

**USACE Hopper Dredging Interactions with Sea Turtles:
Fiscal Year 2009 Annual Summary Report
For the Northern Gulf of Mexico Region**

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FINAL REPORT



BACKGROUND

This report summarizes data collected for dredging interactions with sea turtles during USACE hopper dredging operations throughout the northern Gulf of Mexico in Fiscal Year (FY) 2009 (1 October 2008 through 31 September 2009). Data were collected by contracted observer companies as part of the Endangered Species Observer Program administered by the USACE Districts Galveston, New Orleans, Mobile, and Jacksonville as specified and mandated by the Gulf of Mexico Regional Biological Opinion (GRBO) (issued by the Southeast Region National Marine Fisheries Service (NMFS) on 19 November 2003 and revised 24 June 2005 (Revision 1) and 9 January 2007 (Revision 2) and the USACE GRBO Management Protocol (UGMP) (issued by the USACE South Atlantic Division on 29 December 2006). These data are for hopper (trailing-suction style) dredging projects only and do not include non-hopper (i.e. clamshell bucket, cutterhead) dredging projects. Non-hopper dredges are not monitored for sea turtle entrainments since the mechanical operation of these dredges has been identified as having minimal or no risk to sea turtles (GRBO). Hopper dredges were used instead of non-hopper dredges for the projects presented in this report due to factors related to crew/vessel safety, sea and weather conditions, project configurations, and productivity costs. This report fulfills the reporting requirements, as specified in both the GRBO and the UGMP, for an annual regional summary of hopper dredging-related incidental takes and trawling-related captures/relocations of sea turtles.

METHODS AND DATA SOURCES

Appendix A provides a map designating the 9 locations for the 14 USACE hopper dredging projects in the northern Gulf of Mexico during FY 2009 by USACE District and geographic subregion. The USACE Districts Galveston, New Orleans, Mobile, and Jacksonville were responsible for implementing these hopper dredging projects and for complying with the environmental requirements designated by the GRBO and the UGMP (i.e., use of deflectors, 100% observer coverage, relocation trawling). Due to potential differences in habitat use by sea turtles and differences in dredging environments, the northern Gulf of Mexico region was divided into 4 subregions (West Gulf (WG), Northwest Gulf (NWG), Northeast Gulf (NEG), and East Gulf (EG)) for some data presented in this report. These subregions were defined using the 29° 00" latitude and Mississippi River outlet as boundaries. These subregions are consistent with those presented in Dickerson et al. 2007 to allow continuity in data comparisons.

Data summarized in this report were compiled from individual project summary reports and annual hopper dredging reports on sea turtle interactions for FY 2009 submitted by the USACE Districts Galveston, New Orleans, Mobile, and Jacksonville as well as the Endangered Species Observer Reports submitted by each of the contracted observer companies. Reports are electronically linked within the reference section of this document. These reports, along with individual data profiles for each documented sea turtle incidental take, protocols for mitigation efforts and data collection, and links to the GRBO and UGMP are archived for reference on the USACE Sea Turtle Data Warehouse website: (<http://el.erdc.usace.army.mil/seaturtles/>).

RESULTS

During FY 2009, 14 hopper dredging projects (13 civil works (CW) channel/harbor maintenance of and 1 regulatory (R) beach renourishment) were conducted along the northern Gulf of Mexico with a total of 13 (13 CW; 0 R) dredging-related incidental takes of sea turtles, and 39 (All CW) trawler relocated sea turtles. There was none regulatory trawling project in FY 2009. All summaries for these data are provided in the following appendices.

REFERENCES AND RESOURCES

USACE Sea Turtle Database Warehouse, (<http://el.erdc.usace.army.mil/seaturtles/>).

Dickerson, D., C. Theriot, M. Wolters, C. Slay, T. Bargo, W. Parks. (2007). “[Effectiveness of relocation trawling during hopper dredging for reducing incidental take of sea turtles,](#)” *In: Proceedings of the World Dredging Congress XVIII, USACE ERDC Research Initiatives*. Central Dredging Association, 27 May-1 June 2007, Lake Buena Vista, Florida.

Dickerson, D. D., M. S. Wolters, C. T. Theriot, C. Slay. (2005). “[Dredging impacts on sea turtles in the Southeastern USA: A historical review of protection,](#)” *In: Proceedings of the World Dredging Conference XVII, Dredging in a Sensitive Environment*. Central Dredging Association, 27 September-1 October 2004, Hamburg, Germany.

[Gulf Regional Biological Opinion \(GRBO\). 2003.](#)

[Gulf Regional Biological Opinion \(GRBO\). 2005 revision.](#)

[Gulf Regional Biological Opinion \(GRBO\). 2007 revision.](#)

[USACE Gulf GRBO Management Protocol.](#)

FY 2009 USACE District Annual Reports for Sea Turtle Monitoring during Maintenance Dredging/Beach Nourishment Projects along the Gulf of Mexico Coast:
(Archived at: <http://el.erdc.usace.army.mil/seaturtles/>)

USACE Galveston District. FY 2009. Annual Sea Turtle Monitoring Report

USACE New Orleans District. FY 2009. Annual Sea Turtle Monitoring Report

USACE Mobile District. FY 2009. Annual Sea Turtle Monitoring Report

FY 2009 Project Sea Turtle/Dredging Data Submitted by Endangered Species Observer Companies and USACE Districts (Archived at: <http://el.erdc.usace.army.mil/seaturtles/>)

USACE Galveston District (FY 2009)

[Brazos Island Harbor](#) (East Coast Observers, Inc.)

