



K. Hartman

Habitat differentiation between groups of Risso's dolphins as evidence of coastal nursery areas



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INTRODUCTION

Risso's dolphins (*Grampus griseus*) off the South-East coast of Pico showed a high degree of residency with specific patterns of habitat occupation. Furthermore, new-born and nursing calves are usually sighted in the study area, which can be a strong indicator of a nursery area.

METHODS

A total of 924 sightings were collected from 2004 to 2007 using Photo ID and GPS data. An age classification system using the accumulation of scars on the dolphin's skin was applied to describe three different age classes with calves (Fig.1) A fourth "without calves"-group was also added to the database. In order to look at the differences between sightings distribution a Kruskal-Wallis test and a Man-Whitney test with a Bonferroni correction was applied. A maximum entropy model was used to create Habitat Suitability (HS) maps of each group. To find the spatial preferences of the different groups we studied the range overlap at different thresholds, referring to the areas of maximum probability of occurrence.

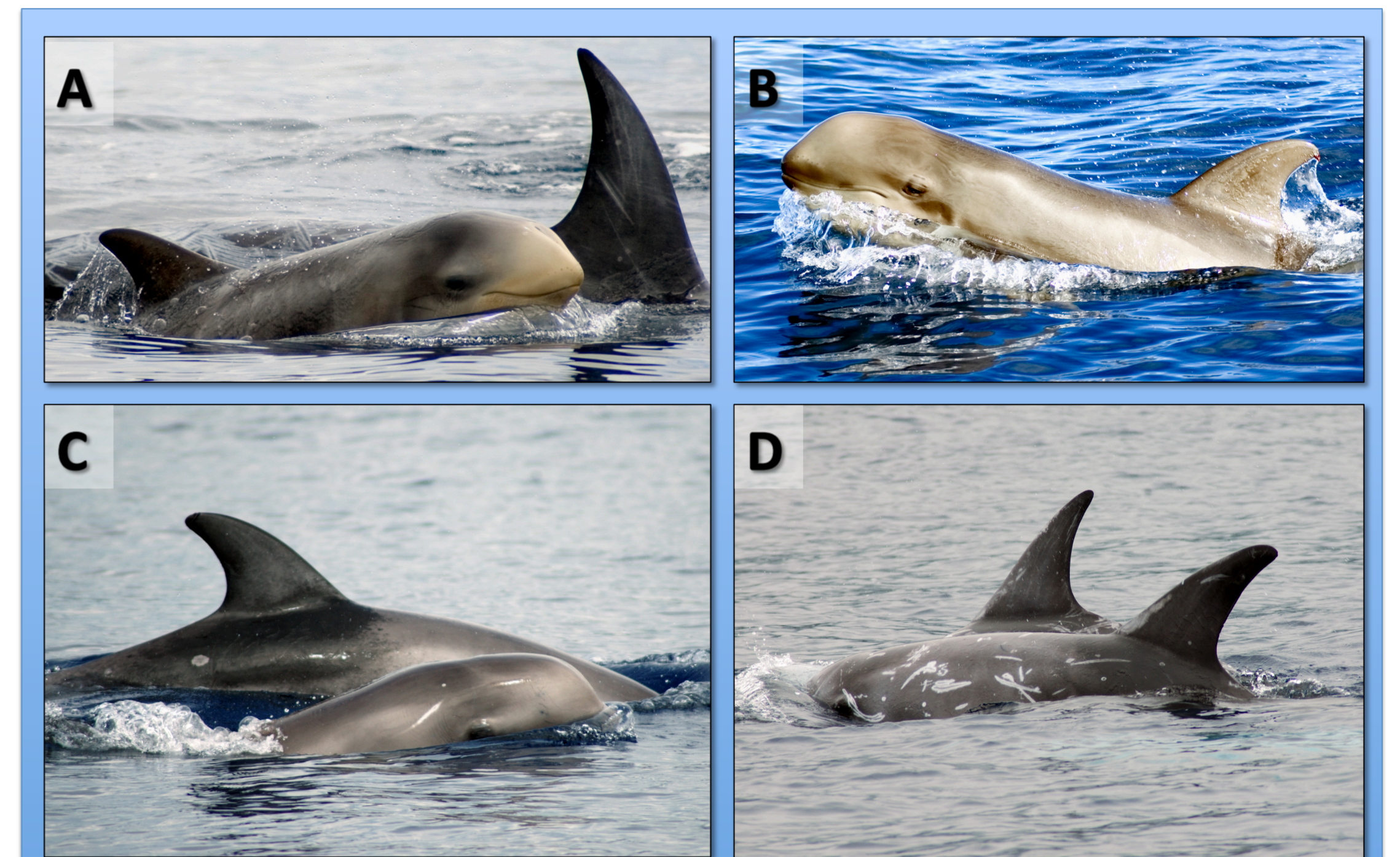


Figure 1. Age classification system examples using the accumulation of scars on the dolphin's skin. The four photos correspond to individuals with different age classifications: (A) new-born calf; (B) 6 months calf; (C) 2 years calf; (D) 4 years calf.

Grampus griseus groups based on calf age and presence:
C06: Groups with calves from 0 to 6 months
C62: Groups with calves from 6 months to 2 years
C24: Groups with calves from 2 to 4 years
NoC: Groups without calves

RESULTS

We found a broad range of occurrence for Risso's dolphins (between 100m and 7.5 km from coast) in our study area. The statistical analysis showed differences between groups, basically between C06 and C24, NoC. The HS maps gives a better idea of the probability of occurrence; C06 prefers coastal areas, with the maximum of suitability near the shore (with a minimum of 150 m and a mean of 1.3km from shore). The 65% threshold applied in the range overlap analysis showed meaningful differences in the distribution

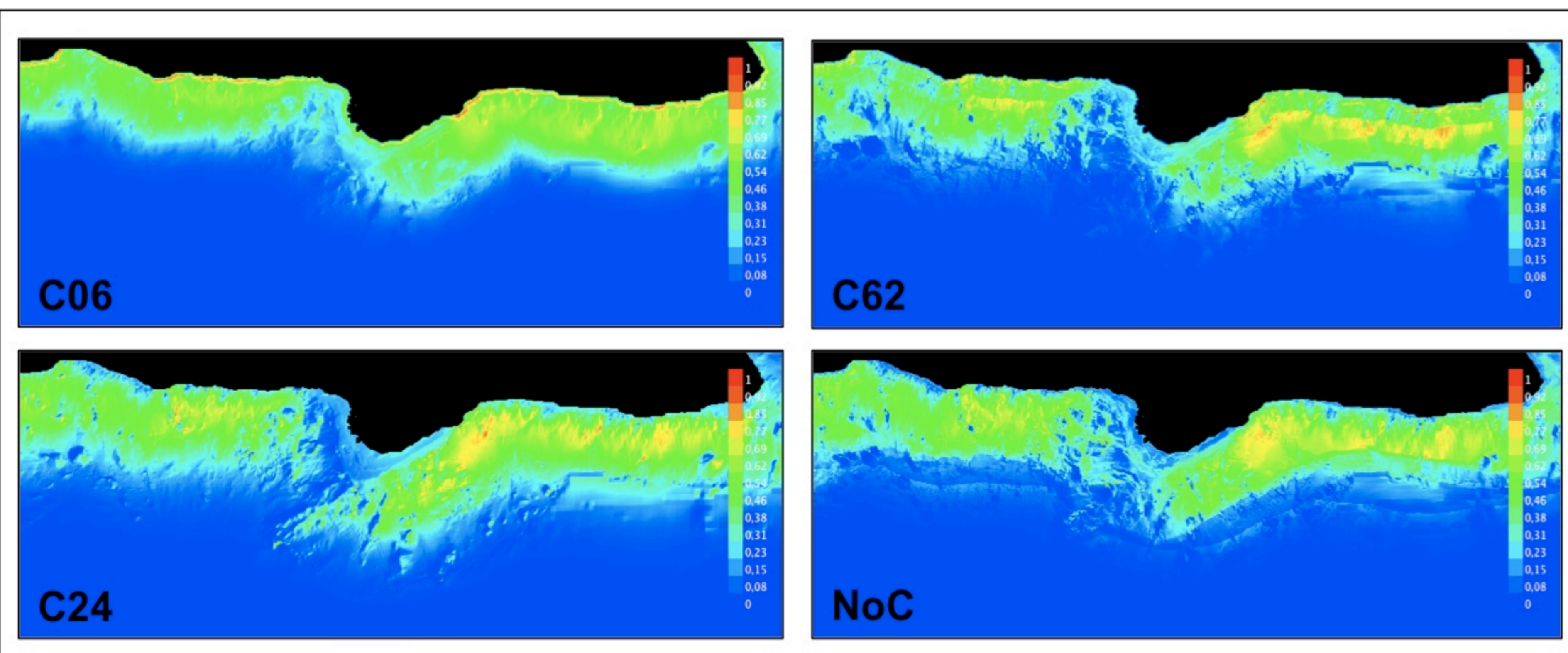


Figure 2: Habitat Suitability Maps of the 4 groups. The black area represents land and red the maximum of suitability.

