	1	1	2	2	15
11	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	18,24628	0	0	1	1	2	2	12
12	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	18,95076	0	0	1	1	1	2	10
13	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	19,59460	0	0	0	1	1	1	8
14	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	20,18136	0	0	0	0	1	1	6
15	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	20,71480	0	0	0	0	1	1	5
16	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	21,19871	0	0	0	0	1	1	4
17	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	21,63685	0	0	0	0	0	0	3
18	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	22,03290	0	0	0	0	0	0	2
19	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	22,39038	0	0	0	0	0	0	2
20	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	22,71262	0	0	0	0	0	0	1
Total									80		58	22	80	284	113	113	22.71

Mean Weight (pounds) 4.89 5.24 22.71

Total Weight Lost To Fishing Mortality 399
Total Weight Lost To Natural Mortality 284 113

Table 6. Low Mortality History Table and UCL Entrainment Estimate for Red Drum (*Sciaenops ocellatus*).

Life History Stage or Age	Natural Mortality Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish In the Absence of the OR1						
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Lost to Natural Mortality	Weight of Fish That Might Have Remained in the Population at End of Year
Egg	0.4984	0	0	0.50	0.61	0.76	198,224	0.00197	390	NA	NA	NA	NA	NA	NA	NA	NA
Larvae	3.4000	0	0	3.40	0.03	0.06	379,714	0.00504	1,912	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 1	1.6080	0	0	1.61	0.20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 2	0.7942	0	0	0.79	0.45	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 3	0.1494	0	0	0.15	0.86	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.27	0.621	1	0.89	0.41	NA	NA	NA	NA	2,594,588	411	944	2,302	2,455	1,067	2,450	
2	0.19	1.149	1	1.34	0.26	NA	NA	NA	NA	6,884,244	99	248	944	4,116	681	1,704	
3	0.16	0.324	1	0.48	0.62	NA	NA	NA	NA	10,234,355	64	153	248	651	321	1,561	
4	0.16	0.19	1	0.35	0.70	NA	NA	NA	NA	11,453,166	24	107	153	280	236	1,231	
5	0.15	0.036	1	0.19	0.83	NA	NA	NA	NA	12,620,000	4	89	107	45	186	1,126	
6	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	13,726,488	9	69	89	126	151	947	
7	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	14,767,522	7	53	69	105	126	788	
8	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	15,739,777	6	41	53	87	104	650	
9	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	16,643,066	5	32	41	71	85	531	
10	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	17,477,944	4	25	32	58	69	432	
11	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	18,246,288	3	19	25	46	56	348	
12	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	18,950,766	2	15	19	37	45	280	
13	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	19,594,660	2	11	15	30	36	224	
14	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	20,181,536	1	9	11	24	28	178	
15	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	20,714,880	1	7	9	19	23	142	
16	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	21,198,711	1	5	7	15	18	112	
17	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	21,636,855	1	4	5	12	14	88	
18	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	22,032,900	0	3	4	9	11	70	
19	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	22,390,388	0	2	3	7	9	55	
20	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	22,712,622	0	2	2	6	7	43	
Total =										625	2,302	2,302	8,198	3,271	43		
Population in Number:										625	2,302	2,302	8,198	3,271	43		
Population in Pound:										4.89	5.24	22.71	4.89	5.24	22.71		

Total Weight Lost To Fishing Mortality	11,513
Total Weight Lost To Natural Mortality	8,198
Total Weight Lost	3,271

Table 7. High Mortality History Table and Average Entrainment Estimate for Red Drum (*Sciaenops ocellatus*).

Life History Stage or Age	Natural Mortality per Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 Fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish in the Absence of the OR1						
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Lost to Natural Mortality	Weight of Fish That Might Have Remained in the Population at End of Year
Egg	0.4984		0	0.50	0.61	0.76	97,905	0.00002		NA	NA	NA	NA	NA	NA	NA	NA
Larvae	6.6000		0	6.60	0.00	0.00	196,072	0.00005		NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 1	2.7800		0	2.78	0.06	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 2	0.9866		0	0.99	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 3	0.2916		0	0.29	0.75	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.27	0.621	1	0.89	0.41	NA	NA	NA	NA	2,59458	4	2	4	11	12	5	12
2	0.19	1.149	1	1.34	0.26	NA	NA	NA	NA	6,88424	3	0	3	4	20	3	8
3	0.16	0.324	1	0.48	0.62	NA	NA	NA	NA	10,23435	0	0	0	1	3	2	7
4	0.16	0.19	1	0.35	0.70	NA	NA	NA	NA	11,45316	0	0	0	1	1	1	6
5	0.15	0.036	1	0.19	0.83	NA	NA	NA	NA	12.62000	0	0	0	1	0	0	5
6	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	13.72648	0	0	0	0	1	1	5
7	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	14.76732	0	0	0	0	1	1	4
8	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	15.73977	0	0	0	0	0	0	3
9	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	16.64306	0	0	0	0	0	0	3
10	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	17.47794	0	0	0	0	0	0	2
11	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	18.24628	0	0	0	0	0	0	2
12	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	18.95076	0	0	0	0	0	0	1
13	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	19.59460	0	0	0	0	0	0	1
14	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	20.18136	0	0	0	0	0	0	1
15	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	20.71480	0	0	0	0	0	0	1
16	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	21.19871	0	0	0	0	0	0	1
17	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	21.63685	0	0	0	0	0	0	0
18	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	22.03290	0	0	0	0	0	0	0
19	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	22.39038	0	0	0	0	0	0	0
20	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	22.71262	0	0	0	0	0	0	0
Total =										11	8	3	0	11	39	16	0
										Population in Number			Population in Pounds				
										Mean Weight (pounds)			5.24				
										Total Weight Lost To Fishing Mortality			55				
										Total Weight Lost To Natural Mortality			39				
													16				

Table 8. High Mortality Life History Table and LCL Entrainment Estimate for Red Drum (*Sciaenops ocellatus*).

