

APPENDIX A2

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.**
 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 2001-2002		With redistribution of effort based on data from 2001-2002	
	Observer Data	Logbook Data	Observer Data	Logbook Data
Leatherback	-43%	-58%	-10%	-37%
Loggerhead	-34%	-56%	-7%	-35%
Other*	-100%	-50%	-100%	-28%

* 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 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
January	1	3	6	12	14%	20%
February	0	3	7	19	0%	14%
March	2	8	5	14	29%	36%
April	2	8	8	16	20%	33%
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%
November	1	18	4	10	20%	64%
December	1	37	4	12	20%	76%
Total	38	192	50	139	43%	58%

Table 3 Example of temporal variation in effectiveness of the central Gulf of Mexico and NEC time/area closure 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
January	0	2	3	6	0%	25%
February	0	3	6	8	0%	27%
March	0	3	5	5	0%	38%
April	2	0	3	3	40%	0%
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%
November	0	2	2	4	0%	33%
December	0	2	2	1	0%	67%
Total	14	54	27	42	34%	56%

Table 4 Example of temporal variation in effectiveness of the central Gulf of Mexico and NEC time/area closure 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
January	0	0	0	0	0%	0%
February	0	0	0	1	0%	0%
March	0	0	0	1	0%	0%
April	1	2	0	0	100%	100%
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%
November	0	0	0	1	0%	0%
December	1	3	0	0	0%	100%
Total	2	5	0	5	100%	50%

Table 5 **Redistribution of fishing effort and leatherback sea turtle interactions in the central Gulf of Mexico and NEC time/area closure alternative.** 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)
Jan	53,531	7	16,182	1	6	1.61e-04	3	9	-2	(2)	-1.8%	-2.3%
Feb	40,163	7	7,278	0	7	2.13e-04	2	9	-2	(4)	-1.8%	-4.0%
Mar	41,457	7	9,359	2	5	1.56e-04	1	6	1	(3)	0.6%	-3.4%
Apr	79,077	10	14,137	2	8	1.23e-04	2	10	0	(3)	0.3%	-3.1%
May	59,689	12	41,818	9	3	1.68e-04	7	10	2	(1)	2.3%	-0.9%
June	47,708	9	21,221	4	5	1.89e-04	4	9	0	(1)	0.0%	-0.9%
July	52,635	17	24,369	13	4	1.42e-04	3	7	10	9	10.9%	10.0%
Aug	40,605	3	14,721	0	3	1.16e-04	2	5	-2	7	-1.9%	8.0%
Sept	20,872	2	18,648	2	0	0.00e+00	0	0	2	9	2.3%	10.3%
Oct	36,570	4	15,896	2	2	9.67e-05	2	4	0	9	0.0%	10.2%
Nov	49,280	5	11,229	1	4	1.05e-04	1	5	0	9	-0.2%	10.0%
Dec	32,673	5	6,773	1	4	1.54e-04	1	5	0	9	-0.1%	10.0%
Total	554,260	88	201,631	37	51	1.62e-03	27	78	9			

Table 6 Redistribution of fishing effort and leatherback sea turtle interactions in the central Gulf of Mexico and NEC time/area closure alternative. 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)
Jan	1,082,142	15	336,728	3	12	1.61e-05	5	17	-2	-2	-0.7%	-0.6%
Feb	763,566	22	194,816	3	19	3.34e-05	7	26	-4	-6	-1.1%	-1.7%
Mar	897,001	22	143,341	8	14	1.86e-05	3	17	5	0	1.6%	-0.1%
Apr	1,267,139	24	280,984	8	16	1.62e-05	5	21	3	3	1.0%	1.0%
May	1,317,311	16	416,920	11	5	5.55e-06	2	7	9	12	2.6%	3.6%
June	1,414,291	31	492,897	22	9	9.77e-06	5	14	17	29	5.2%	8.8%
July	1,563,985	53	714,807	41	12	1.41e-05	10	22	31	60	9.3%	18.1%
Aug	1,555,525	32	611,565	15	17	1.80e-05	11	28	4	64	1.2%	19.3%
Sept	1,221,082	17	551,720	12	5	7.47e-06	4	9	8	72	2.4%	21.7%
Oct	1,119,064	22	392,775	14	8	1.10e-05	4	12	10	82	2.9%	24.6%
Nov	1,020,819	28	368,359	18	10	1.53e-05	6	16	12	94	3.7%	28.4%
Dec	898,269	49	353,073	37	12	2.20e-05	8	20	29	123	8.8%	37.2%
Total	14,120,194	331	4,857,985	192	139	1.88e-04	69	208	123			

