

## APPENDIX A3

**Table 1**      **Percent change in loggerhead, leatherback, and other sea turtle interactions with the combined Gulf of Mexico and NEC time/area closure in effect from May through October.** Based on data from the Pelagic Longline Observer Program and Pelagic Longline Logbook data with and without redistribution of effort.

	Without redistribution of effort from May-Oct 2001-2002		With redistribution of effort based on data from May-Oct 2001-2002	
	Observer Data	Logbook Data	Observer Data	Logbook Data
Leatherback	-35%	-35%	-14%	-24%
Loggerhead	-29%	-44%	-18%	-34%
Other*	0%	0%	0%	11%

\* Other sea turtles include Kemp's Ridley, Hawksbill, and Green.

**Table 2 Example of temporal variation in effectiveness of the central Gulf of Mexico and NEC time/area closure from May through October on leatherback sea turtle bycatch without redistribution of effort.** Source: Pelagic Observer Program data 2001-2002 (Observer Data) and Pelagic Logbook Data 2001-2002 (Logbook Data)

Month	Number of leatherbacks observed caught inside the time/area closure		Number of leatherbacks observed caught outside the time/area closure		Percentage reduction in leatherbacks caught if time/area is closed	
	Observer Data	Logbook Data	Observer Data	Logbook Data	Observer Data	Logbook Data
May	9	11	3	5	75%	69%
June	5	22	4	9	56%	71%
July	13	41	4	12	76%	77%
August	0	15	3	17	0%	47%
September	2	12	0	5	100%	71%
October	2	14	2	8	50%	64%
<b>Total May-Oct</b>	<b>31</b>	<b>115</b>	<b>16</b>	<b>56</b>	<b>35%*</b>	<b>35%*</b>
<b>Total</b>	<b>38</b>	<b>192</b>	<b>50</b>	<b>139</b>		

\* calculated by dividing the number caught from May-Oct by the total number caught in the Atlantic and Gulf of Mexico for the combined years 2001-2002 (88 leatherbacks based on observer data and 331 leatherbacks based on logbook data).

**Table 3 Example of temporal variation in effectiveness of the central Gulf of Mexico and NEC time/area closure from May through October on loggerhead sea turtle bycatch without redistribution of effort.** Source: Pelagic Observer Program data 2001-2002 (Observer Data) and Pelagic Logbook Data 2001-2002 (Logbook Data)

Month	Number of loggerheads observed caught inside the time/area closure		Number of loggerheads observed caught outside the time/area closure		Percentage reduction in loggerheads caught if time/area is closed	
	Observer Data	Logbook Data	Observer Data	Logbook Data	Observer Data	Logbook Data
May	3	5	0	2	100%	71%
June	7	21	0	2	0%	91%
July	1	9	1	2	50%	82%
August	0	2	0	3	0%	40%
September	0	2	0	3	0%	40%
October	1	3	5	3	17%	50%
<b>Total May-Oct</b>	<b>12</b>	<b>42</b>	<b>6</b>	<b>15</b>	<b>29%*</b>	<b>44%*</b>
<b>Total</b>	<b>14</b>	<b>54</b>	<b>27</b>	<b>42</b>		

\* calculated by dividing the number caught from May-Oct by the total number caught in the Atlantic and Gulf of Mexico for the combined years 2001 - 2002 (41 loggerheads based on observer data and 96 loggerheads based on logbook data).

**Table 4 Example of temporal variation in effectiveness of the central Gulf of Mexico and NEC time/area closure from May through October on other sea turtle bycatch without redistribution of effort.** Source: Pelagic Observer Program data 2001-2002 (Observer Data) and Pelagic Logbook Data 2001-2002 (Logbook Data)

Month	Number of other sea turtles observed caught inside the time/area closure		Number of other sea turtles observed caught outside the time/area closure		Percentage reduction in other sea turtles caught if time/area is closed	
	Observer Data	Logbook Data	Observer Data	Logbook Data	Observer Data	Logbook Data
May	0	0	0	0	0%	0%
June	0	0	0	0	0%	0%
July	0	0	0	0	0%	0%
August	0	0	0	0	0%	0%
September	0	0	0	0	0%	0%
October	0	0	0	2	0%	0%
<b>Total May-Oct</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0%*</b>	<b>0%*</b>
<b>Total</b>	<b>2</b>	<b>5</b>	<b>0</b>	<b>5</b>		

\* calculated by dividing the number caught from May-Oct by the total number caught in the Atlantic and Gulf of Mexico for the combined years 2001 - 2002 (2 other sea turtles based on observer data and 10 other sea turtles based on logbook data).

**Table 5 Redistribution of fishing effort and leatherback sea turtle interactions in the central Gulf of Mexico and NEC time/area closure alternative from May through October.** Source: Pelagic Observer Program data from 2001-2002.

