

Determining Ranging Patterns and Association Preferences of Bottlenose Dolphin Communities in Southeast Florida

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Understanding individual ranging patterns and social preferences within a population is critical for identifying stock boundaries and population structure. In Biscayne Bay (southeast Florida), bottlenose dolphins have been monitored since 1990 using photo-identification methods. Residency patterns suggest that the vast majority of individuals are resident to the bay and that two communities exist based on their ranging patterns: one occurring in the northern portion of the bay and another in the southern portion, with limited spatial overlap between the two. However, the spatial boundaries of the “southern” community of Biscayne Bay are not well understood, as movements of individuals are suspected between this area, Florida Bay and the Florida Keys. To further investigate the extent of the southern community, a collaboration was established with the Dolphin Research Center (DRC) in the Florida Keys (study area from Marathon to Islamorada). Using a novel approach incorporating scar pattern analysis, in addition to the standard dorsal fin comparison methods, a total of 41 matches were identified between the Biscayne Bay and the DRC catalogs; encompassing 8% and 25% of the total marked individuals for each catalog, respectively. Preliminary analyses suggest a possible southward extension of the southern community home range and therefore potential spatial and social overlap with the (DRC) community. Using SOCPROG and kernel density estimations (KDEs), we investigated the ranging patterns of these individuals and showed that the southern community includes individuals ranging far beyond the limits of Biscayne Bay. This work highlights the importance of local/regional collaborative research beyond the geographic boundaries (e.g., bay, sound, estuary) of a study area, which can have major impacts for stock boundary assessment and management.