[Freeport Harbor \(Entrance & Jetty Channels\)](#) (Coastwise Consulting, Inc.)

[Houston Ship Channel](#) (Coastwise Consulting, Inc.)

[Galveston Jetty, Entrance, and Harbor & Channel](#) (Coastwise Consulting, Inc.)

[Sabine-Neches Waterway \(Sabine Pass Outer Bar Channel\)](#) (East Coast Observers, Inc.)

USACE New Orleans District (FY 2009)

Calcasieu River Bar Channel (Coastwise Consulting, Inc.)

Calcasieu River Bar Channel (Coastwise Consulting, Inc.)

USACE Mobile District (FY 2009)

**Mobile Harbor and Bar Channel (Coastwise Consulting, Inc.)

Mobile Harbor and Bay Channel (Coastwise Consulting, Inc.)

Mobile Harbor and Bar Channel (Coastwise Consulting, Inc.)

Pascagoula Harbor - Bar Channel (Coastwise Consulting, Inc.)

*Pascagoula Harbor –Horn Island Pass FY08 & FY09 (Coastwise Consulting, Inc.)

Gulfport Harbor – Bar Channel (Coastwise Consulting, Inc.)

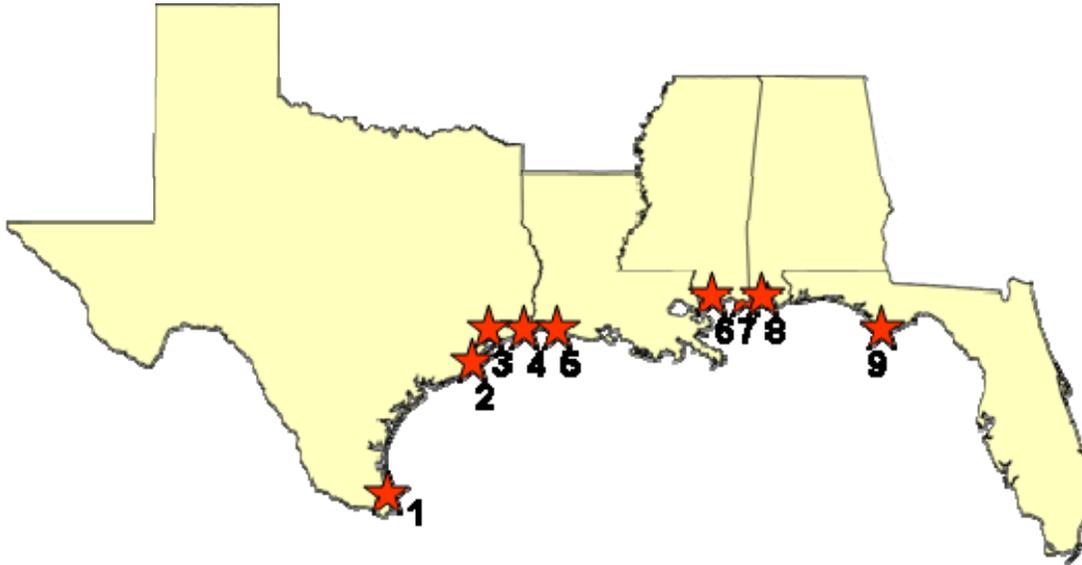
USACE Jacksonville District (FY 2009)

*St. Joe (Peninsula) Beach Renourishment (SPP) (Coastwise Consulting, Inc.)

APPENDICES

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APPENDIX A
FY09 Gulf of Mexico Hopper Dredging Projects



West Gulf (WG)

- 1. Brazos Island Harbor (SWG)
- 2. Freeport Harbor (SWG)

Northwest Gulf (NWG)

- 3. Houston / Galveston Channels (SWG)
- 4. Sabine-Neches Waterway (SWG)
- 5. Calcasieu Pass (MVN)

Northeast Gulf (NEG)

- 6. Gulfport (SAM)
- 7. Pascagoula (SAM)
- 8. Mobile Harbor/Bay (SAM)
- 9. St. Joe Peninsula (SAJ)

East Gulf (EG)

Key

- SWG - USACE Galveston District**
- MVN - USACE New Orleans District**
- SAM - USACE Mobile District**
- SAJ - USACE Jacksonville District**

APPENDIX B-1
Incidental Take Limits Designated by the
Gulf of Mexico Region Biological Opinion

<i>FY09 Incidental Take Limits for Civil Works (CW) and Regulatory (R) Projects as defined by Revision 2 of the Gulf of Mexico Regional Biological Opinion (2007) for Hopper Dredges</i>									
Loggerhead <i>(Caretta caretta)</i>		Green <i>(Chelonia mydas)</i>		Kemp's ridley <i>(Lepidochelys kempii)</i>		Hawksbill <i>(Eretmochelys imbricata)</i>		Gulf Sturgeon <i>(Acipenser oxyrinchus desotoi)</i>	
CW	R	CW	R	CW	R	CW	R	CW	R
32	8	11	3	16	4	3	1	3	1

<i>FY09 Take Limits for Capture Relocation Trawling Operations as defined by Revision 2 of the Gulf of Mexico Regional Biological Opinion (2007)</i>			
Sea Turtle Relocations	Sea Turtle (any species) Relocation Takes (injured or killed)	Gulf Sturgeon Relocations	Gulf Sturgeon Relocation Takes (injured or killed)
300	2	8	1

APPENDIX B-2
FY 2009 Documented Incidental Takes
Designated by Civil Works (CW) vs. Regulatory (R) Projects

