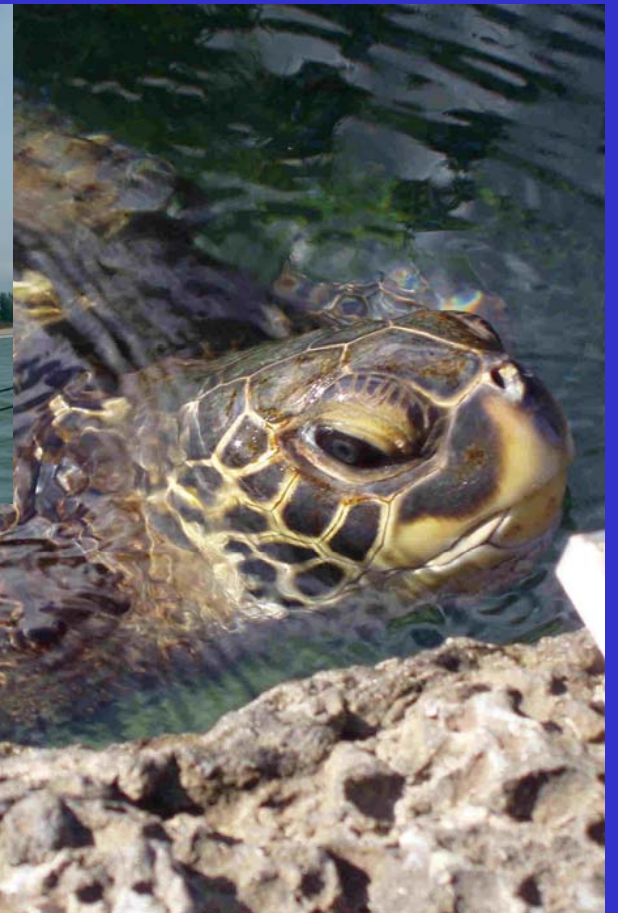


# An Update on Dredging Impacts on Sea Turtles in the Southeastern USA

A Historical Review of Protection and An Introduction to the USACE Sea Turtle Data Warehouse



**D. Dickerson**

U.S. Army Corps of Engineers

**D. Pommer**

U.S. Army Corps of Engineers

# **Dredging Impacts on Sea Turtles in the Southeastern USA**

- **Background**
  - Southeastern USA
  - Sea Turtles
  - Endangered Species Act
- **Effects of Dredging on Sea Turtles**
- **Protection Methods for Various Types of Dredging**
- **Lessons Learned**
- **US Army Corps of Engineers Sea Turtle Data Warehouse**



# Sea Turtle Protection Status



- **Loggerhead – Threatened**



- **Green – Endangered & Threatened**



- **Kemp's Ridley - Endangered**



- **Hawksbill – Endangered**



- **Leatherback - Endangered**

# Endangered Species Act of 1973

## Purpose:

“... to provide a means whereby the ecosystems upon which endangered and threatened species depend may be conserved...”

“... that all Federal departments and agencies shall seek to conserve endangered and threatened species...”