	A	B	C	D	E	F	G	H	I	J	K	L
Month	Number of hooks in the Atlantic & Gulf of Mexico	Number of sea turtles caught in the Atlantic and GOM	Number of hooks in the time/area closure	Number of sea turtles caught in time/area closure	Number of sea turtles caught in the open Atl. & Gulf of Mexico (B-D)	Sea turtle CPUE in the open Atl. & Gulf of Mexico (E/(A-C))	Number of additional sea turtles caught in open Atl. & GOM by displaced effort (C*F)	Sea turtles catch from the open Atl. & GOM with displaced fishing effort (E+G)	Number of sea turtles avoided by area closure (B-H)	Cumulative catch avoided by month (sum of I)	Percent of total sea turtle interactions avoided by month (I/88)	Cumulative percent of total sea turtle interactions avoided by closure (J/88)
May	59,689	12	41,818	9	3	1.68e-04	7	10	2	2	2.3%	2.3%
June	47,708	9	21,221	4	5	1.89e-04	4	9	0	2	0.0%	2.3%
July	52,635	17	24,369	13	4	1.42e-04	3	7	10	12	10.9%	13.1%
Aug	40,605	3	14,721	0	3	1.16e-04	2	5	-2	10	-1.9%	11.2%
Sept	20,872	2	18,648	2	0	0.00e+00	0	0	2	12	2.3%	13.5%
Oct	36,570	4	15,896	2	2	9.67e-05	2	4	0	12	0.0%	13.5%
<b>Total May-Oct</b>	<b>258,079</b>	<b>47</b>	<b>136,673</b>	<b>30</b>	<b>17</b>	<b>7.11e-04</b>	<b>18</b>	<b>35</b>	<b>12</b>			
<b>Total</b>	<b>554,260</b>	<b>88</b>	<b>201,631</b>	<b>37</b>	<b>51</b>	<b>0</b>	<b>27</b>	<b>78</b>	<b>9</b>			

**Table 6      Redistribution of fishing effort and leatherback sea turtle interactions in the central Gulf of Mexico and NEC time/area closure alternative from May through October.** Source: Pelagic Longline Logbook data from 2001-2002.

	A	B	C	D	E	F	G	H	I	J	K	L
Month	Number of hooks in the Atlantic and Gulf of Mexico	Number of sea turtles caught in the Atlantic and GOM	Number of hooks in the time/area closure	Number of sea turtles caught in time/area closure	Number of sea turtles caught in open Atl. & Gulf of Mexico (B-D)	Sea turtle CPUE in the open Atl. & Gulf of Mexico (E/(A-C))	Number of additional sea turtles caught in open Atl. & GOM by displaced effort (C*F)	Sea turtles catch from open Atl. & GOM with displaced fishing effort (E+G)	Number of sea turtles avoided by area closure (B-H)	Cumulative catch avoided by month (sum of I)	Percent of total sea turtle interactions avoided by month (I/331)	Percent of total sea turtle interactions avoided by closure (J/331)
May	1,317,311	16	416,920	11	5	5.55e-06	2	7	9	9	2.6%	2.7%
June	1,414,291	31	492,897	22	9	9.77e-06	5	14	17	26	5.2%	7.9%
July	1,563,985	53	714,807	41	12	1.41e-05	10	22	31	57	9.3%	17.2%
Aug	1,555,525	32	611,565	15	17	1.80e-05	11	28	4	61	1.2%	18.5%
Sept	1,221,082	17	551,720	12	5	7.47e-06	4	9	8	69	2.4%	20.8%
Oct	1,119,064	22	392,775	14	8	1.10e-05	4	12	10	79	2.9%	23.8%
<b>Total May-Oct</b>	<b>8,191,258</b>	<b>171</b>	<b>3,180,684</b>	<b>115</b>	<b>56</b>	<b>6.59e-05</b>	<b>37</b>	<b>93</b>	<b>79</b>			
<b>Total</b>	<b>14,120,194</b>	<b>331</b>	<b>4,857,985</b>	<b>192</b>	<b>139</b>	<b>1.88e-04</b>	<b>69</b>	<b>208</b>				

**Table 7**      **Redistribution of fishing effort and loggerhead sea turtle interactions in the central Gulf of Mexico and NEC time/area closure alternative from May through October.** Source: Pelagic Observer Program data from 2001-2002.

	A	B	C	D	E	F	G	H	I	J	K	L
Month	Number of hooks in the Atlantic & Gulf of Mexico	Number of sea turtles caught in the Atlantic and GOM	Number of hooks in the time/area closure	Number of sea turtles caught in time/area closure	Number of sea turtles caught in open Atl. & Gulf of Mexico (B-D)	Sea turtle CPUE in the open Atl. & Gulf of Mexico (E/(A-C))	Number of additional sea turtles caught in open Atl. & GOM by displaced effort (C*F)	Sea turtles catch from open Atl. & GOM with displaced fishing effort (E+G)	Number of sea turtles avoided by area closure (B-H)	Cumulative catch avoided by month (sum of I)	Percent of total sea turtle interactions avoided by month (I/41)	Percent of total sea turtle interactions avoided by closure (J/41)
May	59,689	3	41,818	3	0	0.00e+00	0	0	3	3	7.3%	7.3%
June	47,708	7	21,221	7	0	0.00e+00	0	0	7	10	17.1%	24.4%
July	52,635	2	24,369	1	1	3.54e-05	1	2	0	10	0.3%	24.7%
Aug	40,605	0	14,721	0	0	0.00e+00	0	0	0	10	0.0%	24.7%
Sept	20,872	0	18,648	0	0	0.00e+00	0	0	0	10	0.0%	24.7%
Oct	36,570	6	15,896	1	5	2.42e-04	4	9	-3	7	-6.9%	17.8%
<b>Total May-Oct</b>	<b>258,079</b>	<b>18</b>	<b>136,673</b>	<b>12</b>	<b>6</b>	<b>2.77e-04</b>	<b>5</b>	<b>11</b>	<b>7</b>			
<b>Total</b>	<b>554,260</b>	<b>41</b>	<b>201,631</b>	<b>14</b>	<b>27</b>	<b>8.72e-04</b>	<b>11</b>	<b>38</b>	<b>3</b>			

**Table 8      Redistribution of fishing effort and loggerhead sea turtle interactions in the central Gulf of Mexico and NEC time/area closure alternative from May through October.** Source: Pelagic Longline Logbook data from 2001-2002.