<i>FY09 Documented Incidental Takes for Gulf of Mexico Civil Works (CW) and Regulatory (R) Hopper Dredging Projects</i>									
Loggerhead <i>(Caretta caretta)</i>		Green <i>(Chelonia mydas)</i>		Kemp's ridley <i>(Lepidochelys kempii)</i>		Hawksbill <i>(Eretmochelys imbricata)</i>		Gulf Sturgeon <i>(Acipenser oxyrinchus desotoi)</i>	
CW	R	CW	R	CW	R	CW	R	CW	R
6	0	4	0	3	0	0	0	0	0

<i>FY09 Total Relocated Turtles and Sturgeon by Gulf of Mexico Civil Works and Regulatory Hopper Dredging Projects</i>							
Sea Turtle Relocations		Sea Turtle (any species) Relocation Takes (injured or killed)		Gulf Sturgeon Relocations		Gulf Sturgeon Relocation Takes (injured or killed)	
CW	R	CW	R	CW	R	CW	R
39	0	0	0	0	0	0	0

39 Civil Works relocated turtles = 29 Cc, 1 Cm, 9 Lk

APPENDIX C
Dredging Project Summary Data
(FY09 Gulf of Mexico Hopper Dredging)

District	Sub-region	Project*	Project Type	Dredge	# Drag-heads	Dredge Dates**	Total Dredge Days**	Total Y ³ Dredged***	Total M ³ Dredged***	Observer Co.
SWG	WG	Brazos Island Harbor	M/C/OD	<i>B.E. Lindholm</i>	2	10/31/08-11/15/08	16	237,772	181,790	ECO
SWG	WG	Freeport Harbor	M/C/OD	<i>Glenn Edwards</i>	2	10/21/08-12/3/08	44	1,577,096	1,205,776	CWC
SWG	NWG	!Galveston Jetty, Entrance, and Harbor Channel	M/C/OD	<i>Glenn Edwards/ Bayport</i>	2/2	12/3/08-2/28/09; 5/29/09-6/28/09; 9/15/09-9/30/09/ 9/1/09-9/30/09	135/30	5,051,468/ 2,799,588	6,002,563	CWC
SWG	NWG	Houston Ship Channel	M/C/OD	<i>Liberty Island</i>	2	2/27/09-3/26/09	28	883,494	675,480	CWC
SWG	NWG	Sabine-Neches Waterway	M/C/OD	<i>Liberty Island</i>	2	7/09/09-9/14/09	68	5,811,515	444,322	ECO
SWG	NWG	Calcasieu Bar Channel	M/C/OD	<i>Newport</i>	2	2/1/09-5/7/09	96	10,667,508	8,155,895	CWC
MVN	NWG	Calcasieu River Bar Channel	M/C/OD	<i>Wheeler</i>	3	8/28/09-9/12/09	16	2,192,563	1,676,335	REM
SAM	NEG	!Mobile Harbor & Bay Channel	M/C/OD	<i>Glenn Edwards/ Columbia/</i>	2/2	3/4/09-5/26/09- 8/18/09-9/13/09/ 3/24/09-5/14/09; 6/8/09 – 7/15/09; 8/3/09-8/27/09	111/115	2,350,458/ 1,238,310	2,743,810	CWC
SAM	NEG	!Mobile Harbor & Bar Channel	M/C/OD	<i>Newport</i>	2	9/15/09–9/30/09	16	301,701	230,667	CWC
SAM	NEG	Mobile Harbor & Bar Channel	M/C/OD	<i>Newport</i>	2	11/20/08-12/08/08; 12/12/08-1/27/09	66	970,536	742,028	CWC
SAM	NEG	Pascagoula Harbor & Bar Channel	M/C/OD	<i>McFarland</i>	2	5/12/09-5/28/09	17	138,000	105,509	CWC
SAM	NEG	!Pascagoula Harbor Bar Channel & Horn Island Pass	M/C/OD	<i>Glenn Edwards /Newport</i>	2/2	10/1/08-10/9/08 10/08/08-11/09/08	42	382,689/ 544,233	708,683	CWC
SAM	NEG	Gulfport Harbor & Bar Chanel	M/C/OD	<i>Padre Island/Liberty Island</i>	2/2	6/15/09-8/16/09/ 9/18/09-10/1/09	77	3,056,430 / 1,847,296	3,749,168	CWC
SAJ	NEG	!St. Joe Peninsula	O/BD	<i>Bayport</i>	2	10/1/08-1/3/09	95	1,457,323	1,114,203	CWC

M = Maintenance; ED = Emergency dredging; C = Channel sediment source; O = Offshore/non-channel sediment source; OD = Ocean disposal; BD = Beach disposal

Gray shaded = Regulatory project

ECO = East Coast Observers, Inc.; CWC = Coastwise Consultants, Inc.; REM = REMSA, Inc.

*Data includes projects that occurred in FY09. Red highlighted projects started in FY08 but finished FY09 and Blue highlighted projects started in FY09 but have carried over into FY10. In these cases cubic yards are estimated per FY if a none total is given.

