Spatial Variation in the Predominant Behavior of Common Bottlenose Dolphins (*Tursiops truncatus*) in the Estuaries of Savannah, GA

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Abstract

Understanding ecology demands the knowledge of how animals use their habitats on a fine spatial scale. Thus, we conducted boat-based surveys in the waters around Savannah, Georgia to document spatial trends in activities of common bottlenose dolphins (*Tursiops truncatus*). Dolphin behavior was recorded in the field and then mapped using ArcGIS 9.3. Dolphins were observed in 443 sightings on 91 days in the summers of 2009 and 2010. Travel was the predominant behavior for 63.2% (n=292) of the sightings. “Unknown” activities were predominant for 22.5% (n=104) of the sightings, primarily “non-directional movement,” which is movement that cannot be identified as any of the other behaviors. “Probable feeding” and “feeding” behaviors combined were observed as the predominant activity in 7.1% (n=35) of the sightings. Social, with boat, and rest behavioral states were the predominant behaviors in less than 5% of the sightings each. Traveling was found evenly spread throughout Savannah area estuaries. No correlation was found between the behaviors and the environmental factors studied. More detailed analyses will be conducted to understand the locations and associated environmental variables of these behaviors. Understanding spatial variation in dolphin behavior will help managers identify critical habitat for these animals.

Introduction

It is important to understand the distribution of the common bottlenose dolphin *Tursiops truncatus* so that those areas with higher densities can be protected from anthropogenic factors.

Feeding may determine the distribution and movements of *T. truncatus* (Barros and Wells, 1998).

Some studies have found correlations between feeding and water depth (Barros and Wells 1998; Würsig and Würsig 1979; Wilson et al. 1997).

Barco et al. (1999) found a positive correlation between water temperature and dolphin abundance in the near shore waters of Virginia Beach, Virginia.

Many have observed that prey drives the movement of these animals (Wilson et al., 1997, and Barros and Wells, 1998).

Objectives

• Analyze environmental influences on the behavior of the common bottlenose dolphin *Tursiops truncatus*.

• Examine spatial distribution of predominant behavior of the bottlenose dolphin.

Methods

• Boat surveys conducted (May-August) 2009 and 2010

• Study area: Inland waters around Savannah, GA

• Data Collected:
  - Group Size
  - Location
  - Depth
  - Salinity
  - Water Temperature (YSI)
  - Creek Width (range finder)
  - Predominant Behavior (Travel, Rest, Play, With boat, Other, Social, Feed (Probable feed included))

• Data mapped using ArcGIS 9.3

Results

Figure 2. Sightings coded by dominant behavior.

Travel was the predominant behavior 63% (n=292) of the sightings; it was also the behavior with the highest presence (n=375).

Figure 3. Sightings in which travel was observed.

While other behaviors were found in a general area, traveling was observed in a large portion of the survey area.

Figure 4. Sightings in which social was observed.

Social behaviors were observed in the areas where multiple rivers, creeks, or bodies of water merged.

Figure 5. Sightings in which feeding was observed.

Feeding was observed throughout the study area. There was no clear pattern in spatial distribution; it is more likely there is a temporal fluctuation in feeding behavior, related to tidal state (see 5. Bowen-Stevens’ poster #18.7).

Figure 6. Sightings in which with-boat was observed.

“With boat” behaviors were found throughout the survey area. This may be due to the severe problem with begging (an action used to identify “with boat”) in the Savannah, GA area (see R. Perrtree’s poster #14.12).

Figure 7. Sightings in which unknown, play, rest, and other behaviors were observed.

Unknown behaviors consisted primarily of “non-directional” movement. Unknown and “other” behaviors had no clear patterns in spatial distribution. Play and rest behaviors were not observed enough to draw conclusions.

Figure 8. Average creek width (m) in which each behavior was present and dominant.

There were no apparent trends in relationship of creek width to presence and dominance of specific behaviors.

Figure 9. Comparison of behavior presence and dominance vs. average depth (m).

There were no apparent trends in relationship of creek depth to presence and dominance of specific behaviors. Resting behavior occurred in deeper waters; however, only 1 sighting had rest as the dominant behavior, and 3 sightings had rest present.

Conclusions

• Behaviors were uniformly distributed across all environmental variables.

• This study was limited by vessel size; our vessel had too deep a draft to survey the smaller, more shallow creeks where we observed dolphins feeding on occasion.

• Further efforts will be to expand the spatial and temporal coverage in this area.

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