South Atlantic Bight and Florida East Coast Pelagic Longline Time-Area Closure Research: 2008-2010 (Update from Final Report)

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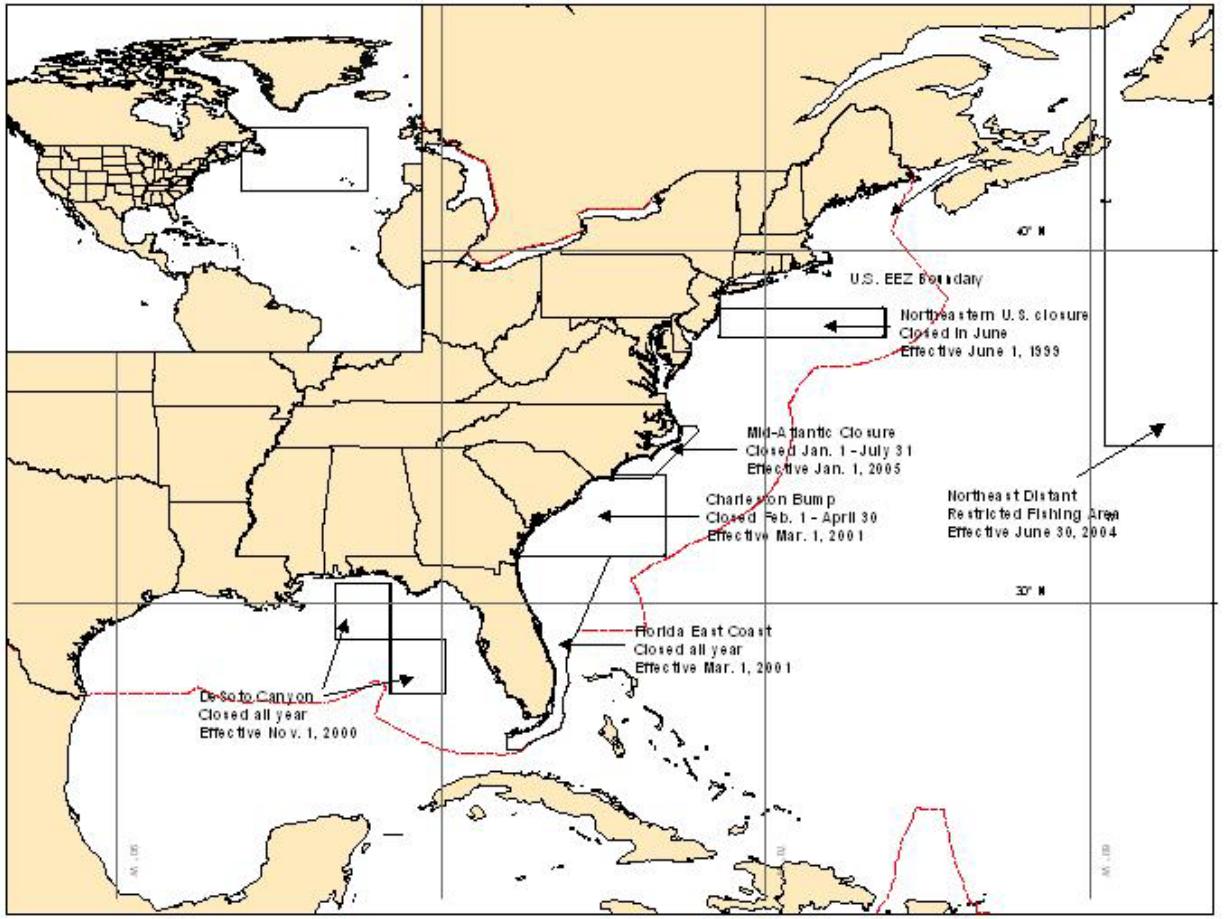
Summary of Research

- 188 sets in both open and closed times/areas of the South Atlantic Bight and Florida East Coast NMFS pelagic statistical areas (not 192 via Spring HMS AP meeting)
- Over 3200 individual animals caught, including 1295 swordfish, 717 tunas, along with 75 blue marlin, 22 white marlin, and 136 sailfish (only 76 combined billfishes discarded dead).
- Bycatch of sharks was minimal, and the main bycatch elasmobranch species were tiger, silky, and night sharks.
- The work interacted with only five sea turtles (three leatherback, two loggerhead), all of which were released alive, and no sea birds or marine mammals.

