



Reading the skin: photographic evidence of lesion dynamics In *Steno bredanensis* from the Canary Islands

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Introduction

Steno bredanensis is an oceanic dolphin species whose external morphology and health conditions remain poorly documented. In the Canary Islands, the species is present year-round and has been monitored through long-term photo-identification programs conducted by SECAC.

Skin disorder, defined as alterations in skin structure or pigmentation, represent valuable non-invasive indicators of individual health status, as well as potential responses to environmental and anthropogenic stressors.

This study provides the first comprehensive assessment of skin anomalies in this species within the Canary Archipelago. The objectives of this study were to identify and classify the different types of skin lesions, analyze their spatial distribution across the body, and investigate their temporal evolution in re-sighted individuals. A total of 663 individuals observed between 2004 and 2025 were analyzed using photographic data.

Data analysis

Three complementary analyses were conducted to investigate skin disorders in *Steno bredanensis*. The first analysis focused on the different types of skin lesions and anomalies observed on the animal, without considering their severity or extent on the body (*Representative examples of the lesions are shown in Fig. 1 and Fig. 2*).

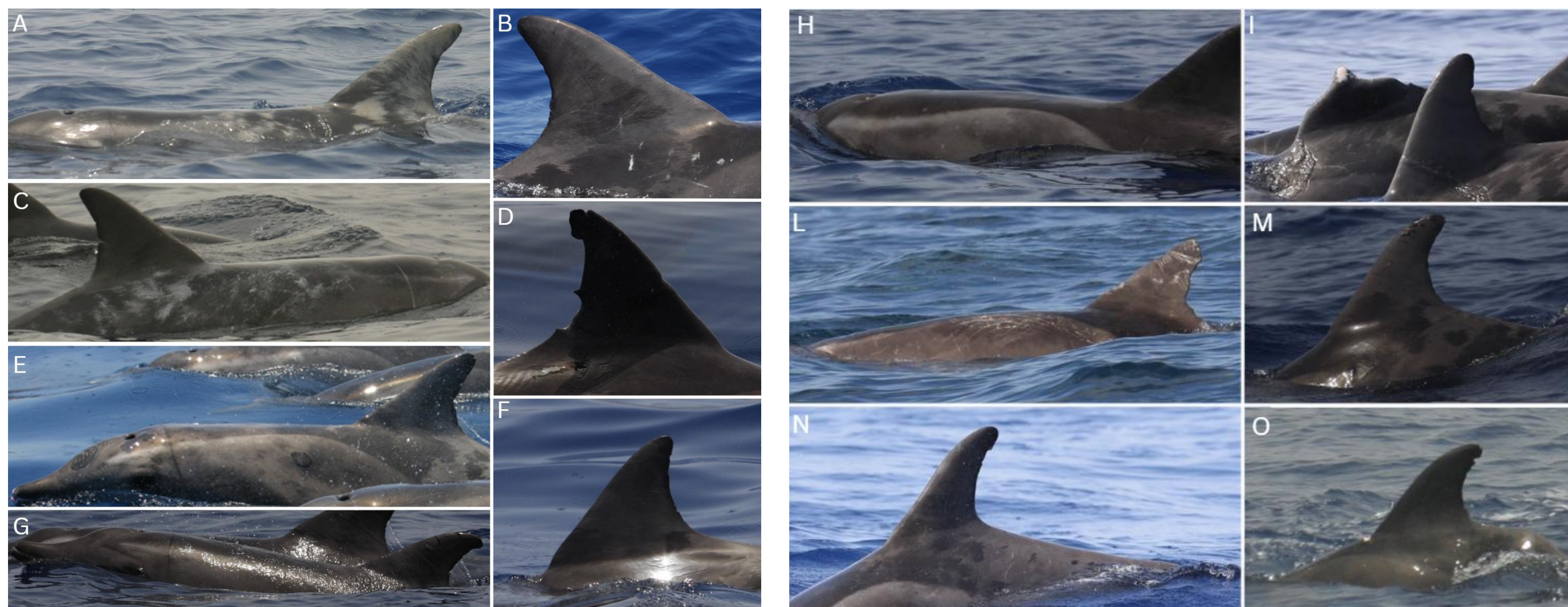


Figure 1: table with the skin disorder considered in the study. A: example of de-pigmentation; B: example of scratch; C: example of dermatitis; D: example of deep indentation; E: example of dark ring and black mark; F: example of small shallow indentation; G: example of neckline.

Figure 2: table with the skin disorder considered in the study. H: example of white patch and white ring lesion; I: example of mutilation; L: example of tooth rakes; M: example of *Xenobalanus globicipitis*; N: example of linear wound; O: example of scoliosis.

