



Unveiling evidence of natural and anthropogenic skin marks on baleen whales (Northwestern Iberian Peninsula coast)

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Introduction

The visual assessment of skin marks and body condition on cetaceans allow the identification of potential natural and anthropogenic threats affecting vulnerable species and their habitat [1,2,3] without being invasive.

Study aim:

- (1) Investigate the **skin health status** through the identification of skin marks on 3 baleen whale species (blue, fin and minke whales) present along the Northwestern Iberia Peninsula coast;
- (2) Comment their possible origin (**natural** or **anthropogenic**);
- (3) Estimate prevalence and abundance of each skin mark;
- (4) Verify if the different skin marks are linked to a specific **species** or **body condition**.

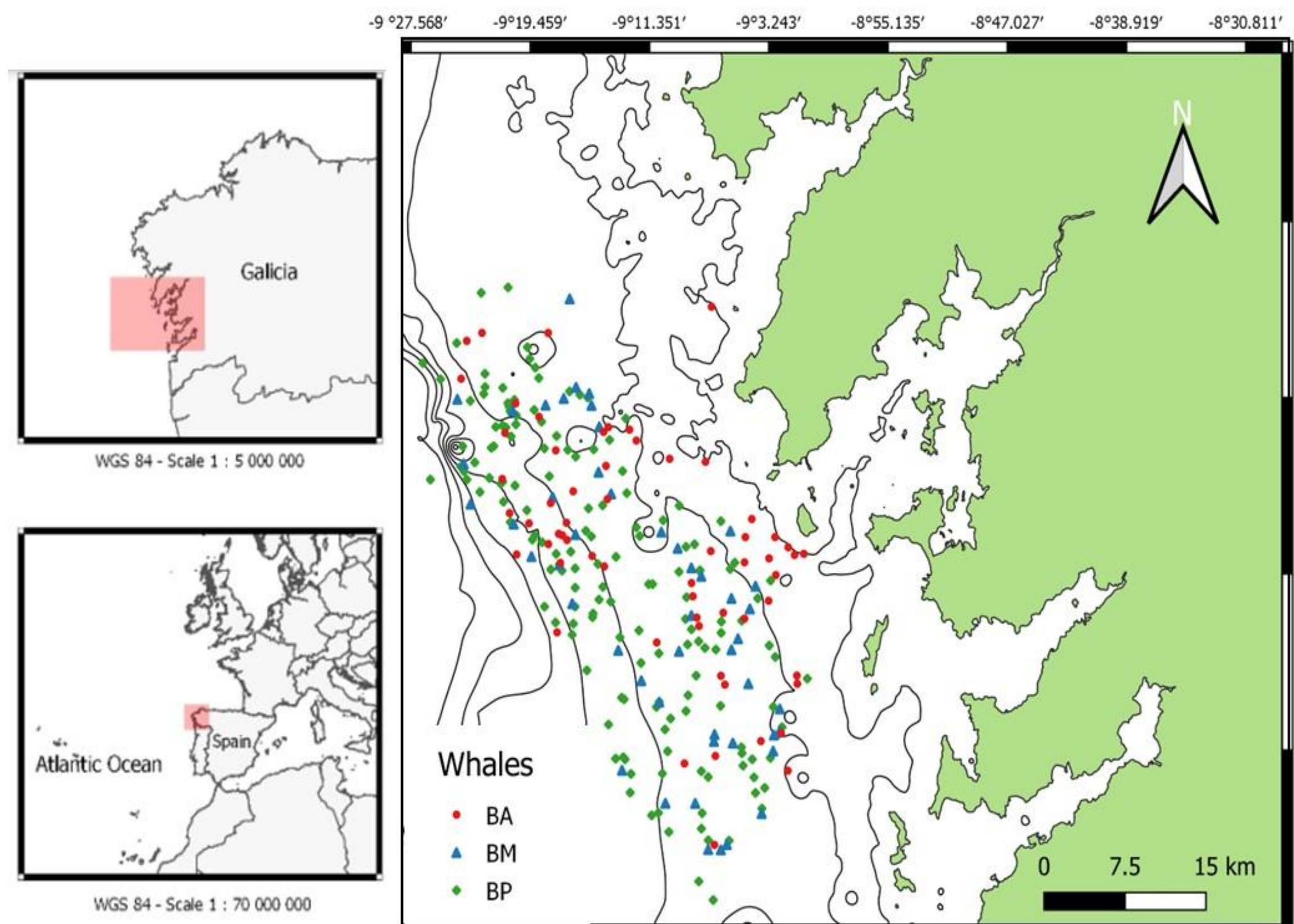


Figure 1- Map with the sighting distribution of minke whales (BA), blue whales (BM) and fin whales (BP).