Life History Stage or Age	Natural Mortality Stage or Age (M)	Fishing Mortality Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish In the Absence of the OR1						
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Lost to Natural Mortality	Weight of Fish That Might Have Remained in the Population at End of Year
Eggs	0.4984	0	1	0.50	0.61	0.76	6,157	0.00002	0	NA	NA	NA	NA	NA	NA	NA	
Larvae	6.6000	0	1	6.60	0.00	0.00	13,421	0.00005	1	NA	NA	NA	NA	NA	NA	NA	
Juvenile 1	2.7800	0	1	2.78	0.06	0.06	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Juvenile 2	0.9866	0	1	0.99	0.37	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Juvenile 3	0.2916	0	1	0.29	0.75	0.75	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
1	0.27	0.621	1	0.89	0.41	0.41	NA	NA	NA	2,594.58	0	0	0	0	0	0	
2	0.19	1.149	1	1.34	0.26	0.26	NA	NA	NA	6,884.24	0	0	0	0	0	0	
3	0.16	0.324	1	0.48	0.62	0.62	NA	NA	NA	10,234.55	0	0	0	0	0	0	
4	0.16	0.19	1	0.35	0.70	0.70	NA	NA	NA	11,453.16	0	0	0	0	0	0	
5	0.15	0.036	1	0.19	0.83	0.83	NA	NA	NA	12,620.00	0	0	0	0	0	0	
6	0.14	0.117	1	0.26	0.77	0.77	NA	NA	NA	13,726.48	0	0	0	0	0	0	
7	0.14	0.117	1	0.26	0.77	0.77	NA	NA	NA	14,767.32	0	0	0	0	0	0	
8	0.14	0.117	1	0.26	0.77	0.77	NA	NA	NA	15,739.77	0	0	0	0	0	0	
9	0.14	0.117	1	0.26	0.77	0.77	NA	NA	NA	16,643.06	0	0	0	0	0	0	
10	0.14	0.117	1	0.26	0.77	0.77	NA	NA	NA	17,477.94	0	0	0	0	0	0	
11	0.14	0.117	1	0.26	0.77	0.77	NA	NA	NA	18,246.28	0	0	0	0	0	0	
12	0.14	0.117	1	0.26	0.77	0.77	NA	NA	NA	18,950.76	0	0	0	0	0	0	
13	0.14	0.117	1	0.26	0.77	0.77	NA	NA	NA	19,594.60	0	0	0	0	0	0	
14	0.14	0.117	1	0.26	0.77	0.77	NA	NA	NA	20,181.56	0	0	0	0	0	0	
15	0.14	0.117	1	0.26	0.77	0.77	NA	NA	NA	20,714.80	0	0	0	0	0	0	
16	0.14	0.117	1	0.26	0.77	0.77	NA	NA	NA	21,198.71	0	0	0	0	0	0	
17	0.14	0.117	1	0.26	0.77	0.77	NA	NA	NA	21,636.85	0	0	0	0	0	0	
18	0.14	0.117	1	0.26	0.77	0.77	NA	NA	NA	22,032.90	0	0	0	0	0	0	
19	0.14	0.117	1	0.26	0.77	0.77	NA	NA	NA	22,390.38	0	0	0	0	0	0	
20	0.14	0.117	1	0.26	0.77	0.77	NA	NA	NA	22,712.62	0	0	0	0	0	0	
Total =											1	3	0	0	0	0	0
Population in Number:											Population in Number:		Population in Pound:				
											Mean Weight (pounds)	4.89	5.24	22.71			

Total Weight Lost To Fishing Mortality	4
To Natural Mortality	1

Table 9. High Mortality Life History Table and UCL Entrainment Estimate for Red Drum (*Sciaenops ocellatus*).

Life History Stage or Age	Natural Mortality Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish In the Absence of the OR1						
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Lost to Natural Mortality	Weight of Fish That Might Have Remained in the Population at End of Year
Eggs	0.4984	0	0	0.50	0.61	0.76	198,224	0.00002	4	NA	NA	NA	NA	NA	NA	NA	NA
Larvae	6.6000	0	0	6.60	0.00	0.00	379,714	0.00005	18	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 1	2.7800	0	0	2.78	0.06	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 2	0.9866	0	0	0.99	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 3	0.2916	0	0	0.29	0.75	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.27	0.621	1	0.89	0.41	NA	NA	NA	NA	2,594.58	4	21	9	23	10	23	23
2	0.19	1.149	1	1.34	0.26	NA	NA	NA	NA	6,884.24	6	2	9	38	6	16	16
3	0.16	0.324	1	0.48	0.62	NA	NA	NA	NA	10,234.55	1	1	2	6	3	14	14
4	0.16	0.19	1	0.35	0.70	NA	NA	NA	NA	11,453.16	0	1	1	3	2	11	11
5	0.15	0.036	1	0.19	0.83	NA	NA	NA	NA	12,620.00	0	1	1	0	2	10	10
6	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	13,726.48	0	1	1	1	1	9	9
7	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	14,767.32	0	0	1	1	1	7	7
8	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	15,739.77	0	0	0	1	1	6	6
9	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	16,643.06	0	0	0	1	1	5	5
10	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	17,477.94	0	0	0	1	1	4	4
11	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	18,246.28	0	0	0	0	1	3	3
12	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	18,950.76	0	0	0	0	0	2	2
13	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	19,594.60	0	0	0	0	0	2	2
14	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	20,181.56	0	0	0	0	0	2	2
15	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	20,714.80	0	0	0	0	0	1	1
16	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	21,198.71	0	0	0	0	0	1	1
17	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	21,636.85	0	0	0	0	0	1	1
18	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	22,032.90	0	0	0	0	0	1	1
19	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	22,390.38	0	0	0	0	0	1	1
20	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	22,712.62	0	0	0	0	0	0	0
Total									21	Total =	16	6	0	21	76	30	0
										Mean Weight (pounds)			4.89			5.24	22.71

Total Weight Lost To Fishing Mortality	107
Total Weight Lost To Natural Mortality	76
Total	30

Table 10. Base Life History Table (Low Larval Mortality) and Average Entrainment Estimate for Red Drum (*Sciaenops ocellatus*).

Life History Stage or Age	Natural Mortality per Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish in the Absence of the OR1					
											Number Potentially Lost to Fishing Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Natural Mortality		
Egg	0.4984	0	1	0.50	0.61	0.76	97,905	0.00148	145	NA	NA	NA	NA	NA	NA	NA
Larvae	3.4000	0	1	3.40	0.03	0.06	196,072	0.00380	745	NA	NA	NA	NA	NA	NA	NA
Juvenile 1	1.6380	0	1	1.64	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 2	0.8964	0	1	0.90	0.41	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 3	0.2988	0	1	0.30	0.74	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.27	0.621	1	0.89	0.41	NA	NA	NA	NA	2,59458	NA	NA	NA	NA	NA	NA
2	0.19	1.149	1	1.34	0.26	NA	NA	NA	NA	6,88424	NA	NA	NA	NA	NA	NA
3	0.16	0.324	1	0.48	0.62	NA	NA	NA	NA	10,23435	NA	NA	NA	NA	NA	NA
4	0.16	0.19	1	0.35	0.70	NA	NA	NA	NA	11,45316	NA	NA	NA	NA	NA	NA
5	0.15	0.036	1	0.19	0.83	NA	NA	NA	NA	12,62000	NA	NA	NA	NA	NA	NA
6	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	13,72648	NA	NA	NA	NA	NA	NA
7	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	14,76732	NA	NA	NA	NA	NA	NA
8	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	15,73977	NA	NA	NA	NA	NA	NA
9	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	16,64306	NA	NA	NA	NA	NA	NA
10	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	17,47794	NA	NA	NA	NA	NA	NA
11	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	18,24628	NA	NA	NA	NA	NA	NA
12	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	18,95076	NA	NA	NA	NA	NA	NA
13	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	19,59460	NA	NA	NA	NA	NA	NA
14	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	20,18136	NA	NA	NA	NA	NA	NA
15	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	20,71480	NA	NA	NA	NA	NA	NA
16	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	21,19871	NA	NA	NA	NA	NA	NA
17	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	21,63685	NA	NA	NA	NA	NA	NA
18	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	22,03290	NA	NA	NA	NA	NA	NA
19	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	22,39038	NA	NA	NA	NA	NA	NA
20	0.14	0.117	1	0.26	0.77	NA	NA	NA	NA	22,71262	NA	NA	NA	NA	NA	NA
Total =										890	890	890	3,171	1,265	17	
Mean Weight (pounds)										4.89	5.24	22.71				
Total Weight Lost To Fishing Mortality										4,453						
Total Weight Lost To Natural Mortality										3,171						
Total Weight Lost To Natural Mortality										1,265						

Table 11. Base Life History Table (High Larval Mortality) and Average Entrainment Estimate for Red Drum (*Sciaenops ocellatus*).