Table 7 Redistribution of fishing effort and loggerhead sea turtle interactions in the central Gulf of Mexico and NEC time/area closure

alternative. 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)
Jan	53,531	3	16,182	0	3	8.03e-05	1	4	-1	(1)	-3.2%	-2.4%
Feb	40,163	6	7,278	0	6	1.82e-04	1	7	-1	(2)	-3.2%	-5.7%
Mar	41,457	5	9,359	0	5	1.56e-04	1	6	-1	(4)	-3.6%	-9.2%
Apr	79,077	5	14,137	2	3	4.62e-05	1	4	1	(2)	3.3%	-5.9%
May	59,689	3	41,818	3	0	0.00e+00	0	0	3	1	7.3%	1.4%
June	47,708	7	21,221	7	0	0.00e+00	0	0	7	8	17.1%	18.4%
July	52,635	2	24,369	1	1	3.54e-05	1	2	0	8	0.3%	18.8%
Aug	40,605	0	14,721	0	0	0.00e+00	0	0	0	8	0.0%	18.8%
Sept	20,872	0	18,648	0	0	0.00e+00	0	0	0	8	0.0%	18.8%
Oct	36,570	6	15,896	1	5	2.42e-04	4	9	-3	5	-6.9%	11.8%
Nov	49,280	2	11,229	0	2	5.26e-05	1	3	-1	4	-1.4%	10.4%
Dec	32,673	2	6,773	0	2	7.72e-05	1	3	-1	3	-2.4%	7.3%
Total	554,260	41	201,631	14	27	8.72e-04	11	38	3			

Table 8 **Redistribution of fishing effort and loggerhead sea turtle interactions in the central Gulf of Mexico and NEC time/area closure**

alternative. 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)
Jan	1,082,142	8	336,728	2	6	8.05e-06	3	9	-1	-1	-0.7%	-1.0%
Feb	763,566	11	194,816	3	8	1.41e-05	3	11	0	-1	0.3%	-0.8%
Mar	897,001	8	143,341	3	5	6.63e-06	1	6	2	1	2.1%	1.4%
Apr	1,267,139	3	280,984	0	3	3.04e-06	1	4	-1	0	-0.9%	0.5%
May	1,317,311	7	416,920	5	2	2.22e-06	1	3	4	5	4.2%	4.7%
June	1,414,291	23	492,897	21	2	2.17e-06	1	3	20	24	20.8%	25.5%
July	1,563,985	11	714,807	9	2	2.36e-06	2	4	7	32	7.6%	33.1%
Aug	1,555,525	5	611,565	2	3	3.18e-06	2	5	0	32	0.1%	33.2%
Sept	1,221,082	5	551,720	2	3	4.48e-06	2	5	0	31	-0.5%	32.7%
Oct	1,119,064	6	392,775	3	3	4.13e-06	2	5	1	33	1.4%	34.1%
Nov	1,020,819	6	368,359	2	4	6.13e-06	2	6	0	32	-0.3%	33.8%
Dec	898,269	3	353,073	2	1	1.83e-06	1	2	1	34	1.4%	35.2%
Total	14,120,194	96	4,857,985	54	42	5.83e-05	20	62	34			

Table 9 Redistribution of fishing effort and other sea turtle interactions in the central Gulf of Mexico and NEC time/area closure alternative. 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)
Jan	53,531	0	16,182	0	0	0.00e+00	0	0	0	0	0.0%	0.0%
Feb	40,163	0	7,278	0	0	0.00e+00	0	0	0	0	0.0%	0.0%
Mar	41,457	0	9,359	0	0	0.00e+00	0	0	0	0	0.0%	0.0%
Apr	79,077	1	14,137	1	0	0.00e+00	0	0	1	1	50.0%	50.0%
May	59,689	0	41,818	0	0	0.00e+00	0	0	0	1	0.0%	50.0%
June	47,708	0	21,221	0	0	0.00e+00	0	0	0	1	0.0%	50.0%
July	52,635	0	24,369	0	0	0.00e+00	0	0	0	1	0.0%	50.0%
Aug	40,605	0	14,721	0	0	0.00e+00	0	0	0	1	0.0%	50.0%
Sept	20,872	0	18,648	0	0	0.00e+00	0	0	0	1	0.0%	50.0%
Oct	36,570	0	15,896	0	0	0.00e+00	0	0	0	1	0.0%	50.0%
Nov	49,280	0	11,229	0	0	0.00e+00	0	0	0	1	0.0%	50.0%
Dec	32,673	1	6,773	1	0	0.00e+00	0	0	1	2	50.0%	100.0%
Total	554,260	2	201,631	2	0	0.00e+00	0	0	2			

Table 10 Redistribution of fishing effort and other sea turtle interactions in the central Gulf of Mexico and NEC time/area closure alternative. 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)
Jan	1,082,142	0	336,728	0	0	0.00e+00	0	0	0	0	0.0%	0.0%
Feb	763,566	1	194,816	0	1	1.76e-06	0	1	0	0	-3.4%	-3.4%
Mar	897,001	1	143,341	0	1	1.33e-06	0	1	0	-1	-1.9%	-5.3%
Apr	1,267,139	2	280,984	2	0	0.00e+00	0	0	2	1	20.0%	14.7%
May	1,317,311	0	416,920	0	0	0.00e+00	0	0	0	1	0.0%	14.7%
June	1,414,291	0	492,897	0	0	0.00e+00	0	0	0	1	0.0%	14.7%
July	1,563,985	0	714,807	0	0	0.00e+00	0	0	0	1	0.0%	14.7%
Aug	1,555,525	0	611,565	0	0	0.00e+00	0	0	0	1	0.0%	14.7%
Sept	1,221,082	0	551,720	0	0	0.00e+00	0	0	0	1	0.0%	14.7%
Oct	1,119,064	2	392,775	0	2	2.75e-06	1	3	-1	0	-10.8%	3.9%
Nov	1,020,819	1	368,359	0	1	1.53e-06	1	2	-1	0	-5.6%	-1.8%
Dec	898,269	3	353,073	3	0	0.00e+00	0	0	3	3	30.0%	28.2%
Total	14,120,194	10	4,857,985	5	5	7.37e-06	2	7	3			

