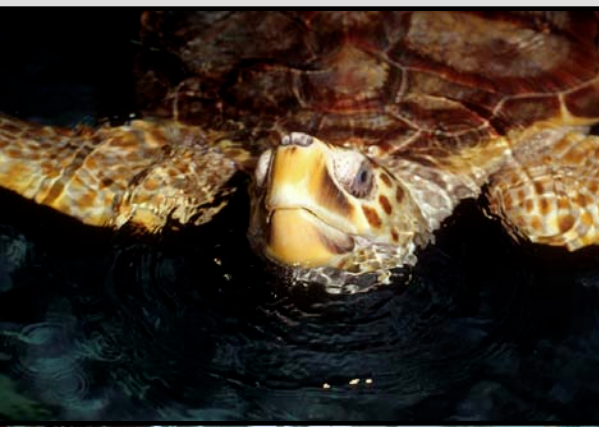


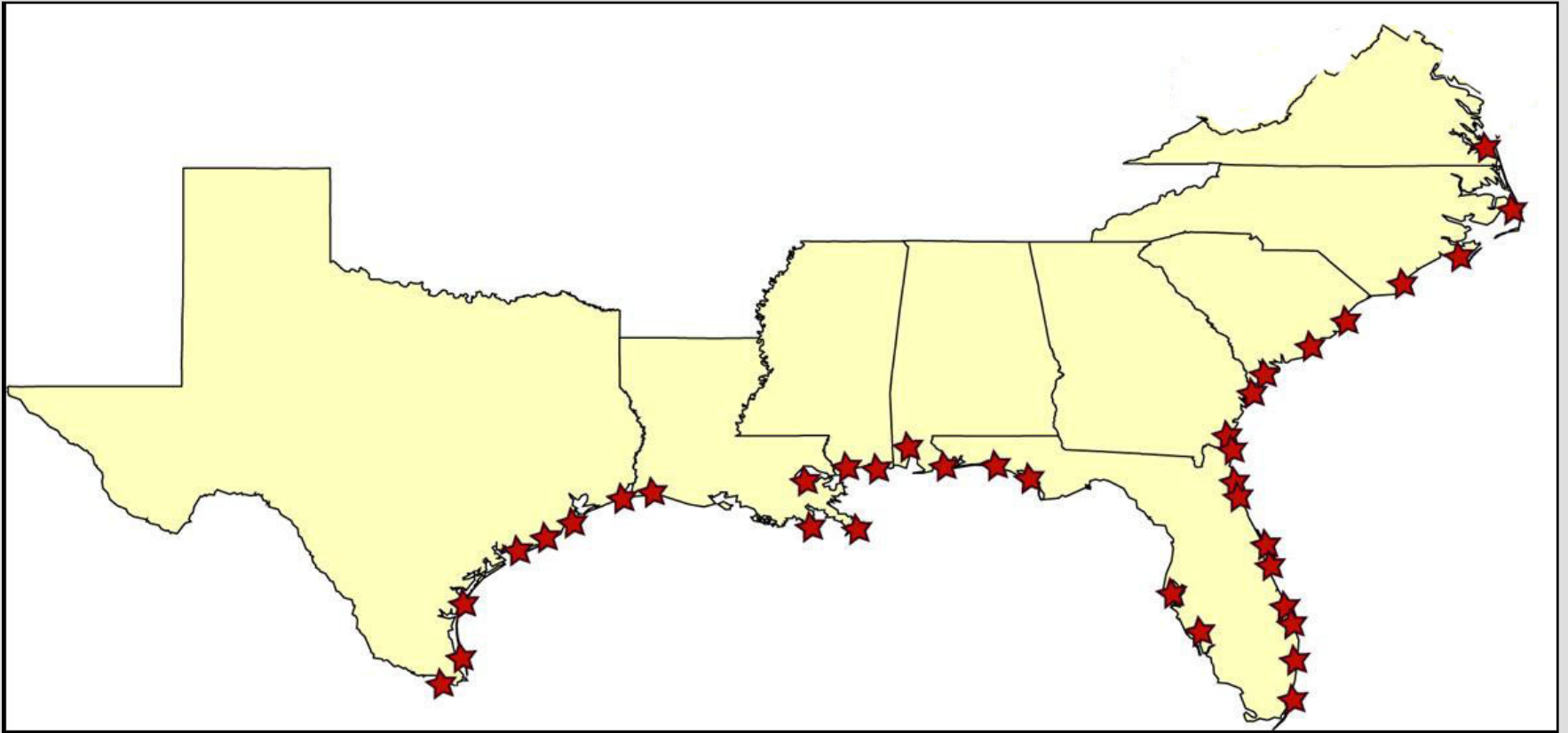
Dredging and Threatened/Endangered Species in the Southeastern US