Life History Stage or Age	Natural Mortality Stage or Age (M)	Fishing Mortality Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish in the Absence of the OR1						
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Lost to Natural Mortality	Weight of Fish That Might Have Remained in Population at End of Year
Egg	0.4984	0	0	0.50	0.61	0.76	97,905	0.00006	6	NA	NA	NA	NA	NA	NA	NA	NA
Larvae	6.6000	0	0	6.60	0.00	0.00	196,072	0.00016	31	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 1	1.6380	0	0	1.64	0.19	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 2	0.8964	0	0	0.90	0.41	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 3	0.2988	0	0	0.30	0.74	0.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.27	0.621	0	0.89	0.41	0.00	NA	NA	NA	2,59458	7	15	37	40	17	40	NA
2	0.19	1.149	0	1.34	0.26	0.00	NA	NA	NA	6,88424	2	4	15	67	11	28	NA
3	0.16	0.324	0	0.48	0.62	0.00	NA	NA	NA	10,23435	1	2	4	11	5	25	NA
4	0.16	0.19	0	0.35	0.70	0.00	NA	NA	NA	11,45316	0	2	2	5	4	20	NA
5	0.15	0.036	0	0.19	0.83	0.00	NA	NA	NA	12,62000	0	1	2	1	3	18	NA
6	0.14	0.117	0	0.26	0.77	0.00	NA	NA	NA	13,72648	0	1	1	2	2	15	NA
7	0.14	0.117	0	0.26	0.77	0.00	NA	NA	NA	14,76732	0	1	1	2	2	13	NA
8	0.14	0.117	0	0.26	0.77	0.00	NA	NA	NA	15,73977	0	1	1	1	2	11	NA
9	0.14	0.117	0	0.26	0.77	0.00	NA	NA	NA	16,64306	0	1	1	1	1	9	NA
10	0.14	0.117	0	0.26	0.77	0.00	NA	NA	NA	17,47794	0	1	1	1	1	7	NA
11	0.14	0.117	0	0.26	0.77	0.00	NA	NA	NA	18,24628	0	0	0	0	1	6	NA
12	0.14	0.117	0	0.26	0.77	0.00	NA	NA	NA	18,95076	0	0	0	0	1	5	NA
13	0.14	0.117	0	0.26	0.77	0.00	NA	NA	NA	19,59460	0	0	0	0	1	4	NA
14	0.14	0.117	0	0.26	0.77	0.00	NA	NA	NA	20,18136	0	0	0	0	0	3	NA
15	0.14	0.117	0	0.26	0.77	0.00	NA	NA	NA	20,71480	0	0	0	0	0	2	NA
16	0.14	0.117	0	0.26	0.77	0.00	NA	NA	NA	21,19871	0	0	0	0	0	2	NA
17	0.14	0.117	0	0.26	0.77	0.00	NA	NA	NA	21,63685	0	0	0	0	0	1	NA
18	0.14	0.117	0	0.26	0.77	0.00	NA	NA	NA	22,03290	0	0	0	0	0	1	NA
19	0.14	0.117	0	0.26	0.77	0.00	NA	NA	NA	22,39038	0	0	0	0	0	1	NA
20	0.14	0.117	0	0.26	0.77	0.00	NA	NA	NA	22,71262	0	0	0	0	0	1	NA
Total =										37	10	0	37	133	53	1	
										Population in Number:		Population in Pound:					
										Mean Weight (pounds)		4.89		5.24		22.71	

Total Weight Lost To Fishing Mortality	186
Total Weight Lost To Natural Mortality	133
	53

Table 12. Base Life History Table and Average Entrainment Estimate for Red Snapper (*Lutjanus campechanus*).

Life History Stage or Age	Natural Mortality Stage or Age (M)	Fishing Mortality Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish in the Absence of the ORY								
											Number Potentially Lost to Fishing Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish That Might Have Remained in the Population at End of Year				
Eggs	0.4984	0	1	0.50	0.61	0.76	175,255	0.00013	23	NA	NA	NA	NA	NA	NA	NA	NA		
Larvae	5.7400	0	1	5.74	0.00	0.01	350,979	0.00035	124	NA	NA	NA	NA	NA	NA	NA	NA		
Juvenile 1	2.4000	0	1	2.40	0.09	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Juvenile 2	0.5001	0	1	0.50	0.61	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
1	0.1	1.009	1	1.11	0.33	NA	NA	NA	NA	NA	9	49	147	28	3	NA	NA		
2	0.1	0.073	1	0.17	0.84	NA	NA	NA	NA	NA	4	41	49	4	4	5	44		
3	0.1	0.288	1	0.39	0.68	NA	NA	NA	NA	NA	3	28	41	22	8	8	64		
4	0.1	0.537	1	0.64	0.53	NA	NA	NA	NA	NA	10	15	28	43	8	8	57		
5	0.1	0.434	1	0.53	0.59	NA	NA	NA	NA	NA	5	9	15	28	6	6	48		
6	0.1	0.289	1	0.39	0.68	NA	NA	NA	NA	NA	2	6	9	15	5	5	44		
7	0.1	0.199	1	0.30	0.74	NA	NA	NA	NA	NA	1	4	6	9	9	5	41		
8	0.1	0.147	1	0.25	0.78	NA	NA	NA	NA	NA	1	3	4	6	6	4	38		
9	0.1	0.116	1	0.22	0.81	NA	NA	NA	NA	NA	0	3	3	4	5	4	35		
10	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	0	2	3	3	4	4	33		
11	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	0	2	2	2	3	3	30		
12	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	0	2	2	2	2	3	27		
13	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	0	1	2	2	2	3	24		
14	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	0	1	1	1	2	2	21		
15	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	0	1	1	1	2	2	18		
Total =										147	23	147	174	65	174	65	18		
Population in Numbers										Population in Pounds									
										Mean Weight (pounds)									
										1.41		2.83		20.03					

Total Weight Lost To Fishing Mortality	257
To Natural Mortality	174
	65

Table 13. Base Life History Table and LCL Entrainment Estimate for Red Snapper (*Lutjanus campechanus*).

Life History Stage or Age	Natural Mortality per Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish In the Absence of the ORY					
											Number Potentially Lost to Fishing Mortality	Number That Might Have Remained in the Population at End of Year	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish That Might Have Remained in the Population at End of Year		
Egg	0.4984	0	0	1	0.50	0.76	51,404	0.00013	7	NA	NA	NA	NA	NA	NA	NA
Larvae	5.7400	0	0	1	5.74	0.01	112,063	0.00035	40	NA	NA	NA	NA	NA	NA	NA
Juvenile 1	2.4000	0	0	1	2.40	0.09	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 2	0.5001	0	0	1	0.50	0.61	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.1	1.009	1	1.11	0.33	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	0.1	0.073	1	0.17	0.84	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	0.1	0.288	1	0.39	0.68	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4	0.1	0.537	1	0.64	0.53	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	0.1	0.434	1	0.53	0.59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	0.1	0.289	1	0.39	0.68	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	0.1	0.199	1	0.30	0.74	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	0.1	0.147	1	0.25	0.78	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	0.1	0.116	1	0.22	0.81	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
13	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
15	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total									46							

Population in Numbers

Population in Pounds

Mean Weight (pounds)	1.41	2.83	20.03
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Total Weight Lost To Fishing Mortality	81
Total Weight Lost To Natural Mortality	20

Table 14. Base Life History Table and UCL Entrainment Estimate for Red Snapper (*Lutjanus campechanus*).