The second analysis examined the spatial distribution of lesions across the body. For this purpose, the dolphin's body was divided into 10 predefined regions, with two additional areas corresponding to the nasal region (a) and the dorsal fin bridge (b) (*Fig. 3*).

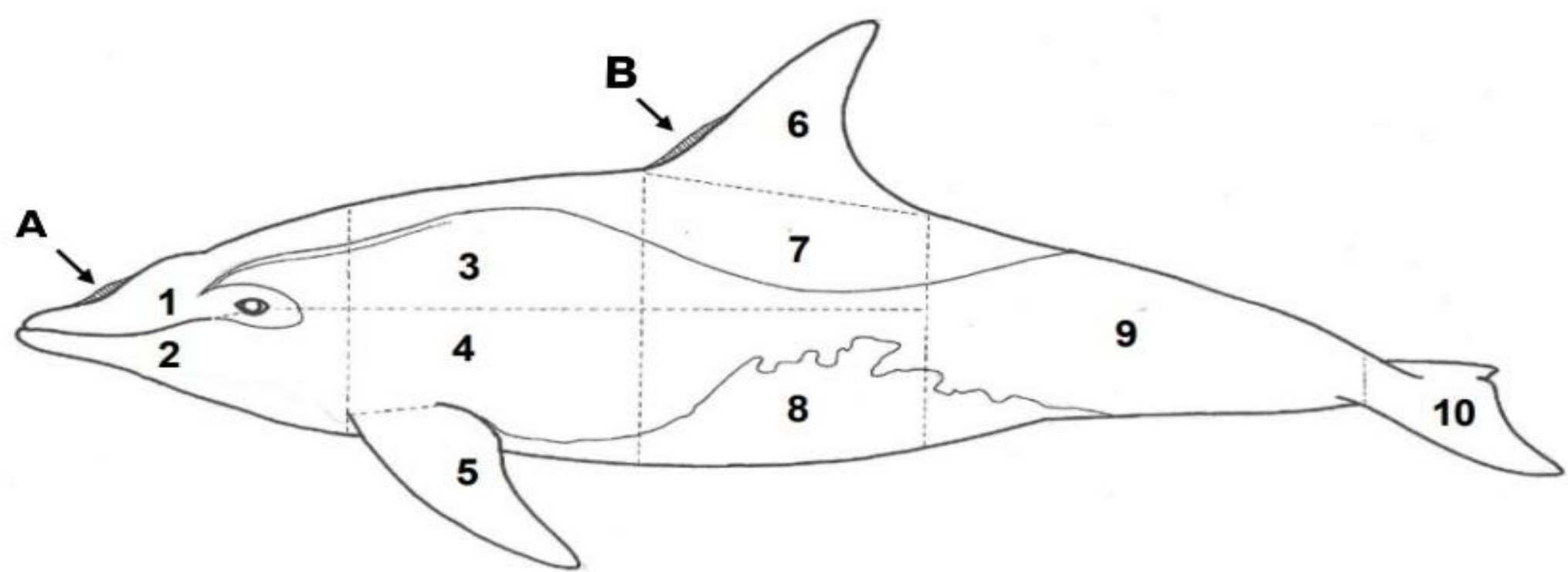


Figure 3: imagine of the dolphin divided into the ten body regions considered for the study and the position of the zone A and B.

The third analysis focused on re-sighted individuals to assess temporal changes in lesions. Changes in existing lesions, healing processes, and the appearance of new lesions were recorded, providing insights into lesion progression and healing patterns over time.



Figure 4: Comparison of individual Sbr135 encountered on the 10/09/2005 (left) and on the 25/08/2010 (right). The irregularities on the dorsal fin facilitated the reliable identification of this individual.

Results

The most frequently observed skin anomalies were small shallow indentations (80%), linear wounds (79%), and tooth rake marks (66%). These results reflect the highly social behaviour of the species since these lesions can be caused during social and mating interactions.

Another interesting observation was the presence of *Xenobalanus globicipitis*, which was detected in a considerable number of individuals. In contrast, abnormal pigmentation and other morphological anomalies such as scoliosis were relatively rare.