Table 11 Percent change in catch of swordfish, yellowfin and bigeye tuna in the central Gulf of Mexico and NEC time/area closure alternative. 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	-21%	18% *
Yellowfin	-38%	-2%
Bigeye	-12%	33% *

* 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 alternative 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
January	1,058	3,320	177	7,493	3,397	1831	12%	49%	9%
February	665	814	95	6,445	1,532	2311	0%	35%	4%
March	446	735	38	7,191	2,256	3459	6%	25%	1%
April	452	3,089	11	7,179	5,126	2343	6%	38%	0%
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%
November	865	2,724	622	4,745	4,716	3468	15%	37%	15%
December	1,066	3,387	378	4,680	3,541	1,823	19%	49%	17%
Total	17,185	42,810	3,613	65,799	70,345	26,272	21%	38%	12%

Table 13 Redistribution of fishing effort and swordfish catch in the central Gulf of Mexico and NEC time/area closure alternative.

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)
Jan	1,082,142	8,551	336,728	1,058	7,493	1.01e-02	3,385	10,878	-2327	-2327	-2.8%	-2.8%
Feb	763,566	7,110	194,816	665	6,445	1.13e-02	2,208	8,653	-1543	-3870	-1.9%	-4.7%
Mar	897,001	7,637	143,341	446	7,191	9.54e-03	1,368	8,559	-922	-4791	-1.1%	-5.8%
Apr	1,267,139	7,631	280,984	452	7,179	7.28e-03	2,046	9,225	-1594	-6385	-1.9%	-7.7%
May	1,317,311	7,587	416,920	537	7,050	7.83e-03	3,264	10,314	-2727	-9112	-3.3%	-11.0%
June	1,414,291	7,315	492,897	2,335	4,980	5.40e-03	2,664	7,644	-329	-9441	-0.4%	-11.4%
July	1,563,985	7,124	714,807	3,308	3,816	4.49e-03	3,212	7,028	96	-9345	0.1%	-11.3%
Aug	1,555,525	6,451	611,565	2,749	3,702	3.92e-03	2,398	6,100	351	-8995	0.4%	-10.8%
Sept	1,221,082	5,736	551,720	2,462	3,274	4.89e-03	2,699	5,973	(237)	-9231	-0.3%	-11.1%
Oct	1,119,064	6,486	392,775	1,242	5,244	7.22e-03	2,836	8,080	-1594	-10825	-1.9%	-13.0%
Nov	1,020,819	5,610	368,359	865	4,745	7.27e-03	2,679	7,424	-1814	-12639	-2.2%	-15.2%
Dec	898,269	5,746	353,073	1,066	4,680	8.58e-03	3,031	7,711	-1965	-14604	-2.4%	-17.6%
Total	14,120,194	82,984	4,857,985	17,185	65,799	8.78e-02	31,789	97,588	(14,604)			

Table 14 Redistribution of fishing effort and yellowfin tuna catch in the central Gulf of Mexico and NEC time/area closure alternative.
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)
Jan	1,082,142	6,717	336,728	3,320	3,397	4.56e-03	1,535	4,932	1785	1785	1.6%	1.6%
Feb	763,566	2,346	194,816	814	1,532	2.69e-03	525	2,057	289	2074	0.3%	1.8%
Mar	897,001	2,991	143,341	735	2,256	2.99e-03	429	2,685	306	2380	0.3%	2.1%
Apr	1,267,139	8,215	280,984	3,089	5,126	5.20e-03	1,461	6,587	1628	4009	1.4%	3.5%
May	1,317,311	10,190	416,920	3,270	6,920	7.69e-03	3,204	10,124	66	4074	0.1%	3.6%
June	1,414,291	14,268	492,897	3,953	10,315	1.12e-02	5,518	15,833	-1565	2509	-1.4%	2.2%
July	1,563,985	15,459	714,807	5,947	9,512	1.12e-02	8,007	17,519	-2060	450	-1.8%	0.4%
Aug	1,555,525	15,435	611,565	6,589	8,846	9.37e-03	5,731	14,577	858	1307	0.8%	1.2%
Sept	1,221,082	11,507	551,720	5,747	5,760	8.61e-03	4,748	10,508	999	2307	0.9%	2.0%
Oct	1,119,064	11,659	392,775	3,235	8,424	1.16e-02	4,556	12,980	-1321	986	-1.2%	0.9%
Nov	1,020,819	7,440	368,359	2,724	4,716	7.23e-03	2,663	7,379	61	1048	0.1%	0.9%
Dec	898,269	6,928	353,073	3,387	3,541	6.49e-03	2,293	5,834	1094	2142	1.0%	1.9%
Total	14,120,194	113,155	4,857,985	42,810	70,345	8.88e-02	40,668	111,013	2,142			