** Project and dredge dates include non-dredging down time unless noted – span of projected listed above

*** Dredge quantities (provided by USACE Districts) may be estimates instead of actual amounts

Y^3 = Total Cubic Yards dredged material; M^3 = Total Cubic Meters dredged material

! Projects carried over two FY's. Galveston Harbor and Mobile Bay & Bar Channels started in FY09 and worked over into FY10. Pascagoula Bar Channel & Horn Island & St. Joe started in FY08 and finished in FY09

APPENDIX D
Distribution of Sea Turtle Incidental Takes by Species
(FY09 Gulf of Mexico Hopper Dredging)

District	Sub-Region	Project	Dredge	Cc	Cm	Lk	Total Takes
SWG	WG	Brazos Island Harbor	<i>B.E. Lindholm</i>	2	1	1	4
SWG	WG	Freeport Harbor	<i>Glenn Edwards</i>	1	2	0	3
SWG	NWG	!Galveston Jetty, Entrance, and Harbor Channel	<i>Glenn Edwards</i>	0	0	0	0
SWG	NWG	!Galveston Jetty, Entrance, and Harbor Channel	<i>Bayport</i>	1	0	0	1
SWG	NWG	Houston Ship Channel	<i>Liberty Island</i>	0	0	0	0
SWG	NWG	Sabine-Neches Waterway	<i>Liberty Island</i>	0	0	0	0
MVN	NWG	Calcasieu River Bar Channel	<i>Wheeler</i>	0	0	1	1
MVN	NWG	Calcasieu Bar Channel	<i>Newport</i>	0	0	0	0
MVN	NEG	Gulfport	<i>Padre Island</i>	1	0	0	1
MVN	NEG	Gulfport	<i>Liberty Island</i>	1	0	1	2
SAM	NEG	Mobile Harbor & Bar Channel	<i>Newport</i>	0	1	0	1
SAM	NEG	!Mobile Harbor & Bay Channel	<i>Glenn Edwards</i>	0	0	0	0
SAM	NEG	!Mobile Harbor & Bay Channel	<i>Columbia</i>	0	0	0	0
SAM	NEG	!Mobile Harbor & Bar Channel	<i>New Port</i>	0	0	0	0
SAM	NEG	!Pascagoula Harbor Bar Channel & Horn Island Pass	<i>Newport</i>	0	0	0	0
SAM	NEG	!Pascagoula Harbor Bar Channel & Horn Island Pass	<i>Glenn Edwards</i>	0	0	0	0
SAM	NEG	Pascagoula Harbor Bar Channel	<i>McFarland</i>	0	0	0	0
SAJ	NEG	!St. Joe Peninsula	<i>Bayport</i>	0	0	0	0
TOTAL				6	4	3	13
Cc = Loggerhead (<i>Caretta caretta</i>); Cm = Green turtle (<i>Chelonia mydas</i>); Lk = Kemp's Ridley (<i>Lepidochelys kempii</i>)							
Gray shaded = Regulatory project							
! Projects carried over two FY's.							

APPENDIX E
Hopper Dredge/Capture Trawler-related Incidental Take Summary
(FY09 Gulf of Mexico Dredging)

District	Sub-region	Project	Species	Take Date	Dredge Load #	Time Recovered	Lat	Long	Water Temp*	SI used?	Trawling used?
SWG	WG	Brazos Island Harbor	Lk	11/3/08	283	0230	N/A	N/A	24.4	Yes	Yes
			Cc	11/08/08	326	1716	N/A	N/A	25.5	Yes	Yes
			Cc	11/11/08	337	1755	N/A	N/A	26.1	Yes	Yes
			Cm	11/12/08	343	1904	N/A	N/A	26.1	Yes	Yes
SWG	WG	Freeport Harbor	Cc	10/23/08	9	2034	28' 56.44	95' 18.13	23.7	Yes	No
			Cm	10/25/08	35	0005	28' 56.29	95' 17.98	23.0	Yes	No
			Cm	11/23/08	267	1140	28' 55.49	95' 22.43	20.0	Yes	No
SWG	NWG	! Galveston Jetty, etc.	Cc	9/24/09	237	1322	29' 17.69	94' 36.57	27.0	Yes	No
MVN	NWG	Calcasieu River Bar	LK	9/3/09	13	0812	29' 41.71	93' 19.93	29.4	Yes	No
SAM	NEG	Gulfport Harbor	Cc	7/18/09	885	1602	30' 09.91	88' 58.136	28.5	Yes	Yes
			Cc	9/20/09	12	0200	30' 07.78	88' 56.42	28.5	Yes	Yes
			LK	9/30/09	61	1630	30' 07.200	88' 55.940	27.2	Yes	Yes
SAM	NEG	Mobile Harbor & Bar	Cm	11/27/08	141	0656	30' 11.357	88' 03.082	13.8	Yes	No
Cc = Loggerhead (<i>Caretta caretta</i>); Cm = Green turtle (<i>Chelonia mydas</i>); Lk = Kemp's ridley (<i>Lepidochelys kempi</i>) N/A = Data not available; SI used? = Silent Inspector in use during dredging project? *Method and location in water column for temperature data collection not identified in reports. Observer's record lat/long of turtle takes either at the beginning, middle, or end of the load. Usually the beginning of the load (Chris Slay, Coastwise Consulting). ! Projects carried over two FY's.											

APPENDIX F
Capture Relocation Trawling Summary Data
(FY09 Gulf of Mexico Hopper Dredging)