	A	B	C	D	E	F	G	H	I	J	K	L
Month	Number of hooks in the Atlantic & Gulf of Mexico	Number of sea turtles caught in the Atlantic and GOM	Number of hooks in the time/area closure	Number of sea turtles caught in time/area closure	Number of sea turtles caught in open Atl. & Gulf of Mexico (B-D)	Sea turtle CPUE in the open Atl. & Gulf of Mexico (E/(A-C))	Number of additional sea turtles caught in open Atl. & GOM by displaced effort (C*F)	Sea turtles catch from open Atl. & GOM with displaced fishing effort (E+G)	Number of sea turtles avoided by area closure (B-H)	Cumulative catch avoided by month (sum of I)	Percent of total sea turtle interactions avoided by month (I/96)	Percent of total sea turtle interactions avoided by closure (J/96)
May	1,317,311	7	416,920	5	2	2.22e-06	1	3	4	4	4.2%	4.2%
June	1,414,291	23	492,897	21	2	2.17e-06	1	3	20	24	20.8%	24.9%
July	1,563,985	11	714,807	9	2	2.36e-06	2	4	7	31	7.6%	32.5%
Aug	1,555,525	5	611,565	2	3	3.18e-06	2	5	0	31	0.1%	32.6%
Sept	1,221,082	5	551,720	2	3	4.48e-06	2	5	0	31	-0.5%	32.1%
Oct	1,119,064	6	392,775	3	3	4.13e-06	2	5	1	32	1.4%	33.6%
<b>Total May-Oct</b>	<b>8,191,258</b>	<b>57</b>	<b>3,180,684</b>	<b>42</b>	<b>15</b>	<b>1.85e-05</b>	<b>10</b>	<b>25</b>	<b>32</b>			
<b>Total</b>	<b>14,120,194</b>	<b>96</b>	<b>4,857,985</b>	<b>54</b>	<b>42</b>	<b>5.83e-05</b>	<b>20</b>	<b>62</b>	<b>34</b>			

**Table 9 Redistribution of fishing effort and other sea turtle interactions in the central Gulf of Mexico and NEC time/area closure alternative from May through October.** Source: Pelagic Observer Program data from 2001-2002.

	A	B	C	D	E	F	G	H	I	J	K	L
Month	Number of hooks in the Atlantic & Gulf of Mexico	Number of sea turtles caught in the Atlantic and GOM	Number of hooks in the time/area closure	Number of sea turtles caught in time/area closure	Number of sea turtles caught in open Atl. & Gulf of Mexico (B-D)	Sea turtle CPUE in the open Atl. & Gulf of Mexico (E/(A-C))	Number of additional sea turtles caught in open Atl. & GOM by displaced effort (C*F)	Sea turtles catch from open Atl. & GOM with displaced fishing effort (E+G)	Number of sea turtles avoided by area closure (B-H)	Cumulative catch avoided by month (sum of I)	Percent of total sea turtle interactions avoided by month (I/2)	Percent of total sea turtle interactions avoided by closure (J/2)
May	59,689	0	41,818	0	0	0.00e+00	0	0	0	0	0.0%	0.0%
June	47,708	0	21,221	0	0	0.00e+00	0	0	0	0	0.0%	0.0%
July	52,635	0	24,369	0	0	0.00e+00	0	0	0	0	0.0%	0.0%
Aug	40,605	0	14,721	0	0	0.00e+00	0	0	0	0	0.0%	0.0%
Sept	20,872	0	18,648	0	0	0.00e+00	0	0	0	0	0.0%	0.0%
Oct	36,570	0	15,896	0	0	0.00e+00	0	0	0	0	0.0%	0.0%
<b>Total May-Oct</b>	<b>258,079</b>	<b>0</b>	<b>136,673</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>			
<b>Total</b>	<b>554,260</b>	<b>2</b>	<b>201,631</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>			

**Table 10 Redistribution of fishing effort and other sea turtle interactions in the central Gulf of Mexico and NEC time/area closure alternative from May through October.** Source: Pelagic Longline Logbook data from 2001-2002.