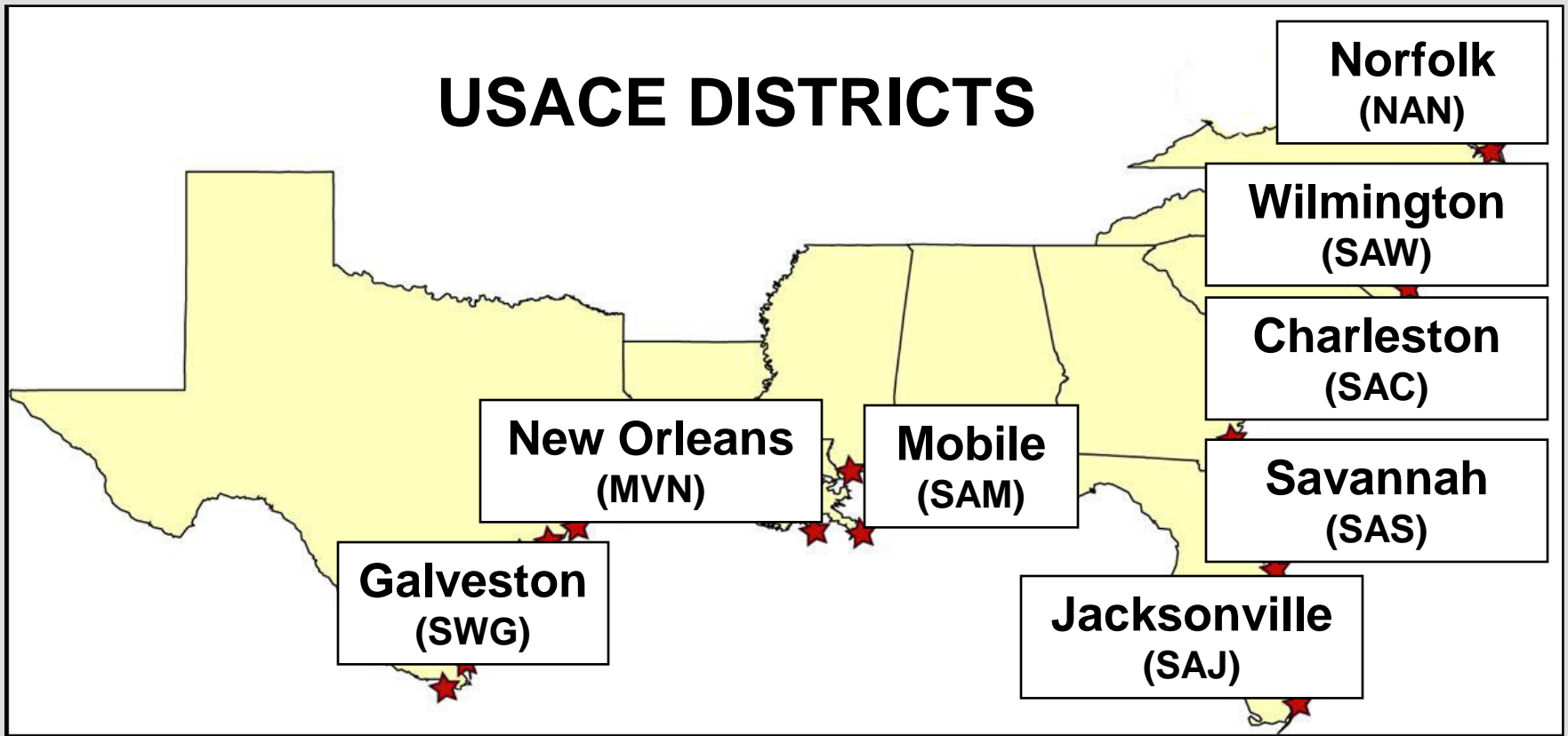
DENA DICKERSON
ERDC, Environmental Lab
U.S. Army Corps of Engineers
Vicksburg, Mississippi