Methodology

Boat-based surveys were carried out between 2017 and 2021 with satisfactory weather conditions. Photographs from 21 BM, 160 BP and 22 BA were used to assess the prevalence and abundance of skin marks and the body conditions of each individual per body section.

Figure 2- Body condition categories: (A) Good body conditions, rounded sides and no vertebrae are visible; (B) Poor body condition, dorsal ridge and/or multiple vertebrae are visible.

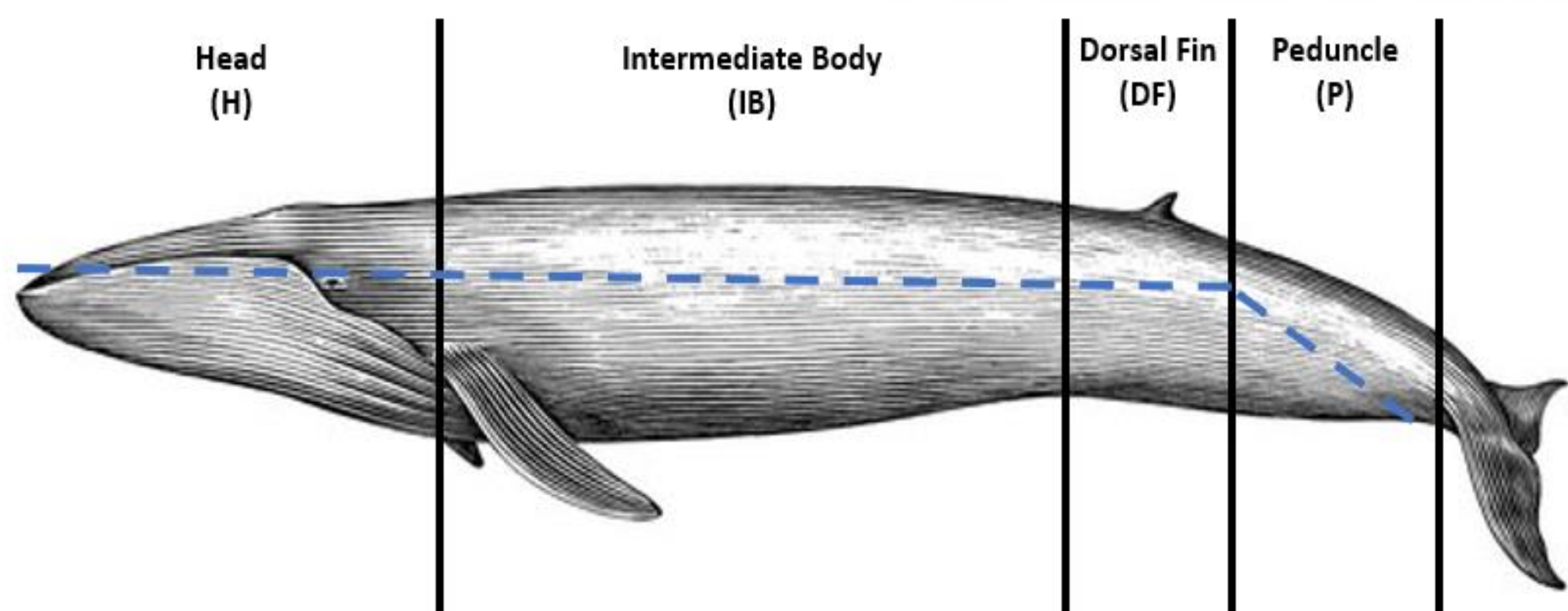


Figure 3- General representation of the body sections. Only the areas above the dashed blue line were considered in this study.

Results

- A total of **36 different types of skin marks** were documented on the 3 species studied.
- The skin marks with **higher prevalence and abundance** were considered of natural origin.
- **Anthropogenic skin marks** were recorded in minority.
- **Herpes, black and white marks** were the skin marks that varied the most. Those skin marks were homogenous between species ($p = 0.520$, $df = 2$, $F = 0.288$) and individual body condition ($p = 0.951$, $df = 1$, $F = 0.0293$).