Current Time-Area Closures



Research Project Goals

1) **Comparison of catch rates between open and closed (experimental portions) areas;**

2) *Comparison of historical and contemporary catch rates between open and closed (experimental portions) areas; and*

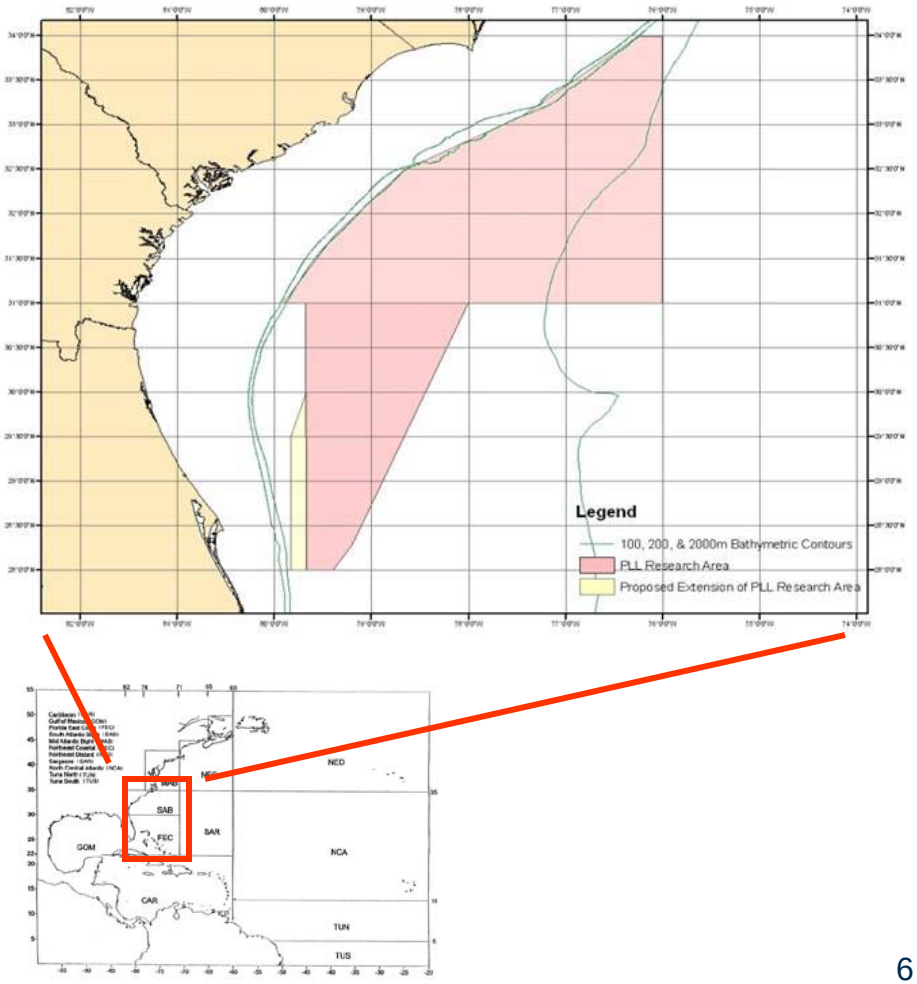
3) *Comparison of historical and contemporary catch rates of hooks*

Research Project Objectives

- Evaluate the catch rates of target and bycatch species within the Charleston Bump and Florida Coast East time-area closures to PLL gear.
- Evaluate bycatch reduction potential for 18/0 non-offset circle hook on swordfish directed bycatch species.
- Evaluate the effectiveness of line cutters and de-hookers for releasing bycatch species.
- Collect data on the spatial and temporal relationship between target and bycatch species.
- Evaluate “immediate” mortality using non-offset 18/0 circle hooks.
- Evaluate bycatch reduction potential for non-offset 18/0 hook on all swordfish-directed fishery bycatch species.