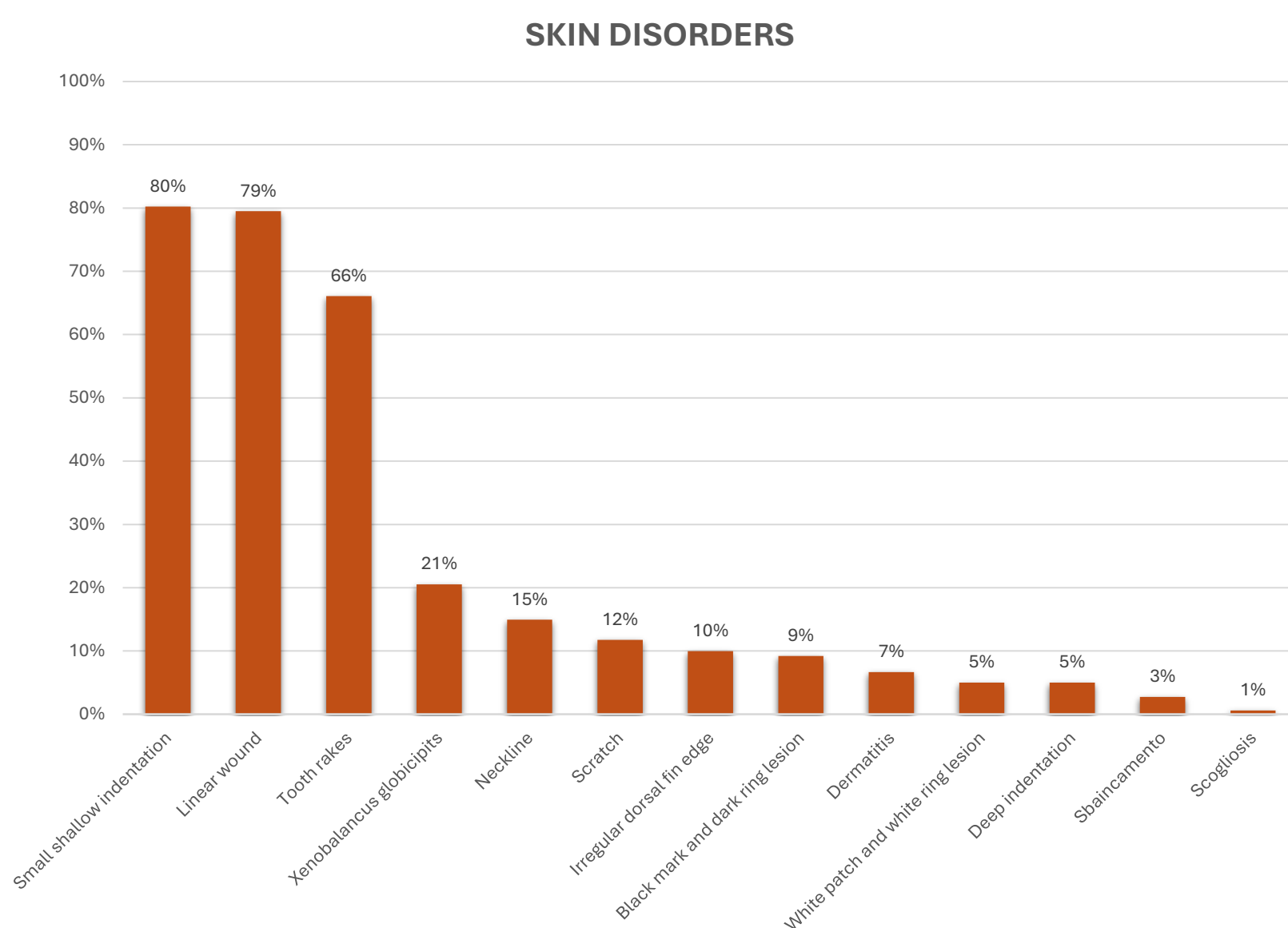


Figure 5: clustered bar showing the percentage of each skin disorder analyzed in the study.

The spatial distribution analysis (*Fig. 6*) showed that the dorsal fin (zone 6) had the highest proportion of recorded lesions. This reflects the photo-identification methodology, as image acquisition was primarily focused on the dorsal fin, and the fact that this area is the most exposed during interactions. Vice versa, fewer data were available for the lower parts of the body, particularly zones 2, 4, 8, and 10, because these areas are less visible during sightings.



Figure 6: clustered bar showing the percentage of observations in which each body zone exhibited an injury.

A total of 157 individuals were re-sighted, with a time interval that went from the same day to 14 years (*Fig. 7*).

This analysis revealed that linear wounds and tooth rakes healed over time but were often replaced by new lesions. *Xenobalanus globicipitis* infestations also disappeared across successive sightings. In contrast, both shallow and deep indentations became more pronounced over time, while dermatitis exhibited progressive deterioration over longer intervals.



Figure 7: clustered bar showing the percentage of the interval frame of re-sighting.

Conclusions

This study provides the first long-term assessment of skin disorders dynamics in *Steno bredanensis*, establishing a baseline for future research. Most lesions appear to be linked to social interactions, while less frequent ones offer insights into individual and population health, as well as environmental and anthropogenic pressures.

Long-term monitoring in the Canary Islands is essential to support conservation efforts, improve management strategies, and better understand the ecology and health of this species.

