

First record of Grey Seal (*Halichoerus grypus*) in the Mediterranean Sea (Eivissa, Balearic Islands, Spain)

Primera cita de foca gris (*Halichoerus grypus*) en el Mediterráneo (Ibiza, Islas Baleares, España)

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Grey seal *Halichoerus grypus* (Fabricius, 1791), inhabits both sides of the North Atlantic Ocean with three isolated populations both geographically and by the timing of reproduction (Bonner 1981, Härkönen *et al.* 2007) (Fig. 1). The populations are distributed in the Baltic, Northeast and Northwest Atlantic, respectively. However, wandering individuals have been observed from as far south as Virginia (USA) in the western Atlantic and Portugal and Spain in the eastern Atlantic (Themido 1948, Zulueta 1962). In the past few years, strandings

and sightings of pups and juveniles of *H. grypus* in the North-Western Iberian Peninsula (Spain) waters have increased considerably mostly in winter months (Duguy *et al.* 1989, Laria *et al.* 2001, López *et al.* 2002). Individuals from the British breeding colonies reach the coasts of the Cantabrian Sea (the south area of the Bay of Biscay) dragged by the current of Portugal. Occasionally, winter storms can push some specimens up to the Strait of Gibraltar (Gutiérrez-Expósito *et al.* 2012). However, *H. grypus* have been never recorded in the Mediterranean

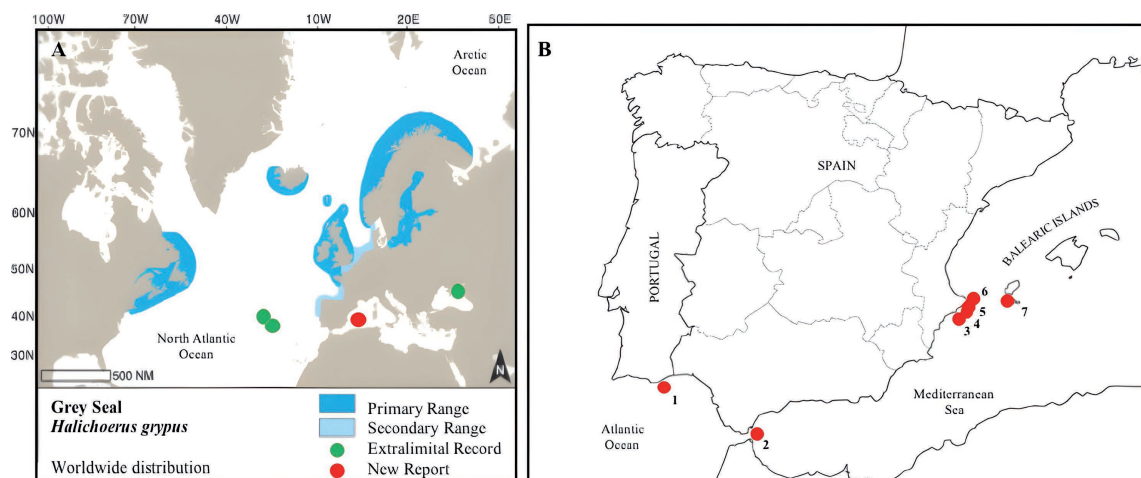


Figure 1. (A) Grey seal distribution, showing the three populations in the Baltic, Northeast Atlantic and Northwest Atlantic. Adapted from Jefferson *et al.* (2011). (B) Grey seal route. Red dots indicate punctual sightings from November 2020 to December 2020. (1) Algarve, (2) Port of Gibraltar, (3) Port of Altea, (4) Cala de Llebeig, (5) Teulada-Moraira, (6) Cala de la Barraca, (7) Cala Jondal (Eivissa Island).

Sea. In fact, the only natively extant pinniped in the Mediterranean Sea is the monk seal *Monachus monachus* (Hermann, 1779), nowadays, one of the most threatened marine mammals, with only 600-700 individuals (Karamanlidis *et al.* 2008).