	A	B	C	D	E	F	G	H	I	J	K	L
Month	Number of hooks in the Atlantic & Gulf of Mexico	Number of sea turtles caught in the Atlantic and GOM	Number of hooks in the time/area closure	Number of sea turtles caught in time/area closure	Number of sea turtles caught in open Atl. & Gulf of Mexico (B-D)	Sea turtle CPUE in the open Atl. & Gulf of Mexico (E/(A-C))	Number of additional sea turtles caught in open Atl. & GOM by displaced effort (C*F)	Sea turtles catch from open Atl. & GOM with displaced fishing effort (E+G)	Number of sea turtles avoided by area closure (B-H)	Cumulative catch avoided by month (sum of I)	Percent of total sea turtle interactions avoided by month (I/10)	Percent of total sea turtle interactions avoided by closure (J/10)
May	1,317,311	0	416,920	0	0	0.00e+00	0	0	0	0	0.0%	0.0%
June	1,414,291	0	492,897	0	0	0.00e+00	0	0	0	0	0.0%	0.0%
July	1,563,985	0	714,807	0	0	0.00e+00	0	0	0	0	0.0%	0.0%
Aug	1,555,525	0	611,565	0	0	0.00e+00	0	0	0	0	0.0%	0.0%
Sept	1,221,082	0	551,720	0	0	0.00e+00	0	0	0	0	0.0%	0.0%
Oct	1,119,064	2	392,775	0	2	2.75e-06	1	3	-1	-1	-10.8%	-10.8%
<b>Total</b>	<b>8,191,258</b>	<b>2</b>	<b>3,180,684</b>	<b>0</b>	<b>2</b>	<b>2.75e-06</b>	<b>1</b>	<b>3</b>	<b>-1</b>			
<b>Total</b>	<b>14,120,194</b>	<b>10</b>	<b>4,857,985</b>	<b>5</b>	<b>5</b>	<b>7.37e-06</b>	<b>2</b>	<b>7</b>	<b>3</b>			

**Table 11** Percent change in catch of swordfish, yellowfin and bigeye tuna in the central Gulf of Mexico and NEC time/area closure alternative from May through October. Based on Pelagic Longline Logbook data with and without redistribution of effort.

	Without redistribution of effort from 2001-2002	With redistribution of effort based on data from 2001-2002
	Logbook Data	Logbook Data
Swordfish	-15%	5%*
Yellowfin	-25%	3%*
Bigeye	-8%	17%*

\* positive sign indicates an increase in catch

**Table 12 Example of temporal variation in effectiveness of the central Gulf of Mexico and NEC time/area closure from May through October on swordfish, yellowfin and bigeye tuna in the Gulf of Mexico without redistribution of effort. Source: Pelagic Logbook Data 2001-2002.**

Month	Number reported caught inside the time/area closure			Number reported caught outside the time/area closure			Percentage reduction in number caught if time/area is closed		
	Swordfish	Yellowfin	Bigeye	Swordfish	Yellowfin	Bigeye	Swordfish	Yellowfin	Bigeye
May	537	3,270	15	7,050	6,920	604	7%	32%	2%
June	2,335	3,953	685	4,980	10,315	811	32%	28%	46%
July	3,308	5,947	421	3,816	9,512	696	46%	38%	38%
August	2,749	6,589	349	3,702	8,846	2419	43%	43%	13%
Septembe	2,462	5,747	466	3,274	5,760	3485	43%	50%	12%
October	1,242	3,235	356	5,244	8,424	3022	19%	28%	11%
<b>Total May-Oct</b>	<b>12,633</b>	<b>28,741</b>	<b>2,292</b>	<b>28,066</b>	<b>49,777</b>	<b>11,037</b>	<b>15%*</b>	<b>25%*</b>	<b>8%*</b>
<b>Total</b>	<b>17,185</b>	<b>42,810</b>	<b>3,613</b>	<b>65,799</b>	<b>70,345</b>	<b>26,272</b>			

\* calculated by dividing the total number caught from May-Oct by the total number caught in the Atlantic and Gulf of Mexico for the combined years 2001 - 2002.

**Table 13 Redistribution of fishing effort and swordfish catch in the central Gulf of Mexico and NEC time/area closure from May through October.** Source: Pelagic Longline Logbook data from 2001-2002.

	A	B	C	D	E	F	G	H	I	J	K	L
Month	Number of hooks in the Atlantic & Gulf of Mexico	Number of swordfish caught in the Atlantic & Gulf of Mexico	Number of hooks in the time/area closure	Number of swordfish caught in time/area closure	Number of swordfish caught in open Atl. & Gulf of Mexico (B-D)	Swordfish CPUE in the open Atl. & Gulf of Mexico (E/(A-C))	Number of additional swordfish caught in open Atl. & GOM by displaced effort (C*F)	Swordfish catch from open Atl. & GOM with displaced fishing effort (E+G)	Number of swordfish avoided by area closure (B-H)	Cumulative catch avoided by month (sum of I)	Percent of total swordfish avoided by month (I/82,984)	Percent of total swordfish avoided by closure (J/82,984)
May	1,317,311	7,587	416,920	537	7,050	7.83e-03	3,264	10,314	-2727	-2727	-3.3%	-3.3%
June	1,414,291	7,315	492,897	2,335	4,980	5.40e-03	2,664	7,644	-329	-3056	-0.4%	-3.7%
July	1,563,985	7,124	714,807	3,308	3,816	4.49e-03	3,212	7,028	96	-2960	0.1%	-3.6%
Aug	1,555,525	6,451	611,565	2,749	3,702	3.92e-03	2,398	6,100	351	-2610	0.4%	-3.1%
Sept	1,221,082	5,736	551,720	2,462	3,274	4.89e-03	2,699	5,973	-237	-2846	-0.3%	-3.4%
Oct	1,119,064	6,486	392,775	1,242	5,244	7.22e-03	2,836	8,080	-1594	-4440	-1.9%	-5.4%
<b>Total May-Oct</b>	<b>8,191,258</b>	<b>40,699</b>	<b>3,180,684</b>	<b>12,633</b>	<b>28,066</b>	<b>3.38e-02</b>	<b>17,074</b>	<b>45,140</b>	<b>-4440</b>			
<b>Total</b>	<b>14,120,194</b>	<b>82,984</b>	<b>4,857,985</b>	<b>17,185</b>	<b>65,799</b>	<b>8.78e-02</b>	<b>31,789</b>	<b>97,588</b>	<b>-14604</b>			

**Table 14 Redistribution of fishing effort and yellowfin tuna catch in the central Gulf of Mexico and NEC time/area closure from May through October.** Source: Pelagic Longline Logbook data from 2001-2002.