# Endangered Species Act of 1973

**Enforcement** (National Marine Fisheries Service)



**Federal Project** (Channel Dredging)



**Potential Adverse Impact** (Sea Turtles)



**Management Alternatives**



**Incidental Take Limit**



**Monitoring of Incidental Take**

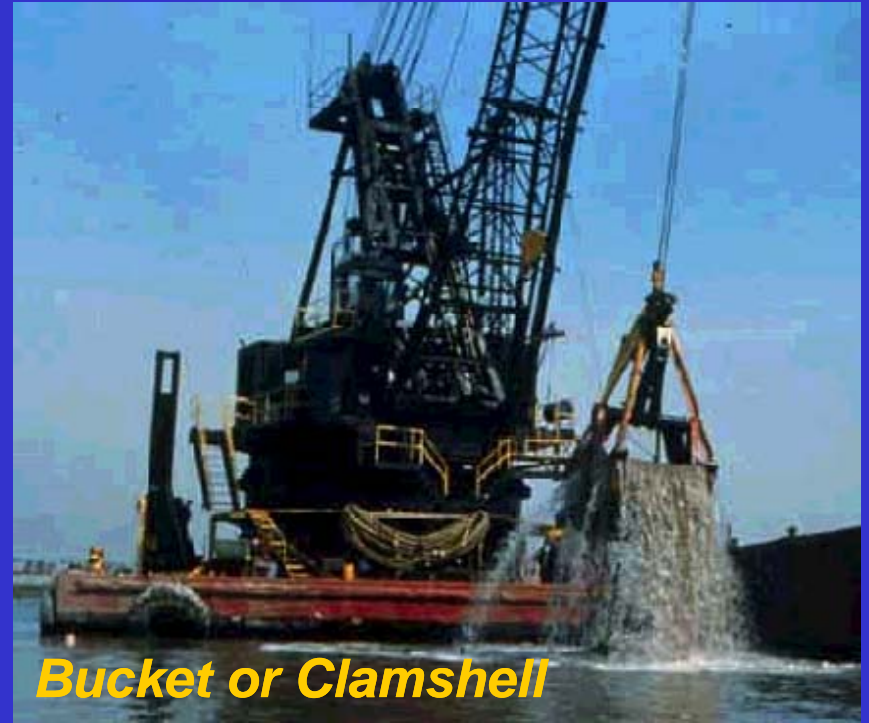
# Current Protection Methods

- Dredge type
- Environmental Windows
- Draghead Type
- Deflectors for Draghead
- Relocation of Turtles





*Cutterhead*



*Bucket or Clamshell*

# Conventional Dredges

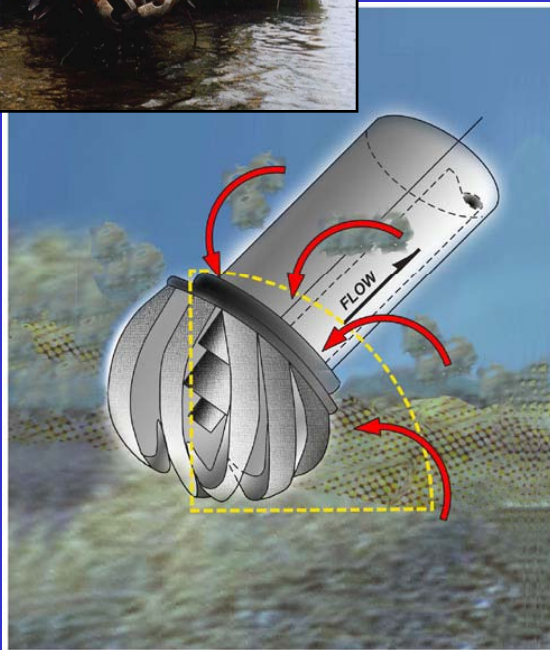
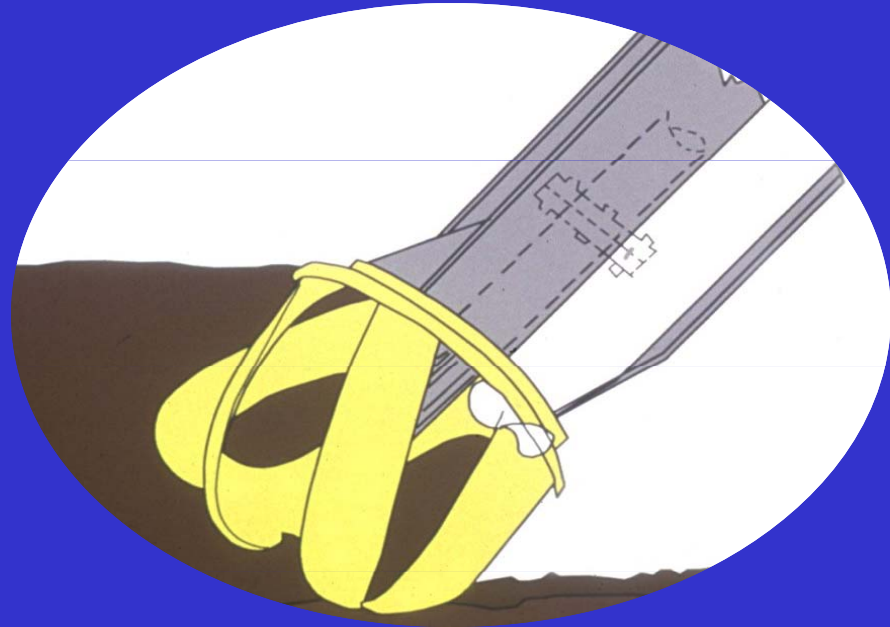
Coastal U.S. Projects