Table 15 Redistribution of fishing effort and bigeye tuna catch in the central Gulf of Mexico and NEC time/area closure alternative.
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)
Jan	1,082,142	2,008	336,728	177	1831	2.46e-03	827	2658	-650	-650	-2.2%	-2.2%
Feb	763,566	2,406	194,816	95	2311	4.06e-03	792	3103	-697	-1347	-2.3%	-4.5%
Mar	897,001	3,497	143,341	38	3459	4.59e-03	658	4117	-620	-1966	-2.1%	-6.6%
Apr	1,267,139	2,354	280,984	11	2343	2.38e-03	668	3011	-657	-2623	-2.2%	-8.8%
May	1,317,311	619	416,920	15	604	6.71e-04	280	884	-265	-2888	-0.9%	-9.7%
June	1,414,291	1,496	492,897	685	811	8.80e-04	434	1245	251	-2637	0.8%	-8.8%
July	1,563,985	1,117	714,807	421	696	8.20e-04	586	1282	-165	-2801	-0.6%	-9.4%
Aug	1,555,525	2,768	611,565	349	2419	2.56e-03	1567	3986	-1218	-4020	-4.1%	-13.5%
Sept	1,221,082	3,951	551,720	466	3485	5.21e-03	2873	6358	-2407	-6426	-8.1%	-21.5%
Oct	1,119,064	3,378	392,775	356	3022	4.16e-03	1634	4656	-1278	-7704	-4.3%	-25.8%
Nov	1,020,819	4,090	368,359	622	3468	5.32e-03	1958	5426	-1336	-9040	-4.5%	-30.3%
Dec	898,269	2,201	353,073	378	1823	3.34e-03	1181	3004	-803	-9843	-2.7%	-32.9%
Total	14,120,194	29,885	4,857,985	3,613	26,272	3.64e-02	13,456	39,728	(9,843)			

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 alternative.** 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
Blue Marlin	Dead Discards	-57%	+31%
	Live Discards	-30%	-8%
	All Discards	-38%	+3%
White Marlin	Dead Discards	-42%	+10%
	Live Discards	-30%	-9%
	All Discards	-34%	-3%

Table 17 Example of temporal variation in effectiveness of the central Gulf of Mexico and NEC time/area closure alternative 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
January	6	9	15	9	71	80	40%	11%	16%
February	0	4	4	4	49	53	0%	8%	7%
March	0	1	1	16	111	127	0%	1%	1%
April	1	10	11	17	87	104	6%	10%	10%
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%
Septembe	24	57	81	21	77	98	0.533333	43%	45%
October	10	37	47	6	25	31	63%	60%	60%
November	12	13	25	1	33	34	92%	28%	42%
December	4	5	9	10	43	53	29%	10%	15%
Total	300	389	689	223	915	1138	57%	30%	38%

Table 18 Redistribution of fishing effort and blue marlin dead discards in the central Gulf of Mexico and NEC time/area closure alternative. 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)
Jan	1,082,142	15	336,728	6	9	1.21e-05	4	13	2	2	0.4%	0.4%
Feb	763,566	4	194,816	0	4	7.03e-06	1	5	-1	1	-0.3%	0.1%
Mar	897,001	16	143,341	0	16	2.12e-05	3	19	-3	-2	-0.6%	-0.5%
Apr	1,267,139	18	280,984	1	17	1.72e-05	5	22	-4	-6	-0.7%	-1.2%
May	1,317,311	23	416,920	9	14	1.55e-05	6	20	3	-4	0.5%	-0.7%
June	1,414,291	70	492,897	36	34	3.69e-05	18	52	18	14	3.4%	2.7%
July	1,563,985	234	714,807	174	60	7.07e-05	51	111	123	138	23.6%	26.3%
Aug	1,555,525	55	611,565	24	31	3.28e-05	20	51	4	141	0.7%	27.1%
Sept	1,221,082	45	551,720	24	21	3.14e-05	17	38	7	148	1.3%	28.3%
Oct	1,119,064	16	392,775	10	6	8.26e-06	3	9	7	155	1.3%	29.6%
Nov	1,020,819	13	368,359	12	1	1.53e-06	1	2	11	166	2.2%	31.8%
Dec	898,269	14	353,073	4	10	1.83e-05	6	16	-2	164	-0.5%	31.3%
Total	14,120,194	523	4,857,985	300	223	2.73e-04	136	359	164			