	A	B	C	D	E	F	G	H	I	J	K	L
Month	Number of hooks in the Atlantic & Gulf of Mexico	Number of tuna caught in Atl. & Gulf of Mexico	Number of hooks in the time/area closure	Number of tuna caught in time/area closure	Number of tuna caught in open Atl. & Gulf of Mexico (B-D)	Tuna CPUE in the open Atl. & Gulf of Mexico (E/(A-C))	Number of additional tuna caught in open Atl. & GOM by displaced effort (C*F)	Tuna catch from open Atl. & GOM with displaced fishing effort (E+G)	Number of tuna avoided by area closure (B-H)	Cumulative catch avoided by month (sum of I)	Percent of total tunas avoided by month (I/113,155)	Percent of total tunas avoided by closure (J/113,155)
May	1,317,311	10,190	416,920	3,270	6,920	7.69e-03	3,204	10,124	66	66	0.1%	0.1%
June	1,414,291	14,268	492,897	3,953	10,315	1.12e-02	5,518	15,833	-1565	-1499	-1.4%	-1.3%
July	1,563,985	15,459	714,807	5,947	9,512	1.12e-02	8,007	17,519	-2060	-3559	-1.8%	-3.1%
Aug	1,555,525	15,435	611,565	6,589	8,846	9.37e-03	5,731	14,577	858	-2701	0.8%	-2.4%
Sept	1,221,082	11,507	551,720	5,747	5,760	8.61e-03	4,748	10,508	999	-1702	0.9%	-1.5%
Oct	1,119,064	11,659	392,775	3,235	8,424	1.16e-02	4,556	12,980	-1321	-3022	-1.2%	-2.7%
<b>Total May-Oct</b>	<b>8,191,258</b>	<b>78,518</b>	<b>3,180,684</b>	<b>28,741</b>	<b>49,777</b>	<b>5.97e-02</b>	<b>31,764</b>	<b>81,541</b>	<b>-3022</b>			
<b>Total</b>	<b>14,120,194</b>	<b>113,155</b>	<b>4,857,985</b>	<b>42,810</b>	<b>70,345</b>	<b>8.88e-02</b>	<b>40,668</b>	<b>111,013</b>	<b>2,142</b>			

**Table 15      Redistribution of fishing effort and bigeye tuna catch in the central Gulf of Mexico and NEC time/area closure from May through October.** Source: Pelagic Longline Logbook data from 2001-2002.

	A	B	C	D	E	F	G	H	I	J	K	L
Month	Number of hooks in the Atlantic & Gulf of Mexico	Number of tuna caught in Atl. & Gulf of Mexico	Number of hooks in the time/area closure	Number of tuna caught in time/area closure	Number of tuna caught in open Atl. & Gulf of Mexico (B-D)	Tuna CPUE in the open Atl. & Gulf of Mexico (E/(A-C))	Number of additional tuna caught in open Atl. & GOM by displaced effort (C*F)	Tuna catch from open Atl. & GOM with displaced fishing effort (E+G)	Number of tuna avoided by area closure (B-H)	Cumulative catch avoided by month (sum of I)	Percent of total tunas avoided by month (I/29,885)	Percent of total tunas avoided by closure (J/29,885)
May	1,317,311	619	416,920	15	604	6.71e-04	280	884	-265	-265	-0.9%	-0.9%
June	1,414,291	1,496	492,897	685	811	8.80e-04	434	1245	251	-14	0.8%	0.0%
July	1,563,985	1,117	714,807	421	696	8.20e-04	586	1282	-165	-179	-0.6%	-0.6%
Aug	1,555,525	2,768	611,565	349	2419	2.56e-03	1567	3986	-1218	-1397	-4.1%	-4.7%
Sept	1,221,082	3,951	551,720	466	3485	5.21e-03	2873	6358	-2407	-3803	-8.1%	-12.7%
Oct	1,119,064	3,378	392,775	356	3022	4.16e-03	1634	4656	-1278	-5082	-4.3%	-17.0%
<b>Total May-Oct</b>	<b>8,191,258</b>	<b>13,329</b>	<b>3,180,684</b>	<b>2,292</b>	<b>11,037</b>	<b>1.43e-02</b>	<b>7,373</b>	<b>18,410</b>	<b>-5082</b>			
<b>Total</b>	<b>14,120,194</b>	<b>29,885</b>	<b>4,857,985</b>	<b>3,613</b>	<b>26,272</b>	<b>3.64e-02</b>	<b>13,456</b>	<b>39,728</b>	<b>-9843</b>			

**Table 16**      **Percent change in catch of blue and white marlin dead and live discards in the central Gulf of Mexico and NEC time/area closure from May through October.** Based on Pelagic Longline Logbook data with and without redistribution of effort.