Southeastern US



Southeastern US



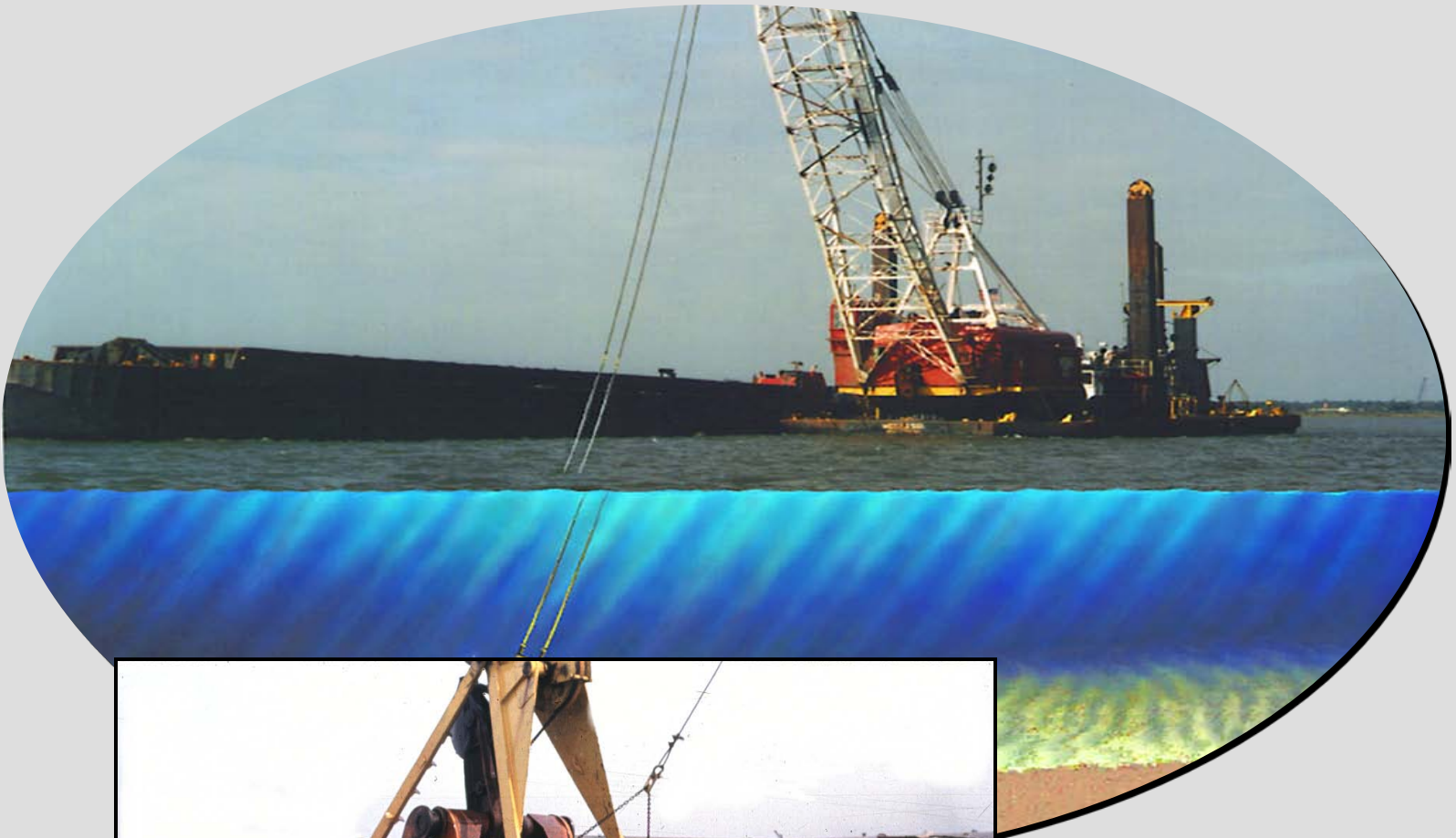
DREDGING ACTIVITIES

IN WATER

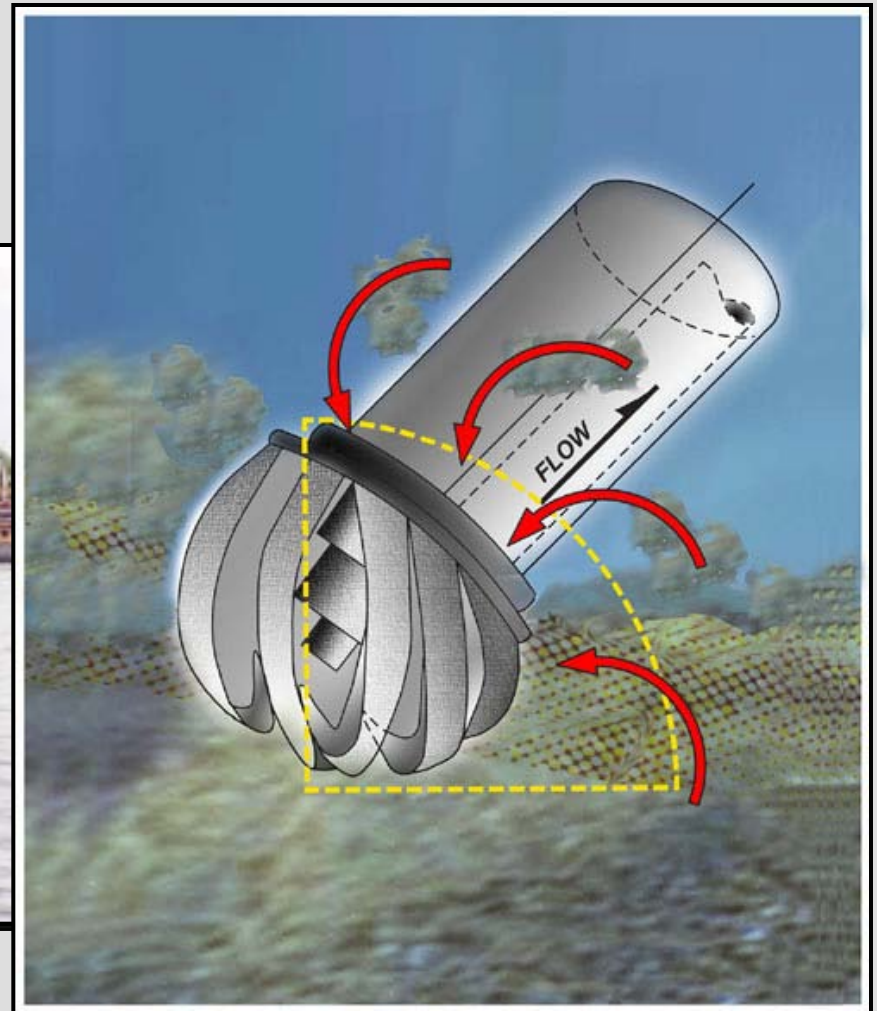


ON SHORE

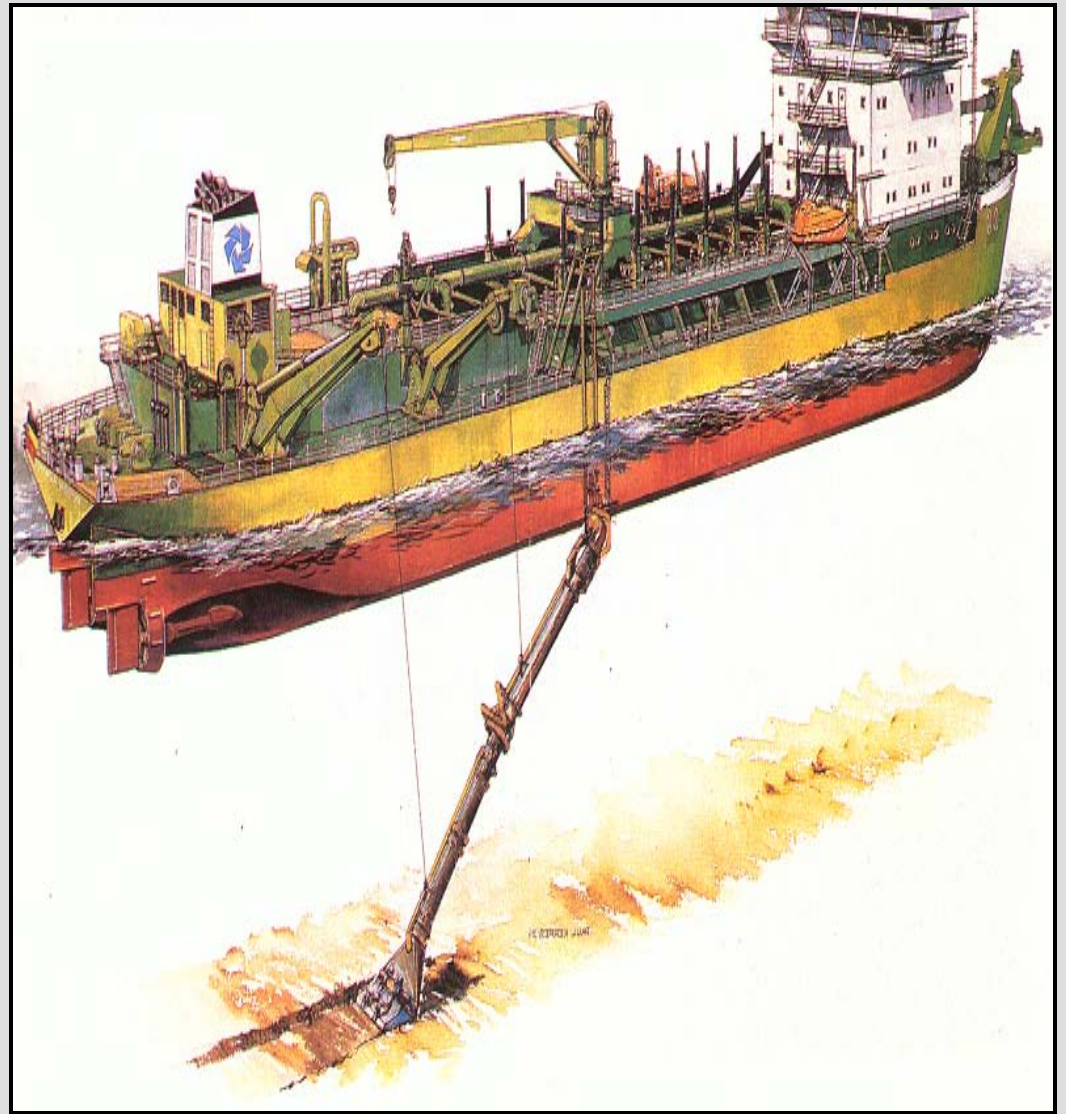




**Bucket or
Clamshell**



Cutterhead



Hopper Trailing Suction

26 Federal TE Species Potentially Impacted during Dredging Projects in the Southeastern US

- **Beach jacquemontia (E)**
- **Seabeach amaranth (T)**
- **Stag horn coral (T)**
- **Elkhorn coral (T)**
- **Piping plover (T)**
- **Alabama red-bellied turtle (E)**
- **Kemp's ridley sea turtle (E)**
- **Hawksbill sea turtle (E)**
- **Leatherback sea turtle (E)**
- **Green sea turtle (E/T)**
- **Loggerhead sea turtle (T)**
- **Olive ridley sea turtle (T)**

- **Anastasia Island beach mouse (E)**
- **Southeastern beach mouse (T)**
- **West Indian manatee (E)**
- **North Atlantic right whale (E)**
- **Humpback whale (E)**
- **Blue whale (E)**
- **Fin whale (E)**
- **Sei whale (E)**
- **Sperm whale (E)**
- **Shortnose sturgeon (E)**
- **Atlantic sturgeon (Pending)**
- **Gulf sturgeon (T)**
- **Pallid sturgeon (E)**
- **Smalltooth sawfish (E)**