District	Sub-Region	Project	Trawl Vessel*	Trawl Dates	Total Trawl Days	Total Tows	Cc	Cm	Lk	Total Relocated	Avg. Tows/Day	Observer Co.
SWG	WG	Brazos Island Harbor	**Miss Adrienne, **Breakaway	10/30/08- 11/14/08	16/16	820	1	1	0	2	25.63	ECO
WG	WG	Freeport Harbor	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SWG	NWG	!Galveston Jetty, Entrance, and Harbor Channel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SWG	NWG	Houston Ship Channel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MVN	NWG	Sabine-Neches Waterway	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SAM	NEG	Calcasieu Bar Channel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SAM	NEG	Calcasieu River Bar Channel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SAM	NEG	***Gulfport Harbor Channel	Lady Paige, Captain Wick	6/15/09- 8/16/09, 9/17/09-10/1/09	78	2420	22	0	6	28	31.0	CWC
SAM	NEG	!Mobile Harbor & Bar Channel	Simple Man, Captain Wick	9/14/09-9/30/09	17	381	4	0	2	6	22.41	CWC
SAM	NEG	Mobile Harbor & Bar Channel	Captain Wick	12/2/08-12/8/08	7	176	0	0	0	0	25.14	CWC
SAM	NEG	!Mobile Harbor & Bay Channel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SAM	NEG	Pascagoula Harbor & Bar Channel	Lady Paige	5/12/09-5/28/09	17	377	2	0	1	3	22.18	CWC
SAM	NEG	!Pascagoula Harbor Bar Channel & Horn Island Pass	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SAM	NEG	!St. Joseph Peninsula	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL TURTLES RELOCATED BY SPECIES							29	1	9	39		

Cc = Loggerhead (*Caretta caretta*); Cm = Green turtle (*Chelonia mydas*); Lk = Kemp's ridley (*Lepidochelys kempi*)

N/A = Not Applicable since relocation did not occur during that project

ECO = East Coast Observers, Inc.; CWC = Coastwise Consultants, Inc.

*Each trawlers worked 24 hours/2 crews during the project. **Two trawlers worked simultaneously.

***Also relocated 2 cc and 1 kemps (not included in numbers above) from Oct 2 – Oct 7, 2009 (FY10) onboard Lady Paige (119 tows, 6 days) while supporting drag bar operation following the dredging operation in Gulfport Harbor.

Gray shaded = Regulatory project

! Projects carried over two FY's.

APPENDIX G
Dredging Project Summary Data by Subregion and USACE District
(FY09 Gulf of Mexico Hopper Dredging)

Dredging Data Summary	Subregion				
	West Gulf	Northwest Gulf	Northeast Gulf	East Gulf	TOTAL
Total Dredge Projects	2	5	7	0	14
Total Turtle Takes	7	2	4	0	13
Total Dredge Days	60	373	539	0	972
Total Turtle Takes/Days Dredged	0.1167	0.00536	0.0074	0	0.0134
Total Cubic Yards	1,814,868	27,406,136	12,286,976	0	41,507,980
Total Cubic Meters	1,387,566	20,953,494	9,394,067	0	31,735,128
Total Turtle Takes/1000-y ³	0.00386	0.00007	0.00033	0	0.00031
Total Turtle Takes/1000-m ³	0.00504	0.00010	0.00043	0	0.00041

Dredging Summary Data	USACE District				
	Galveston	New Orleans	Mobile	Jacksonville	Total
Total Dredge Projects	5	2	6	1	14
Total Turtle Takes	8	1	4	0	13
Total Dredge Days	321	112	444	95	975
Total Turtle Takes/Days Dredged	0.0249	0.00893	0.00901	0	0.0133
Total Cubic Yards	16,360,933	12,860,071	10,829,653	1,457,323	41,507,980
Total Cubic Meters	12,508,831	9,832,230	8,279,864	1,114,203	31,735,128
Total Turtle Takes/1000-y ³	0.00049	0.00008	0.00037	0	0.00031
Total Turtle Takes/1000-m ³	0.00064	0.00010	0.00048	0	0.00041

APPENDIX H
Capture Relocation Trawling Summary Data by Subregion and USACE District
(FY09 Gulf of Mexico Hopper Dredging)