*Hopper Trailing Suction*



# Cutterhead



# Bucket or Clamshell

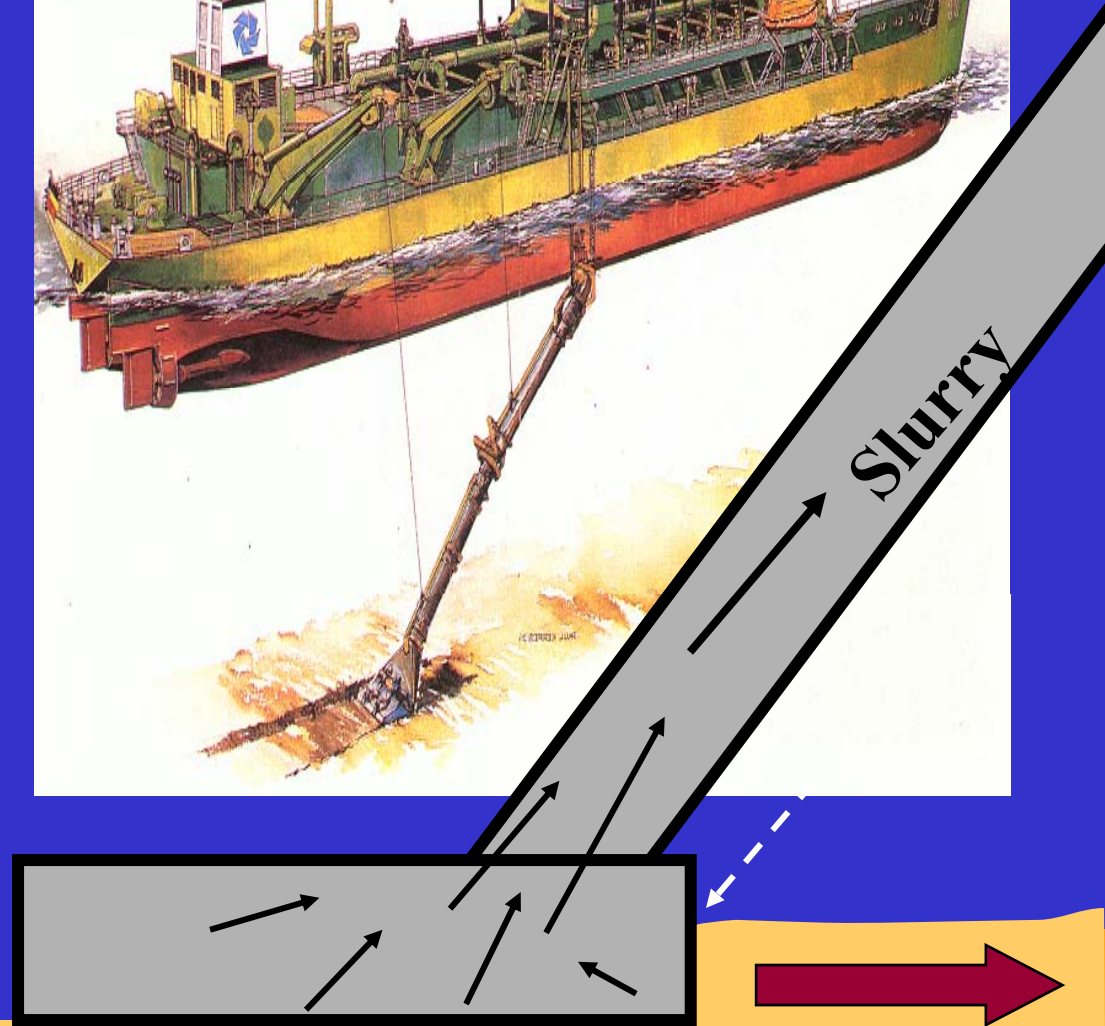
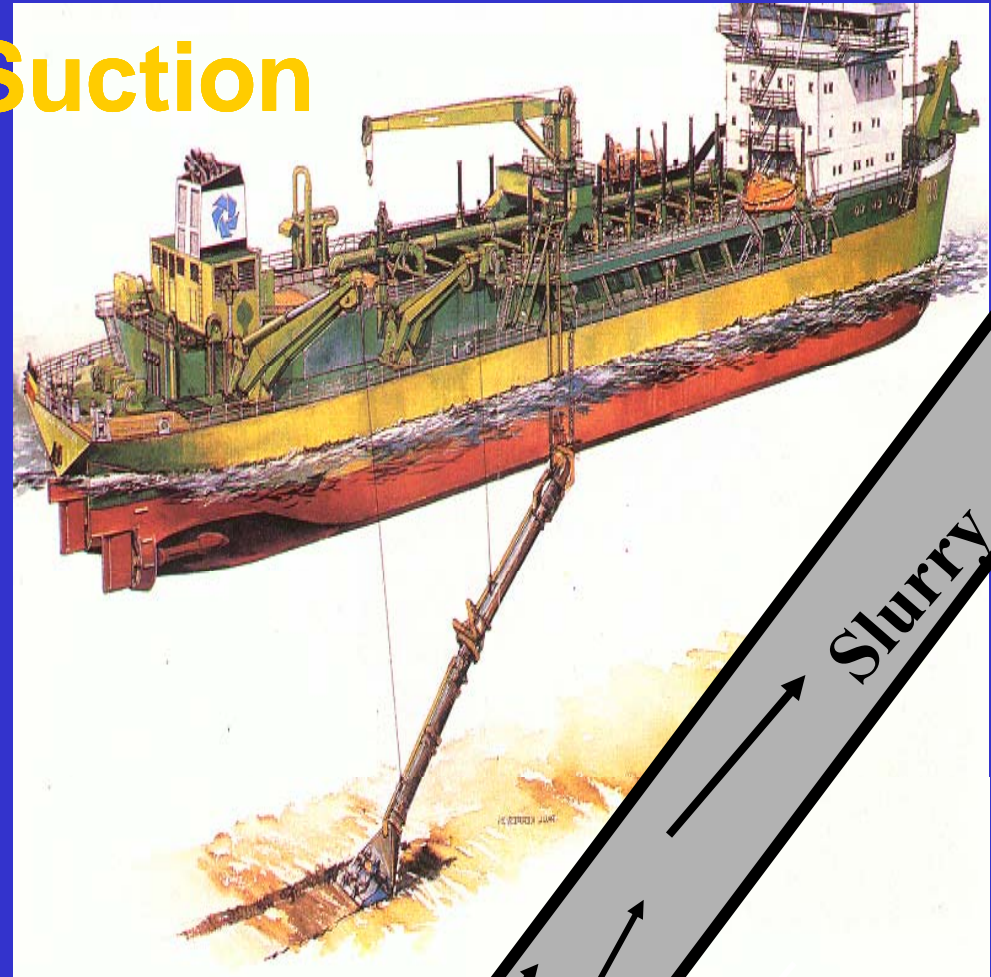