26 Federal TE Species Potentially Impacted during Dredging Projects in the Southeastern US

Limited Distribution (7)

- Beach jacquemontia (E)
- Seabeach amaranth (T)
- Stag horn coral (T)
- Elkhorn coral (T)
- Piping plover (T)
- Alabama red-bellied turtle (E)
- Kemp's ridley sea turtle (E)
- Hawksbill sea turtle (E)
- Leatherback sea turtle (E)
- Green sea turtle (E/T)
- Loggerhead sea turtle (T)
- Olive ridley sea turtle (T)

- Anastasia Island beach mouse (E)
- Southeastern beach mouse (T)
- West Indian manatee (E)
- North Atlantic right whale (E)
- Humpback whale (E)
- Blue whale (E)
- Fin whale (E)
- Sei whale (E)
- Sperm whale (E)
- Shortnose sturgeon (E)
- Atlantic sturgeon (Pending)
- Gulf sturgeon (T)
- Pallid sturgeon (E)
- Smalltooth sawfish (E)

Beach Plants

Federal T/E Species	SAJ	SAC	SAW
Beach Jacquemontia (E)	X		
Seabeach Amaranth (T)		X	X

Beach Jacquemontia



Photo: George K. Rogers
www.plantbook.org

Seabeach Amaranth



Photo by Bill Adams

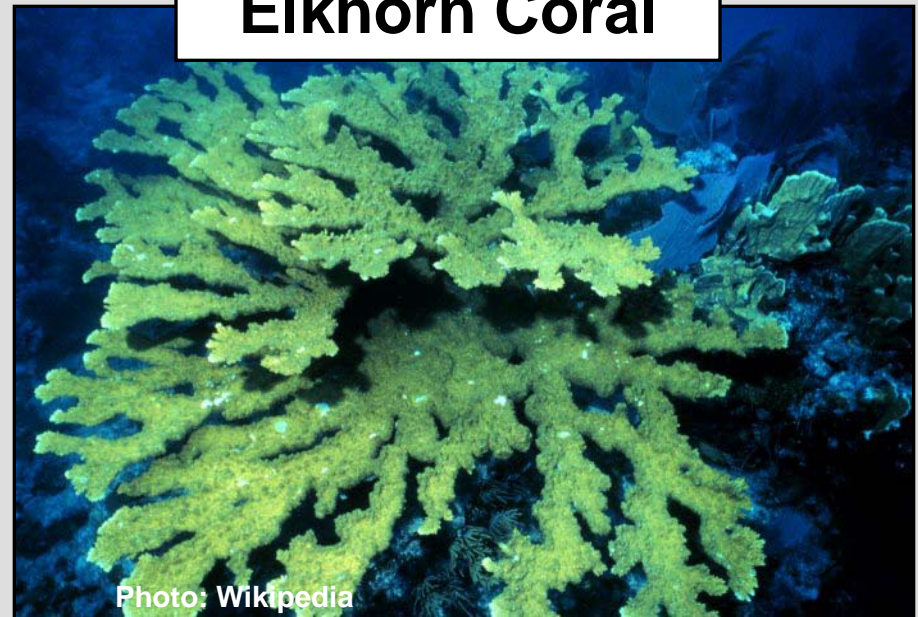
Corals

Federal T/E Species	SAJ
Staghorn Coral (<i>Acropora cervicornis</i>) (T)	X
Elkhorn Coral (<i>Acropora palmata</i>) (T)	X

