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Introduction

Bottlenose dolphins (*Tursiops truncatus*) are one of the most widespread cetacean species with seasonal occurrence across the Northeast Atlantic coastline. One method of monitoring a particular population uses photo-identification to describe individuals and characteristics of their appearance. For example, in looking at damage to the dorsal fin, we can measure the fin shape, describe damage to the fin and note any evidence of skin disease or parasitism. Some skin conditions we observed were tattoo skin disease (TSD), pox virus (POX), Focal Skin Diseases (FSD), Pale Skin Patches (PSP), skin lineal anomalies (SLA), and Ulcerative Dermatitis (UD) (Hart et al. 2012). For this study we characterized features of the dorsal fin and evidence of infectious disease to investigate how dolphins differ in this environment. Some features are natural while others indicate injury, exposure to pathogens or poor health. Since there is no information on dolphins in this area, our historical understanding is limited (Torres et al. 2005, Toth et al. 2012). Future research should include visual and acoustic surveys along the coastline using different platforms (sea, air or land) and using continuous sampling methods year round. We found 81% of our sample to have fin damage and 46% showed signs of skin lesions or anomalies. This area is especially important because it is the most active marine port in the Eastern U.S. with extreme levels of human activity where pollution and boat activity may be risky.



Fig 1. *T. truncatus* observed <5 kilometers from the shoreline along Rockaway Beach toward Breezy Point on June 17th, 2019 (Raslich, A.) Sightings are reported frequently close to shore, interacting with swimmers, surfers, boats and jetskis. Developing a monitoring program on the Rockaways will help to learn more about their routine and collect photo-identification to see what individuals are frequenting the area.

Method

- Photo ID aboard whale watching trips (2014-2018) (**Fig 1**)
 - Photo ID beach surveys on Beach 60th-89th, Far Rockaway (**Fig 2**)
- Using the photo-id software “Darwin” fins were traced to define the shape and then coded for damage.
 - We obtain a list of triangulated distance measurements that describe the fin shape and categorize features of interest and compare them for matching individuals, features, or conditions.

Analysis

- All fins were given a category for damages (Fig. 5) and skin conditions (Fig. 6)