Species	Disposition	Without redistribution of effort from 2001-2002	With redistribution of effort based on data from 2001-2002
		Logbook Data	Logbook Data
<b>Blue Marlin</b>	Dead Discards	-53%	-31%
	Live Discards	-27%	1%*
	All Discards	-34%	-8%
<b>White Marlin</b>	Dead Discards	-40%	-14%
	Live Discards	-27%	5%*
	All Discards	-31%	-1%

**Table 17 Example of temporal variation in effectiveness of the central Gulf of Mexico and NEC time/area closure alternative from May through October on blue marlin discards without redistribution of effort.** Source: Pelagic Observer Program data 2001-2002 (Observer Data) and Pelagic Logbook Data 2002 (Logbook Data)

Month	Number reported caught inside the time/area closure			Number reported caught outside the time/area closure			Percentage reduction in number caught if time/area is closed		
	Dead Discards	Live Discards	Combined Discards	Dead Discards	Live Discards	Combined Discards	Dead Discards	Live Discards	Combined Discards
May	9	19	28	14	66	80	39%	22%	26%
June	36	51	85	34	73	107	51%	40%	44%
July	174	151	325	60	155	215	74%	49%	60%
August	24	34	58	31	125	156	44%	21%	27%
September	24	57	81	21	77	98	53%	43%	45%
October	10	37	47	6	25	31	63%	60%	60%
<b>Total May-Oct</b>	<b>277</b>	<b>347</b>	<b>624</b>	<b>166</b>	<b>521</b>	<b>687</b>	<b>53%*</b>	<b>27%*</b>	<b>34%*</b>
<b>Total</b>	<b>300</b>	<b>389</b>	<b>689</b>	<b>223</b>	<b>915</b>	<b>1138</b>			

\* calculated by dividing the total number caught from May-Oct by the total number caught in the Atlantic and Gulf of Mexico for the combined years 2001 - 2002.

**Table 18      Redistribution of fishing effort and blue marlin dead discards in the central Gulf of Mexico and NEC time/area closure from May through October.** Source: Pelagic Longline Logbook data from 2001-2002.

	A	B	C	D	E	F	G	H	I	J	K	L
Month	Number of hooks in the Atlantic & Gulf of Mexico	Number of dead discards in Atl. & Gulf of Mexico	Number of hooks in the time/area closure	Number of dead discards in time/area closure	Number of discards in open Atl. & Gulf of Mexico (B-D)	Marlin CPUE in the open Atl. & Gulf of Mexico (E/(A-C))	Number of additional marlin discards in open Atl. & GOM by displaced effort (C*F)	Marlin discards from open Atl. & GOM with displaced fishing effort (E+G)	Number of marlin discards avoided by area closure (B-H)	Cumulative discards avoided by month (sum of I)	Percent of total marlin discards by month (I/523)	Percent of total marlin discards avoided by closure (J/523)
May	1,317,311	23	416,920	9	14	1.55e-05	6	20	3	3	0.5%	0.6%
June	1,414,291	70	492,897	36	34	3.69e-05	18	52	18	21	3.4%	4.0%
July	1,563,985	234	714,807	174	60	7.07e-05	51	111	123	144	23.6%	27.6%
Aug	1,555,525	55	611,565	24	31	3.28e-05	20	51	4	148	0.7%	28.3%
Sept	1,221,082	45	551,720	24	21	3.14e-05	17	38	7	155	1.3%	29.6%
Oct	1,119,064	16	392,775	10	6	8.26e-06	3	9	7	162	1.3%	30.9%
<b>Total May-Oct</b>	<b>8,191,258</b>	<b>443</b>	<b>3,180,684</b>	<b>277</b>	<b>166</b>	<b>1.96e-04</b>	<b>116</b>	<b>282</b>	<b>162</b>			
<b>Total</b>	<b>14,120,194</b>	<b>523</b>	<b>4,857,985</b>	<b>300</b>	<b>223</b>	<b>2.73e-04</b>	<b>136</b>	<b>359</b>	<b>164</b>			

**Table 19     Redistribution of fishing effort and blue marlin live discards in the central Gulf of Mexico and NEC time/area closure from May through October.** Source: Pelagic Longline Logbook data from 2001-2002.

	A	B	C	D	E	F	G	H	I	J	K	L
Month	Number of hooks in the Atlantic & Gulf of Mexico	Number of live discards in Atl. & Gulf of Mexico	Number of hooks in the time/area closure	Number of live discards in time/area closure	Number of discards in open Atl. & Gulf of Mexico (B-D)	Marlin CPUE in the open Atl. & Gulf of Mexico (E/(A-C))	Number of additional marlin discards in open Atl. & GOM by displaced effort (C*F)	Marlin discards from open Atl. & GOM with displaced fishing effort (E+G)	Number of marlin discards avoided by area closure (B-H)	Cumulative discards avoided by month (sum of I)	Percent of total marlin discards by month (I/1304)	Percent of total marlin discards avoided by closure (J/1304)
May	1,317,311	85	416,920	19	66	7.33e-05	31	97	-12	-12	-0.9%	-0.9%
June	1,414,291	122	492,897	51	71	7.71e-05	38	109	13	1	1.0%	0.1%
July	1,563,985	306	714,807	151	155	1.83e-04	130	285	21	22	1.6%	1.7%
Aug	1,555,525	159	611,565	34	125	1.32e-04	81	206	-47	-25	-3.6%	-2.0%
Sept	1,221,082	134	551,720	57	77	1.15e-04	63	140	-6	-32	-0.5%	-2.4%
Oct	1,119,064	62	392,775	37	25	3.44e-05	14	39	23	-8	1.8%	-0.6%
<b>Total May-Oct</b>	<b>8,191,258</b>	<b>868</b>	<b>3,180,684</b>	<b>349</b>	<b>519</b>	<b>6.15e-04</b>	<b>357</b>	<b>876</b>	<b>-8</b>			
<b>Total</b>	<b>14,120,194</b>	<b>1,304</b>	<b>4,857,985</b>	<b>391</b>	<b>913</b>	<b>1.16e-03</b>	<b>498</b>	<b>1411</b>	<b>-107</b>			

**Table 20      Redistribution of fishing effort and blue marlin dead and live discards combined in the central Gulf of Mexico and NEC time/area closure from May through October.** Source: Pelagic Longline Logbook data from 2001-2002.

