

# Sea Turtles and the Deepwater Horizon Oil Spill



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# Overview

- Natural Resource Damage Assessment (NRDA)
  - Process and terminology
  - Damage Assessment and Restoration
- NRDA and spill response
  - Turtle Injury Table
- Cooperative NRDA plans for sea turtles
- Sea turtle rehabilitation and release
- Restoration options and path forward

# Natural Resource Damage Assessment (NRDA)

1. Developed following *Exxon Valdez*
2. A legal process under the Oil Pollution Act of 1990
3. OPA regulations require Trustees to give the responsible parties (RP) an opportunity to participate in a cooperative assessment process
4. Trustees can be federal, state, and/or tribal

# NRDA Process

1. Pre-Assessment
  - Collection of ephemeral data
2. Injury Assessment
  - Short- and long-term Studies
3. Restoration to restore, rehabilitate, replace or acquire the equivalent



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# NRDA Outcome

1. Restoration – includes emergency restoration (Emergency and/or Final)
2. Damage Assessment and Restoration Plan (DARP)

**Restoration needs are based on ecological measures of losses (injuries from spill) and gains (from in-kind restoration).**

**End point is to baseline conditions: OPA states that “Baseline means the condition of the natural resources and services that would have existed had the incident not occurred”.**

# Coordination Between Spill Response and NRDA

1. NRDA Pre-assessment and response activities occur simultaneously
2. Nesting and hatching response efforts
3. Capture and relocation/rehabilitation efforts
  - Trained observers/handlers on skimming vessels
  - Field reconnaissance
  - Recovery/rehabilitation centers
4. Establishment of a wildlife hotline





# Sea Turtles Collected During the Spill Response

Sea Turtles Collected Alive				
	Visibly Oiled	No Visible Oil	Pending	Total
Alabama	5	7	0	12
Florida	3	14	0	17
Louisiana	3	6	0	9
Mississippi	0	41	0	41
Texas	0	0	0	0
On-Water	445	11	0	456
<b>Total</b>	<b>456</b>	<b>79</b>	<b>0</b>	<b>535</b>
Sea Turtles Collected Dead				
	Visibly Oiled	No Visible Oil	Pending	Total
Alabama	5	67	48	120
Florida	1	24	44	69
Louisiana	7	19	108	134
Mississippi	1	208	71	280
Texas	0	0	0	0
On-Water	4	1	1	5
<b>Total</b>	<b>18</b>	<b>319</b>	<b>272</b>	<b>608</b>
Total Collected				
	Visibly Oiled	No Visible Oil	Pending	Total
Alabama	10	74	48	132
Florida	4	38	44	86
Louisiana	10	25	108	143
Mississippi	1	249	71	321
Texas	0	0	0	0
On-Water	449	12	1	461
<b>Total</b>	<b>474</b>	<b>398</b>	<b>272</b>	<b>1143</b>

# Majority of Data is Observational

## 1. Data Coming Soon:

- Nesting data from Kemp's and Loggerhead studies
- Response data including necropsies, in situ burning, skimming, sargassum, etc.
- Aerial survey data for distribution and abundance
- Satellite tagging data

## 2. Potential data collection

- Analysis plans are currently under development
- Live capture health assessments and BCI



# Nesting Studies

## 1. Loggerheads

- Primarily panhandle of FL, MS, AL
- Goal:
  - Determine and quantify potential exposure and injuries to nesting adults
  - Nesting female physical condition

## 2. Kemp's ridley

- Padre Island and Coastal Texas Study Area
- Goal:
  - Assess nesting female physical condition, inter-nesting movements, and blood chemistry
  - Document hatching and emergence success
  - Nesting Studies Process: Nest identification, sampling of female and nest contents, pathological and chemical analysis



