Student report sheet.

Names of all group members: _____

ID and name for Dolphin 1: _____

ID and name for Dolphin 2: _____

Plot each of the coordinates for the sightings on the map (20 pts). Use a different color for each dolphin and write what each symbol represents in the blank space of the legend (5 pts).

Draw a geometric shape (e.g., a circle, rectangle, triangle) around the sightings for each dolphin. The shape has to include each point in the shape but does not have to touch each point.

1. What geometric shape best fits the sightings for Dolphin 1? _____

   For Dolphin 2? _____

Using your metric ruler and calculator, find the areas of your geometric shapes using one or more of the equations below. Even if you use your calculator, you need to write down the equations with the numbers you use to find your final answer.

Area of a rectangle = length × width
Area of a triangle = ½ base × height
Area of a trapezoid = ½ (base 1 + base 2) × height
Area of a circle = π × radius^2

What is the area of your shape for Dolphin 1? _____cm^2

Dolphin 2? _____cm^2

2. How many km on the scale on the map = 1 cm on your metric ruler? This is your conversion factor. 1 cm = _____ km (5 pts)

Use a ratio to convert the areas you found from centimeters to kilometers.

*Important: You must multiply the area by the conversion factor <u>two</u> times because you are converting from cm^2 to km^2 (two dimensions), and not just from cm to km (one dimension).

For example, if your original area was 14.5 cm^2 and your conversion factor was 1 cm = 2.3 km^2, then 14.5 × 2.3 × 2.3 = 76.7 km^2

3. What are the areas of your shapes in km^2? (10 pts)

   Dolphin 1 _____km^2 Dolphin 2 _____km^2

4. Are the areas and shapes of the utilization areas of the two dolphins different? How? (10 pts)

5. A minimum convex polygon (MCP) is created by connecting the outermost points so that all points are inside the polygon. How do you think your areas will compare to the actual MCP areas? Larger, smaller, the same? Why? (5 pts)

Obtain the actual MCP areas from your teacher.

Actual MCP for Dolphin 1 _____ Actual MCP for Dolphin 2 _____

Were your assumptions correct?

6. Look at the sightings for Dolphin 1. Do you see any spatial relationships in the data? Is the dolphin found in a particular area? What reasons could there be for this? (Think about food, habitat, humans, tides, behavior, and geography.) (10 pts)

Do the same for Dolphin 2. (10 pts)

7. Challenge: These data were recorded in one summer. If we had sighting information for the entire year, do you think it would look the same? Why or why not? (5 pts)

Answer key.

Dolphin code and name	**Area (km^2)**	**Behaviors or characteristics exhibited by the dolphin and the resulting spatial patterns**
30025 – Batman	85.93	30025 associates with shrimp trawlers and begs. It is sighted over a large area and in areas where shrimp trawlers dock and fish.
30007 – Mullet	12.65	30007 strand feeds. It is seen in small creeks at low tide.