Damage Categories

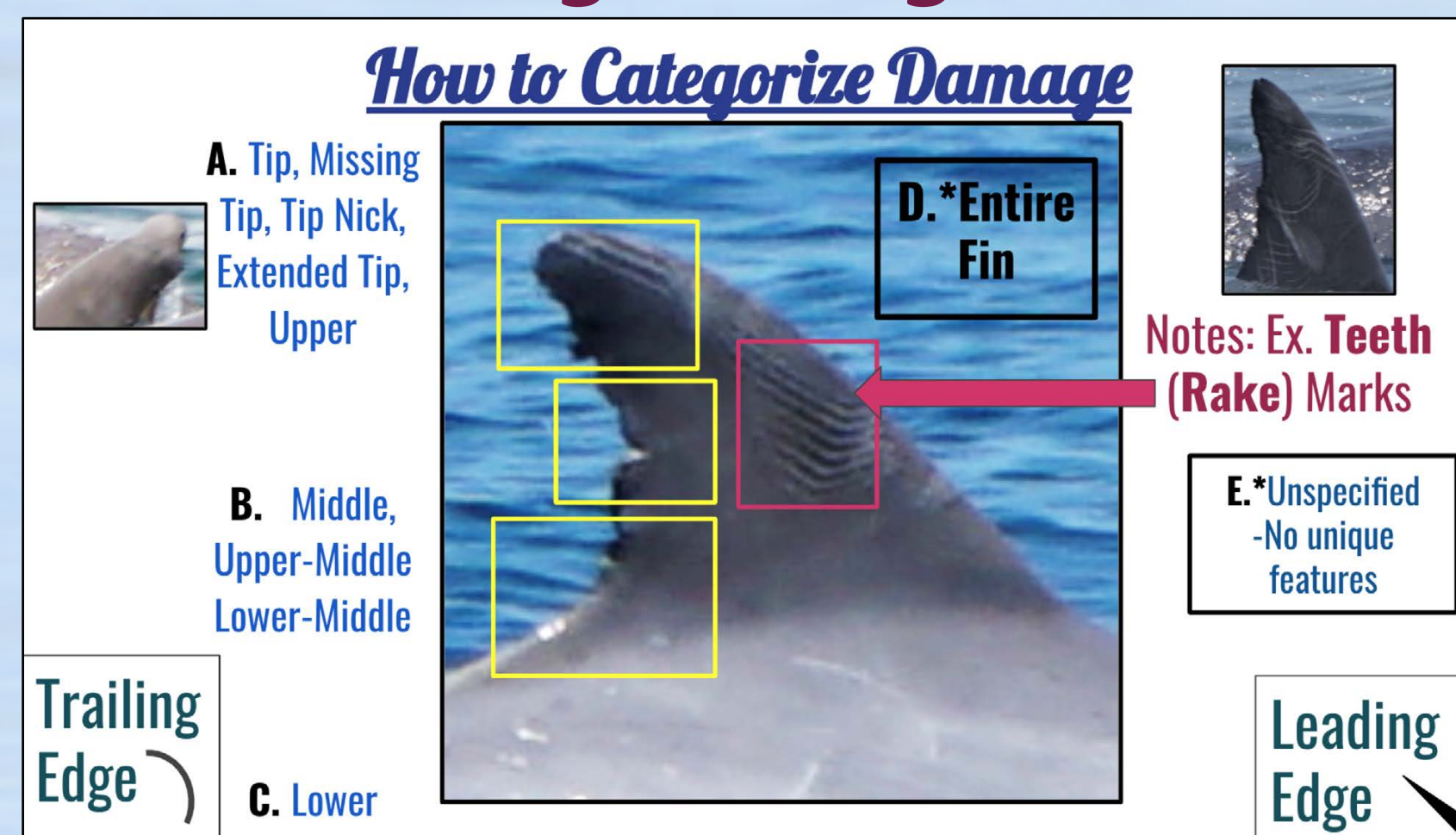


Fig 5. All fins were scored for damages (notches, nicks, contours) along the leading or trailing edge in sections or related to features (i.e. missing tip) and notes were added for scarring, pigmentation or skin conditions.