Life History Stage or Age	Natural Mortality Stage or Age (M)	Fishing Mortality Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish in the Absence of the ORV					
											Number Potentially Lost to Fishing Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Natural Mortality		
Egg	0.4984	0	0	1	0.50	0.76	308,417	0.00013	NA	41	NA	NA	NA	NA	NA	NA
Larvae	5.7400	0	0	1	5.74	0.01	590,798	0.00035	NA	208	NA	NA	NA	NA	NA	NA
Juvenile 1	2.4000	0	0	1	2.40	0.09	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 2	0.5001	0	0	1	0.50	0.61	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.1	1.009	1	1.11	0.33	NA	NA	NA	NA	NA	0.312303291	82	250	47	5	26
2	0.1	0.288	1	0.39	0.84	NA	NA	NA	NA	NA	1,078,177,702	69	69	6	8	75
3	0.1	0.537	1	0.64	0.53	NA	NA	NA	NA	NA	2,299,544,69	47	47	38	13	108
4	0.1	0.434	1	0.53	0.59	NA	NA	NA	NA	NA	3,865,054,56	25	25	72	13	96
5	0.1	0.289	1	0.39	0.68	NA	NA	NA	NA	NA	5,643,088,548	11	11	47	11	82
6	0.1	0.199	1	0.30	0.74	NA	NA	NA	NA	NA	7,514,896,779	10	10	26	9	74
7	0.1	0.147	1	0.25	0.78	NA	NA	NA	NA	NA	9,386,632,383	7	7	16	8	69
8	0.1	0.116	1	0.22	0.81	NA	NA	NA	NA	NA	11,190,853,68	6	6	11	7	64
9	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	12,883,402,38	5	5	8	7	59
10	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	14,438,749,38	4	4	5	6	55
11	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	15,845,309,04	3	3	4	5	51
12	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	17,101,360,25	3	3	4	5	45
13	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	18,211,767,51	2	2	3	4	40
14	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	19,185,482,84	2	2	2	4	35
15	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	20,033,372,138	0	0	2	3	31
Total =											209	250	295	110	31	
											Population in Numbers		Population in Pounds			
											Mean Weight (pounds)	1.41	2.83	20.03		
											Total Weight Lost To Fishing Mortality		435			
											To Natural Mortality		110			

Table 15. Low Mortality Life History Table and Average Entrainment Estimate for Red Snapper (*Lutjanus campechanus*).

Life History Stage or Age	Natural Mortality Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 Fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish in the Absence of the ORY						
											Number Potentially Lost to Fishing Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality			
Egg	0.4984	0	0	0.50	0.61	0.76	175,235	0.00519	910	NA	NA	NA	NA	NA	NA	NA	
Larvae	4.0500	0	0	4.05	0.02	0.03	350,979	0.01350	4,739	NA	NA	NA	NA	NA	NA	NA	
Juvenile 1	0.4500	0	0	0.45	0.64	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Juvenile 2	0.5004	0	0	0.50	0.61	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
1	0.1	1.009	1	1.11	0.33	NA	NA	NA	5,649	NA 0.312203291	341	1,864	1,075	1,075	1,075	582	
2	0.1	0.073	1	0.17	0.84	NA	NA	NA	NA	NA 1.078177702	171	1,568	135	185	185	1,690	
3	0.1	0.288	1	0.39	0.68	NA	NA	NA	NA	NA 2.29954469	130	1,063	860	299	299	2,445	
4	0.1	0.537	1	0.64	0.53	NA	NA	NA	NA	NA 3.86505456	79	562	1,632	304	304	2,174	
5	0.1	0.434	1	0.53	0.59	NA	NA	NA	NA	NA 5.643088548	44	330	1,067	246	246	1,861	
6	0.1	0.289	1	0.39	0.68	NA	NA	NA	NA	NA 7.514896779	27	223	330	593	205	1,679	
7	0.1	0.199	1	0.30	0.74	NA	NA	NA	NA	NA 9.386632383	19	166	223	361	181	1,556	
8	0.1	0.147	1	0.25	0.78	NA	NA	NA	NA	NA 11.19085368	15	129	166	242	164	1,449	
9	0.1	0.116	1	0.22	0.81	NA	NA	NA	NA	NA 12.88340238	14	104	129	174	150	1,344	
10	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA 14.43874938	8	87	104	116	138	1,253	
11	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA 15.84530904	7	72	87	105	126	1,144	
12	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA 17.10136025	6	60	72	95	113	1,027	
13	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA 18.21176751	5	50	60	84	100	910	
14	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA 19.18548284	4	42	50	74	88	797	
15	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA 20.03372138	3	35	42	64	76	693	
Total =											Population in Numbers		Population in Pounds				
											4,739	875	35	5,649	6,677	2,480	693
											Mean Weight (pounds)		1.41	2.83	20.03		

Total Weight Lost To Fishing Mortality 9,850
Total Weight Lost To Natural Mortality 6,677
Total Weight Lost 2,480

Table 16. Low Mortality History Table and LCL Entrainment Estimate for Red Snapper (*Lutjanus campechanus*).

Life History Stage or Age	Natural Mortality Stage or Age (M)	Fishing Mortality Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish In the Absence of the ORV						
											Number Potentially Lost to Fishing Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish That Might Have Remained in the Population at End of Year			
Egg	0.4984	0	0	0.50	0.61	0.76	51,404	0.00519	267	NA	NA	NA	NA	NA	NA		
Larvae	4.0300	0	0	4.03	0.02	0.03	112,063	0.01350	1,513	NA	NA	NA	NA	NA	NA		
Juvenile 1	0.4500	0	0	0.45	0.64	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Juvenile 2	0.5004	0	0	0.50	0.61	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
1	0.1	1.009	1	1.11	0.33	NA	NA	NA	NA	NA 0.312703291	1,085	108	587	1,780	34		
2	0.1	0.073	1	0.17	0.84	NA	NA	NA	NA	NA 1.078177702	39	54	494	587	58		
3	0.1	0.288	1	0.39	0.68	NA	NA	NA	NA	NA 2.29954469	118	41	335	494	42		
4	0.1	0.537	1	0.64	0.53	NA	NA	NA	NA	NA 3.86505456	133	25	177	335	271		
5	0.1	0.434	1	0.53	0.59	NA	NA	NA	NA	NA 5.643088548	60	14	104	177	514		
6	0.1	0.289	1	0.39	0.68	NA	NA	NA	NA	NA 7.514896779	25	9	70	104	336		
7	0.1	0.199	1	0.30	0.74	NA	NA	NA	NA	NA 9.386632383	12	6	52	70	187		
8	0.1	0.147	1	0.25	0.78	NA	NA	NA	NA	NA 11.19085368	7	5	41	52	114		
9	0.1	0.116	1	0.22	0.81	NA	NA	NA	NA	NA 12.88340238	4	4	33	41	76		
10	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA 14.43874938	3	3	27	33	55		
11	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA 15.84530904	2	2	23	27	36		
12	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA 17.10136025	2	2	19	23	33		
13	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA 18.21176751	1	1	16	19	30		
14	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA 19.18548284	1	1	13	16	26		
15	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA 20.03572138	1	1	11	13	23		
										1,780	1,493	11	1,780	2,104	781	218	
										Population in Numbers				Population in Pounds			
										Mean Weight (pounds)				2.83			

Total Weight Lost To Fishing Mortality	3,104
To Natural Mortality	2,104
	781

Table 17. Low Mortality History Table and UCL Entrainment Estimate for Red Snapper (*Lutjanus campechanus*).

