Data from: Distribution and population structure of the smooth-hound shark, *Mustelus mustelus* (Linnaeus, 1758), across an oceanic archipelago: combining several data sources to promote conservation

Abstract

These data were generated to ivestigate the distribution and population structure of *Mustelus mustelus* across the Canarian Archipelago. This shark is widely found in the eastern Atlantic Ocean and catalogued as ‘Vulnerable’ by the IUCN European assessment. Data on the distribution and population structure of this species across the islands of the Canarian archipelago, located along an east to west gradient in the north-eastern Atlantic, were collected by taking advantage of ‘Local Ecological Knowledge’, in terms of sightings in coastal waters. This source of qualitative and quantitative data (sightings) demonstrated that adults of *M. mustelus* has a significantly larger presence in the eastern and central, than in the western islands of the archipelago. Adult smooth-hound sharks were significantly more observed in sandy and sandy-rocky bottoms, with individuals seen throughout the entire year, whereas juveniles aggregate on very shallow waters in spring and summer. Such aggregations require a special management strategy, as they play a key role in critical life stages; these sites should be protected from human perturbations. We also suggest a temporal fishing ban between April and October, when individuals tend to concentrate on nearshore waters. Because of the large differences in presence of this shark among the Canarian Islands, management of the species should be adapted to the specific peculiarities of each island, rather than adopting a management policy at the entire archipelago-scale. Overall, this study sets the basis for further investigation to promote conservation of this vulnerable shark in the study region.

Description

This dataset contains biologic, environmental and geographical data about the sightings of *Mustelus mustelus* individuals across the Canarian Archipelago. Data are included in an Excel file: “Sighting data of *Mustelus mustelus* in the Canary Islands.xlsx”; this file can be opened with Microsoft Office Excel or OpenOffice Calc software. The file includes only one sheet where the information is organized as follows:

Column A: island (name of the Island, i.e., El Hierro, La Palma, La Gomera, Tenerife, Gran Canaria, Fuerteventura and Lanzarote).

Column B: locality (name of the locality of sighting within each island).

Columns C & D: utmx and utmy coordinates, respectively (Reference System EPSG4083 REGCAN95, UTM28)

Columns E & F: geographic coordinates, Latitude and longitude, respectively (Reference System EPSG4081 REGCAN95 Geographics 2D).

Column G: date of the sighting.

Column H: depth of the sighting (in meters).

Column I: number of individuals recorded.

Column J: total length of individuals (in meters).

Column K: habitat where individuals were sighted (i.e., sandy, sandy-rocky, rocky bottoms, and seagrass meadows).

Column L: respondent number

Column M: profession of the reponder (i.e., marine scientist, professional diver, angling fisher, scuba diver, professional fisher, spearfisher, underwater photographer, scuba instructor).

Column N: organization to which the respondent belongs; these data were anonimyzed to protect personal data.

Columns O, P & Q: these columns contain additional data about the observations.

Methods

- Data were obtained through personal surveys conducted in all the Canary Islands. The questions in the survey were as follows:

1. Respondent name?

2. Name of the Organization?

3. Have you ever seen *Mustelus mustelus* sharks during your dives in the Canary Islands?

4. Have you ever fished *Mustelus mustelus* sharks during your fishing days in the Canary Islands?

5. If yes, Were the individuals observed juveniles or adults? (<70 cm or >70 cm, respectively).

6. What was the Island of the sighting?

7. What was the locality within the island?

8. What was the date of sighting?

9. What was the type of habitat (sandy, rocky, sandy-rocky or seagrass meadows)?

10. What was the depth of sighting?

11. What was the number of individuals?

12. What were the observed sizes?

13. Have you photographs or video tapes of your sightings or catches?

14. Do you know anyone who has observed or fished *Mustelus mustelus* sharks in the Canary Islands?

15. If yes, can you provide us the contact information for that person?

- Statistical analysis

All statistical modelling and testing were implemented in the R4.0.2statistical environment (R Core Team). A t-test checked whether the mean depth at which adults were sighted differed from the mean depth at which juveniles and subadults were sighted. Contingency tables and associated χ2 tests checked for differences in the proportions of sightings according to the seasons (winter, spring, summer and autumn) and habitats of sightings, separately for juveniles and subadults and adults, respectively, for the overall study. Mixed-effects Generalized Linear Models (GLMs) were fitted to the number of sightings by means of the ‘lmerTest’ R package (Kuznetsova, Brockhoff & Christensen, 2017), to test for differences among the three island groups (eastern, central, and western islands), as a fixed factor, and years and islands within each group as random factors. All models were fitted using a ‘negative binomial’ family distribution of residuals, with a ‘log’ link function, which is robust for overdispersed data. Diagnosis plots of residuals and Q–Q plots were visually inspected to check the appropriateness of the fitted models (Harrison et al., 2018). We used the function ‘relevel’ to run models with varying reference levels to assess significant differences between each pair of island groups.

References

Harrison, X.A., Donaldson, L., Correa-Cano, M.E., Evans, J., Fisher, D.N., Goodwin, C.E.D. et al (2018). A brief introduction to mixed effects modelling and multi-model inference in ecology. *PeerJ*, 6, e4794. [https://](https://doi.org/10.1016/j.cub.2017.04.038)doi:10.7717/PEERJ.4794

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