	A	B	C	D	E	F	G	H	I	J	K	L
Month	Number of hooks in the Atlantic & Gulf of Mexico	Number of discards in Atl. & Gulf of Mexico	Number of hooks in the time/area closure	Number of discards in time/area closure	Number of discards in open Atl. & Gulf of Mexico (B-D)	Marlin CPUE in the open Atl. & Gulf of Mexico (E/(A-C))	Number of additional marlin discards in open Atl. & GOM by displaced effort (C*F)	Marlin discards from open Atl. & GOM with displaced fishing effort (E+G)	Number of marlin discards avoided by area closure (B-H)	Cumulative discards avoided by month (sum of I)	Percent of total marlin discards by month (I/1832)	Percent of total marlin discards avoided by closure (J/1832)
May	1,317,311	108	416,920	28	80	8.89e-05	37	117	-9	-9	-0.5%	-0.5%
June	1,414,291	194	492,897	87	107	1.16e-04	57	164	30	21	1.6%	1.1%
July	1,563,985	540	714,807	325	215	2.53e-04	181	396	144	165	7.9%	9.0%
Aug	1,555,525	214	611,565	58	156	1.65e-04	101	257	-43	122	-2.4%	6.6%
Sept	1,221,082	182	551,720	81	101	1.51e-04	83	184	-2	119	-0.1%	6.5%
Oct	1,119,064	78	392,775	47	31	4.27e-05	17	48	30	150	1.7%	8.2%
<b>Total May-Oct</b>	<b>8,191,258</b>	<b>1,316</b>	<b>3,180,684</b>	<b>626</b>	<b>690</b>	<b>8.17e-04</b>	<b>476</b>	<b>1166</b>	<b>150</b>			
<b>Total</b>	<b>14,120,194</b>	<b>1,832</b>	<b>4,857,985</b>	<b>691</b>	<b>1141</b>	<b>1.44e-03</b>	<b>638</b>	<b>1779</b>	<b>53</b>			

**Table 21 Example of temporal variation in effectiveness of the central Gulf of Mexico and NEC time/area closure from May through October on white marlin discards in the Gulf of Mexico without redistribution of effort.** Source: Pelagic Observer Program data 2001-2002 (Observer Data) and Pelagic Logbook Data 2002 (Logbook Data)

Month	Number reported caught inside the time/area closure			Number reported caught outside the time/area closure			Percentage reduction in number caught if time/area is closed		
	Dead Discards	Live Discards	Combined Discards	Dead Discards	Live Discards	Combined Discards	Dead Discards	Live Discards	Combined Discards
May	9	31	40	34	105	139	21%	23%	22%
June	47	66	113	74	146	223	39%	31%	34%
July	165	192	357	74	140	214	69%	58%	63%
August	33	72	105	70	218	288	32%	25%	27%
September	17	48	65	23	113	130	43%	30%	33%
October	15	16	31	11	43	54	58%	27%	36%
<b>Total May-Oct</b>	<b>286</b>	<b>425</b>	<b>711</b>	<b>286</b>	<b>765</b>	<b>1,048</b>	<b>40%*</b>	<b>27%*</b>	<b>31%*</b>
<b>Total</b>	<b>301</b>	<b>484</b>	<b>785</b>	<b>411</b>	<b>1,109</b>	<b>1,517</b>			

\* calculated by dividing the total number caught from May-Oct by the total number caught in the Atlantic and Gulf of Mexico for the combined years 2001 - 2002.

**Table 22     Redistribution of fishing effort and white marlin dead discards in the central Gulf of Mexico and NEC time/area closure from May through October.** Source: Pelagic Longline Logbook data from 2001-2002.