Staghorn Coral



Elkhorn Coral



Beach Mammals

Federal T/E Species	SAJ
Anastasia Island Beach Mouse (E)	X
Southeastern Beach Mouse (T)	X

Anastasia Isl. Beach Mouse



Southeastern Beach Mouse



Freshwater Turtle

Federal T/E Species	SAM
Alabama Red-Bellied Turtle (E)	X

Alabama Red-Bellied Turtle



Photo: Bill Summerour

26 Federal TE Species Potentially Impacted during Dredging Projects in the Southeastern US

Widespread Distribution (19)

- Beach jacquemontia (E)
- Seabeach amaranth (T)
- Stag horn coral (T)
- Elkhorn coral (T)
- Piping plover (T)
- Alabama red-bellied turtle (E)
- Kemp's ridley sea turtle (E)
- Hawksbill sea turtle (E)
- Leatherback sea turtle (E)
- Green sea turtle (E/T)
- Loggerhead sea turtle (T)
- Olive ridley sea turtle (T)

- Anastasia Island beach mouse (E)
- Southeastern beach mouse (T)
- West Indian manatee (E)
- North Atlantic right whale (E)
- Humpback whale (E)
- Blue whale (E)
- Fin whale (E)
- Sei whale (E)
- Sperm whale (E)
- Shortnose sturgeon (E)
- Atlantic sturgeon (Pending)
- Gulf sturgeon (T)
- Pallid sturgeon (E)
- Smalltooth sawfish (E)

Piping Plover

Federal T/E Species	SWG	MVN	SAM	SAJ	SAS	SAC	SAW	NAN
Piping Plover (T)	X	X	X	X	X	X	X	X



Piping Plover



Photo: USFWS

Smalltooth sawfish

Federal T/E Species	SWG	MVN	SAM	SAJ	SAS	SAC	SAW	NAN
Smalltooth Sawfish (E)	(x)	(x)	(x)	X	(x)	(x)	(x)	(x)



Marine Mammals

Federal T/E Species	SWG	MVN	SAM	SAJ	SAS	SAC	SAW	NAN
West Indian Manatee (E)	(x)	(x)	X	X	X	(x)	(x)	(x)

West Indian Manatee



Nearshore Whales

Federal T/E Species	SWG	MVN	SAM	SAJ	SAS	SAC	SAW	NAN
North Atlantic Right Whale (E)				X	X	X	X	X
Humpback Whale (E)	(x)	(x)	(x)	X	X	X	X	X

North Atlantic Right Whale



Photo: Chris Slay

Humpback whale

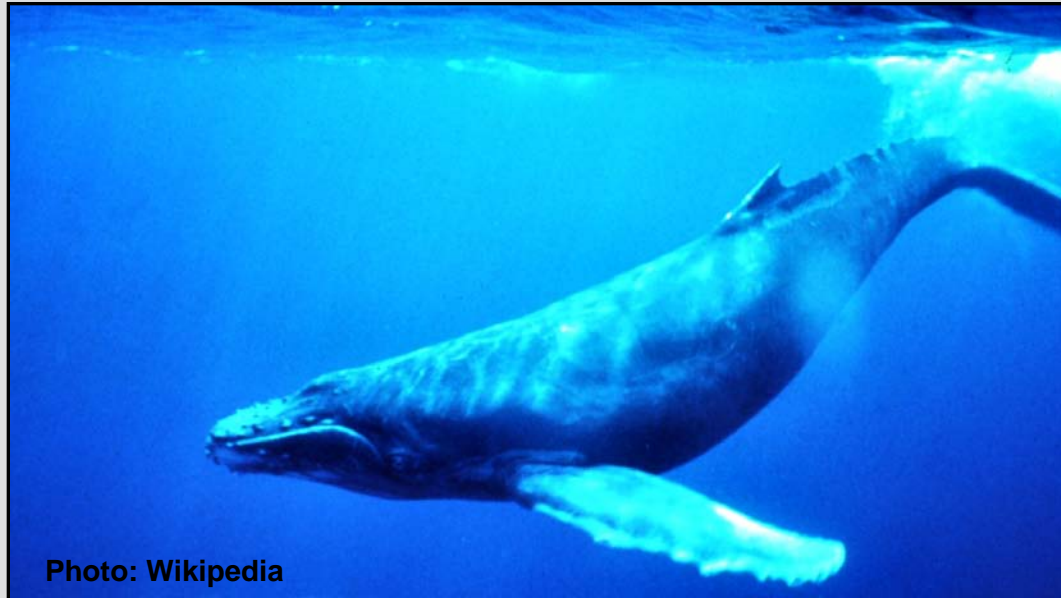


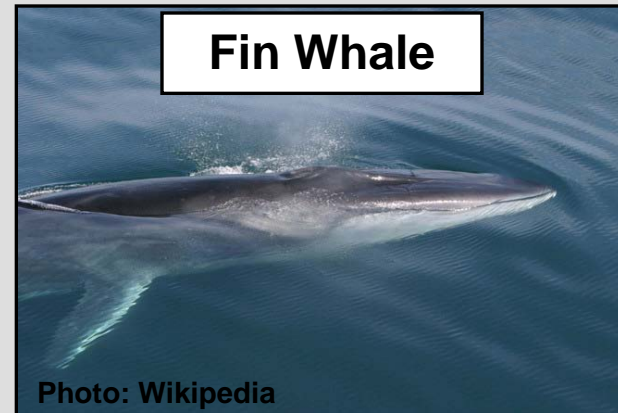
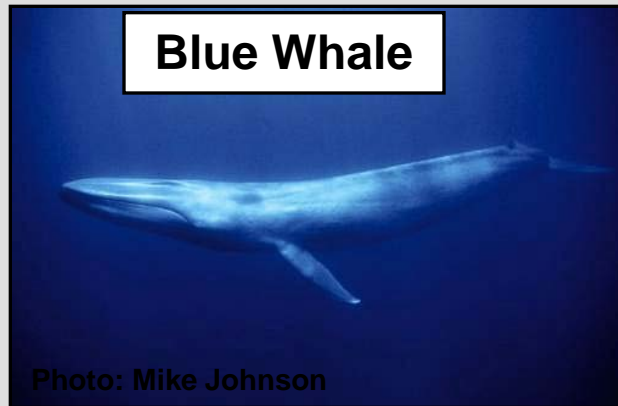
Photo: Wikipedia