# Hopper Trailing Suction



# Hopper Trailing Suction



**Direction of Dragarm  
Movement**



# Incidental Takes



*Only Hopper Trailing Suction*

# Historical Review



- **Monitoring for incidental takes**
- **Research studies**
- **Protection methods**
- **Effectiveness of protection methods**

# Lessons Learned

- **History of dredging impact issues regarding sea turtles is important**
- **Share data**
- **USACE Sea Turtle Data Warehouse**



# Protection Methods

## *Implemented 1992*

- Dredge type
- Dredging Window
- Draghead Turtle Deflector
- Turtle Trawling Relocation

# Protection Methods

*Dredge Type*



# Protection Methods

<b>DREDGING WINDOW</b> <i>South Atlantic Region</i>	
<b>Months</b>	<b>Requirement</b>
<b>JAN</b>	<b>Hopper Dredging</b>
<b>FEB</b>	
<b>MAR</b>	
<b>APR</b>	<b><u>No</u> Hopper Dredging</b>
<b>MAY</b>	
<b>JUN</b>	
<b>JUL</b>	
<b>AUG</b>	
<b>SEP</b>	
<b>OCT</b>	
<b>NOV</b>	
<b>DEC</b>	<b>Hopper Dredging</b>

# Protection Methods

## *Draghead Turtle Deflector*





# Protection Methods

## *Relocation Trawling*



# Monitoring for Incidental Takes

- Observers used since 1980
- Inconsistent requirements until mid-1990s
- Minimal screening up until 1992
- 65+ channels monitored





# Observer Program Objectives



- Document dredging impacts on threatened & endangered species
  - Record incidental takes
  - Collect supporting data