Life History Stage or Age	Natural Mortality Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish in the Absence of the ORV						
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Lost to Natural Mortality	Weight of Fish That Might Have Remained in Population at End of Year
Egg	0.4984	0	0	0.50	0.61	0.76	308,417	0.00519	1,602	NA	NA	NA	NA	NA	NA	NA	
Larvae	4.0300	0	0	4.03	0.02	0.03	590,798	0.01350	7,977	NA	NA	NA	NA	NA	NA	NA	
Juvenile 1	0.4500	0	0	0.45	0.64	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Juvenile 2	0.5004	0	0	0.50	0.61	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
1	0.1	1.009	1	1.11	0.33	NA	NA	NA	NA	NA	5,840	579	3,160	9,579	1,823	181	987
2	0.1	0.073	1	0.17	0.84	NA	NA	NA	NA	NA	212	290	2,658	3,160	228	313	2,866
3	0.1	0.288	1	0.39	0.68	NA	NA	NA	NA	NA	634	220	1,803	2,658	1,459	507	4,147
4	0.1	0.537	1	0.64	0.53	NA	NA	NA	NA	NA	716	133	954	1,803	2,768	515	3,686
5	0.1	0.434	1	0.53	0.59	NA	NA	NA	NA	NA	321	74	559	954	1,810	417	3,155
6	0.1	0.289	1	0.39	0.68	NA	NA	NA	NA	NA	134	46	379	559	1,006	348	2,848
7	0.1	0.199	1	0.30	0.74	NA	NA	NA	NA	NA	65	33	281	379	612	307	2,638
8	0.1	0.147	1	0.25	0.78	NA	NA	NA	NA	NA	37	25	219	281	410	279	2,456
9	0.1	0.116	1	0.22	0.81	NA	NA	NA	NA	NA	23	20	177	219	295	254	2,278
10	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	14	16	147	177	196	233	2,124
11	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	11	13	122	147	179	213	1,940
12	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	9	11	102	122	161	191	1,741
13	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	8	9	88	102	142	169	1,543
14	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	6	8	70	88	125	148	1,352
15	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	5	6	59	70	108	129	1,175
Total =										9,579	1,485	59	9,579	11,322	4,205	11,322	1,175

Mean Weight (pounds)	1.41	2.83	20.03
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Total Weight Lost To Fishing Mortality	16,701
Total Weight Lost To Natural Mortality	11,322
	4,205

Table 18. High Mortality Life History Table and Average Entrainment Estimate for Red Snapper (*Lutjanus campechanus*).

Life History Stage or Age	Natural Mortality Stage or Age (M)	Fishing Mortality Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish in the Absence of the ORV					
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Lost to Natural Mortality
Egg	0.4984	0	0	0.50	0.61	0.76	175,255	0.00001	1	NA	NA	NA	NA	NA	NA	NA
Larvae	7.6500	0	1	7.65	0.00	0.00	350,979	0.00001	5	NA	NA	NA	NA	NA	NA	NA
Juvenile 1	3.7200	0	1	3.72	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 2	0.5000	0	1	0.50	0.61	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.1	1.009	1	1.11	0.33	NA	NA	NA	NA	NA 0.312303291	NA	NA	NA	NA	NA	NA
2	0.1	0.073	1	0.17	0.84	NA	NA	NA	NA	NA 1.078177702	NA	NA	NA	NA	NA	NA
3	0.1	0.288	1	0.39	0.68	NA	NA	NA	NA	NA 2.2995469	NA	NA	NA	NA	NA	NA
4	0.1	0.537	1	0.64	0.53	NA	NA	NA	NA	NA 3.86505456	NA	NA	NA	NA	NA	NA
5	0.1	0.434	1	0.53	0.59	NA	NA	NA	NA	NA 5.643088548	NA	NA	NA	NA	NA	NA
6	0.1	0.289	1	0.39	0.68	NA	NA	NA	NA	NA 7.514896779	NA	NA	NA	NA	NA	NA
7	0.1	0.199	1	0.30	0.74	NA	NA	NA	NA	NA 9.386632383	NA	NA	NA	NA	NA	NA
8	0.1	0.147	1	0.25	0.78	NA	NA	NA	NA	NA 11.19085368	NA	NA	NA	NA	NA	NA
9	0.1	0.116	1	0.22	0.81	NA	NA	NA	NA	NA 12.88540238	NA	NA	NA	NA	NA	NA
10	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA 14.43874938	NA	NA	NA	NA	NA	NA
11	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA 15.84530904	NA	NA	NA	NA	NA	NA
12	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA 17.10136025	NA	NA	NA	NA	NA	NA
13	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA 18.21176751	NA	NA	NA	NA	NA	NA
14	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA 19.18548284	NA	NA	NA	NA	NA	NA
15	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA 20.05372138	NA	NA	NA	NA	NA	NA
Total =										6	5	1	6	7	3	1
Mean Weight (pounds)										1.41	2.83	20.03				

Total Weight Lost To Fishing Mortality	10
To Natural Mortality	7
	3

Table 19. High Mortality History Table and LCL Entrainment Estimate for Red Snapper (*Lutjanus campechanus*).

Life History Stage or Age	Natural Mortality Stage or Age (M)	Fishing Mortality Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish In the Absence of the ORV				
											Number Potentially Lost to Fishing Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Remained in the Population at End of Year
Egg	0.4984	0	1	0.50	0.61	0.76	51,404	0.00001	0	0	NA	NA	NA	NA	NA
Larvae	7.6500	0	1	7.65	0.00	0.00	112,063	0.00001	2	2	NA	NA	NA	NA	NA
Juvenile 1	3.7200	0	1	3.72	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 2	0.5000	0	1	0.50	0.61	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.1	1.009	1	1.11	0.33	NA	NA	NA	NA	0.31203291	0	0	0	0	0
2	0.1	0.073	1	0.17	0.84	NA	NA	NA	NA	1.07817702	0	0	0	0	0
3	0.1	0.288	1	0.39	0.68	NA	NA	NA	NA	2.29954469	0	0	0	0	0
4	0.1	0.537	1	0.64	0.53	NA	NA	NA	NA	3.86505456	0	0	0	0	0
5	0.1	0.434	1	0.53	0.59	NA	NA	NA	NA	5.643088548	0	0	0	0	0
6	0.1	0.289	1	0.39	0.68	NA	NA	NA	NA	7.514896779	0	0	0	0	0
7	0.1	0.199	1	0.30	0.74	NA	NA	NA	NA	9.386652383	0	0	0	0	0
8	0.1	0.147	1	0.25	0.78	NA	NA	NA	NA	11.19085368	0	0	0	0	0
9	0.1	0.116	1	0.22	0.81	NA	NA	NA	NA	12.88340238	0	0	0	0	0
10	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	14.43874938	0	0	0	0	0
11	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	15.84530904	0	0	0	0	0
12	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	17.10136025	0	0	0	0	0
13	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	18.21176751	0	0	0	0	0
14	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	19.1848284	0	0	0	0	0
15	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	20.03372138	0	0	0	0	0
Total =										2	0	0	2	0	0
Population in Numbers										Population in Pounds					
										2	0	0	2	0	0
										1.41	2.83	2.83	2.83	2.83	2.83
										Mean Weight (pounds)	1.41	2.83	2.83	2.83	2.83

Total Weight Lost To Fishing Mortality	3
To Natural Mortality	2

Table 20. High Mortality History Table and UCL Entrainment Estimate for Red Snapper (*Lutjanus campechanus*).

