



# Comparing the location and morphology of minke whale dorsal fin marks: Scotland and Iceland

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## 1. Introduction

Photo-identification is widely used as a tool for investigating the life history and behavioural ecology of cetaceans. Minke whales (*Balaenoptera acutorostrata*) have proven to be successful candidates for the use of photo-identification methods (Dorsey 1990, Gill 1994, Tscherter & Morris 2005, Baumgartner *et al.* 2007). In particular, marks occurring along the edge of the dorsal fin have proven useful in discriminating between individual whales. However, little is understood of the processes which lead to the formation of these marks. The following short pilot study was conducted to determine if the characteristics of these marks differed between one geographical area and another.

## 2. Methods

A comparative analysis of dorsal fin edge marks (DEMs) was carried out from whales from the Moray Firth (MF) in northeast Scotland ( $n=28$ ) and from Skjálfandi Bay (SB) in northeast Iceland ( $n=28$ ) (figure 1). A dorsal fin layout system was used to test for significantly different proportions of marks occurring in the position (anterior, posterior, upper, lower, tip) and shape (rounded, squared, triangular, indented, cut-off) of the dorsal fin nicks recorded for recognisable animals from each of the respective study areas (figure 2 and table 1).

## 3. Results

When mark categories between catalogues were compared and examined with Chi-Squared tests, a significant difference was found in the relative position of marks (Chi-sq=10.373, df=8,  $p=0.035$ ). However, no significant difference was observed in the frequencies of dorsal edge mark morphologies between the two regions (Chi-sq=0.769, df=8,  $p=0.943$ ).

## 4. Discussion

It is concluded from the results that the unique processes by which these different shaped marks occur are the same between these two geographically-isolated areas. Processes which could potentially cause or promote DEMs include inter- (predation) and intra- (competition) specific interaction events, parasitic attachment and collisions with vessels or debris. Therefore, it is important to identify which of these processes may be responsible for each of the different DEM types. Investigating the processes by which minke whales may acquire these markings might help to increase our understanding of their life history and any subsequent impacts that may affect them. Conducting comparative photo-identification studies of minke whales between isolated studies may subsequently help in the development and/or standardisation of techniques used in future investigations for this species allowing more detailed, comparative research.

## 5. References

- Baumgartner, N., Robinson, K.P. & Pierce, G.J. 2007. Preliminary photo-identification analysis of minke whales on the east coast of Scotland. *European Research on Cetaceans* 21 (distributed on CD-ROM).
- Dorsey, E.M. 1990. Minke whales (*Balaenoptera acutorostrata*) from the west coast of North America: Individual recognition and small-scale site fidelity. *Report of the International Whaling Commission Special Issue* 12: 357-368.
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- Tscherter, U. & Morris, C. 2005. Identifying a Majority of Minke Whales (*Balaenoptera acutorostrata*) in the St. Lawrence Based on the Presence of Dorsal Fin Edge Marks. *European Research on Cetaceans* 19 (distributed on CD-ROM).

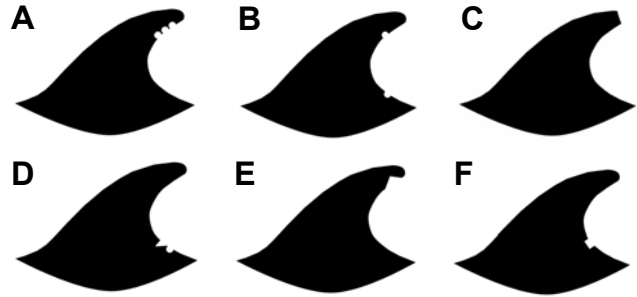


Figure 1. Examples of dorsal fins examined highlighting the position and morphology of marks. A MF\_14, B MF\_06, C MF\_09, D SB\_03, E SB\_05 and F SB\_11.

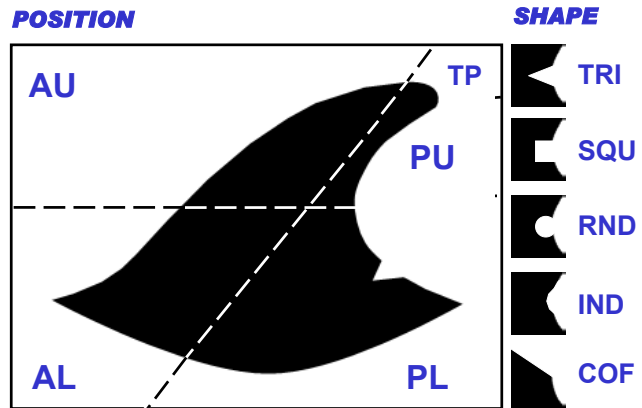


Figure 2. Diagram depicting classification fields used in organising and defining DEMs for comparison between minke whale image catalogues. Key: AU = Anterior Upper nick; AL = anterior lower nick; PU = posterior upper nick; PL = posterior lower nick; TP = nick at tip. TRI = triangular nick shape; SQU = square; RND = rounded; IND = indented; and COF = cut off.

Table 1. Tables showing the proportions of minke whale DEM nick positions and shapes between the Moray Firth and Skjálfandi Bay catalogues.

POSITION	AU	AL	PU	PL	TIP
CRRU	3.703	0.000	51.851	29.629	14.818
HWM	10.714	0.000	32.142	42.857	14.285
SHAPE	TRI	SQU	RND	IND	COF
CRRU	17.857	0.000	71.142	7.142	3.571
HWM	46.428	3.571	28.571	14.285	7.142