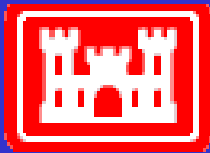
# Screening of Dredged Material



# Sea Turtle Research Program Cooperative Efforts & Studies

-  **USACE**
- **USACE Engineering Research & Development Center**
- **National Marine Fisheries Service**
- **Dredging Industry**
- **US Navy**
- **University of Florida**
- **University of Georgia**
- **Florida Atlantic University**
- **Virginia Institute of Marine Sciences**



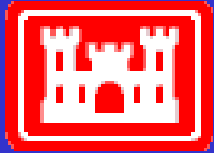


# *Sea Turtle Research Program*

## Cooperative Efforts & Studies

- **US Army Corps of Engineers (USACE)**
  - 1/3 Districts & 1/2 Divisions
- **USACE Engineering Research & Development Center**
- **National Marine Fisheries Service**
- **Dredging Industry**
- **US Navy**
- **University of Florida**
- **University of Georgia**
- **Florida Atlantic University**
- **Virginia Institute of Marine Sciences**





# *Sea Turtle Research Program*

## ➤ Biological Studies

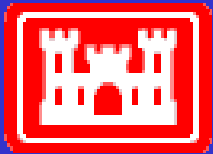
- Relative Abundance
- Behavioral Studies

## ➤ Engineering Studies

- Acoustic Detection
- Acoustic Dispersal
- Draghead Modifications







# Sea Turtle Research Program

## Biological Studies

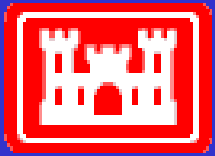


### Channel use?

- Who?
- When?
- Where?
- How many?

Relative  
Abundance





# *Sea Turtle Research Program*

## *Biological Studies*

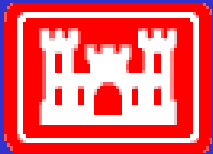


### *Channel Use?*

- *Spatial movement?*
- *Temporal movement?*

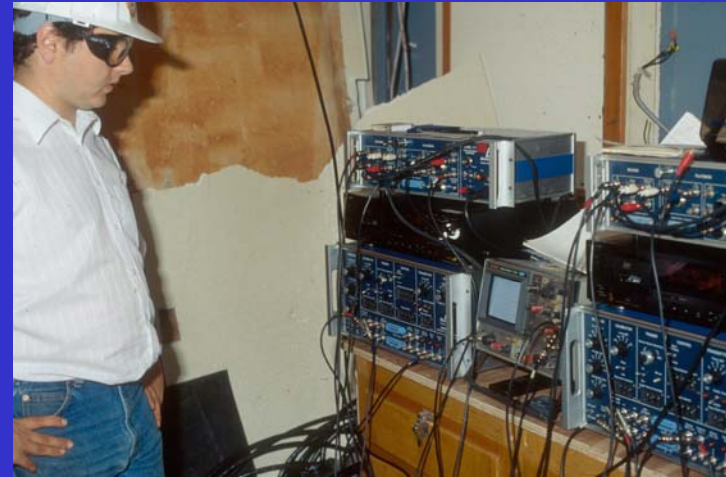


## *Behavioral Studies*



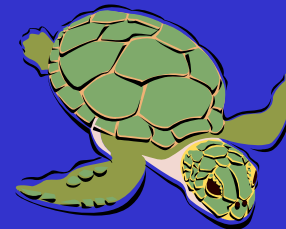
# Sea Turtle Research Program

## Engineering Studies



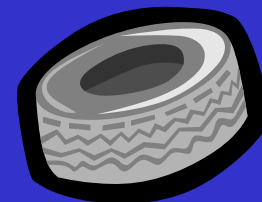
- *Locate sea turtles*
- *Survey sea turtles*
- *Practicality?*

**Acoustic Detection**



=

?