# Sargassum Plan

## North-central and eastern Gulf and Coastal FL

### 1. Goal:

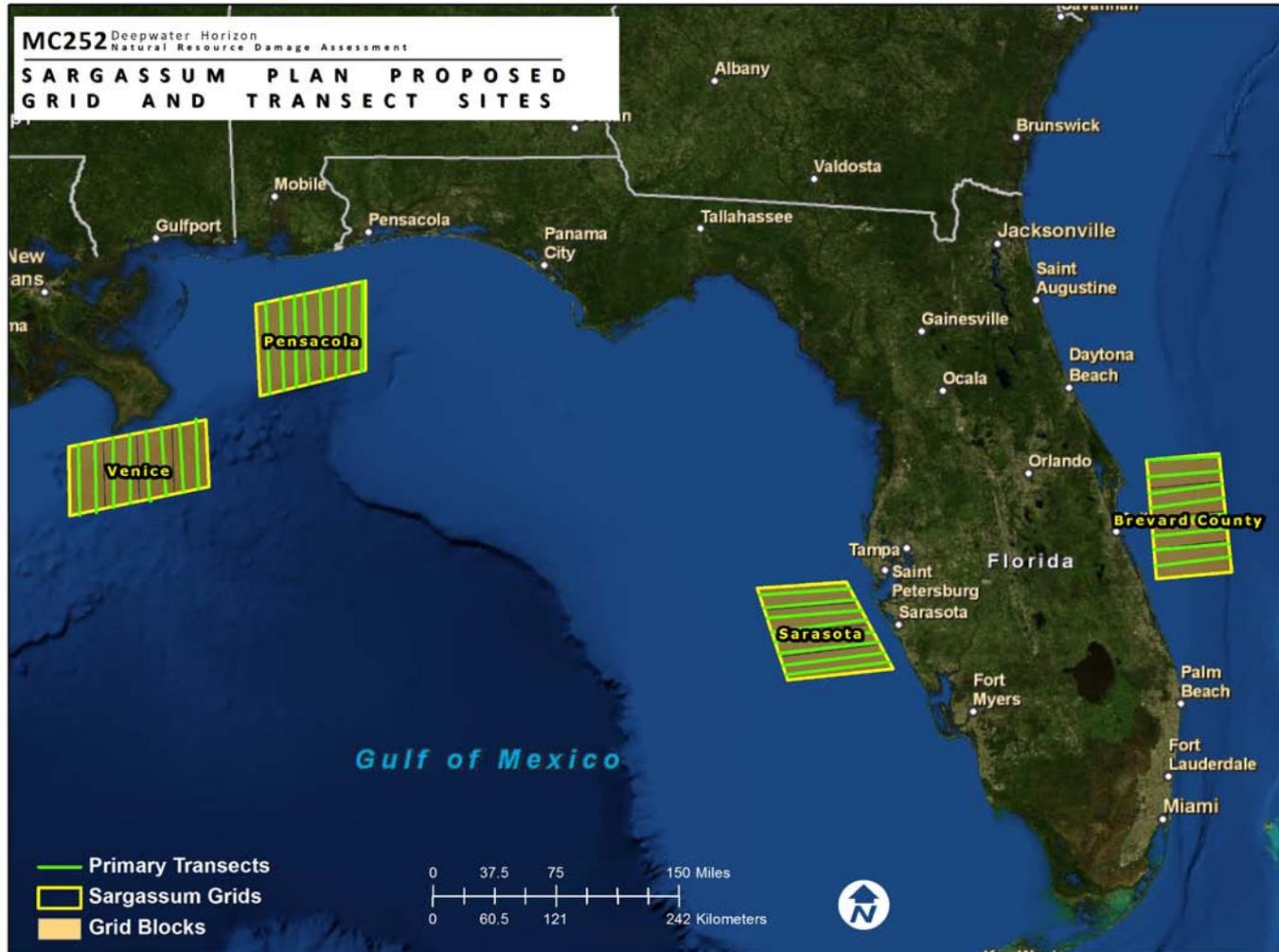
- Determine the aerial extent and distribution of *Sargassum*
- Evaluate spatial relationship to previously observed surface oil and dispersants
- Document the density, condition, diet, and potential oil exposure of pelagic neonate sea turtles associated with floating *Sargassum*

### 2. Process:

- Use aerial surveys to direct boat-based collection efforts
- Evaluate use of satellite imagery for *Sargassum* abundance distribution
- Sample two oiled areas and two reference areas



# Sargassum Plan Grid and Transect Sites-





# West of Mississippi Entanglement Plan

Nearshore entanglement surveys and bio-telemetric assessment along selected beachfront, tidal pass, and estuarine/bay habitats west of the Mississippi River Delta.

## **Goal:**

- Understand distribution and abundance of threatened and endangered sea turtles

## **Process:**

- Target sea turtle sizes, life-history stages, and habitats not typically assessed by aerial and on-water directed surveys.
- Use satellite telemetry to assess post-capture/release movements and habitat-use patterns.
- Collect blood and tissue samples for chemical, toxicological and gender ratio analysis



# Aerial Surveys for Distribution and Abundance

Continental shelf and shelf-break in conjunction with marine mammal surveys

## **Goal:**

- Document seasonal abundance and spatial distribution of potentially impacted, protected sea turtle populations