Table 19 **Redistribution of fishing effort and blue marlin live discards in the central Gulf of Mexico and NEC time/area closure alternative.** 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)
Jan	1,082,142	80	336,728	9	71	9.52e-05	32	103	-23	-23	-1.8%	-1.8%
Feb	763,566	53	194,816	4	49	8.62e-05	17	66	-13	-36	-1.0%	-2.7%
Mar	897,001	112	143,341	1	111	1.47e-04	21	132	-20	-56	-1.5%	-4.3%
Apr	1,267,139	97	280,984	10	87	8.82e-05	25	112	-15	-71	-1.1%	-5.4%
May	1,317,311	85	416,920	19	66	7.33e-05	31	97	-12	-82	-0.9%	-6.3%
June	1,414,291	122	492,897	51	71	7.71e-05	38	109	13	-69	1.0%	-5.3%
July	1,563,985	306	714,807	151	155	1.83e-04	130	285	21	-49	1.6%	-3.7%
Aug	1,555,525	159	611,565	34	125	1.32e-04	81	206	-47	-96	-3.6%	-7.3%
Sept	1,221,082	134	551,720	57	77	1.15e-04	63	140	-6	-102	-0.5%	-7.8%
Oct	1,119,064	62	392,775	37	25	3.44e-05	14	39	23	-79	1.8%	-6.0%
Nov	1,020,819	46	368,359	13	33	5.06e-05	19	52	-6	-84	-0.4%	-6.5%
Dec	898,269	48	353,073	5	43	7.89e-05	28	71	-23	-107	-1.8%	-8.2%
Total	14,120,194	1304	4,857,985	391	913	1.16e-03	498	1411	-107			

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 alternative.** 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)
Jan	1,082,142	95	336,728	15	80	1.07e-04	36	116	-21	-21	-1.2%	-1.1%
Feb	763,566	57	194,816	4	53	9.32e-05	18	71	-14	-35	-0.8%	-1.9%
Mar	897,001	128	143,341	1	127	1.69e-04	24	151	-23	-58	-1.3%	-3.2%
Apr	1,267,139	115	280,984	11	104	1.05e-04	30	134	-19	-77	-1.0%	-4.2%
May	1,317,311	108	416,920	28	80	8.89e-05	37	117	-9	-86	-0.5%	-4.7%
June	1,414,291	194	492,897	87	107	1.16e-04	57	164	30	-56	1.6%	-3.1%
July	1,563,985	540	714,807	325	215	2.53e-04	181	396	144	88	7.9%	4.8%
Aug	1,555,525	214	611,565	58	156	1.65e-04	101	257	-43	45	-2.4%	2.4%
Sept	1,221,082	182	551,720	81	101	1.51e-04	83	184	-2	42	-0.1%	2.3%
Oct	1,119,064	78	392,775	47	31	4.27e-05	17	48	30	73	1.7%	4.0%
Nov	1,020,819	59	368,359	25	34	5.21e-05	19	53	6	79	0.3%	4.3%
Dec	898,269	62	353,073	9	53	9.72e-05	34	87	-25	53	-1.4%	2.9%
Total	14,120,194	1832	4,857,985	691	1141	1.44e-03	638	1779	53			

Table 21 Example of temporal variation in effectiveness of the central Gulf of Mexico and NEC time/area closure 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
January	1	12	13	25	69	94	4%	15%	12%
February	0	4	4	9	43	52	0%	9%	7%
March	0	3	3	29	60	89	0%	5%	3%
April	0	8	8	38	120	158	0%	6%	5%
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%
November	13	20	33	6	19	25	68%	51%	57%
December	1	12	13	18	33	51	5%	27%	20%
Total	301	484	785	411	1,109	1,517	42%	30%	34%

Table 22 Redistribution of fishing effort and white marlin dead discards in the central Gulf of Mexico and NEC time/area closure alternative. 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)
Jan	1,082,142	26	336,728	1	25	3.35e-05	11	36	-10	-10	-1.4%	-1.4%
Feb	763,566	9	194,816	0	9	1.58e-05	3	12	-3	-13	-0.4%	-1.8%
Mar	897,001	29	143,341	0	29	3.85e-05	6	35	-6	-19	-0.8%	-2.6%
Apr	1,267,139	38	280,984	0	38	3.85e-05	11	49	-11	-29	-1.5%	-4.1%
May	1,317,311	43	416,920	9	34	3.78e-05	16	50	-7	-36	-0.9%	-5.1%
June	1,414,291	121	492,897	47	74	8.03e-05	40	114	7	-29	1.0%	-4.0%
July	1,563,985	239	714,807	165	74	8.71e-05	62	136	103	74	14.4%	10.4%
Aug	1,555,525	103	611,565	33	70	7.42e-05	45	115	-12	62	-1.7%	8.7%
Sept	1,221,082	40	551,720	17	23	3.44e-05	19	42	-2	60	-0.3%	8.4%
Oct	1,119,064	26	392,775	15	11	1.51e-05	6	17	9	69	1.3%	9.6%
Nov	1,020,819	19	368,359	13	6	9.20e-06	3	9	10	78	1.4%	11.0%
Dec	898,269	19	353,073	1	18	3.30e-05	12	30	-11	67	-1.5%	9.5%
Total	14,120,194	712	4,857,985	301	411	4.97e-04	234	645	67			