H. grypus was not documented outside the boreal waters of the Atlantic until 2001, when a female was observed in the Black Sea that probably escaped from captivity. The activity of this seal was registered for more than 10 years, becoming the first case of long-term survival of an exotic pinniped out of the Atlantic Ocean (Gladilina *et al.* 2013).

Population sizes of *H. grypus* are still increasing in the majority of colonies. The global population of this species is estimated to be around 316,000 mature individuals and the total population size reaching 632,000. In accordance with previous data, *H. grypus* has recently been listed as Least Concern (LC) under the International Union for Conservation of Nature (IUCN) Red List (Bowen 2016). *H. grypus*, similar to other gregarious animals, has no tendency to colonize new terrains but generally returns to its natal locality to reproduce (Matthiopoulos *et al.* 2005). However, under conditions that may compromise reproductive success, such as overcrowded breeding sites (Coulson & Hickling 1964), migration from the natal site is favoured (Pomeroy *et al.* 2000, Gaggiotti *et al.* 2002).

Interaction with commercial fisheries, entanglement with marine debris, chemical pollutants and illegal shooting represents the main threats facing grey seals populations (Harding & Härkönen 1999, Debier *et al.* 2003, Hall *et al.* 2003, Varjopuro 2011, Hernandez-Milian *et al.* 2019). Owing to the close spatial separation between fishery hotspots and seal foraging areas, commercial fisheries operations has become one of the main threats (Tixier *et al.* 2020). The severe threat of long-line fisheries includes fish-hook ingestion and entanglement with abandoned, lost and discarded fishing gears. In many cases, the entangling item causes a constriction around the neck or body of the affected animal, which can be eventually fatal (Derraik 2002). In this sense, in a previous study 64% of entangled seals (58 specimens between 2004 and 2008) in the southwest UK presented injuries considered relevant (Allen *et al.* 2012). Moreover, the ingestion of a fish-hook can cause perforations in the digestive tract and may drive the death of the seal through either starvation, ulceration, blood loss or infection (Fowler 1987, Derraik 2002).

In this note, we present the first documentation of a *H. grypus* in the Spanish Mediterranean coast, specifically in waters of Eivissa Island in the Balearic. Although there are references to sightings in the Mediterranean of North Atlantic pinnipeds such as the Harbor Seal *Phoca vitulina* Linnaeus, 1758 (Fundación CRAM 2008), Hooded Seal *Cystophora cristata* (Erxleben, 1777) (Bellido *et al.* 2008) and Harp Seal *Pagophilus groenlandicus* (Erxleben, 1777) (Bellido *et al.* 2009) in the Mediterranean, this is the first observation of *H. grypus*. At the end of November 2020, punctual sightings of the seal identified as the observed individual were recorded for the first time (Fig 1). According with the information published in several newspapers (La Vanguardia on 11th December, Las Provincias on 11th December, Levante on 24th December, Diario de Ibiza on 4th January, Periódico de Ibiza y Formentera on 5th January), firstly, the animal was observed near a tuna farm in the Algarve, located in the southwest of Portugal. Secondly, on 26th November, the seal was swimming close to the port of Gibraltar, spending the night on a jetty of the port. Thirdly, the pinniped was sighted on 10th December in the port of Altea (Alicante, Spain) and during days was touring along the Valencian Community coastline. On 14th November, veterinarian members of the Fundación Oceanogràfic tried to capture the animal after seeing that it presented a long-line around the neck. Finally, on 24th December it was found freshly dead in Cala Jondal (South of Eivissa Island) (Fig. 1). Government environmental agents from the Balearic Islands recorded biometric data and carried out the necropsy at the COFIB (Consortio para la Recuperación de la Fauna de les Illes Balears) headquarters. The specimen was a 194 cm long adult female with a poor body condition. As had been previously observed, the animal had a long-line sticking out of his mouth and showed a visible constriction around his neck with an open wound caused by the nylon (Fig. 2). Frozen sections of the whole digestive tract and liver, heart and kidney samples were transferred to the Interdisciplinary Ecology Group laboratory in the University of the Balearic Islands and stored at -80 °C for further analysis. Digestive content was cautiously examined. Regarding food remains, only three cephalopod beaks were collected, two inside the stomach, and one in the intestines. Additionally, a fish-hook was found nailed in the stomach (Fig. 2).