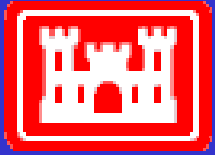


# *Sea Turtle Research Program*

## *Engineering Studies*

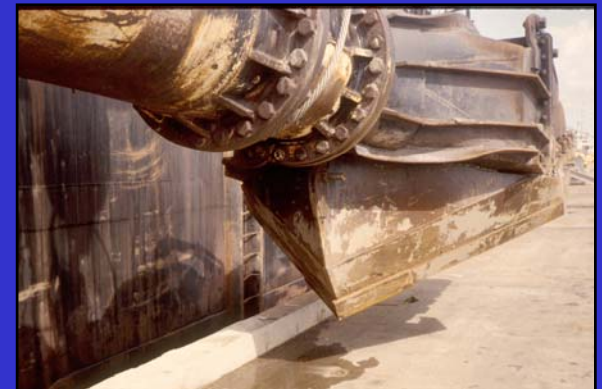
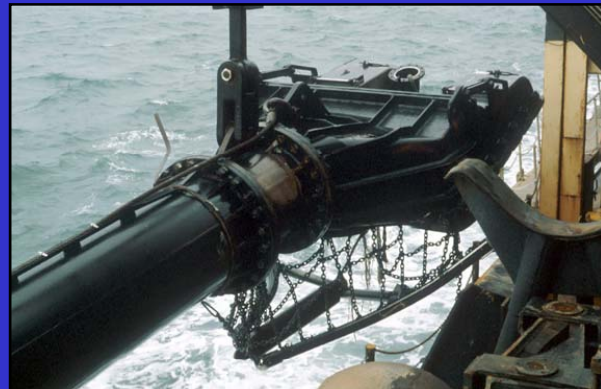
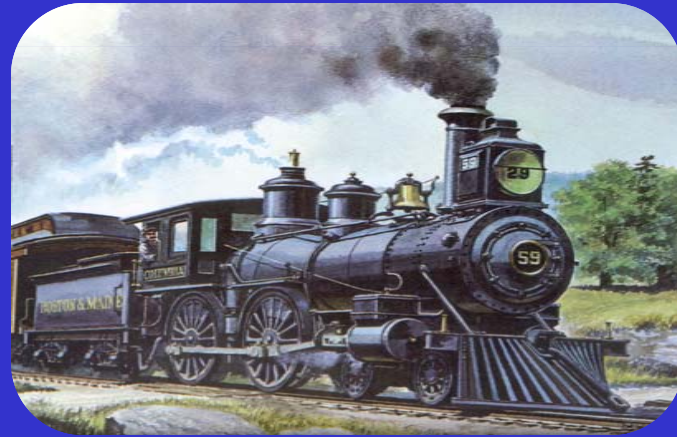
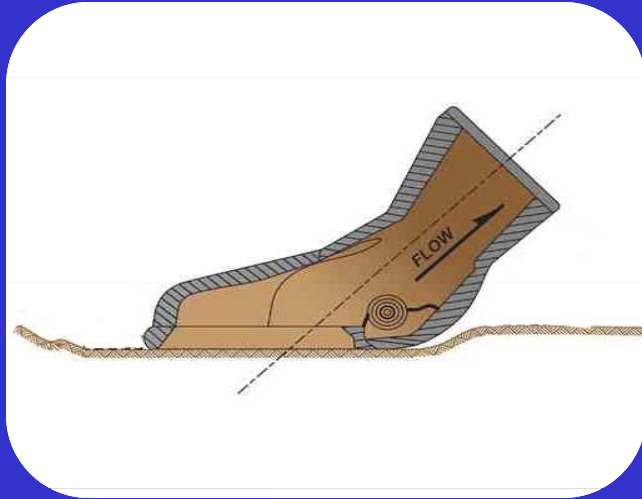


**Acoustic Dispersal**



# *Sea Turtle Research Program*

## *Engineering Studies*



## **Draghead Modification**

# **USACE**

## **Sea Turtle Data Warehouse**

- **USACE Sea Turtle Warehouse was created to centralize and archive historical and future data regarding sea turtle impacts from hopper dredging activities for long-term continuity and evaluation of these data.**

# **USACE**

## **Sea Turtle Data Warehouse**

### **Disclaimer:**

- **This data is property of the U.S. Army Corps of Engineers.**
- **Terms of use of the data:**
  - **Not to use data contained in USACE Sea Turtle Data Warehouse in any publication, product, or commercial application without prior written consent of the data owner.**
  - **To cite USACE Sea Turtle Data Warehouse appropriately after approval of use is obtained.**
  - **Not to hold USACE Sea Turtle Data Warehouse liable for errors in the data. While we have made every effort to ensure the quality of the database, we cannot guarantee the accuracy of these datasets.**

# **USACE**

## **Sea Turtle Data Warehouse**

- **This is a dynamic site that is continually being populated and updated.**
- **Data collected since 1980**
- **Data can be viewed by:**
  - **Division**
  - **District**
  - **Project**
  - **Turtle species**
  - **Region**

# **USACE**

## **Sea Turtle Data Warehouse**

- **Reports can be generated on-line:**
  - **General Take Reports**
  - **Water Temperature Based Take Reports can be generated**
- **<http://el.erdc.usace.army.mil/seaturtles/>**



