Relationships between mom and offspring in short-finned pilot whales, *Globicephala macrorhynchus,* by drone footage

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Background

- Short-finned pilot whales are very social marine mammals that have interactions we do not fully understand.
- They are distributed throughout temperate and tropical waters world-wide (Olson, 2018).
- They prefer deeper waters with high densities of squid for foraging. However, they can be found at varying distances from shore (WDC, 2019).
- Their body is long and is typically black or dark brown with a gray saddle behind its dorsal fin (NOAA, 2019).
- Maturation for males and females is around 10 years of age
    - Females can live up to 60 years, males 45 years (NOAA, 2019).
- Females go through menopause and will act as a caregiver within their pod (WDC, 2019)
- Techniques and drone developments are giving researchers the opportunity to record and analyze social behavior among various marine mammal species.
- Behavioral observations were made using unmanned aerial systems (UAS) during 53 gray whale sightings
    - There was no detected behavioral response by whales from the UAS (Torres et al., 2018).

Table 1: Database of every fifth photo in flight 1

File Name	Interaction(s)	surfacing	swimming	feeding
17-51-16_10-08-2018_DSC08123	M&O, MK, P	1		1
17-51-16_10-08-2018_DSC08128	M&O, MK, P	1		1
17-51-16_10-08-2018_DSC08133	M&O, MK, P	1		1
17-51-16_10-08-2018_DSC08138	M&O, MK, P, I	1		1
17-51-16_10-08-2018_DSC08143	M&O, MK, P, I	1		1
17-51-16_10-08-2018_DSC08148	M&O, MK, P	1	1	1
17-51-16_10-08-2018_DSC08153	M&O, MK, P		1	

Methods

Study Area

- 40 miles offshore of Hatteras, NC
- Drone Footage
- Taken on August 8, 2018
- Flight one 17:51-18:18

Database

- Every fifth photo was taken from flight one within the database to be analyzed.

Evaluation

- Surfacing was determined if any part of the body was out of the water (Figure 1).
- Swimming was determined if the calf was underwater and its mouth was visible and away from its mother (Figure 2).
- Feeding was determined if the mouth was not visible and position of its body lined up with assumed feeding position under the mother (Figure 3).

Analysis

- Behavior was counted once even if there was more than one calf performing the same behavior.
    - Tally system used for frequency

Abstract

My study focuses on interactions among mom and offspring short-finned pilot whales. It is important to look at the aspects of pilot whale biology, behavior, and ecology to better understand the species and the challenges they face. Therefore, if we can properly identify and follow individuals, it would allow us follow and observe the population, track their development, and study their behavior over long periods of time.

Figure 1: Calf surfacing (17-51-16_10-08-2018_DSC08393.JPG)

Figure 2: Calf swimming (17-51-16_10-08-2018_DSC08168.JPG)

Figure 3: Calf feeding (17-51-16_10-08-2018_DSC08598.JPG)

Results and Discussion

- Frequency of behavior in descending order: swimming, feeding, surfacing.
- One photo within flight one was unusable. Leaving a total of 113 photos to be analyzed.
    - High success rate of useable data
- In flight one, calves spent more time swimming and feeding near the surface then actually surfacing.
- Averages of the frequency of behavior are based on every fifth photo.
    - Assumptions of calf behavior were made based on their positioning.
- The use of drones for marine mammal research is a growing field.
- Further studies may look at each photo in flight one to determine the temporal scale in which each of these behaviors are performed.
- May be compared to flights 2, 3, and 4.
- Seeing as this study was comparable to the one on gray whales, we may assume there were no behavior responses detected by whales from the drone.

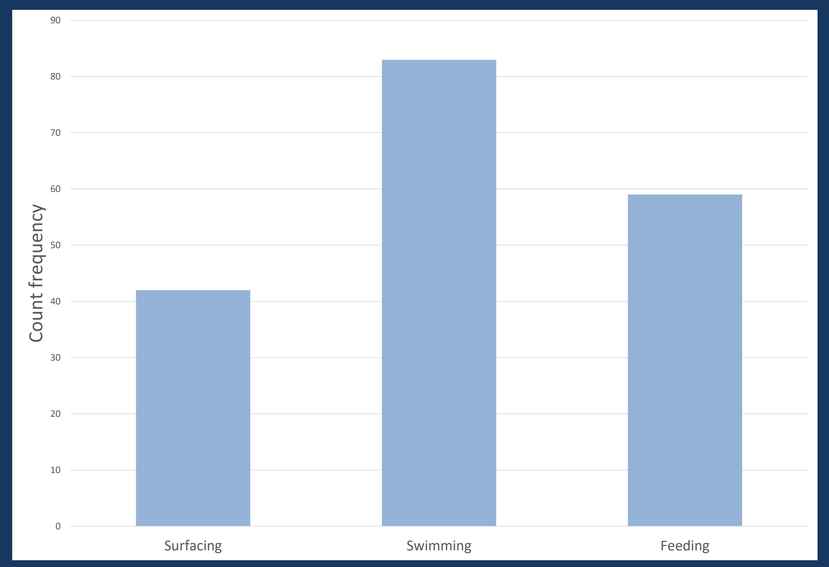

Figure 5: Frequency of calf behavior in flight one

Acknowledgements

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