Project EFP Details: Area

- Original experimental areas in pink
- Based on concerns that the lower part of the EFC closure could not be adequately fished, a small experimental area in southern end was extended (yellow) in 2009 EFP renewal



Project Methods

- Ports included Dania (FL), Pompano Beach (FL), Cape Canaveral (FL), and Cherry Point (SC)
- Project did not include any compensation to any participating vessel; even hooks had to be provided by the vessel

	2008		2009		2010		Total	
	SETS	TRIPS	SETS	TRIPS	SETS	TRIPS	SETS	TRIPS
U04	18	4	41	8	8	2	67	14
V04	6	1	6	1	4	1	16	3
C05	7	3	25	6			32	9
S01	6	1	7	1			13	2
W04	3	1					3	1
D04	24	4					24	4
M03	5	1					5	1
N06					15	2	15	2
Z05					13	1	13	1

Total Effort: Individual Research Sets

2008				2009				2010			
Q1	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
D04048:5	D04051:9	U04002:1	C05001:1		C05004:1	C05007:4	C05009:6	U04013:2	U04014:6	N06001:6	
D04049:4	V04001:6	U04003:6	C05003:4		C05005:7	C05008:2	U04011:5		V04003:4	N06002:9	
D04050:6	W04001:3	U04004:8	CO5002:1		C05006:5	U04007:7	U04012:4		Z05001:9	Z05002:4	
S01096:6			MO3001:5		S01109:7	U04008:7					
U04001:3					U04005:5	U04009:4					
					U04006:5	U04010:4					
					V04002:6						

- Original proposal called for 256 experimental sets over one, 12-month period – using statistical power estimation tools and historical CPUE data, such work would have provided a minimum power of (1-β)=0.90
- Final sets totaled 188, although 10 sets not fully observed, so not included in catch rate analyses (60 closed to 114 closed)

Catch Rates: Swordfish

	CPUE Comparison					
	Open	**Closed**	**Significant Difference?**	**Statistical Power**		**GLM Significant Terms**
Swordfish						
All	6.767	17.907	**	1.00		A
	11.135	*33.404*				
Retained Only	10.108	10.852	**	0.559		A*Q
	20.876	*24.379*				
Discarded/Released Only	0.231	0.695	**	0.979		A, Q
	5.815	*9.025*				