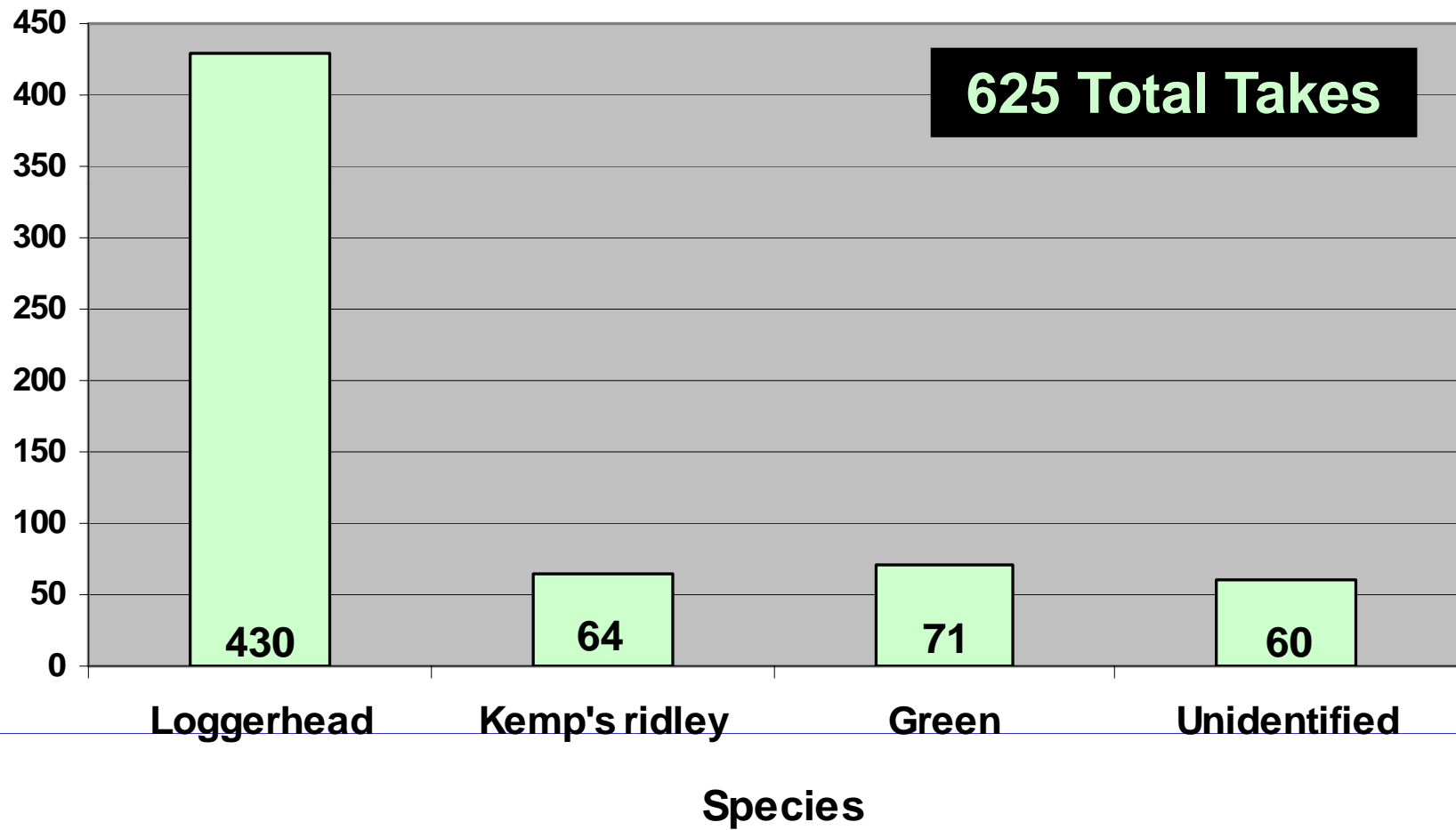
# Turtle Information

- **References**
- **Reports**
- **Biological Assessments/Opinions**
- **Extensive Data**
- **Annual Allotted Takes**
- **Annual Relocated Turtles**



# Sea Turtle Takes by Species 1980-2007

Sea Turtle Incidental Takes



# Sea Turtle Takes by Species 1995-2007

Sea Turtle Incidental Takes