Table 23 Redistribution of fishing effort and white marlin live discards in the central Gulf of Mexico and NEC time/area closure alternative. 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)
Jan	1,082,142	81	336,728	12	69	9.26e-05	31	100	-19	-19	-1.2%	-1.2%
Feb	763,566	47	194,816	4	43	7.56e-05	15	58	-11	-30	-0.7%	-1.9%
Mar	897,001	63	143,341	3	60	7.96e-05	11	71	-8	-38	-0.5%	-2.4%
Apr	1,267,139	128	280,984	8	120	1.22e-04	34	154	-26	-64	-1.6%	-4.0%
May	1,317,311	136	416,920	31	105	1.17e-04	49	154	-18	-82	-1.1%	-5.1%
June	1,414,291	212	492,897	66	146	1.58e-04	78	224	-12	-94	-0.8%	-5.9%
July	1,563,985	332	714,807	192	140	1.65e-04	118	258	74	-20	4.7%	-1.2%
Aug	1,555,525	290	611,565	72	218	2.31e-04	141	359	-69	-89	-4.3%	-5.6%
Sept	1,221,082	161	551,720	48	113	1.69e-04	93	206	-45	-134	-2.8%	-8.4%
Oct	1,119,064	59	392,775	16	43	5.92e-05	23	66	-7	-142	-0.5%	-8.9%
Nov	1,020,819	39	368,359	20	19	2.91e-05	11	30	9	-132	0.6%	-8.3%
Dec	898,269	45	353,073	12	33	6.05e-05	21	54	-9	-142	-0.6%	-8.9%
Total	14,120,194	1593	4,857,985	484	1109	1.36e-03	626	1735	-142			

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 alternative.** 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)
Jan	1,082,142	107	336,728	13	94	1.26e-04	42	136	-29	-29	-1.3%	-1.3%
Feb	763,566	56	194,816	4	52	9.14e-05	18	70	-14	-43	-0.6%	-1.9%
Mar	897,001	92	143,341	3	89	1.18e-04	17	106	-14	-57	-0.6%	-2.5%
Apr	1,267,139	166	280,984	8	158	1.60e-04	45	203	-37	-94	-1.6%	-4.1%
May	1,317,311	179	416,920	40	139	1.54e-04	64	203	-24	-118	-1.1%	-5.1%
June	1,414,291	336	492,897	113	223	2.42e-04	119	342	-6	-124	-0.3%	-5.4%
July	1,563,985	571	714,807	357	214	2.52e-04	180	394	177	52	7.7%	2.3%
Aug	1,555,525	393	611,565	105	288	3.05e-04	187	475	-82	-29	-3.5%	-1.3%
Sept	1,221,082	195	551,720	65	130	1.94e-04	107	237	-42	-71	-1.8%	-3.1%
Oct	1,119,064	85	392,775	31	54	7.44e-05	29	83	2	-69	0.1%	-3.0%
Nov	1,020,819	58	368,359	33	25	3.83e-05	14	39	19	-51	0.8%	-2.2%
Dec	898,269	64	353,073	13	51	9.35e-05	33	84	-20	-71	-0.9%	-3.1%
Total	14,120,194	2302	4,857,985	785	1517	1.85e-03	856	2373	-71			

Figure 1 Map showing closeup of NEC closure area and coordinates.