Life History Stage or Age	Natural Mortality Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish In the Absence of the ORV					
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Lost to Natural Mortality
Egg	0.4984	0	0	0.50	0.61	0.76	308,417	0.00001	2	NA	NA	NA	NA	NA	NA	NA
Larvae	7.6500	0	1	7.65	0.00	0.00	590,798	0.00001	8	NA	NA	NA	NA	NA	NA	NA
Juvenile 1	3.7200	0	1	3.72	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 2	0.5000	0	1	0.50	0.61	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 3	0.0000	0	1	0.00	1.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.1	1.009	1	1.11	0.33	NA	NA	NA	NA	NA	0.31203291	NA	NA	NA	NA	NA
2	0.1	0.073	1	0.17	0.84	NA	NA	NA	NA	NA	1.07817702	NA	NA	NA	NA	NA
3	0.1	0.288	1	0.39	0.68	NA	NA	NA	NA	NA	2.29954469	NA	NA	NA	NA	NA
4	0.1	0.537	1	0.64	0.53	NA	NA	NA	NA	NA	3.86505456	NA	NA	NA	NA	NA
5	0.1	0.434	1	0.53	0.59	NA	NA	NA	NA	NA	5.643088548	NA	NA	NA	NA	NA
6	0.1	0.289	1	0.39	0.68	NA	NA	NA	NA	NA	7.514896779	NA	NA	NA	NA	NA
7	0.1	0.199	1	0.30	0.74	NA	NA	NA	NA	NA	9.386652383	NA	NA	NA	NA	NA
8	0.1	0.147	1	0.25	0.78	NA	NA	NA	NA	NA	11.19085368	NA	NA	NA	NA	NA
9	0.1	0.116	1	0.22	0.81	NA	NA	NA	NA	NA	12.88340238	NA	NA	NA	NA	NA
10	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	14.43874938	NA	NA	NA	NA	NA
11	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	15.84530904	NA	NA	NA	NA	NA
12	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	17.10136025	NA	NA	NA	NA	NA
13	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	18.21176751	NA	NA	NA	NA	NA
14	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	19.18548284	NA	NA	NA	NA	NA
15	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	20.03372138	NA	NA	NA	NA	NA
Total =										10						
										Population in Numbers		Population in Pounds				
										8	2	0	10	12	4	1
										Mean Weight (pounds)		1.41	2.83			20.03

Total Weight Lost To Fishing Mortality	17
To Natural Mortality	4

Table 21. Base Life History (Low Larval Mortality) Table and Average Entrainment Estimate for Red Snapper (*Lutjanus campechanus*).

Life History Stage or Age	Natural Mortality Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish In the Absence of the ORV					
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Lost to Natural Mortality
Egg	0.4984	0	1	0.50	0.61	0.76	175,255	0.00074	130	NA	NA	NA	NA	NA	NA	NA
Larvae	4.0300	0	1	4.03	0.02	0.03	350,979	0.00192	674	NA	NA	NA	NA	NA	NA	NA
Juvenile 1	2.4000	0	1	2.40	0.09	0.09	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 2	0.5001	0	1	0.50	0.61	0.61	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.1	1.009	1	1.11	0.33	NA	NA	NA	NA	0.312303291	490	49	265	804	15	83
2	0.1	0.073	1	0.17	0.84	NA	NA	NA	NA	1.078177702	18	24	265	265	19	26
3	0.1	0.288	1	0.39	0.68	NA	NA	NA	NA	2.29954469	53	18	151	223	122	241
4	0.1	0.537	1	0.64	0.53	NA	NA	NA	NA	3.86505456	60	11	80	151	232	348
5	0.1	0.434	1	0.53	0.59	NA	NA	NA	NA	5.643088548	27	6	47	80	152	309
6	0.1	0.289	1	0.39	0.68	NA	NA	NA	NA	7.514896779	11	4	32	47	84	265
7	0.1	0.199	1	0.30	0.74	NA	NA	NA	NA	9.386632383	5	3	24	32	51	221
8	0.1	0.147	1	0.25	0.78	NA	NA	NA	NA	11.19085368	3	2	18	24	34	206
9	0.1	0.116	1	0.22	0.81	NA	NA	NA	NA	12.88540238	2	2	15	18	25	191
10	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	14.43874938	1	1	12	15	16	178
11	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	15.84530904	1	1	10	12	15	163
12	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	17.10136025	1	1	9	10	13	146
13	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	18.21176751	1	1	7	9	12	129
14	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	19.18548284	1	1	6	7	10	113
15	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	20.03572138	0	1	5	6	9	99
Total =										804	125	5	804	950	353	99
										Population in Numbers		Population in Pounds				
										Mean Weight (pounds)		2.83				

Total Weight Lost To Fishing Mortality	1,402
To Natural Mortality	950
	353

Table 22. Base Life History (High Larval Mortality) Table and Average Entrainment Estimate for Red Snapper (*Lutjanus campechanus*).

Life History Stage or Age	Natural Mortality Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish In the Absence of the ORV					
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Lost to Natural Mortality
Egg	0.4984	0	0	0.50	0.61	0.76	175,255	0.00002	3	NA	NA	NA	NA	NA	NA	NA
Larvae	7.6500	0	0	7.65	0.00	0.00	350,979	0.00005	18	NA	NA	NA	NA	NA	NA	NA
Juvenile 1	2.4000	0	0	2.40	0.09	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 2	0.5001	0	0	0.50	0.61	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.1	1.009	1	1.11	0.33	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	0.1	0.073	1	0.17	0.84	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	0.1	0.288	1	0.39	0.68	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4	0.1	0.537	1	0.64	0.53	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	0.1	0.434	1	0.53	0.59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	0.1	0.289	1	0.39	0.68	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	0.1	0.199	1	0.30	0.74	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	0.1	0.147	1	0.25	0.78	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	0.1	0.116	1	0.22	0.81	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
13	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
14	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
15	0.1	0.084	1	0.18	0.83	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total =										22	22	26	10	3	22	3

Mean Weight (pounds)	1.41	2.83	20.03
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Total Weight Lost To Fishing Mortality	38
Total Weight Lost To Natural Mortality	26
	10

Topic Report 3 - Biological Resources

Table 23. Base Life History Table and Average Entrainment Estimate for Gulf Menhaden (Brevoortia patronus).

Life History Stage or Age	Natural Mortality Stage or Age (M)	Fishing Mortality Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish in the Absence of the ORV				
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish That Might Have Remained in the Population at End of Year
Egg	1.8270	0	0	1.83	0.16	0.28	637,560,173	0.00012	79,001	NA	NA	NA	NA	NA	NA
Larvae	3.8350	0	0	3.84	0.02	0.04	1,276,828,458	0.00088	1,117,406	NA	NA	NA	NA	NA	NA
Juvenile 1	3.8779	0	0	3.88	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.131179834	477,428	241,550	1,196,407	62,629	31,687
2	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.241990667	96,391	48,768	241,550	23,326	11,801
3	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.348069196	19,461	9,846	48,768	6,774	3,427
4	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.437623557	3,929	1,988	9,846	1,719	870
5	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.507986545	793	401	1,988	403	204
										Total =	598,003	302,554	1,498,560	94,851	47,989
											Population in Numbers				
											Population in Pounds				
											Mean Weight (pounds)				
											0.16				
											0.16				

Total Weight Lost To Fishing Mortality	237,691
To Natural Mortality	94,851
	94,851

Table 24. Base Life History Table and LCL Entrainment Estimate for Gulf Menhaden (Brevoortia patronus).

