

## **A Continuation Study of Social Dynamics and Individual Identifications for a group of Atlantic spotted dolphins (*Stenella frontalis*) observed around North Bimini Island, Bahamas**

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### **ABSTRACT**

Data collection in 2002 on the group dynamics of Atlantic spotted dolphins (*Stenella frontalis*) found on the Great Bahamas Bank, north of Bimini Island, marks the second year of study for this study population by DCP.

A total of 60 boat trips were spent searching for dolphins around Bimini yielding 29.17 hours of search effort. On 31 trips, 63 encounters were recorded providing approximately 11 hours of video. On trips when dolphins were observed, spotted dolphins comprised 95% of the encounters and bottlenose dolphins were in 6% of the encounters. The percentage is greater than 100 since one encounter represented both species in a mixed aggregation. A total sighting rate of 68% (59% for morning trips and 72% for afternoon trips) was observed. Average encounter length was 10.7 minutes with five dolphins per observed group. In 2001, 61 individual spotted dolphins were identified by scars, marks and pigmentation patterns. Re-sight rate of individuals in this study group was 52% with 30 newly identified dolphins added to the catalog. Updated photographs confirmed previous identifications and addition of new scars and spots. The gender of 39 spotted dolphins was documented: 30 are female and 9 are male.

Distribution of age classes for identified spotted dolphins observed around Bimini is 28 are fused 5 (adults), 4 are mottled (sub-adults), 21 are speckled (juveniles), and 9 are two-toned (calves). Data from 2002 coupled with that of 2001 provides information on the dolphin group – associations, distribution and some patterns of behavior and movement such that we plan to begin examining the communication patterns between these dolphins in 2003.

### **INTRODUCTION**

Atlantic spotted dolphins (*Stenella frontalis*) frequent the waters of the Bahamas; the newest group most recently identified swims around Bimini near the Great Bahamas

Bank. Members of this species and possibly this study population have been observed for more than 25 years north of Grand Bahamas Island, on the White Sand Ridge (Dudzinski, 1996; Herzing 1991, 1997; Brunnick 2000). Swim with dolphin programs abound in the Bahamas, yet little is known about this group of spotted dolphins around Bimini. In 2001, DCP began an examination of the group dynamics of the spotted dolphins found around Bimini and the Great Bahamas Bank to better understand parameters of this population. Are the groups observed both north and south of Grand Bahamas Island distinct or members of a larger population resident to Bahamian waters? Identification of individuals facilitates calculations of the following parameters: population size, distribution, and site fidelity, COA, age/gender composition, and more. An examination of these parameters provides baseline data necessary to understand shifts in population size, behavior or association patterns, which could be the result of any type of change in their environment. This baseline data also provides information on the dolphins as the swim programs in the area increase in scope and popularity. Longitudinal data will permit analyses of how swimmer presence might affect the dolphins and their behavior and distribution. This report summarizes our methodology and preliminary results for the 2001 summer field season.

## **METHODS**

### *Study Site*

The shallow sandbanks north of the Bimini Islands were our primary study area. Depths ranged from six to 20 m within five to 10 km north of the island of North Bimini, Bahamas. The main survey area was approximately established by the following boundaries: 25° 54' N to 25° 48' N; 79° 18' W to 79° 11' W. Also searched on several survey days was the area from shore up to 3 km west along the length of North Bimini Island.

### *Study Animals*

Atlantic spotted dolphins were the main species under consideration. See previous DCP reports and our web site for more information on specific species characteristics. Bottlenose dolphins (*Tursiops truncatus*) were observed on several occasions and were included on an *ad libitum* basis.

### *Data Collection Protocol*

Data collection followed the protocol outlined in previous reports to the Bahamas Government by the Dolphin Communication Project and are available upon request. Data were collected between 23 June to 24 September 2002 from 60 boat trips (operated by *Bimini Undersea*). As available, trips were offered during morning hours (0830h-1230h) or in the late afternoon (1530h - 2000h), with the latter comprising 72% of all trips.

### **RESULTS**

A total of 29.17 hours was spent on-effort searching for dolphins inside the main survey area north of Bimini Islands. The following Tables document identified dolphins per gender and age category as well as sighting rates, encounter durations and seasonality within the summer season.

### **DISCUSSION**

A preliminary assessment of the spotted dolphin group observed around Bimini, The Bahamas, was conducted: 27 individual spotted dolphins were reliably re-identified and observed during the field season. As yet, not matches in identification have been confirmed between this dolphin group and the spotted dolphins observed north of Grand Bahamas Island (Dudzinski 1996, Herzing, Wild Dolphin Project, pers. comm., 2002). As the remaining video footage is analyzed and photographs from both study locations are compared, matches may be found. The number of females to males was 3:1 for identified dolphins, however, it is not yet possible to determine if this is the sex ratio for this group. Similarly, significantly more adults and juveniles were identified compared with calves and sub-adults. More information is required on dolphin group activity and behavior before conclusions may be drawn as to how the dolphins use this area.

### **ACKNOWLEDGMENTS**

Bimini Undersea provided vessel platforms and logistical support during the summer field season for data collection. DolphinSwim provided space during their ecotours to

DCP field staff. Data were gathered under a permit granted to DCP from the Bahamas National Government (2002). Mr. R. Aubrey assisted with permit procedures.

**LITERATURE CITED**

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**Table 1.** Research effort summary from Bimini 2002 spotted dolphin field season.

Total Number of Boat Trips: 60	No. June boat trips: 1
No. AM trips: 17	No. July boat trips: 28
No. PM trips: 43	No. Aug. boat trips: 23
	No. Sept. boat trips: 8
Total % rate dolphins observed: 68%	
% rate dolphins observed on AM trips: 59%	
% rate dolphins observed on PM trips: 72%	
<i>Spotted dolphins observed on 83% of all sightings.</i>	
<i>Bottlenose dolphins observed on 20% of all sightings.</i>	
Average No. spotted dolphins per encounter: 4	
Average No. encounter minutes (length): 10.7 min.	
Average No. encounters per trip: 1.6	
Total amount of video recorded: 11.3 hours	

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**Table 2.** Preliminary population dynamics for Bimini Atlantic spotted dolphin group.

<u>Age Class</u>	<u>Sex</u>			<u>TOTAL</u>
	<u>Female</u>	<u>Male</u>	<u>Unknown</u>	
calf, two-toned	5	1	3	9
juvenile, speckled	9	6	6	21
sub-adult, mottled	2	0	2	4
adult, fused	14	2	12	28
TOTAL	30	9	23	