A Summary of Marine Turtle Sightings from NMFS/SEFC Aerial Census Surveys for Cetaceans and Turtles in the Gulf of Mexico, 1983-1986

by

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Introduction

The Southeast Fisheries Center has completed seven regional aerial surveys within the Gulf of Mexico to determine abundance of marine mammals and turtles. These surveys, termed GOMEX (Gulf of Mexico), were completed in the Northwestern Gulf and Northeastern Gulf independently. All surveys were conducted in a Twin Beechcraft D-18 equipped with a plexiglass and glass observation bubble in the nose. All flights were completed at about 200 km/hr at 229 m altitude. Two observers were in the observation bubble when sampling along randomly selected transects.

Surveys 1-4 were conducted from Brownsville, Texas to New Orleans, Louisiana (Figure 1). Flights were completed over eleven bays and along the coast out to about 5 km beyond the 100 meter bathymetric contour. This study area is about 144,052 km^2 and sampling was completed with 15% of the bay area surveyed, 12.5% of the inshore area sampled and about 7.5% of the offshore area sampled. Bays ranged from about 24 km^2 to 1379 km^2 in area; the inshore sampling blocks from 174

km^2 to 6483 km^2 in area; and the offshore blocks from 1444 km^2 to 16,361 km^2. The outer boundary of the inshore areas extend from about 28 to 93 km offshore. The outer boundary of the offshore areas (which follows 5 km beyond the 100 m contour) extends from about 93 km to 222 km offshore. Thus, the state/federal water boundaries for Texas and Louisiana both are within the inshore sampling blocks (Figure 1).

Surveys 5-7 were completed from New Orleans, Louisiana to Key West, Florida (Figure 2). This study area is about 212,542 km^2 and was also divided into bays, inshore and offshore sampling blocks. Inshore sampling areas range from 9 km offshore to 139 km offshore and offshore sampling blocks range from 28 km up to 278 km offshore (Figure 2).

Results and Discussion

The total number of sightings of loggerhead (*Caretta caretta*) leatherback turtles (*Dermochelys coriacea*) and those unidentified to species were tabulated from individual survey reports (Table 1). Of the total 1,513 turtles sighted, 1,428 or 94% were identified as loggerhead turtles. In the Northwestern Gulf Surveys (1-4), of the total 64 turtles sighted, 55 or 86% were identified as loggerhead turtles. No Kemp's ridley turtles (*Lepidochely kempi*) were identified during over water flights and only one was observed dead on a beach near Cameron, Louisiana (Ralph Owen, SEFC/NMFS, Miami Laboratory, personal communication). Of the total 1,513

turtles sighted, 1,449 or 96% were observed during the Northeastern Gulf surveys (5-7). Of the total 1,449 turtles sighted during surveys 5-7, 1,373 or 95% were identified as loggerhead turtles.

Although the Northwestern study area is about 65% the total area of the Northeastern Gulf study area, this areal difference does not explain the extreme difference in numbers of turtles sighted between these two study areas. In general, the sighting conditions were relatively equitable between these areas i.e., Beaufort sea state, glare amount and turbidity of the water in the inshore and offshore blocks were similar (Ralph Owen, NMFS/SEFC, personal communication). Therefore, if the study areas were equal in area, then it would be expected that there would be a 35% increase in the numbers of turtles sighted in the Northwestern area, which gives an expected number of sightings of loggerhead turtles of 74 and a total of 86 total turtle sightings. Thus, correcting for sampling area does not alter the conclusion that overall there are more turtles east of New Orleans, than west of New Orleans (Table 1).

The Northwestern Gulf sampling blocks were arbitrarily designated as Western (B = Bay; I = Inshore; O = Offshore - B 1-6; I 1-3; and O 1-2) Gulf and Northwestern Gulf (B 7-11; I 4-7; O 4-6). The numbers of loggerhead turtles sighted in these two areas were tabulated and are presented in Table 2. Except for survey 4 (summer 1984) the number of turtles

recorded was greater in the Northwestern than Western Gulf by a minimum factor of 7:1. Thus, of 55 loggerhead turtle sightings, 48 or 87% were in the Northwestern blocks from the Louisiana/Texas border to New Orleans, Louisiana.

