## Globally endangered sea turtles of the

## Palmyra Atoll National Wildlife Refuge:

## A Focus on Scientific Analysis

## Worksheet

## Group Members:

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### A) Asking questions about sea turtle research at Palmyra Atoll

Why study sea turtles at Palmyra? Based on the background, please formulate **two research questions** (one scientific and one management/conservation questions) that can be addressed through research at PANWR.

### B) Identifying objectives for sea turtle research at the PANWR

For each research question, please identify **3 priority objectives** for sea turtle research at the PANWR. Include a justification of why meeting each objective is important to addressing the proposed research question.

### C) Methods and results: focus on sea turtle surveys at Palmyra Atoll

To advance the research and conservation of sea turtles at Palmyra Atoll, studies began there in 2005. One major objective of the early research at Palmyra was to gain some understanding of sea turtle distribution and abundance there. To this end, surveys were carried out to document the occurrence of sea turtles along the atoll about every three months from August 2005 to September 2006, and approximately annually thereafter. Survey counts were conducted by 5 to 10 researchers who simultaneously traveled by kayak and boat along non-linear transects, each counting the number of turtles that they encountered on the transect. The total number of turtles counted was influenced by weather and visibility conditions, and as many as 120 turtles were seen during the roughly 2-hour survey period.

To help provide insights into conservation and management, you will use data from the first survey to investigate the abundance of endangered sea turtles along the atoll. The coordinates of sea turtle sightings were recorded in this survey using Global Positioning System (GPS) technology and overlaid with satellite images to investigate ecological interactions. Below are the results of this survey, which took place in August 2005 (Appendix 1: Figures 4-8). Use these data to reply to the following questions. For each question, also consider what some limitations might be in only using these survey data to formulate your answers.

1. Which species appears to be most common along the atoll?
2. Are sea turtles found randomly throughout the atoll? If not, identify areas where sea turtles are most commonly seen.
3. Assuming the data are correct, what might be some explanations to account for their distribution?
4. Identify strengths and weaknesses of using this survey to assess turtle distribution at the PANWR.
5. How would you carry out future surveys to improve the quality of conclusions drawn from these data?
6. Now look at the results of additional surveys, which followed a more defined survey design (Appendix 2: Figures 9-11). Do they confirm the conclusions based on the first survey? Are these data sufficient to estimate distribution and relative abundance of sea turtles along the atoll? Based on these data, design three testable hypotheses for future studies investigating distribution and abundance.

### D) Proposed topic for the final project