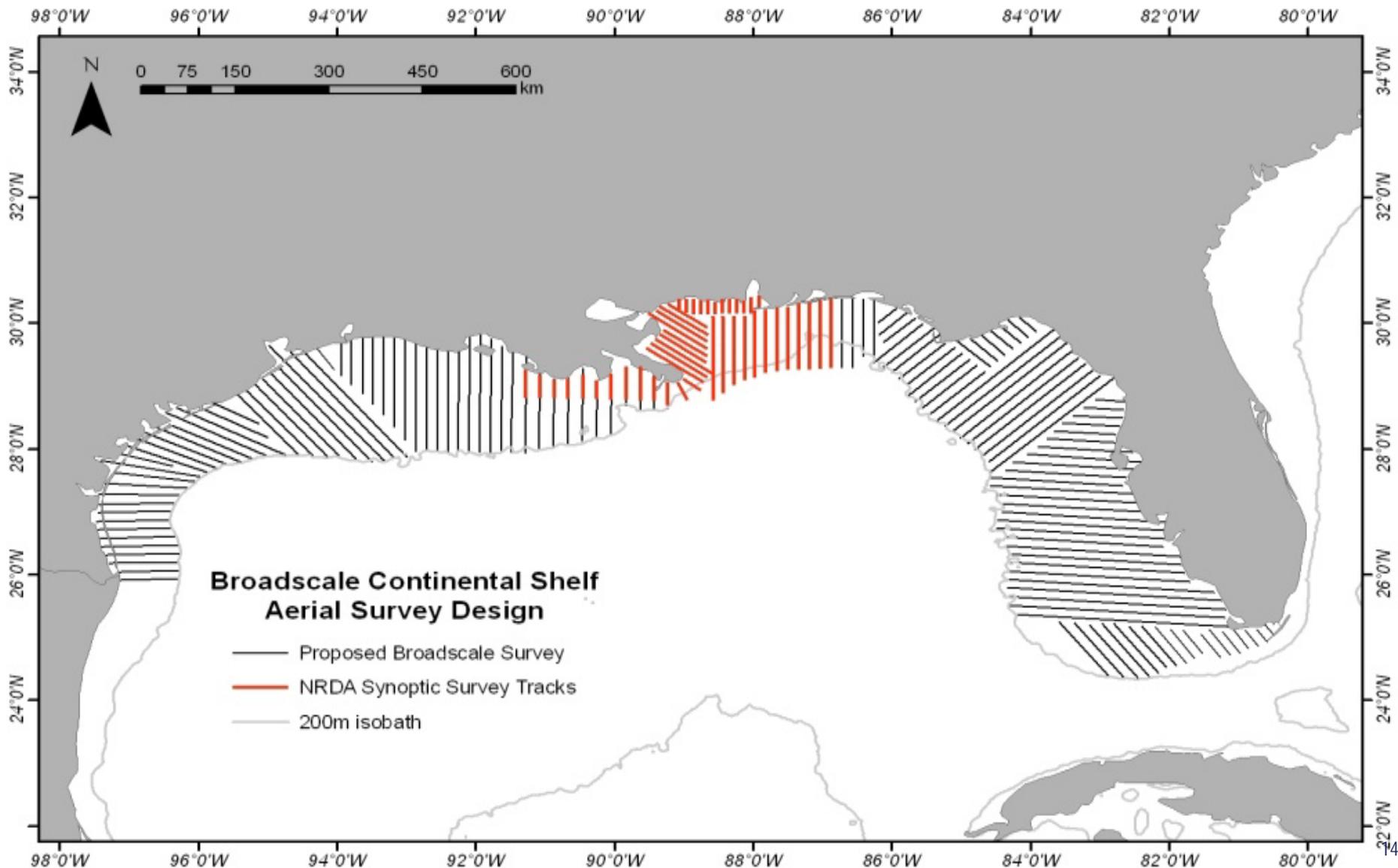
## **Process:**

- Conduct seasonal surveys beginning in January 2011
- Use laptop computer connected to the aircraft's GPS system

## **Next Steps:**

- Photogrammetric methods are being developed to estimate turtle size

# Aerial Surveys for Distribution and Abundance



# Cooperative Samples Collected

1. **Body Condition Indices (BCIs)**
2. **Blood, fecal, as well as lavage samples**
3. **Scutes samples for stable isotope analysis**
4. **Tissue samples, carapace swipes**
5. **GPS satellite data**
  - Location
  - Water temperature
  - Date and time
  - Estimate of location accuracy
6. **Visual inspection for flipper tags**
7. **Electronic scan for PIT and metal-wire tags**

# Sea Turtle Rehabilitation

1. Nearly 500 oiled sea turtles (primarily Loggerhead and Kemps) captured and rehabilitated
  - Extensive cleaning, blood and tissue sampling, enhanced diet and BCI monitoring
  - Tagging will allow for life history data evaluation
2. The majority of rehabilitated sea turtles returned to the wild
3. Veterinarians and literature suggest full recovery of oiled turtles is likely





# The Path Forward

## Restoration:

Prevent or reduce on-going impacts on turtles

### 1. Emergency Restoration

- “An action [that] is needed to avoid irreversible loss of natural resources , or to prevent or reduce any continuing danger to natural resources or similar need for emergency action” – OPA