Life History Stage or Age	Natural Mortality Stage or Age (M)	Fishing Mortality Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish in the Absence of the ORV				
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish That Might Have Remained in the Population at End of Year
Egg	1.8270	0	0	1.83	0.16	0.28	8,349,217	0.00012	1,035	NA	NA	NA	NA	NA	NA
Larvae	3.8350	0	0	3.84	0.02	0.04	18,201,655	0.00088	15,929	NA	NA	NA	NA	NA	NA
Juvenile 1	3.8779	0	0	3.88	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.131179834	6,769	3,425	16,964	888	449
2	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.241990667	1,367	691	3,425	331	167
3	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.348069196	276	140	691	96	49
4	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.437623557	56	28	140	24	12
5	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.507986545	11	6	28	6	3
										Total =	8,479	4,290	21,248	1,345	680
											Population in Numbers				
											Population in Pounds				
											Mean Weight (pounds)				
											0.16				
											0.16				

Total Weight Lost To Fishing Mortality	3,370
To Natural Mortality	1,345
	1,345

Table 25. Base Life History Table and UCL Entrainment Estimate for Gulf Menhaden (Brevoortia patronus).

Life History Stage or Age	Natural Mortality per Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish in the Absence of the ORY						
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Lost to Natural Mortality	Weight of Fish That Might Have Remained in the Population at End of Year
Egg	1.8270	0	0	1.83	0.16	0.28	1,869,506,613	0.00012	231,653	NA	NA	NA	NA	NA	NA	NA	NA
Larvae	3.8350	0	0	3.84	0.02	0.04	3,581,192,554	0.00088	3,134,053	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 1	3.8779	0	0	3.88	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.131179834	1,343,091	1,343,091	679,524	176,186	176,186	89,140	NA
2	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.241990667	271,165	271,165	137,194	65,619	65,619	33,200	NA
3	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.348069196	54,747	54,747	27,699	19,056	19,056	9,641	NA
4	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.437623557	11,053	11,053	5,592	4,837	4,837	2,447	NA
5	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.507986545	2,232	2,232	1,129	5,592	1,134	574	NA
Total									3,365,706				4,215,715	266,833	266,833	135,001	
Population in Numbers											Population in Pounds						
Mean Weight (pounds)											0.16						

Total Weight Lost To Fishing Mortality	668,667
To Natural Mortality	266,833

Table 26. Low Mortality Life History Table and Average Entrainment Estimate for Gulf Menhaden (Brevoortia patronus).

Life History Stage or Age	Natural Mortality per Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish in the Absence of the ORY						
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Lost to Natural Mortality	Weight of Fish That Might Have Remained in the Population at End of Year
Egg	1.5660	0	0	1.57	0.21	0.35	637,560,173	0.00036	228,003	NA	NA	NA	NA	NA	NA	NA	NA
Larvae	2.9280	0	0	2.93	0.05	0.10	1,276,828,458	0.00196	2,508,437	NA	NA	NA	NA	NA	NA	NA	NA
Juvenile 1	3.9455	0	0	3.95	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.131179834	1,091,981	1,091,981	552,478	143,246	143,246	72,474	NA
2	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.241990667	220,467	220,467	111,543	53,351	53,351	26,992	NA
3	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.348069196	44,512	44,512	22,520	15,493	15,493	7,839	NA
4	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.437623557	8,987	8,987	4,547	3,933	3,933	1,990	NA
5	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.507986545	1,814	1,814	918	922	922	466	NA
Total									2,736,440				3,427,528	216,945	216,945	109,761	
Population in Numbers											Population in Pounds						
Mean Weight (pounds)											0.16						

Total Weight Lost To Fishing Mortality	543,650
To Natural Mortality	216,945

Table 27. Low Mortality History Table and LCL Entrainment Estimate for Gulf Menhaden (Brevoortia patronus).

Life History Stage or Age	Natural Mortality per Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish In the Absence of the ORY							
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in Population at End of Year	Total Number at Age	Weight of Fish That Might Have Remained in the Population at End of Year			
Egg	1.5660	0	0	1.57	0.21	0.35	8,349,217	0.00036	2,986	NA	NA	NA	NA	NA	NA	NA		
Larvae	2.9280	0	0	2.93	0.05	0.10	18,201,655	0.00196	35,759	NA	NA	NA	NA	NA	NA	NA		
Invenile 1	3.9455	0	0	3.95	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
1	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.131179834	7,822	38,745	2,028	2,028	1,026	NA		
2	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.241990667	1,579	7,822	755	755	382	NA		
3	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.348069196	630	1,579	219	219	111	NA		
4	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.437623557	127	64	319	56	28	NA		
5	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.507986545	26	64	13	13	7	NA		
Total											19,366	48,529	9,798	3,072	3,072	1,554	NA	
											Population in Numbers		Population in Pounds					
											Mean Weight (pounds)		0.16		0.16		0.16	

Total Weight Lost To Fishing Mortality	7,697
To Natural Mortality	3,072
	3,072

Table 28. Low Mortality History Table and UCL Entrainment Estimate for Gulf Menhaden (Brevoortia patronus).

Life History Stage or Age	Natural Mortality per Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish In the Absence of the ORY							
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in Population at End of Year	Total Number at Age	Weight of Fish That Might Have Remained in the Population at End of Year			
Egg	1.5660	0	0	1.57	0.21	0.35	1,869,506,613	0.00036	668,568	NA	NA	NA	NA	NA	NA	NA		
Larvae	2.9280	0	0	2.93	0.05	0.10	3,581,192,554	0.00196	7,035,555	NA	NA	NA	NA	NA	NA	NA		
Invenile 1	3.9455	0	0	3.95	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
1	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.131179834	1,555,436	7,704,124	403,292	403,292	204,042	NA		
2	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.241990667	314,037	1,555,436	150,203	150,203	75,994	NA		
3	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.348069196	125,317	314,037	43,619	43,619	22,069	NA		
4	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.437623557	25,301	63,403	11,072	11,072	5,602	NA		
5	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.507986545	5,108	12,801	2,595	2,595	1,313	NA		
Total											3,850,770	9,649,800	1,948,261	610,782	610,782	309,019	NA	
											Population in Numbers		Population in Pounds					
											Mean Weight (pounds)		0.16		0.16		0.16	

Total Weight Lost To Fishing Mortality	1,530,583
To Natural Mortality	610,782
	610,782

Table 29. High Mortality History Table and Average Entrainment Estimate for Gulf Menhaden (Brevoortia patronus).