Skin Condition Categories

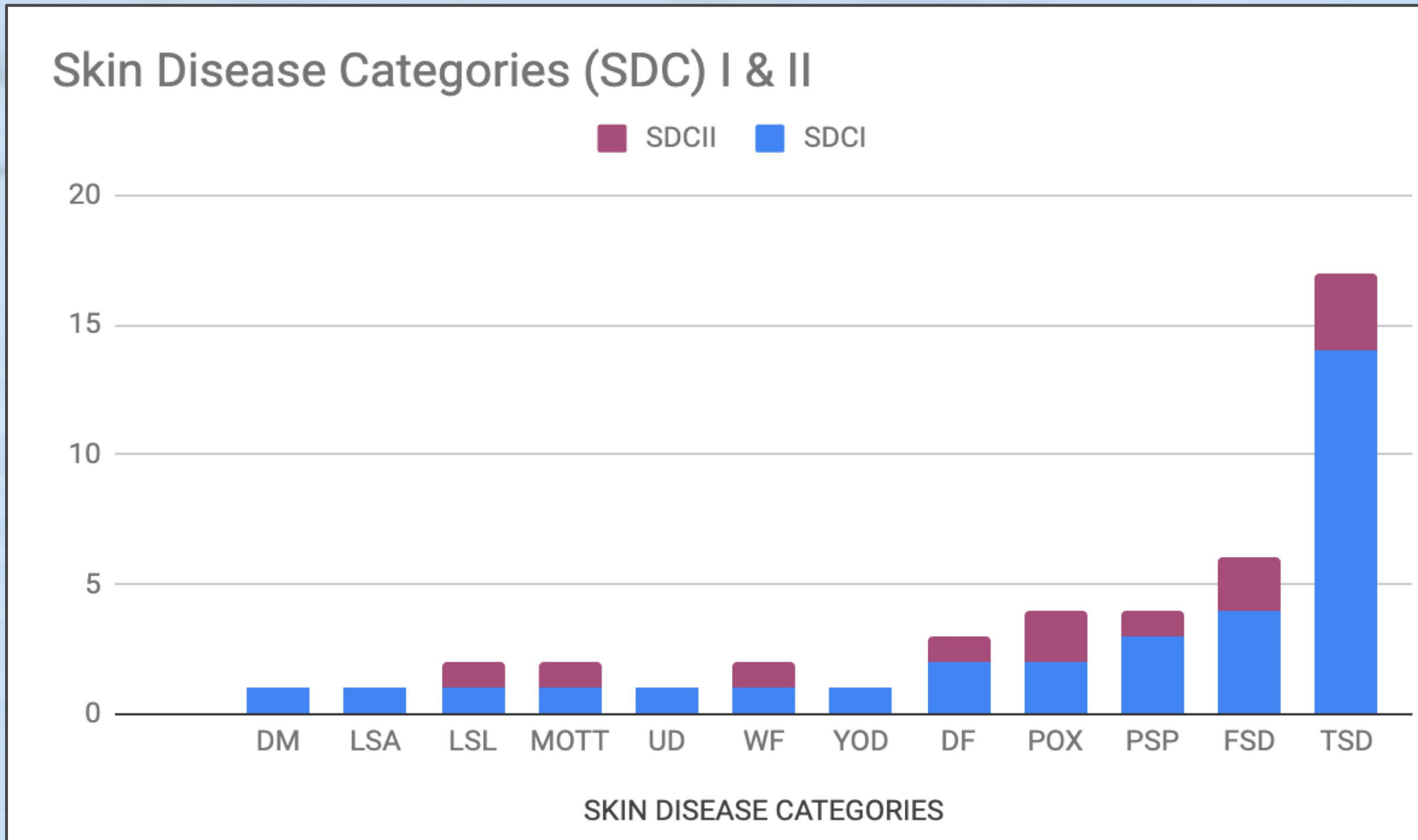
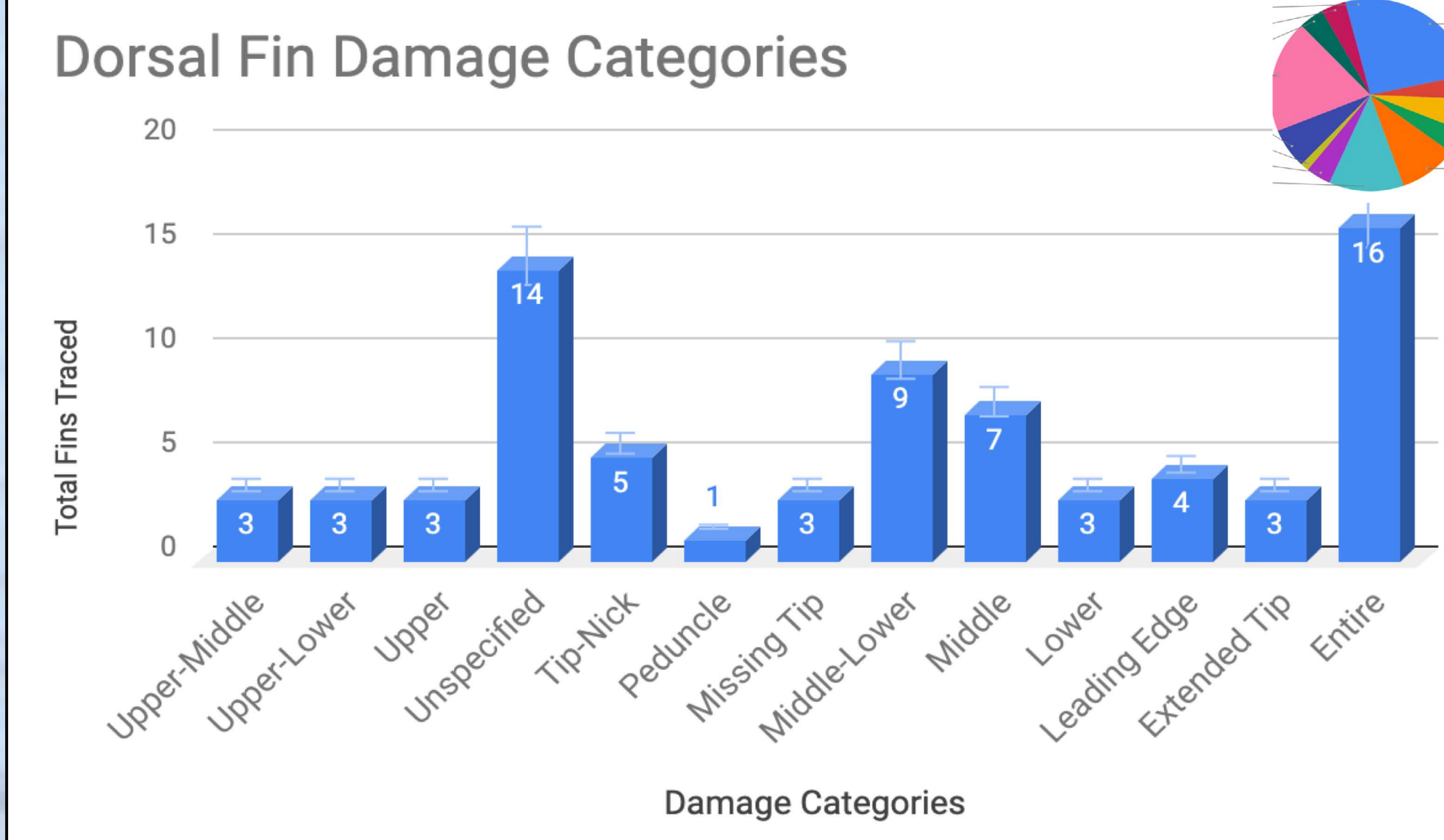