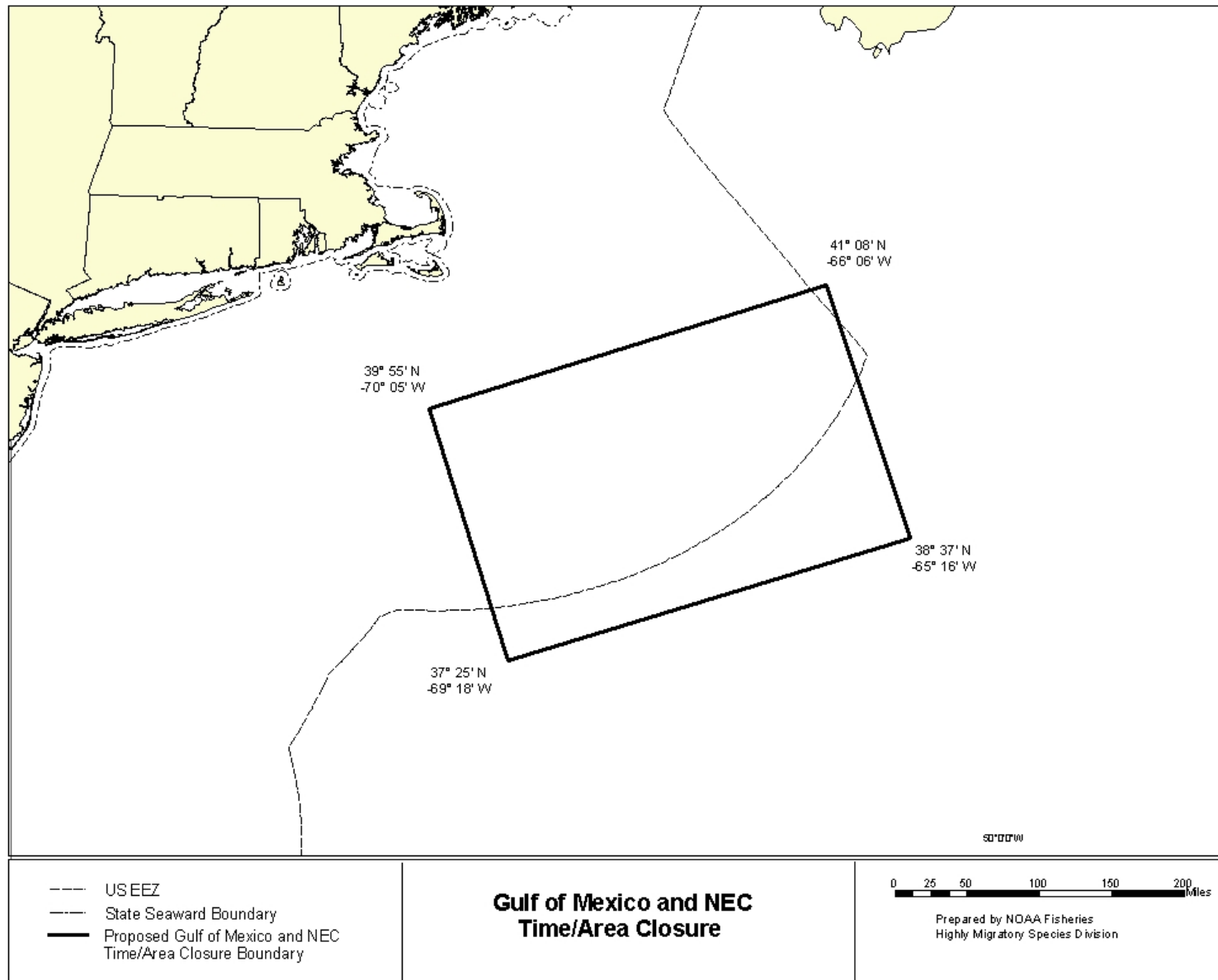


Figure 2 Map showing all reported sets, sea turtle interactions, and the proposed Gulf of Mexico and NEC time/area closure. Source: Pelagic Longline Logbook 2001-2002.