Table 1. Range overlap at a 65% threshold. Differences between groups are clearly observed; especially between C06 and all the other groups.

Species	C06	C62	C24	NoC
C06	1.00	0.58	0.44	0.42
C62	-	1.00	0.77	0.75
C24	-	-	1.00	0.76
NoC	-	-	-	1.00

CONCLUSION

- There is a clear age related spatial segregation, suggesting the existence of nursery groups.
- Groups with younger calves or new-borns prefer very coastal areas, probably due to the protection offered by a shadow area.
- These coastal areas are an easy target for the "Whale Watching" and "Swimming With Dolphins" operations creating a possible disturbance to the nursery groups.

Acknowledgments:

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References:

- (1) Hartman, K. L., Visser, F., Hendriks, A.J.E. (2008). Social structure of Risso's dolphins (*Grampus griseus*) at the Azores: a stratified community based on highly associated social units. *Can. J. Zool.*, 86, 294-306. (2) Warren, D.L., Glor, R.E., Turelli, M. (2010). ENMTools: a toolbox for comparative studies of environmental niche models. *Ecography*, 33, 607-611. (3) Phillips, S., Anderson, R., & Schapire, R. (2006). Maximum entropy modeling of species geographic distributions. *Ecological Modelling*, 190(3-4), 231-259.



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G 04

A genetic study of the harbour porpoise's comeback around French coasts

Eric Alfonsi, Michaël C. Fontaine, François-Gilles Carpentier, Victor Le Gorgeu, Willy Dabin, Olivier Van Canneyt, Sami Hassani, Jean-Luc Jung

G 05

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Inês Carvalho, Jaqueline Loo, Tim Collins, Cristina Pomilla, Jaco Barendse, Peter B. Best, Matt Leslie, Howard C. Rosenbaum

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Mitochondrial DNA control region diversity of the bottlenose dolphin (*Tursiops truncatus*) from the Adriatic Sea

Dušica Divac Brni, Viktorija Herceg, Martina uras Gomeri, Tomislav Gomeri, Ana Galov

HABITAT USE

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Temporal patterns in habitat use of harbour porpoises (*Phocoena phocoena*) in Broadhaven Bay, northwest Ireland

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HA 02

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Data of opportunity for the study of the spatial patterns of an estuarine population of bottlenose dolphins (Sado Estuary, Portugal)

Carina Silva, Patrícia Mota, Rute Portugal, Francisco Andrade

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Habitat preference between groups of Risso's dolphins as evidence of coastal nursery areas

Marc Fernandez, Karin Hartman, José M.N. Azevedo

HA 05

Towards an objective and quantitative approach for dolphin habitat: characteristics of bottlenose (*Tursiops* sp.) and spinner dolphin (*Stenella longirostris*) habitat and their application to management and conservation

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HA 06

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HA 07

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Raquel Soley, Debbie Russell, Thomas Doniol-Valcroze

HA 04

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Previous studies have shown strong site fidelity by Risso's dolphins at a site off Pico Island, Azores. Females with calves tend to be seen together, often with newborn calves. In this study we analyse position and photo-identification data gathered on ocean surveys from 2004 to 2007 to look at the distribution of females with calves of different ages (newborns to 6 months old, 6 months to 2 years and 2 to 4 years) and compare it with pods with no calves present. The association of the different groups with selected ecogeographical variables was tested, and a maximum entropy model was used to create habitat suitability maps, using a 50mx50m grid. The female pods with younger calves were found to have a significantly distinct distribution from those with older calves or without calves. The main difference was that the pods with younger calves tended to be found closer to the shore, whereas the other groups used a wider offshore area. More extensive sampling is required in order to validate the existence and geographical distribution of coastal nursery areas for this species. However, we believe the present data is enough to elicit precautionary conservation measures to reduce human impact on a vulnerable part of the dolphin society, such as that associated with boat traffic, whale watching and swimming with dolphins operations.