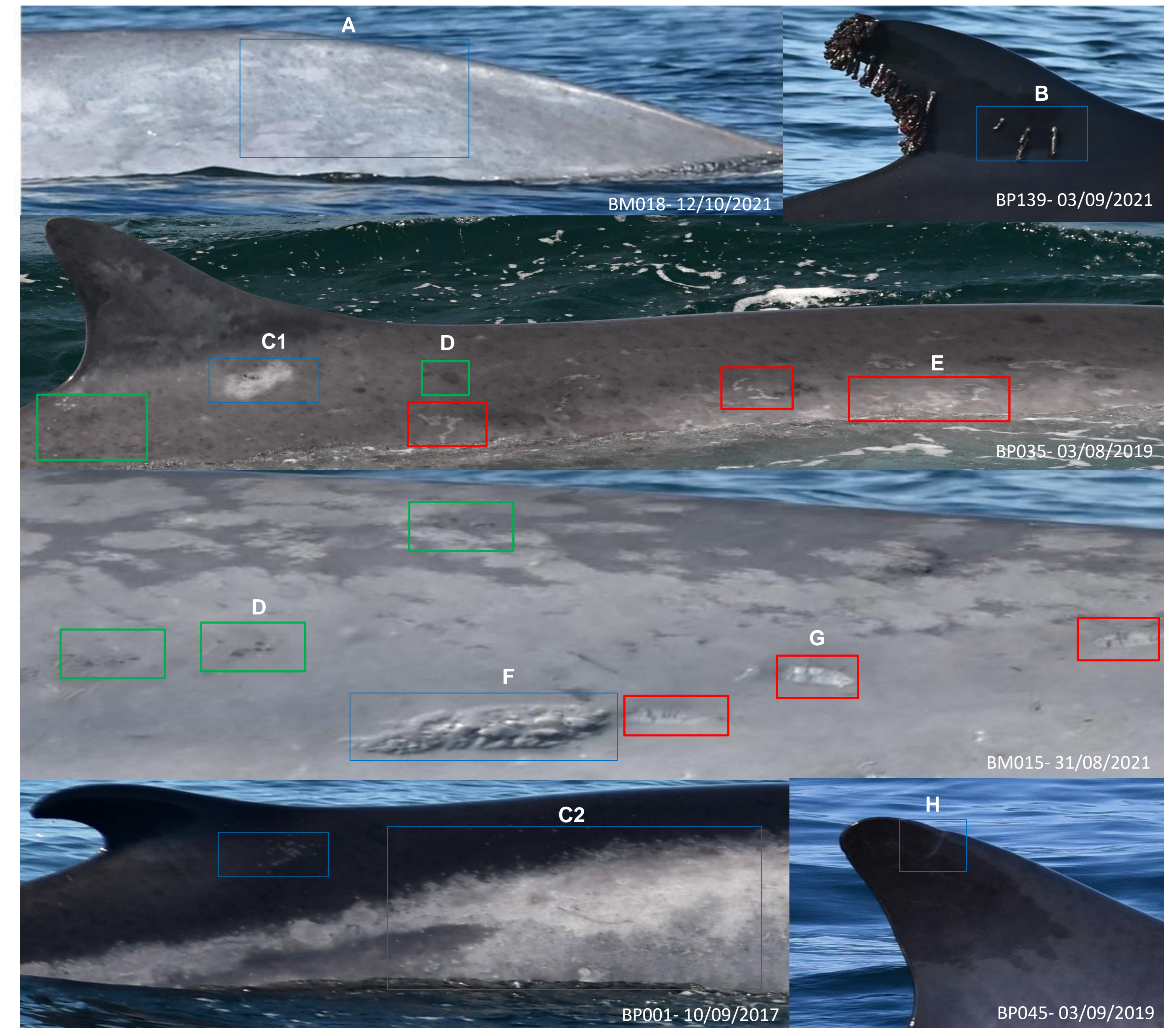


Figure 4- Examples of different types of skin marks observed:

Natural origin- (A) Herpes-like, (B) Ectoparasite *Xenobalanus globicipitis*, (C1) White marks, (D) Black marks, (E) Jellyfish scars, (F) Blister agglomeration, and (G) Cookie-cutter bite (shark *Isistius* spp.).

Anthropogenic origin- (C2) White marks emerging from fishing net scratches (BP001 was found entangled in a fishing gear); (H) Nick leading edge probably caused by interaction with fishing activities.

Conclusion

Baleen whales present on the Northeast Atlantic Ocean exhibited skin marks indicators of global problematics such as climate change (blisters and jellyfish scars) and anthropogenic impacts (some injuries, fin outliners, propeller cut and fishing net entanglement). Herpes, black and white marks contributed the most for the variability of skin marks on whales, however none of those are related to a specific species or body condition.

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