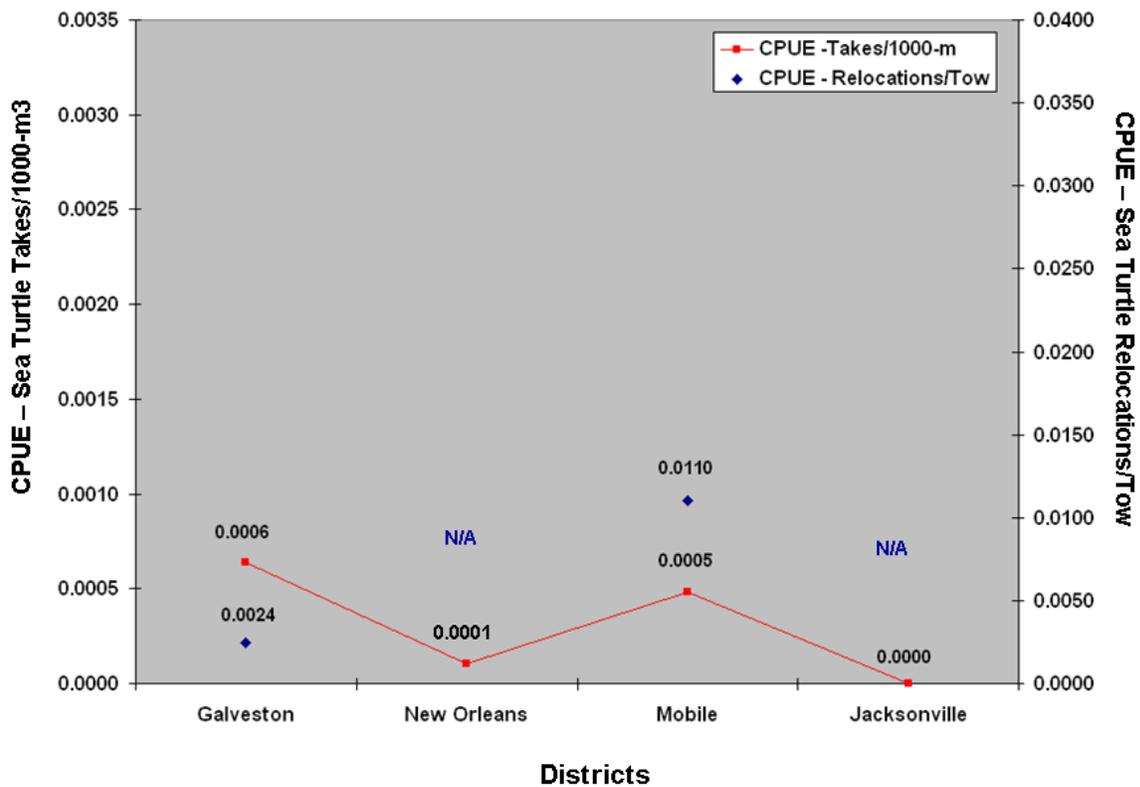
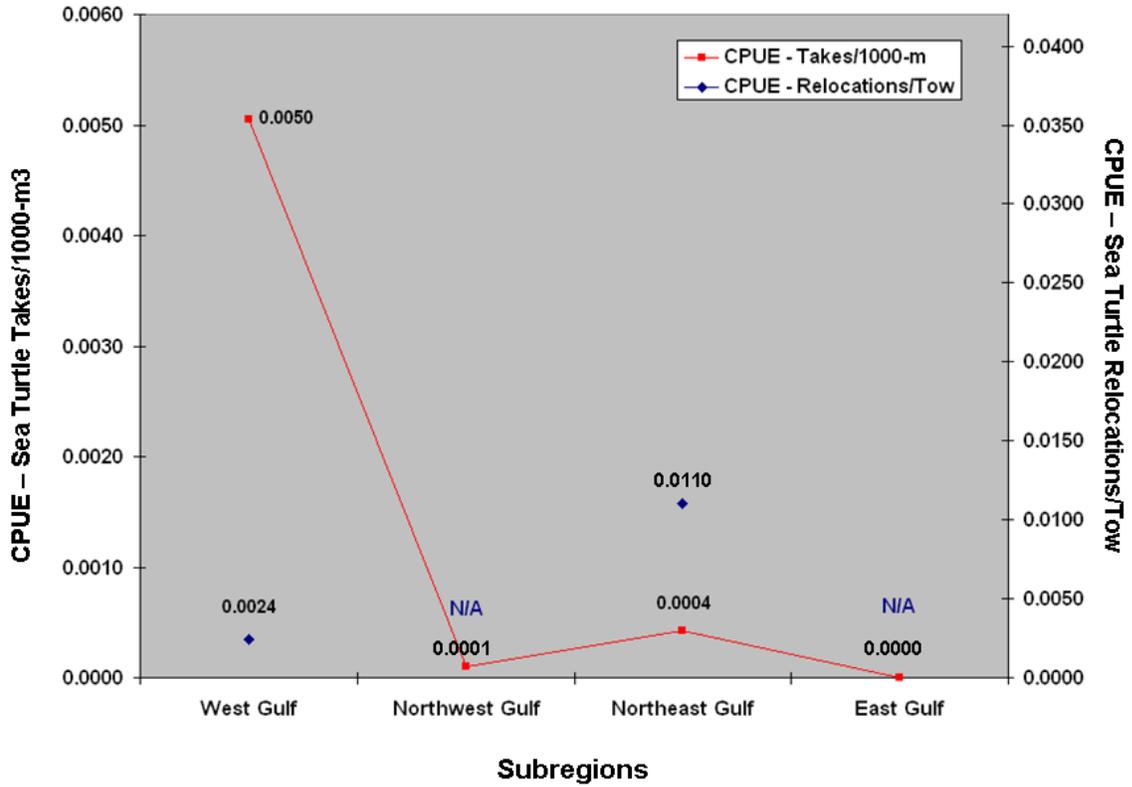
Relocation Trawling Summary Data	Subregion				
	West Gulf	Northwest Gulf	Northeast Gulf	East Gulf	TOTAL
Total Trawl Projects	1	N/A	4	N/A	5
Total Turtles Relocated	2	N/A	37	N/A	39
Total Trawl Days	30	N/A	119	N/A	151
Total Tows	820	N/A	3354	N/A	4,174
Total Turtles Trawled/Total Days	0.0625	N/A	0.3109	N/A	0.2583
Total Turtles Trawled/Total Tows	0.0024	N/A	0.0110	N/A	0.0093
Average Tows per day	25.63	N/A	28.18	N/A	27.64

Relocation Trawling Summary Data	USACE District				
	Galveston	New Orleans	Mobile	Jacksonville	Total
Total Trawl Projects	1	N/A	4	N/A	5
Total Turtles Relocated	2	N/A	37	N/A	39
Total Trawl Days	32	N/A	119	N/A	151
Total Tows	820	N/A	3354	N/A	4,174
Total Turtles Trawled/Total Days	0.0625	N/A	0.3109	N/A	0.2583
Total Turtles Trawled/Total Tows	0.0024	N/A	0.0110	N/A	0.0093
Average Tows per day	25.63	N/A	28.18	N/A	27.64

N/A = No relocation trawling performed; Each trawler worked 24 hours/day with 2 crews during the project; Brazo Island Harbor projects had two trawlers working simultaneously during project.