Likewise in the Northeastern surveys, sampling blocks were divided into Northeastern (B 1-15; I 1-9; O 1-8) and Eastern (B 16-28; I 10-23; O 9-15). Of the total 1,373 loggerhead turtles sighted, 1,092 or 79% were in the Eastern sampling blocks or about four times as many turtles were reported in the Eastern vs Northeastern sampling blocks. In fact, of the total 1,513 turtles sighted, (72%) were off the Florida west coast (not including the panhandle) and identified as loggerhead turtles.

The number of loggerhead turtles sighted within all bays, inshore and offshore areas were tabulated and are presented in Table 3. In the Northwestern Gulf (Surveys 1-4), 64% were sighted in the offshore areas; 36% were sighted in the inshore areas; and none were sighted in the bays. No seasonal trend is apparent in number of sightings within or between these areas.

In the Northeastern Gulf (Surveys 5-7), 7% of all loggerhead turtles were sighted in the bays, primarily in the summer. Seventy-two percent (72%) of the loggerhead turtles sighted were in the inshore areas and about 21% were sighted

in offshore areas. From these data, it appears there is a trend toward sighting more animals offshore from summer to winter. Whether this reflects animals moving offshore in the winter or a change in sighting conditions is not known. However, through all three seasons, the greatest number of sightings occurred in the inshore areas. It cannot be determined at this time where within these inshore areas turtles are located, relative to distance from shore

Conclusions

1. There were more turtles sighted in the Northeastern Gulf (Surveys 5-7) of Mexico than the Northwestern (Surveys 1-4) (96% vs 4%).

2. Within the Northwestern Gulf, 87% of all the loggerhead turtles sighted were in the Northern portion of the sampling area, which corresponds roughly from the Texas/Louisiana border to New Orleans, LA.

3 Within the Northeastern Gulf (Surveys 5-7), 79% of loggerhead turtles were in the Florida west coast sampling blocks, not including the panhandle.

4. The greatest number of turtles (40% of all sightings) were sighted during the summer 1984 survey in the Northeastern Gulf (Survey 5).

5. There is no seasonal trend in the number of sightings of turtles in the Northwestern Gulf.

6. In the Northeastern Gulf, there appears to be an increase in the number of turtles sighted offshore in the winter suggesting that turtles may move offshore in the winter.

Table 1. Numbers of sightings of turtles from SEFC/NMFS Gulf of Mexico aerial surveys. CC = loggerhead turtles, *Caretta caretta*; DC = leatherback turtles, *Dermochelys coriacea*; and UK = unidentified to species. Surveys, 1-4 were completed in the Northwestern Gulf and 5-7 in the Northeastern Gulf.

Survey No.	Dates	CC	DC	UK	Total
1	9/19/83 - 9/26/83	13	1	4	18
2	1/4/84 - 2/9/84	13	0	2	15
3	4/26/84 - 5/27/84	24	0	2	26
4	7/16/84 - 9/16/84	5	0	0	5
5	6/16/85 - 9/1/85	584	3	13	600
6	9/15/85 - 10/29/85	485	11	38	534
7	1/10/86 - 3/2/86	304	7	4	315
Total		1,428	22	63	1,513

Table 2. Number of loggerhead turtles sighted in the Northern (NW) vs Western (W) sampling areas for surveys 1-4; and Northern (NE) vs Eastern (E) sampling areas for surveys 5-7. Seasons are included as defined using the survey dates from Table 1.

Survey No.	Season	W	NW	NE	E	Total
1	Fall	1	12	--	--	13
2	Winter	0	13	--	--	13
3	Spring	3	21	--	--	24
4	Summer	3	2	--	--	5
5	Summer	--	--	85	499	584
6	Fall	--	--	150	335	485
7	Winter	--	--	46	258	304

Table 3. Numbers of loggerhead turtles sighted in bays (B), inshore areas (I) and offshore areas (O), by survey number. Surveys 1-4 were completed for the Northwestern Gulf and surveys 5-7 for the Northeastern Gulf. The season for each survey is also included using the survey dates from Table 1.

Survey No.	Season	B	I	O	Total
1	Fall	0	10	3	13
2	Winter	0	0	13	13
3	Spring	0	8	16	24
4	Summer	0	2	3	5
5	Summer	42	458	84	584
6	Fall	37	337	111	485
7	Winter	14	188	102	304
TOTAL		93	1,003	332	1,428