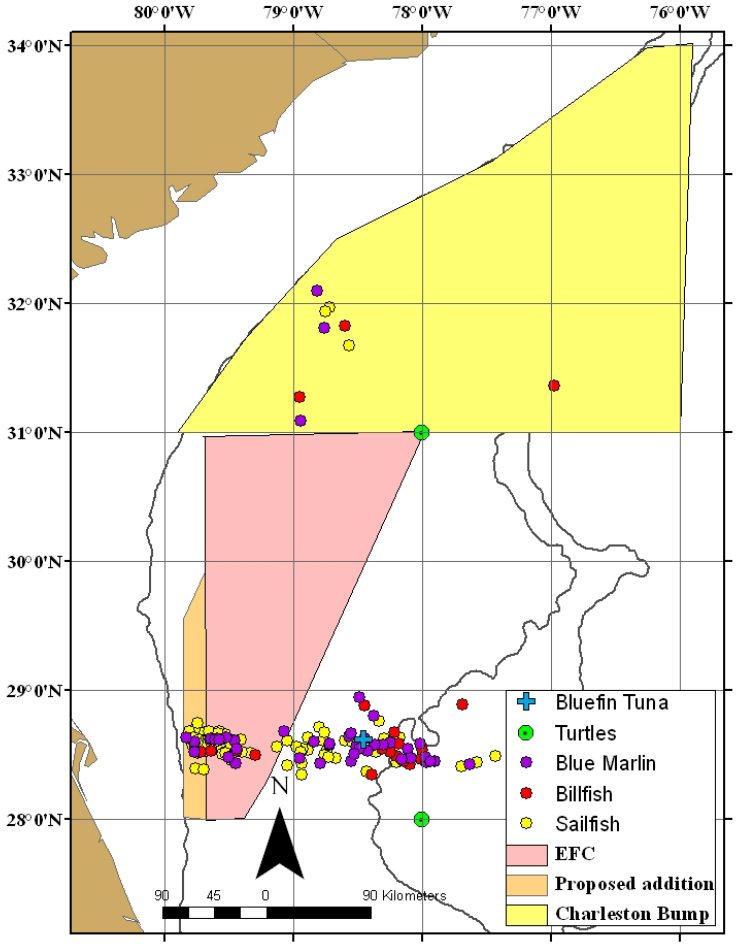
Catch Rates: Tunas and Mahi

	CPUE Comparison				
	Open	Closed	Significant Difference?	Statistical Power	GLM Significant Terms
Tunas					
Bigeye	0.082	< 0.0001	**	1.00	A, Q, A*Q
	8.926	*0.605*			
Yellowfin	< 0.0001	< 0.0001	**	0.999	A
	5.481	*0.582*			
Albacore	< 0.0001	< 0.0001	**	0.999	A, Q, A*Q
	8.684	*0.074*			
Blackfin	< 0.0001	< 0.0001	*	0.811	A, Q
	0.678	*0.214*			
Dolphinfish	< 0.0001	< 0.0001	**	0.991	A, Q, A*Q
	4.144	*12.82*			

Catch Rates: Billfish Bycatch

	CPUE Comparison					
	Open	Closed	Significant Difference?	Statistical Power		GLM Significant Terms
Billfishes						
White Marlin	< 0.0001	< 0.0001	*	0.549		A, Q, A*Q
	0.35	*0.141*				
Sailfish	< 0.0001	< 0.0001	**	0.24		Q, A*Q
	1.193	*2.448*				
Blue Marlin	< 0.0001	< 0.0001	*	0.475		A, Q
	1.061	*0.663*				

Billfish Bycatch



Catch Rates: Shark Bycatch

	CPUE Comparison				
	Open	Closed	Significant Difference?	Statistical Power	GLM Significant Terms
Sharks					
Tiger	< 0.0001	< 0.0001		0.679	A
	1.185	*2.093*			
Silky	< 0.0001	< 0.0001	**	0.999	A, Q
	1.046	*5.17*			
Dusky	none	< 0.0001	*	na	Q
	none	*0.155*			
Night	< 0.0001	< 0.0001	**	0.999	A, Q, A*Q
	0.201	*6.028*			
Shortfin Mako	< 0.0001	< 0.0001		0.085	none
	0.175	*0.244*			

Conclusions: Project

- Requirements for EFP resulted in few participating vessels – many more were willing, but did not qualify
- Unwillingness (or inability, due to EFP requirements) for vessels to conduct year-round sampling in CB
- Zero interactions with any recreational vessel

Conclusions: Catches

- Overall billfish mortality* minimal, as was sea turtle bycatch and bluefin tuna incidental catch

- Significantly higher catch rates of all swordfish and swordfish discards within closed areas

- Unknown effects of using non-offset 18/0 circle hooks versus fleet-standard offset 18/0 circle hooks or non-offset size 16/0 circle hooks

*** Defined as "mortality at haulback"**

Management Considerations?

- Locations of target and bycatch species catches might allow more specific area targeting of closed areas

- Significant interaction effects of area*quarter in most species-level analyses might allow more time-specific targeting of closed areas

However, both suggestions are under the presumption that neither alternative strategy would increase bycatch nor result in any other undesirable outcome.