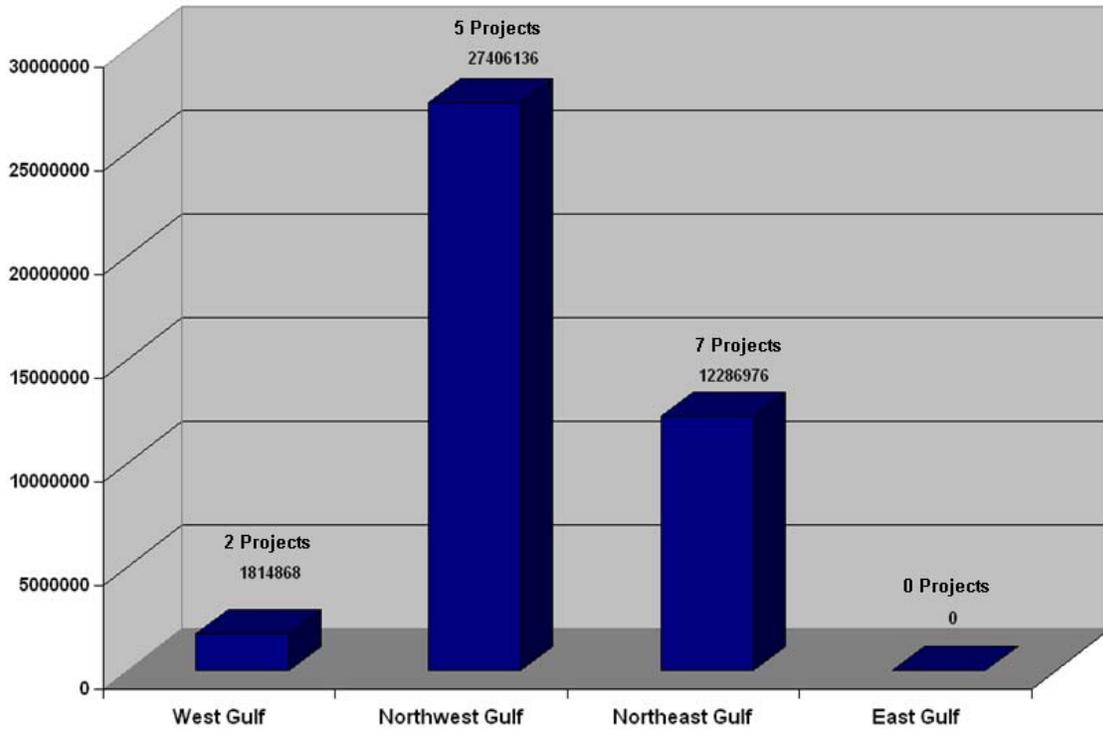
APPENDIX I

Catch per Unit Effort Comparisons for Sea Turtle Dredge Takes and Capture Trawl Relocations by Subregion and USACE District (FY09 Gulf of Mexico Hopper Dredging)

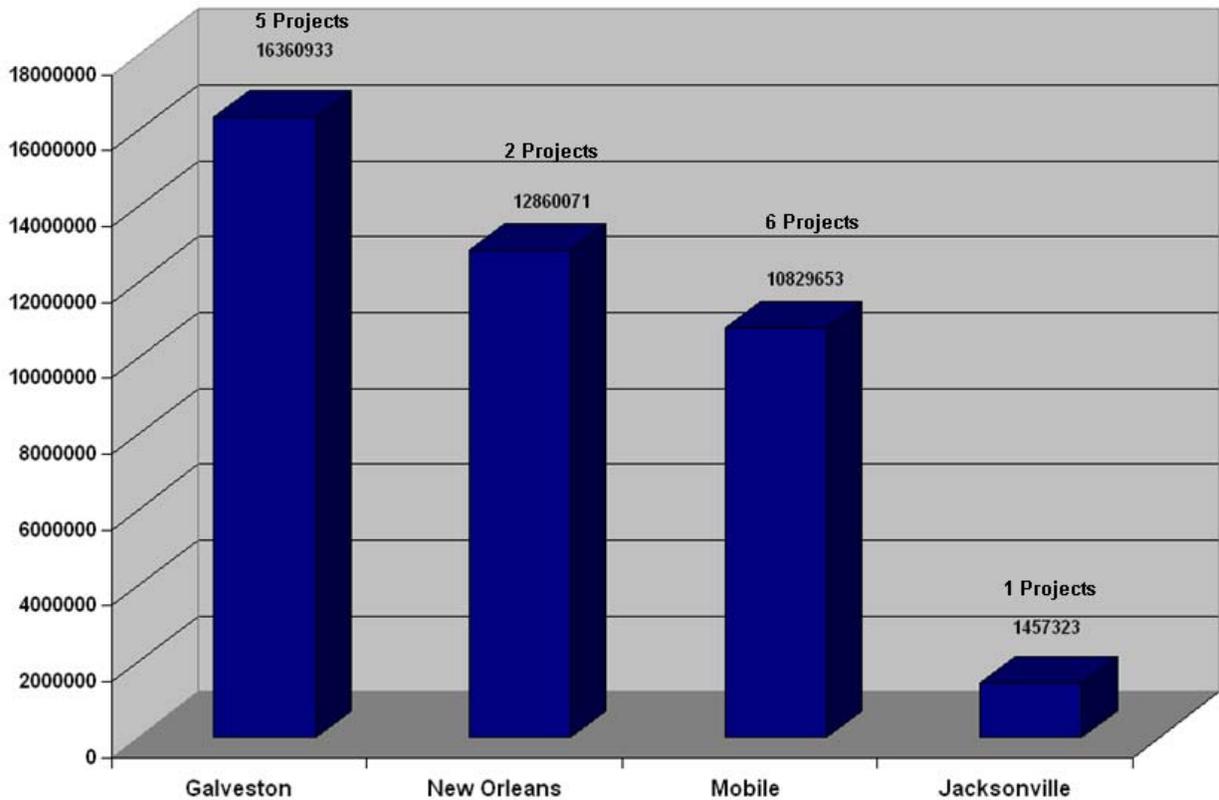


APPENDIX J

Distribution of Dredged Material Quantities (Cubic Yards) by Geographic Subregion and USACE Districts