Life History Stage or Age	Natural Mortality per Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish In the Absence of the ORY							
											Number Potentially Lost to Fishing Mortality	Number That Might Have Remained in Population at End of Year	Total Number at Age	Potentially Lost to Fishing Mortality	Potentially Remained in Population at End of Year	Weight of Fish That Might Have Remained in the Population at End of Year		
Egg	12.4200	0	1	12.42	0.00	0.00	637,560,173	0.00000	1	NA	NA	NA	NA	NA	NA	NA		
Larvae	4.6200	0	1	4.62	0.01	0.02	1,276,828,458	0.00038	485,041	NA	NA	NA	NA	NA	NA	NA		
Invenile 1	3.9390	0	1	3.94	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
1	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.131179834	193,557	97,928	485,041	25,391	25,391	12,846		
2	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.241990667	39,078	19,771	97,928	9,457	9,457	4,784		
3	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.348069196	7,890	3,992	19,771	2,746	2,746	1,389		
4	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.437623557	1,593	806	3,992	697	697	353		
5	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.507986545	322	163	806	163	163	83		
									485,041	Total	242,439	122,660	607,539	38,454	38,454	19,455		
											Population in Numbers		Population in Pounds					
											Mean Weight (pounds)		0.16		0.16		0.16	

Total Weight Lost To Fishing Mortality 96,363
To Natural Mortality 38,454

Table 30. High Mortality History Table and LCL Entrainment Estimate for Gulf Menhaden (Brevoortia patronus).

Life History Stage or Age	Natural Mortality per Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish In the Absence of the ORY							
											Number Potentially Lost to Fishing Mortality	Number That Might Have Remained in Population at End of Year	Total Number at Age	Potentially Lost to Fishing Mortality	Potentially Remained in Population at End of Year	Weight of Fish That Might Have Remained in the Population at End of Year		
Egg	12.4200	0	1	12.42	0.00	0.00	8,349,217	0.00000	0	NA	NA	NA	NA	NA	NA	NA		
Larvae	4.6200	0	1	4.62	0.01	0.02	18,201,655	0.00038	6,914	NA	NA	NA	NA	NA	NA	NA		
Invenile 1	3.9390	0	1	3.94	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
1	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.131179834	2,759	1,396	6,914	362	362	183		
2	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.241990667	557	282	1,396	135	135	68		
3	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.348069196	112	57	282	39	39	20		
4	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.437623557	23	11	57	10	10	5		
5	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.507986545	5	2	11	2	2	1		
									6,914	Total	3,456	1,749	8,661	548	548	277		
											Population in Numbers		Population in Pounds					
											Mean Weight (pounds)		0.16		0.16		0.16	

Total Weight Lost To Fishing Mortality 1,374
To Natural Mortality 548

Table 30. High Mortality History Table and UCL Entrainment Estimate for Gulf Menhaden (Brevoortia patronus).

Life History Stage or Age	Natural Mortality per Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Entrained at Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish In the Absence of the ORV					
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Lost to Natural Mortality
Egg	12.4200	0	0	12.42	0.00	0.00	1,869,506,613	0.00000	3	NA	NA	NA	NA	NA	NA	NA
Larvae	4.6200	0	0	4.62	0.01	0.02	3,581,192,554	0.00038	1,360,420	NA	NA	NA	NA	NA	NA	NA
Juvenile 1	3.9390	0	0	3.94	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.131179834	542,879	274,665	1,360,423	71,215	71,215	36,030
2	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.241990667	109,605	55,454	274,665	26,523	26,523	13,419
3	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.348069196	22,129	11,196	55,454	7,702	7,702	3,897
4	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.437623557	4,468	2,260	11,196	1,955	1,955	989
5	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.507986545	902	456	2,260	458	458	232
Total =											679,983	344,031	1,703,998	107,854	107,854	54,568
											Population in Numbers		Population in Pounds			
											Mean Weight (pounds)		0.16		0.16	

Total Weight Lost To Fishing Mortality	270,276
Total Weight Lost To Natural Mortality	107,854

Table 31. Base Life History (Low Larval Mortality) Table and Average Entrainment Estimate for Gulf Menhaden (Brevoortia patronus).

Life History Stage or Age	Natural Mortality per Stage or Age (M)	Fishing Mortality per Stage or Age (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Entrained at Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish In the Absence of the ORV					
											Number Potentially Lost to Fishing Mortality	Number Potentially Lost to Natural Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Lost to Natural Mortality
Egg	1.8270	0	0	1.83	0.16	0.28	637,560,173	0.00031	195,676	NA	NA	NA	NA	NA	NA	NA
Larvae	2.9280	0	0	2.93	0.05	0.10	1,276,828,458	0.00210	2,683,871	NA	NA	NA	NA	NA	NA	NA
Juvenile 1	3.8779	0	0	3.88	0.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.131179834	1,149,088	581,370	2,879,546	150,737	150,737	76,264
2	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.241990667	231,997	117,377	581,370	56,141	56,141	28,404
3	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.348069196	46,839	23,698	117,377	16,303	16,303	8,249
4	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.437623557	9,457	4,785	23,698	4,138	4,138	2,094
5	0.8	0.8	0.8	1.60	0.20	NA	NA	NA	NA	0.507986545	1,909	966	4,785	970	970	491
Total =											1,439,290	728,196	3,606,776	228,290	228,290	115,501
											Population in Numbers		Population in Pounds			
											Mean Weight (pounds)		0.16		0.16	

Total Weight Lost To Fishing Mortality	572,081
Total Weight Lost To Natural Mortality	228,290

Table 32. Base Life History (Low Larval Mortality) Table and Average Entrainment Estimate for Gulf Menhaden (*Brevoortia patronus*).

Life History Stage or Age	Natural Mortality				Fishing Mortality (F)	% Vulnerable to Fishery	Total Mortality per Stage (Z)	Fraction Surviving at Stage or Age	Corrected Survival Fraction	Number Potentially Entrained at Stage or Age	Cumulative Survival at Stage or Age	Projected Mortality of Age-1 fish	Weight of an Individual Fish at Median Age of Death	Projected Fate of Age-1 Fish In the Absence of the ORV						
	Stage or Age (M)	Mortality per Stage or Age	Stage or Age	Stage or Age										Number Potentially Lost to Fishing Mortality	Number That Might Have Remained in the Population at End of Year	Total Number at Age	Weight of Fish Potentially Lost to Fishing Mortality	Weight of Fish Potentially Remained in the Population at End of Year		
Eggs	1.8270	0	1	1.83	0.16	0.28	637,560,173	0.00006	36,034	NA	NA	NA	NA	NA	NA	NA	NA			
Larvae	4.6200	0	1	4.62	0.01	0.02	1,276,828,458	0.00040	515,601	NA	NA	NA	NA	NA	NA	NA	NA			
Juvenile 1	3.8779	0	1	3.88	0.02	NA	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			
1	0.8	0.8	1	1.60	0.20	NA	NA	NA	NA	0.13179834	111,373	551,634	28,877	28,877	14,610	NA	NA			
2	0.8	0.8	1	1.60	0.20	NA	NA	NA	NA	0.24090667	22,486	111,373	10,755	10,755	5,441	NA	NA			
3	0.8	0.8	1	1.60	0.20	NA	NA	NA	NA	0.348069196	8,973	22,486	3,123	3,123	1,580	NA	NA			
4	0.8	0.8	1	1.60	0.20	NA	NA	NA	NA	0.437623557	1,812	4,540	793	793	401	NA	NA			
5	0.8	0.8	1	1.60	0.20	NA	NA	NA	NA	0.507986545	366	917	185	186	94	NA	NA			
Total =													551,634	690,950	43,733	43,733	22,127			
Population in Numbers													Population in Pounds							
Mean Weight (pounds)													0.16	0.16	0.16	0.16	0.16			

Total Weight Lost To Fishing Mortality	109,594
Total Weight Lost To Natural Mortality	43,733