Nearshore Whales



Offshore Whales

Federal T/E Species	SWG	MVN	SAM	SAJ	SAS	SAC	SAW	NAN
Blue Whale (E)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)
Fin Whale (E)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)
Sei Whale (E)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)
Sperm Whale (E)	(x)	(x)	(x)	(x)	(x)	(x)	(x)	(x)



Sturgeon

Federal T/E Species	MVN	SAM	SAJ	SAS	SAC	SAW	NAN
Shortnose Sturgeon (E)			(x)	X	X	X	X
Atlantic Sturgeon (Federal Listing Pending)			(x)	X	X	X	X
Gulf Sturgeon (T)	X	X	X				
Pallid Sturgeon (E)	X						

Atlantic and Gulf Coast Sturgeon

Shortnose Sturgeon

(Acipenser brevirostrum)

Atlantic Sturgeon (Federal Listing Pending)

(Acipenser o. oxyrinchus)



Photo NMFS






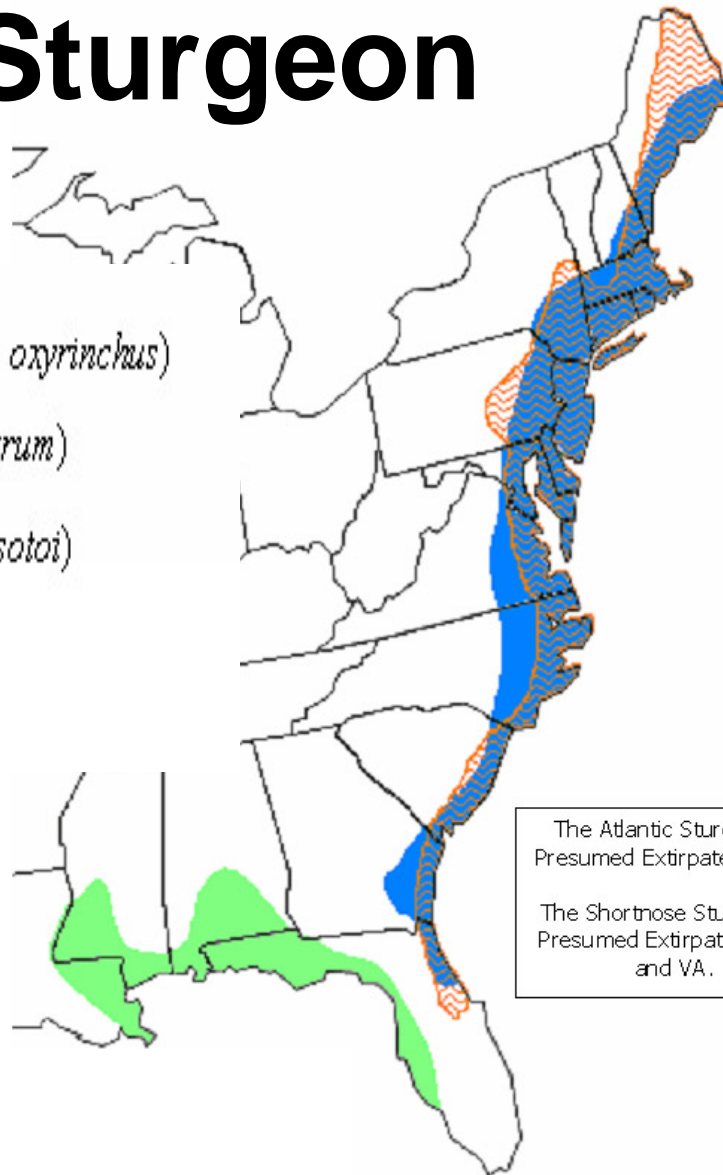
Photo "Fishes of Alabama and the Mobile Basin"

Gulf Sturgeon

(Acipenser oxyrinchus desotoi)

Atlantic & Gulf Coast Sturgeon

-  Atlantic (*Acipenser oxyrinchus oxyrinchus*)
-  Shortnose (*Acipenser brevirostrum*)
-  Gulf (*Acipenser oxyrinchus desotoi*)



The Atlantic Sturgeon is Presumed Extirpated in DC.

The Shortnose Sturgeon is Presumed Extirpated in DC and VA.

Inland Sturgeon

(Rare or Uncommon)