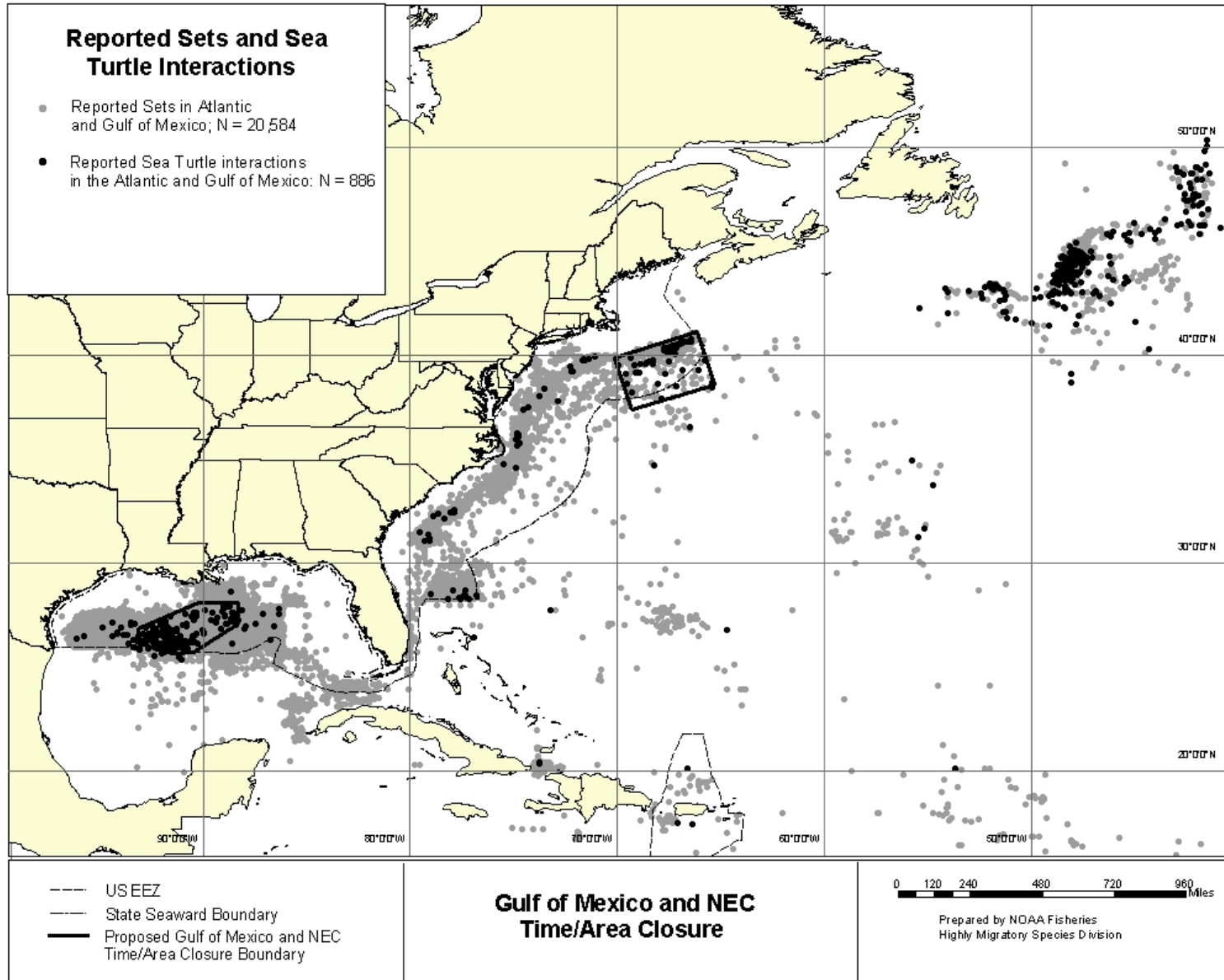


Figure 3 Map showing all observed sets and sea turtle interactions in the NEC time/area closure. Source: Pelagic Observer Program 2001-2002.

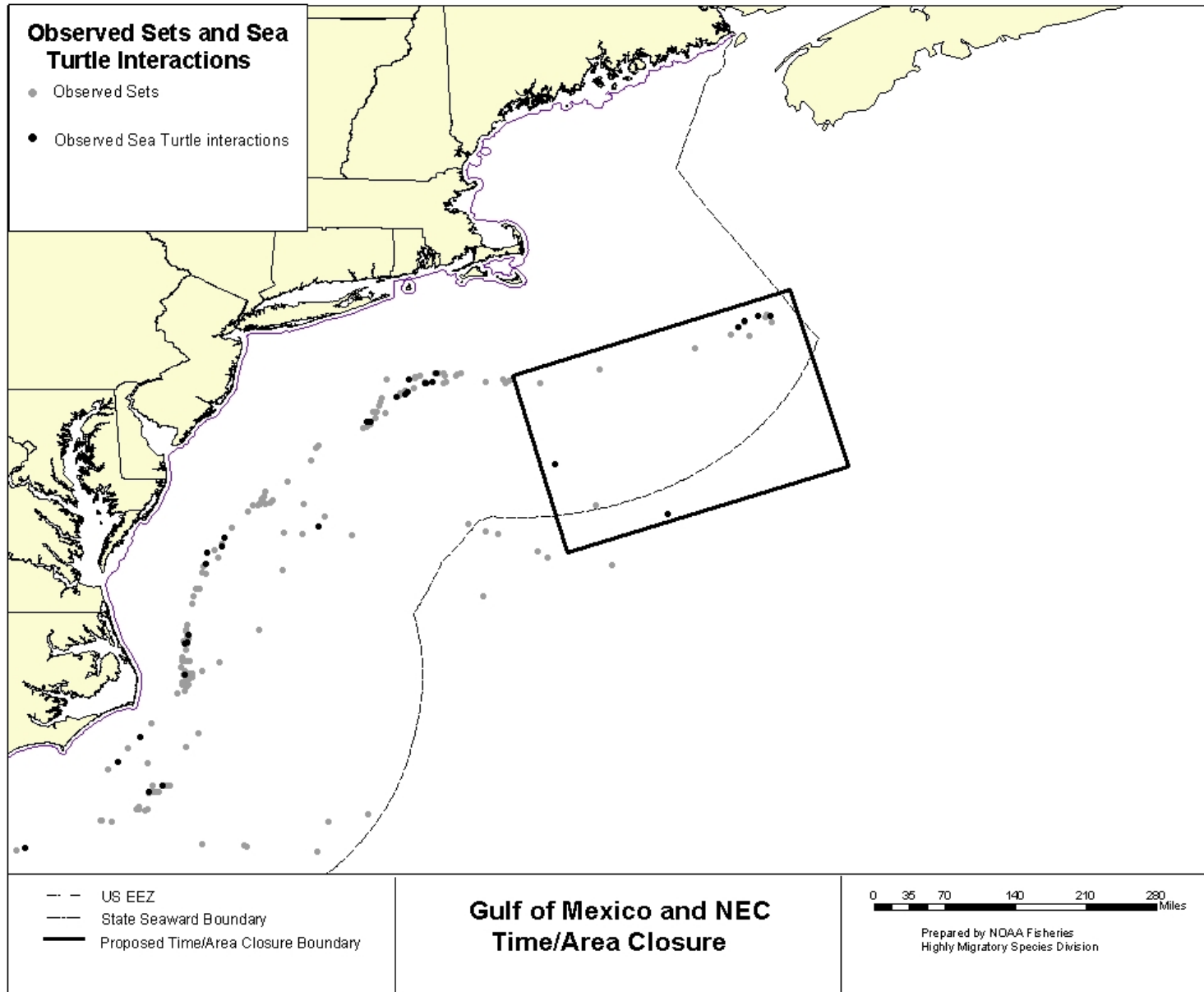


Figure 4 Map showing all logbook reported sets and sea turtle interactions in the NEC time/area closure. Source: Pelagic Longline Logbook 2001-2002.