Figure 2. (A) Adult female grey seal found dead stranded in Cala Jondal (Eivissa Island) on December 24th 2020. (B) Head detail, the grey seal had a longline sticking out of his mouth and showed a visible constriction around his neck. (C) Fish-hook nailed in the stomach.

In accordance with the nearest natural habitats of *H. grypus* to the Mediterranean Sea, the individual recorded in December 2020, is probably of atlantic origin and could have come from the population that exists on the French coasts (in the Molène and Sept Îles), which were sustained by immigration of juvenile seals from Great Britain (Prieur & Duguay 1981), or from the Great Britain colonies. It enters the Mediterranean Sea through the Strait of Gibraltar. Interestingly, Vincent *et al.* (2005)

reported the mobility of juvenile and adult *H. grypus* at the periphery of the core colony, suggesting that *H. grypus* movements along the French coasts and across the Channel are particularly frequent.

In conclusion, it seems reasonable to assume that vagrancy was probably the main reason why the individual entered in the Mediterranean Sea, after a long trip from the Northeast Atlantic shores. Thus, when trying to return to its original distribution area in an involuntary way, the seal has been entering

the Mediterranean Sea. In 2022, an additional observation was reported in March at Moroccan coast (Keznine *et al.* 2023), thus confirming a low flow of the species into the Mediterranean. Hence, documentation of these isolated records is needed as they help to enrich knowledge of the distribution and new movement patterns of this species, as well as to improve the tools for the management and conservation of their populations.

