

Distribution and Density of Sea Turtles in the Gulf of Mexico: GoMMAPPS First Field Season



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Sea Turtles

5 species in the Gulf of Mexico

loggerhead

green

Kemp's ridley

hawksbill

leatherback



Nesting

- Kemp's – Mexico and Texas; expanding to AL, FL in small numbers
- Loggerheads – SE US population; Northern Gulf is a genetically distinct nesting group (NW FL to TX)
- Greens: small numbers
- Hawksbills do not nest in the northern GoM; nest in Southern GoM (Mexico)



In-water

Hatchlings leave nesting beaches and remain in oceanic habitat

Recruit to neritic habitat as juveniles

Utilize coastal bays and nearshore Gulf waters

Loggerheads, Kemp's ridleys, greens, hawksbills (very small numbers)

Move to adult foraging grounds when they reach reproductive maturity

Utilize shared habitat



The overarching goal of this project is to collect broad-scale information on the distribution and abundance of sea turtles in the Gulf of Mexico to inform seasonally- and spatially-explicit density estimates

Tasks

1. Broadscale aerial surveys: NMFS, imaging
2. Habitat modeling
3. Satellite tracking
4. Genetic composition and connectivity



1. **Broadscale aerial surveys: NMFS and USFWS flights.
Imaging: initiating late summer/fall 2017**



2. Habitat modeling

Two phases to habitat modeling:

1. Model historic satellite tracking and aerial survey data to help guide future surveys
2. Model data collected during GoMMAPPS

Satellite tracking

Kemp's ridleys ($n = 63$)

loggerheads ($n = 63$)

species distribution models (SDM): frequently used to predict the distribution of target species based on habitat relationships inferred from species occurrence

Ensemble Ecological Niche Model (EENM) : multiple modeling approaches by combining algorithms from different classes

We applied EENM to identify potential foraging habitats

3. Satellite tracking



Nesting

- loggerheads and Kemp's - Hart et al. (2012), Foley et al (2013), Shaver et al. (2013), Hart et al (2014), etc
- greens

In-water

- loggerheads, Kemp's ridleys, greens
captures in MS Sound off AL and MS
trawling

Satellite tracking

(1) Adult nesting green turtles

Almost nothing is known about green turtles that nest in the northern Gulf of Mexico. Small but consistent (and seemingly increasing) nesting group.

About 400-km of nesting beaches in NW FL

2011: 15

2012: 11

2013: 44

2014: 13

2015: 58

2016: 9

FWC statewide data: <http://myfwc.com/research/wildlife/sea-turtles/nesting/monitoring/>



460 man-hours of surveying for 2017 green turtle tagging



2. In-water captures

AL and MS coastal waters in late August/early September

TX waters in mid-late September

Trawling trips in September

(“Sea Turtle Movement and Habitat Use in the Northern Gulf of Mexico”)

Chandeleur Islands

Ship Shoal (S. LA coast)





Genetic analyses

Transferring samples to:

Dr. Brian Shamblin at University of Georgia

Dr. Ylenia Chiari and Dr. Scott Glaberman at the University of South
Alabama

Next steps for year 1

- **Habitat modeling: combine satellite tracking data with NMFS aerial survey data**
- **Imaging surveys: Coastal LA in September**
- **Satellite tagging: AL, MS, TX waters; trawling**
 - Developing partnerships with TX researchers**
 - Developing partnerships with MX researchers**
 - Combine historic datasets**
 - Deploy additional tags in MX**
- **Genetic analyses**

Questions?