Subregions



Districts

APPENDIX K
Distribution of Sea Turtle Takes by Month
(FY09 Gulf of Mexico Hopper Dredging)

PROJECT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Brazos Island Harbor											4	
Freeport Harbor										2	1	
!Galveston Jetty, Entrance, and Harbor Channel									1			
Houston Ship Channel												
Sabine-Neches Waterway												
Calcasieu Bar Channel												
Calcasieu River Bar Channel									1			
!Mobile Harbor & Bay Channel												
!Mobile Harbor & Bar Channel												
Mobile Harbor & Bar Channel											1	
Pascagoula Harbor – Horn Island												
!Pascagoula Harbor & Bar Channel												
Gulfport Harbor and Bar Channel							1		2			
!St. Joseph Peninsula												
TOTAL LOGGERHEAD TAKES	0	0	0	0	0	0	1	0	2	1	2	0
TOTAL GREEN TURTLE TAKES	0	1	3	0								
TOTAL KEMP'S RIDLEY	0	2	0	1	0							
TOTAL TURTLE TAKES BY MONTH	0	0	0	0	0	0	1	0	4	2	6	0
TOTAL PROJECTS BY MONTH	2	2	3	2	3	3	3	3	6	3	5	3
Cc = Loggerhead (<i>Caretta caretta</i>); Cm = Green turtle (<i>Chelonia mydas</i>); Lk = Kemp's ridley (<i>Lepidochelys kemp</i>) Shaded areas = project occurrence (projects under 5 days in one month not included) ! Projects carried over two FY's.												

APPENDIX L
Distribution of Project Dredge Days by Month
(FY09 Gulf of Mexico Hopper Dredging)

PROJECT	DREDGE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Brazos Island Harbor	<i>B.E. Lindholm</i>											15	
Freeport Harbor	<i>Glenn Edwards</i>										11	30	
Galveston Jetty, Entrance, and Harbor Channel	<i>Glenn Edwards/Bayport</i>	31/0	28/0				28/0			16/30			29/0
Houston Ship Channel	<i>Liberty Island</i>			26									
Sabine-Neches Waterway	<i>Liberty Island</i>							23	31	14			
Calcasieu Bar Channel	<i>Newport</i>		28	31	30	7							
Calcasieu River Bar Channel	<i>Wheeler</i>									12			
Mobile Harbor & Bay Channel	<i>Glenn Edwards/Columbia</i>			28/8	30/30	26/14	0/23	0/15	14/25	13/0			
Mobile Harbor & Bar Channel	<i>Newport</i>									16			
Mobile Harbor & Bar Channel	<i>New Port</i>	27										11	27
Pascagoula Harbor – Horn Island	<i>Glenn Edwards/Newport</i>										9/24	0/9	
Pascagoula Harbor & Bar Channel	<i>McFarland</i>					17							
Gulfport Harbor and Bar Channel	<i>Padre Island/Liberty Island</i>						16/0	31/0	16/0	0/12			
St. Joseph Peninsula	<i>Bayport</i>										31	30	31
TOTAL DAYS DREDGED BY MONTH		58	56	93	90	64	67	69	86	113	75	95	87
TOTAL TURTLE TAKES BY MONTH		0	0	0	0	0	0	1	0	4	2	6	0
TURTLES TAKES PER DREDGE DAY BY MONTH		0	0	0	0	0	0	0.0145	0	0.0354	0.0267	0.0632	0
Shaded areas = Project occurrence (projects under 5 days in one month not included)													
! Projects carried over two FY's.													

APPENDIX M
Non-Sea Turtle Species Incidental Takes or Noted Occurrences
(FY09 Gulf of Mexico Hopper Dredging)

Species	Project	Observations/Remarks
Gulf Sturgeon	N/A	N/A
Whales/Manatees	N/A	N/A
Bottlenose Dolphin	Brazo Island Houston Ship Channel Sabine Neches Waterway Calcasieu (Spring) Calcasieu (Summer) St. Joseph Peninsula (Oct1-Jan3) Mobile Harbor & Bay Channel Mobile Harbor & Bar Channel Pascagoula Harbor-Horn Island	Many sightings of pairs and pods of dolphin each day Many sightings of pairs and pods of dolphin each day Many sightings of pairs and pods of dolphin each day Few sightings almost every other day Many sightings of pairs and pods of dolphin each day Few sightings mentioned during project Many sightings of pairs and pods of dolphin each day Many sightings of pairs and pods of dolphin each day Few sightings mentioned during project
Shark	Brazo Island Sabine Neches Waterway St. Joseph (Oct1-Jan3)	1 Juvenile shark, 1 Bonnethead 1 Black Tip shark 2 Dogfish, 1 listed as just shark
Horseshoe Crab	Houston Ship Channel St. Joseph Peninsula (Oct1-Jan3) Mobile Harbor & Bay Channel Mobile Harbor & Bar Channel Pascagoula Harbor-Horn Island	3 horseshoe crab 49 horseshoe crab 9 horseshoe crab Only 1 mention of horseshoe crabs ~10+ listings of horseshoe crab
N/A = No known occurrences observed No daily reports or load sheets received for Mobile Harbor & Bar Channel (Sept), Pascagoula Harbor & Bar Channel and Gulfport Harbor and Bar Channel.		