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References

- Allen R., Jarvis D., Sayer S. & Mills C. 2012. Entanglement of grey seals *Halichoerus grypus* at a haul out site in Cornwall, UK. *Marine Pollution Bulletin*, 64: 2815-2819. DOI: [10.1016/j.marpolbul.2012.09.005](https://doi.org/10.1016/j.marpolbul.2012.09.005)
- Bellido J.J., Cabot J., Castillo J.J., Báez J.C., Martín J.J., Mons J.L. ... & Real R. 2009. First record of the harp seal (*Pagophilus groenlandicus*) extralimital presence in the Mediterranean Sea. *Marine Biodiversity Records*, 2: e169. DOI: [10.1017/S1755267209990959](https://doi.org/10.1017/S1755267209990959)
- Bellido J.J., Castillo J.J., Farfán M.A., Martín J.J., Mons J.L. & Real R. 2008. First records of hooded seals (*Cystophora cristata*) in the Mediterranean Sea. *Marine Biodiversity Records*, 1: e74. DOI: [10.1017/S1755267207007804](https://doi.org/10.1017/S1755267207007804)
- Bonner W.N. 1981. Grey seal *Halichoerus grypus* Fabricius, 1791, Pp: 111-144. In: S.H. Ridgway & R.J. Harrison (eds.). *Handbook of Marine Mammals 2. Seals*. Academic Press, London.
- Bowen D. 2016. *Halichoerus grypus*. The IUCN Red List of Threatened Species. DOI: [10.2305/IUCN.UK.2016-1.RLTS.T9660A45226042.en](https://doi.org/10.2305/IUCN.UK.2016-1.RLTS.T9660A45226042.en)
- Coulson J.C. & Hickling G. 1964. The Breeding Biology of the Grey Seal, *Halichoerus grypus* (Fab.), on the Farne Islands, Northumberland. *Journal of Animal Ecology*, 33: 485-512. DOI: [10.2307/2568](https://doi.org/10.2307/2568)
- Debiez C., Pomeroy P.P., Dupont C., Joiris C., Comblin V., Le Boulengé E. ... & Thomé J.P. 2003. Quantitative dynamics of PCB transfer from mother to pup during lactation in UK grey seals *Halichoerus grypus*. *Marine Ecology Progress Series*, 247: 237-248. DOI: [10.3354/MEPS247237](https://doi.org/10.3354/MEPS247237)
- Derraik J.G.B. 2002. The pollution of the marine environment by plastic debris: a review. *Marine Pollution Bulletin*, 44: 842-852. DOI: [10.1016/S0025-326X\(02\)00220-5](https://doi.org/10.1016/S0025-326X(02)00220-5)
- Duguay C., Nores R., Pérez C. & Sequeira M. 1989. Repartition et fréquence des pinnipèdes sur les côtes Atlantiques de France, d'Espagne, et du Portugal. 77ème réunion estatutaire, La Haye, 1989. Comité des Mammifères marins.
- Fowler C.W. 1987. Marine debris and northern fur seals: a case study. *Marine Pollution Bulletin*, 18: 326-335. DOI: [10.1016/S0025-326X\(87\)80020-6](https://doi.org/10.1016/S0025-326X(87)80020-6)
- Fundación CRAM, 2008. Foca común en el Delta del Ebro - CRAM [WWW Document]. URL <https://cram.org/clinica-y-rescate/medicina-y-cirugia/foca-comun-en-el-delta-del-ebro/> (accessed 5.31.23).
- Gaggiotti O.E., Jones F., Amos W., Harwood J. & Nichols R.A. 2002. Patterns of colonization in a grey seal metapopulation. *Nature* 416: 424-427. DOI: [10.1038/416424a](https://doi.org/10.1038/416424a)
- Gladilina E.V., Kovtun A., Kondakov A., Syomik M., Pronin K. & Gol'din E. 2013. Grey seal *Halichoerus grypus* in the Black Sea: the first case of long-term survival of an exotic pinniped. *Marine Biodiversity Records*, 6: 1-6. DOI: [10.1017/S1755267213000018](https://doi.org/10.1017/S1755267213000018)
- Gutiérrez-Expósito C., Rivilla J.C., Alís S., Máñez M., Garrido H., Justo-Jiménez F. & Cobo M.D. 2012. Veinticinco años (1986-2011) de monitorización de varamientos de mamíferos marinos en el litoral de Doñana (Huelva, SO España). *Galemys, Spanish Journal of Mammalogy*, 24: 86-90. DOI: [10.7325/Galemys.2012.N09](https://doi.org/10.7325/Galemys.2012.N09)
- Hall A.J., Kalantzi O.I. & Thomas G.O. 2003. Polybrominated diphenyl ethers (PBDEs) in grey seals during their first year of life-are they thyroid hormone endocrine disrupters? *Environmental Pollution* 126: 29-37. DOI: [10.1016/S0269-7491\(03\)00149-0](https://doi.org/10.1016/S0269-7491(03)00149-0)
- Harding K. & Härkönen T. 1999. Development in the Baltic grey seal (*Halichoerus grypus*) and ringed seal (*Phoca hispida*) populations during the 20th century. *Ambio*, 28: 619-627.
- Härkönen T., Brasseur S., Teilmann J., Vincent C., Dietz R., Abt K. & Reijnders P. 2007. Status of grey seals along mainland Europe from the Southwestern Baltic to France. *NAMMCO Scientific Publications*, 6: 57-68. DOI: [10.7557/3.2721](https://doi.org/10.7557/3.2721)
- Hernandez-Milian G., Lusher A., MacGibbon S. & Rogan E. 2019. Microplastics in grey seal (*Halichoerus grypus*) intestines: Are they associated with parasite aggregations? *Marine Pollution Bulletin*, 146: 349-354. DOI: [10.1016/j.marpolbul.2019.06.014](https://doi.org/10.1016/j.marpolbul.2019.06.014)