Pallid Sturgeon

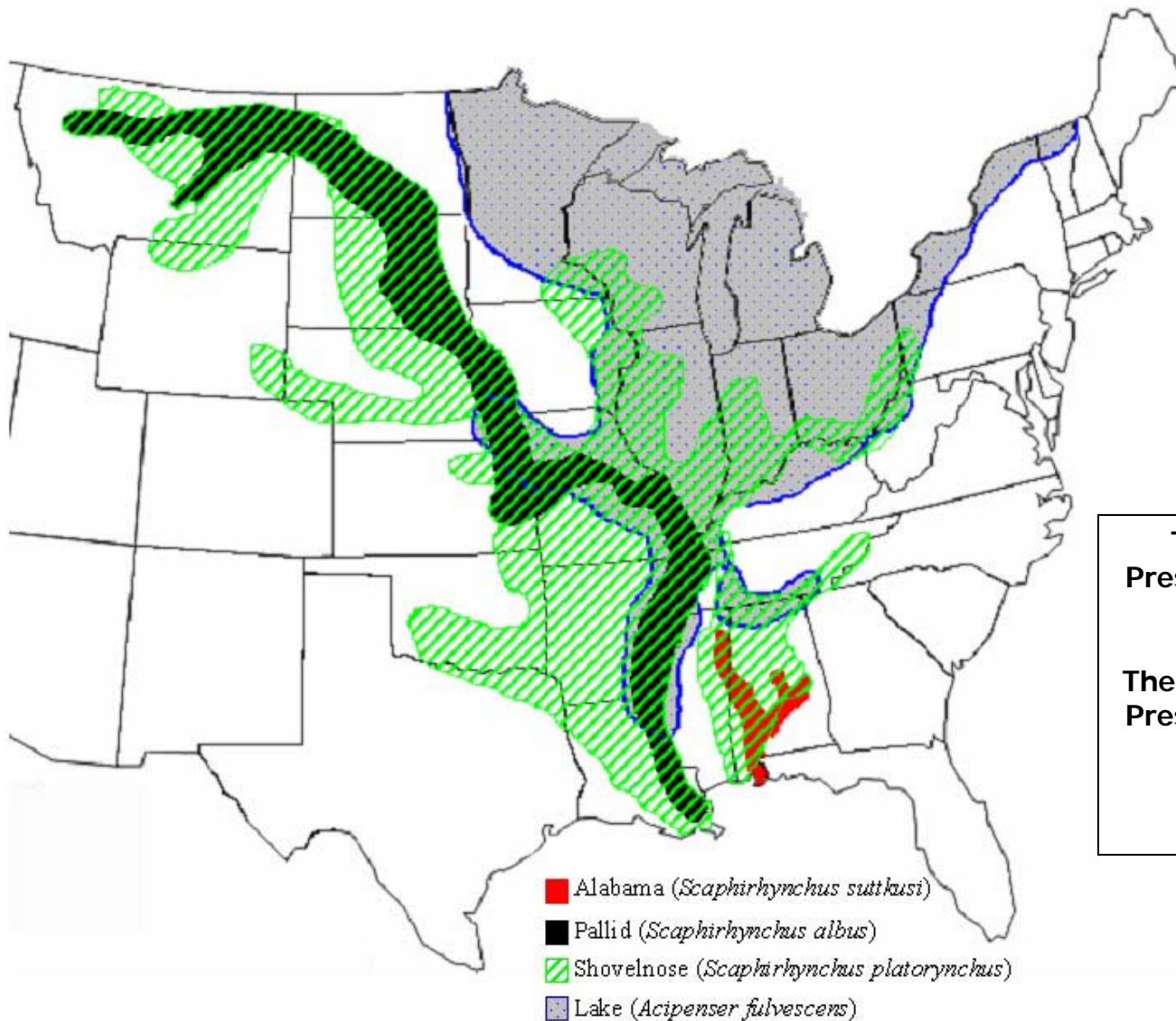
(*Scaphirhynchus albus*)



Alabama Sturgeon

(*Scaphirhynchus suttkusi*)

Inland Sturgeon



The Lake Sturgeon is Presumed Extirpated in AL, LA, MS, NC, ND, WV.

The Shovelnose Sturgeon is Presumed Extirpated in AL, NM, OH, PA, WV.

Dredging Impacts to Sturgeon

From NMFS Biological Opinions

- **Entrain adults, juveniles, larvae, eggs**
- **Bury sturgeon, eggs, habitat**
- **Disrupt migration**
- **Disturb spawning, foraging, refuge areas**
- **Destroy benthic food resources**
- **Release contaminated toxins**

Take Incidental Take



Art by J Hoover

Sea Turtles

Federal T/E Species	SWG	MVN	SAM	SAJ	SAS	SAC	SAW	NAN
Kemp's Ridley Sea Turtle (E)	X	X	X	X	X	X	X	X
Loggerhead Sea Turtle (T)	X	X	X	X	X	X	X	X
Green Sea Turtle (E/T)	X	X	X	X	X	X	X	X
Leatherback Sea Turtle (E)	X	X	X	X	X	X	X	X
Hawksbill Sea Turtle (E)	X	X	X	X	X	(x)	(x)	(x)
Olive Ridley Sea Turtle (T)				X				