### 2. Final Restoration

- Projects chosen as part of restoration package once injury assessment has been completed



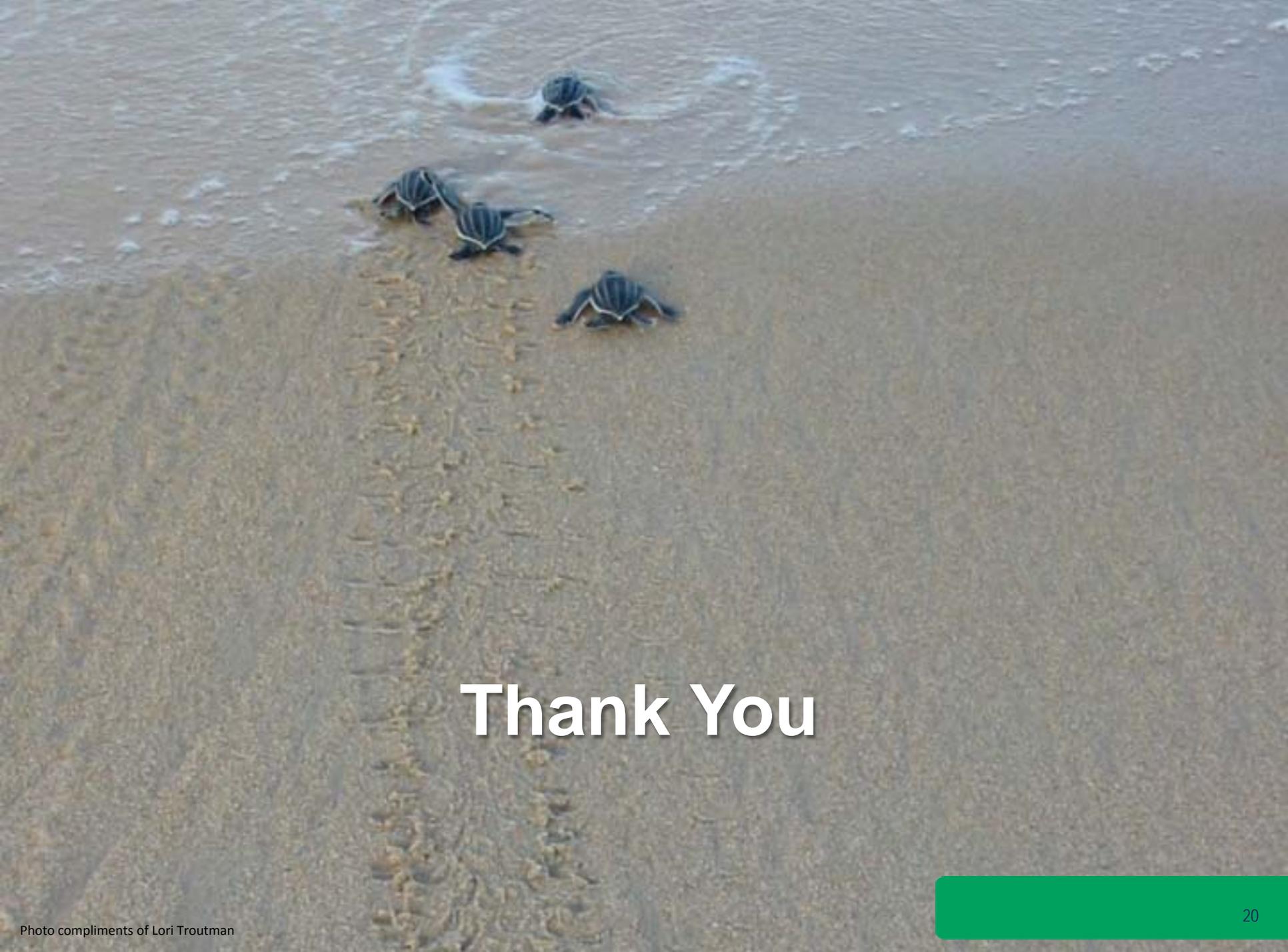
# Known Sea Turtle Restoration Options

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1. **Maximize efficiency of nesting identification and protection**
  2. **Predation protection to increase nest survival and hatchling success**
  3. **Light mitigation to decrease risk of hatchlings becoming disoriented**
  4. **Turtle Excluder Device (TEDs) advocacy, promotion, and enforcement**
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# Summary

- Comprehensive programs have been put in place to evaluate different species and various life stages of sea turtles
- Important to separate DWH impacts from pre-existing or other natural impacts on sea turtles
  
- Restoration options are being analyzed in parallel to the performance of the injury assessment



**Thank You**