- Jefferson T.A., Webber M.A. & Pitman R. 2011. *Marine Mammals of the World: A Comprehensive Guide to Their Identification*. Elsevier, 328 pp.
- Karamanlidis A.A., Androukaki E., Adamantopoulou S., Chatzistryrou A., Johnson W.M., Kotomatas S. ... & Dendrinou P. 2008. Assessing accidental entanglement as a threat to the Mediterranean monk seal *Monachus monachus*. *Endangered Species Research*, 5(2): 205-213. DOI: [10.3354/ESR00092](https://doi.org/10.3354/ESR00092)
- Kezvine M., Mghili B., Analla M. & Aksissou M. 2023. First observation of the grey seal *Halichoerus grypus* on the Moroccan Mediterranean coast. *Cahiers de Biologie Marine*, 3(64): 125-128. DOI: [10.21411/CBM.A.3DB9598F](https://doi.org/10.21411/CBM.A.3DB9598F)
- Laria L., López A., Alonso J.M. & AMBAR. 2001. Situación actual de la foca gris (*Halichoerus grypus*) en el Cantábrico y Atlántico peninsular. *Resúmenes 1º Simposium de la Sociedad Española de Cetáceos. Ceuta, 23-27 febrero de 2000*: 40-44.
- Matthiopoulos J., Harwood J. & Thomas L. 2005. Metapopulation consequences of site fidelity for colonially breeding mammals and birds. *Journal of Animal Ecology*, 74: 716-727. DOI: [10.1111/J.1365-2656.2005.00970.X](https://doi.org/10.1111/J.1365-2656.2005.00970.X)
- Pomeroy P.P., Twiss S.D. & Redma P., 2000. Philopatry, Site Fidelity and Local Kin Associations within Grey Seal Breeding Colonies. *Ethology*, 106: 899-919. DOI: [10.1046/j.1439-0310.2000.00610.x](https://doi.org/10.1046/j.1439-0310.2000.00610.x)
- Prieur D. & Duguy R. 1981. Les phoques des côtes de France: 3. Le phoque gris (*Halichoerus grypus*) (The seals of the French coasts: 3. The grey seal). *Mammalia*, 45: 8398.
- Themido A. 1948. As focas das costas de Portugal. *Memorias e Estudos do Museu de Zoologia da Universidade de Coimbra*, 179: 1-14.
- Tixier P., Lea M.-A., Hindell M.A., Welsford D., Mazé C., Gourguet S. & Arnould P.Y. 2020. When large marine predators feed on fisheries catches: Global patterns of the depredation conflict and directions for coexistence. *Fish and Fisheries*, 22: 31-53. DOI: [10.1111/faf.12504](https://doi.org/10.1111/faf.12504)
- Varjopuro R. 2011. Co-existence of seals and fisheries? Adaptation of a coastal fishery for recovery of the Baltic grey seal. *Marine Policy*, 35: 450-456. DOI: [10.1016/j.marpol.2010.10.023](https://doi.org/10.1016/j.marpol.2010.10.023)
- Vincent C., Fedak M.A., McConnell B.J., Meynier L., Saint-Jean C. & Ridoux V. 2005. Status and conservation of the grey seal, *Halichoerus grypus*, in France. *Biological Conservation*, 126: 62-73. DOI: [10.1016/j.biocon.2005.04.022](https://doi.org/10.1016/j.biocon.2005.04.022)
- Zulueta A. 1962. Una foca de la especie *Halichoerus grypus* (Fabricius) anillada en la isla de Ransey (Gales) y capturada en Santoña (prov. de Santander), *Boletín de la Real Sociedad Española de Historia Natural (Sección Biológica)*, 60: 123-129.

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