	A	B	C	D	E	F	G	H	I	J	K	L
Month	Number of hooks in the Atlantic & Gulf of Mexico	Number of dead discards in Atl. & Gulf of Mexico	Number of hooks in the time/area closure	Number of dead discards in time/area closure	Number of discards in open Atl. & Gulf of Mexico (B-D)	Marlin CPUE in the open Atl. & Gulf of Mexico (E/(A-C))	Number of additional marlin discards in open Atl. & GOM by displaced effort (C*F)	Marlin discards from open Atl. & GOM with displaced fishing effort (E+G)	Number of marlin discards avoided by area closure (B-H)	Cumulative discards avoided by month (sum of I)	Percent of total marlin discards by month (I/712)	Percent of total marlin discards avoided by closure (J/712)
May	1,317,311	43	416,920	9	34	3.78e-05	16	50	-7	-7	-0.9%	-1.0%
June	1,414,291	121	492,897	47	74	8.03e-05	40	114	7	0	1.0%	0.1%
July	1,563,985	239	714,807	165	74	8.71e-05	62	136	103	103	14.4%	14.5%
Aug	1,555,525	103	611,565	33	70	7.42e-05	45	115	-12	91	-1.7%	12.7%
Sept	1,221,082	40	551,720	17	23	3.44e-05	19	42	-2	89	-0.3%	12.5%
Oct	1,119,064	26	392,775	15	11	1.51e-05	6	17	9	98	1.3%	13.7%
Nov	1,020,819	19	368,359	13	6	9.20e-06	3	9	10	107	1.4%	15.1%
Dec	898,269	19	353,073	1	18	3.30e-05	12	30	-11	96	-1.5%	13.6%
<b>Total May-Oct</b>	<b>10,110,346</b>	<b>610</b>	<b>3,902,116</b>	<b>300</b>	<b>310</b>	<b>3.71e-04</b>	<b>203</b>	<b>513</b>	<b>96</b>			
<b>Total</b>	<b>14,120,194</b>	<b>712</b>	<b>4,857,985</b>	<b>301</b>	<b>411</b>	<b>4.97e-04</b>	<b>234</b>	<b>645</b>	<b>67</b>			

**Table 23     Redistribution of fishing effort and white marlin live discards in the central Gulf of Mexico and NEC time/area closure from May through October.** Source: Pelagic Longline Logbook data from 2001-2002.

	A	B	C	D	E	F	G	H	I	J	K	L
Month	Number of hooks in the Atlantic & Gulf of Mexico	Number of live discards in Atl. & Gulf of Mexico	Number of hooks in the time/area closure	Number of live discards in time/area closure	Number of discards in open Atl. & Gulf of Mexico (B-D)	Marlin CPUE in the open Atl. & Gulf of Mexico (E/(A-C))	Number of additional marlin discards in open Atl. & GOM by displaced effort (C*F)	Marlin discards from open Atl. & GOM with displaced fishing effort (E+G)	Number of marlin discards avoided by area closure (B-H)	Cumulative discards avoided by month (sum of I)	Percent of total marlin discards by month (I/1593)	Percent of total marlin discards avoided by closure (J/1593)
May	1,317,311	136	416,920	31	105	1.17e-04	49	154	-18	-18	-1.1%	-1.1%
June	1,414,291	212	492,897	66	146	1.58e-04	78	224	-12	-30	-0.8%	-1.9%
July	1,563,985	332	714,807	192	140	1.65e-04	118	258	74	44	4.7%	2.8%
Aug	1,555,525	290	611,565	72	218	2.31e-04	141	359	-69	-25	-4.3%	-1.6%
Sept	1,221,082	161	551,720	48	113	1.69e-04	93	206	-45	-70	-2.8%	-4.4%
Oct	1,119,064	59	392,775	16	43	5.92e-05	23	66	-7	-78	-0.5%	-4.9%
<b>Total May-Oct</b>	<b>8,191,258</b>	<b>1,190</b>	<b>3,180,684</b>	<b>425</b>	<b>765</b>	<b>8.99e-04</b>	<b>502</b>	<b>1267</b>	<b>-78</b>			
<b>Total</b>	<b>14,120,194</b>	<b>1,593</b>	<b>4,857,985</b>	<b>484</b>	<b>1109</b>	<b>1.36e-03</b>	<b>626</b>	<b>1735</b>	<b>-142</b>			

**Table 24**      **Redistribution of fishing effort and white marlin dead and live discards combined in the central Gulf of Mexico and NEC time/area closure from May through October.** Source: Pelagic Longline Logbook data from 2001-2002.

	A	B	C	D	E	F	G	H	I	J	K	L
Month	Number of hooks in the Atlantic & Gulf of Mexico	Number of discards in Gulf of Mexico	Number of hooks in the time/area closure	Number of discards in time/area closure	Number of discards in open Gulf of Mexico (B-D)	Marlin CPUE in the open Gulf of Mexico (E/(A-C))	Number of additional marlin discards in open GOM by displaced effort (C*F)	Marlin discards from open GOM with displaced fishing effort (E+G)	Number of marlin discards avoided by area closure (B-H)	Cumulative discards avoided by month (sum of I)	Percent of total marlin discards by month (I/2302)	Percent of total marlin discards avoided by closure (J/2302)
May	1,317,311	179	416,920	40	139	1.54e-04	64	203	-24	-24	-1.1%	-1.0%
June	1,414,291	336	492,897	113	223	2.42e-04	119	342	-6	-30	-0.3%	-1.3%
July	1,563,985	571	714,807	357	214	2.52e-04	180	394	177	147	7.7%	6.4%
Aug	1,555,525	393	611,565	105	288	3.05e-04	187	475	-82	65	-3.5%	2.8%
Sept	1,221,082	195	551,720	65	130	1.94e-04	107	237	-42	23	-1.8%	1.0%
Oct	1,119,064	85	392,775	31	54	7.44e-05	29	83	2	25	0.1%	1.1%
<b>Total</b>	<b>8,191,258</b>	<b>1759</b>	<b>3,180,684</b>	<b>711</b>	<b>1048</b>	<b>1.22e-03</b>	<b>687</b>	<b>1735</b>	<b>25</b>			
<b>Total</b>	<b>14,120,194</b>	<b>2302</b>	<b>4,857,985</b>	<b>785</b>	<b>1517</b>	<b>1.85e-03</b>	<b>856</b>	<b>2373</b>	<b>-71</b>			