Southeastern US Sea Turtles



Kemp's ridley



Loggerhead



Green



Leatherback

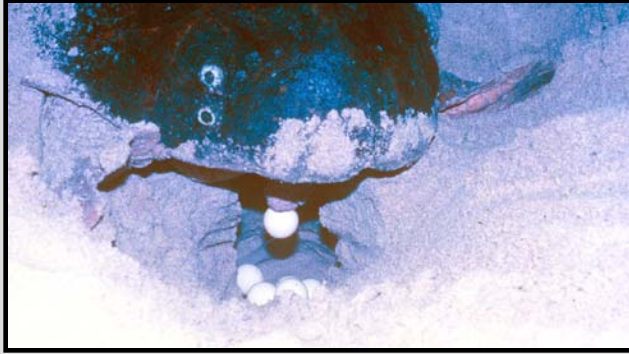


Hawksbill



Olive ridley

Dredging Impacts to Sea Turtles



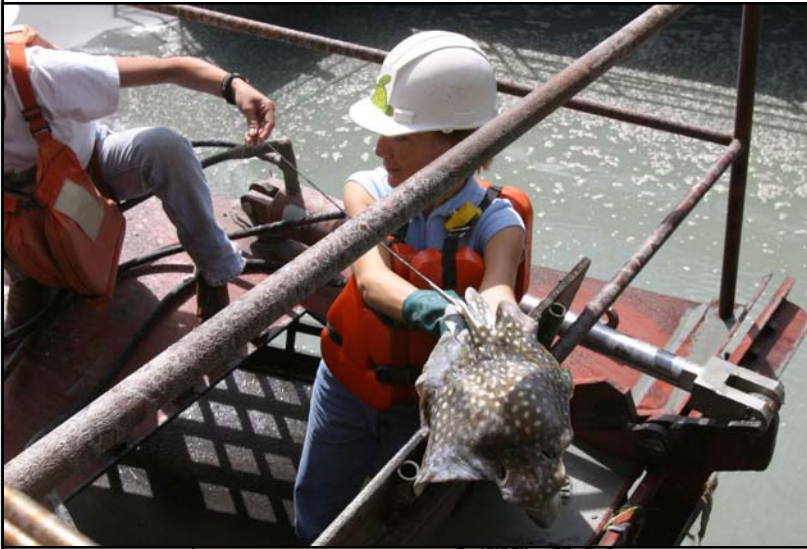
On Shore Impacts



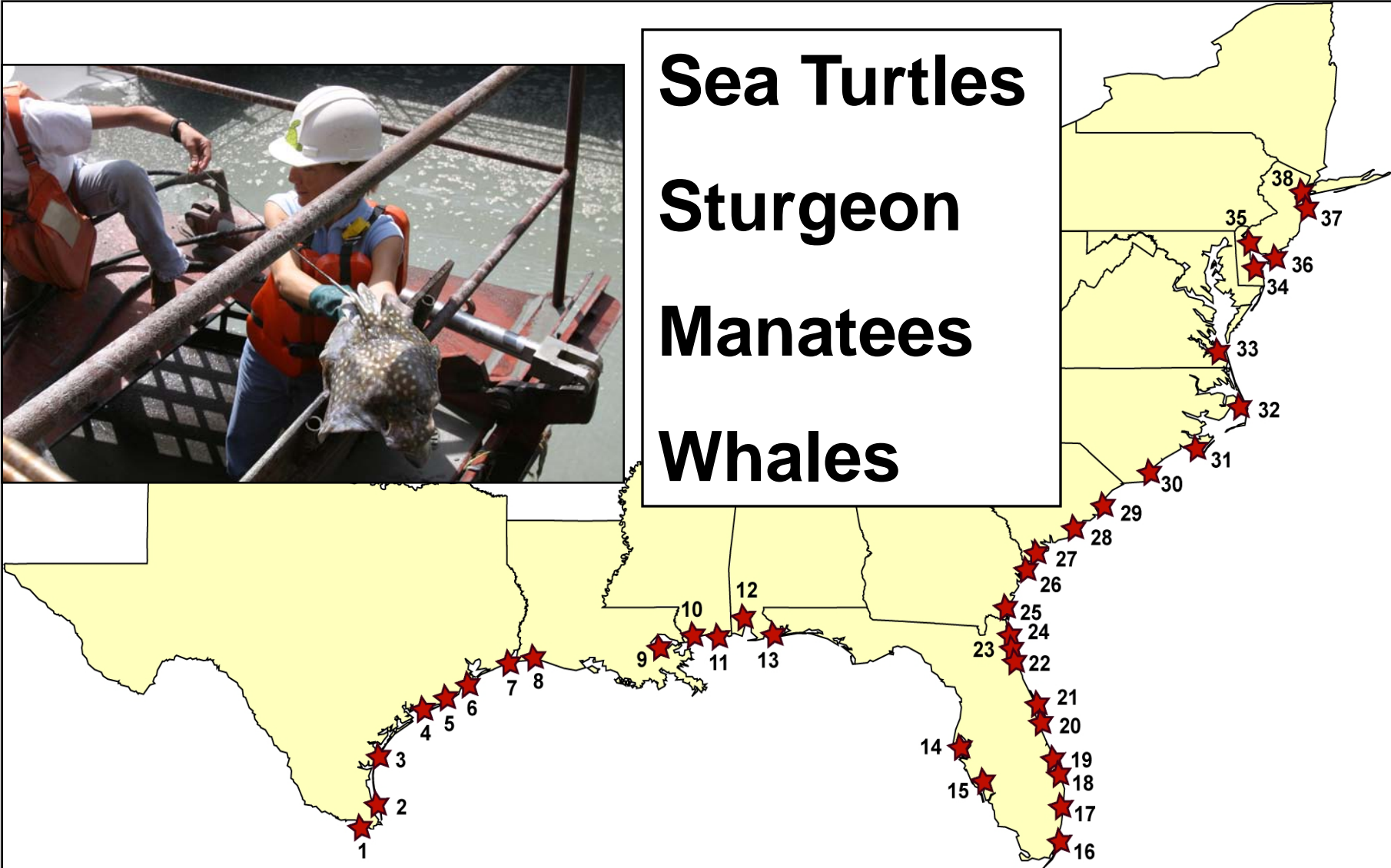
In Water Impacts

- **Entrain adults, subadults, juveniles**
- **Disrupt nesting activities**
- **Destroy nests and nesting habitat**

Dredge Observer Program



Sea Turtles
Sturgeon
Manatees
Whales



77+ sites monitored

Documented Takes by Dredges



693

Sea Turtles

1980-2011

(31.5 years)



34

Sturgeon

1990-2011

(21.5 years)



34 Documented Sturgeon Takes by Dredges (1990-2011)

3 Sturgeon Species

11

Shortnose



21

Atlantic



2

Gulf



693 Documented Sea Turtles Takes by Dredges (1980-2011)

3 Sea Turtle Species (61 Unknown)

467

Loggerhead



84

Green



74

Kemp's ridley



FY10 Sea Turtle Dredge Takes

Atlantic (NC - FL)	Loggerheads		Kemp's		Greens		Hawksbill		Total
Allotted	35		7		7		2		51
FY10	1		1		4		0		6
Remained	34		6		3		2		45
US Gulf	CW	R	CW	R	CW	R	CW	R	
Allotted	32	8	16	4	11	3	3	1	78
FY10	1	3	3	0	1	0	0	0	8
Remained	31	5	13	4	10	3	3	1	70
CW=Civil Works; R=Regulatory									Total FY10 Takes
									14

**Methods used to minimize
dredging impacts on T/E
species include.....**