Fig 6. Photos were scored based on comparisons to recent literature assessments (Hupman et al. 2017) Hart et al. 2012) **From Left to Right** : Tattoo skin disease, focal skin disease, pale skin patches, pox virus, lineal skin anomalies, ulcerative dermatitis.

Fig 7. *Xenobalanus globicipitus* is a sessile barnacle and commensal ectoparasite found only on whales and dolphins. It attaches temporarily to travel and can hide the features of the fin.

Results

- **74 DF** randomly selected and traced (**28%** of identified individuals) **21.6%** of described damages were of the “entire” fin, **18.9%** had unspecified or no damage.
- **40.5%** had *Xenobalanus globicipitus* present. Multiple individuals were chosen for each date but there were no similarities.
- **34** dolphin images were selected to categorize skin conditions. **47%** showed signs of Tattoo Skin Disease (TSD), 12.5% of Focal Skin Disease and 9.4% with Pale Skin Patches. These ID selections were **12.9%** of the NYB catalog.



Discussion

Ultimately, this research focused on what these categories can tell us about the dolphins of New York Bight. As we compared dorsal fins, it helped us observe similar damage features and found that in the skin disease sample, many individuals with lesions were in the same group. While this shows a general sense of the type of damage and skin conditions dolphins have, these methods are qualitative. For example, Darwin does not work well with angular fins and did not match similarities or even individuals sighted twice correctly. On the Rockaways, we have seen small groups of dolphins and think it is important to continue this research to learn more about their patterns here and protect them in this very busy coastline. In the future, we can improve methods and recommend a beach monitoring program. Skin diseases are especially important because they can be infectious, affecting other dolphins and people of the community. It's also important to observe these individuals next year to see how these features of damage and skin lesions may have changed. With development in the area, it's important that we continue research in this region.

References

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Fig 2,3,4. Photo-identification analysis in Darwin software. Each fin is traced using a transformation matrix with triangulation of each contour. We categorized the damage, included sighting information and named each individual. Lastly, we performed a match analysis to compare each fin to other individuals. We found (2) matches from individuals observed on beach surveys to individuals sighted on boat surveys.