

Monitoring and observation of seabirds: A study of *Larus michahellis* in the Al Hoceima region in Moroccan Mediterranean Sea.

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INTRODUCTION

Monitoring seabirds and their interactions with fishing activities plays an essential role in maintaining the health of marine ecosystems. Seabirds are key indicators of the well-being and biodiversity of marine ecosystems, while their interactions with fisheries reflect broader ecological dynamics and human impact on marine environments. This monitoring effort is essential for developing effective mitigation measures to conserve seabird populations in the Mediterranean. By drawing on the scientific data collected through monitoring programs, policymakers can develop evidence-based policies and regulations that address conservation challenges and align with marine sustainability objectives.

As part of the coastal bird monitoring initiative on the Mediterranean coast of Morocco, a notable sighting of a leg-tagged migratory species was documented in the port of Jebha. At the same time, a survey of fishermen was carried out to assess the incidence of seabird bycatch.

MATERIALS & METHODS

The study area is located in the coastal region of Al Hoceima, more precisely at the port of Jebha. This location was chosen for its rich marine biodiversity and ecological importance, yet it also confronts numerous potential threats to seabirds. The port of Jebha offers privileged access to a variety of marine ecosystems. The methodology applied to this study consisted of observing birds on board a trawler, using binoculars and accelerated photography, as well as observing their movements, behavior and recording the geographical coordinates of the observation, in order to document the species.

To assess the bird incidental catch, questionnaires were drawn up for local fishermen. This combined approach allows us to understand the interactions between coastal birds and fishing activities in this specific region.

RESULTS

The findings of the observation allowed to identify a species of *Larus michahellis*, on December 18, 2020, aboard a trawler in fishing operation, distinguished by the code "Number of white stripe N: F9P" marked on its legs. This observation lasted around 20 minutes, during which it displayed foraging and feeding behaviours.

Data analysis indicated that this species migrated a total distance of 957 km across four observations spanning three countries (Spain, Portugal, and Morocco) over a five-month period. The majority of sightings occurred within ports, suggesting a notable correlation between this species and fishing activity. Notably, the questionnaire distributed to trawlers at the Jebha port revealed no recorded incidents of seabird bycatch during the period from February 1st, 2021, to February 19th, 2021.

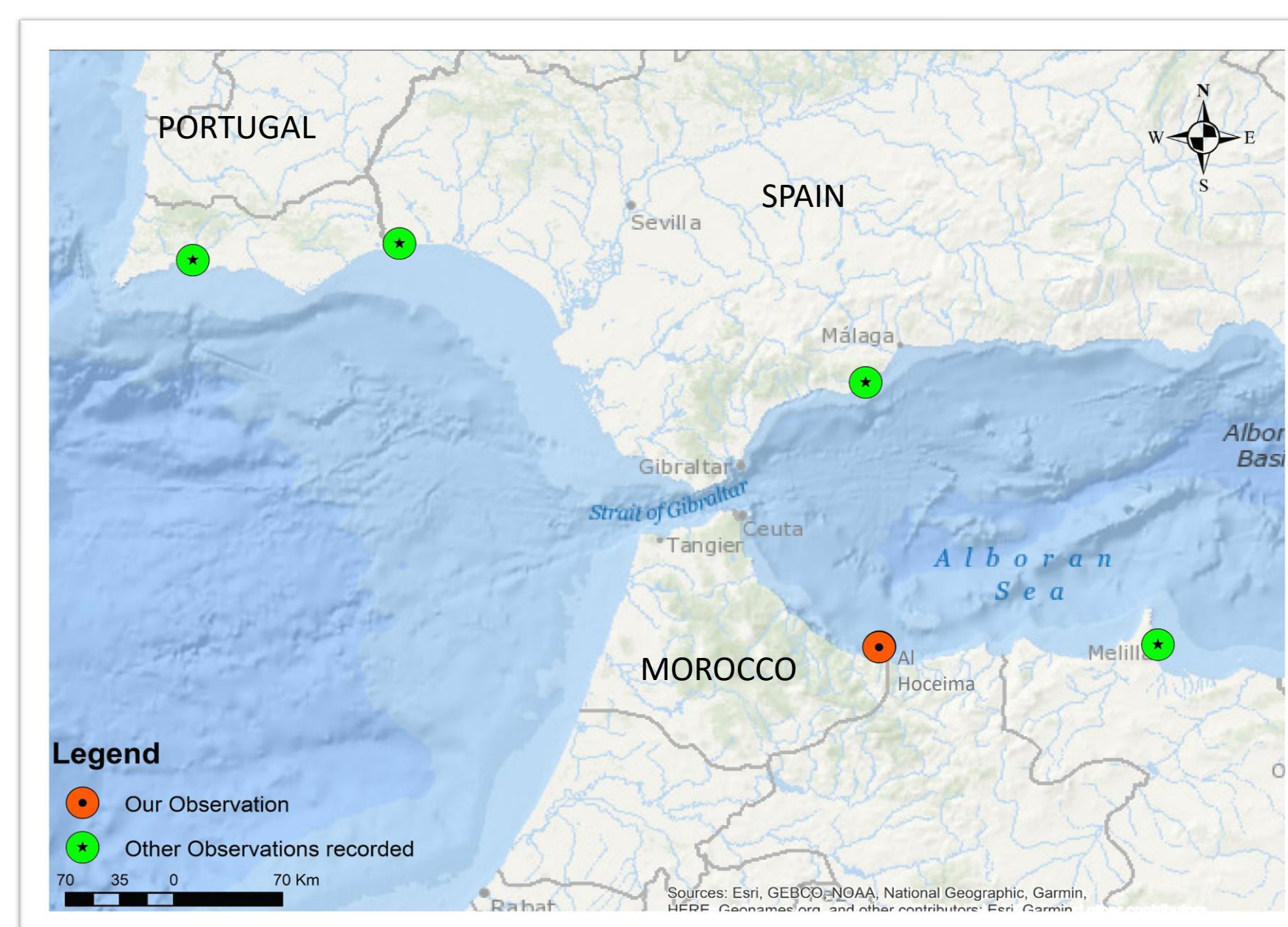


Figure 1: Difference observation sites of the same *Larus michahellis* individual

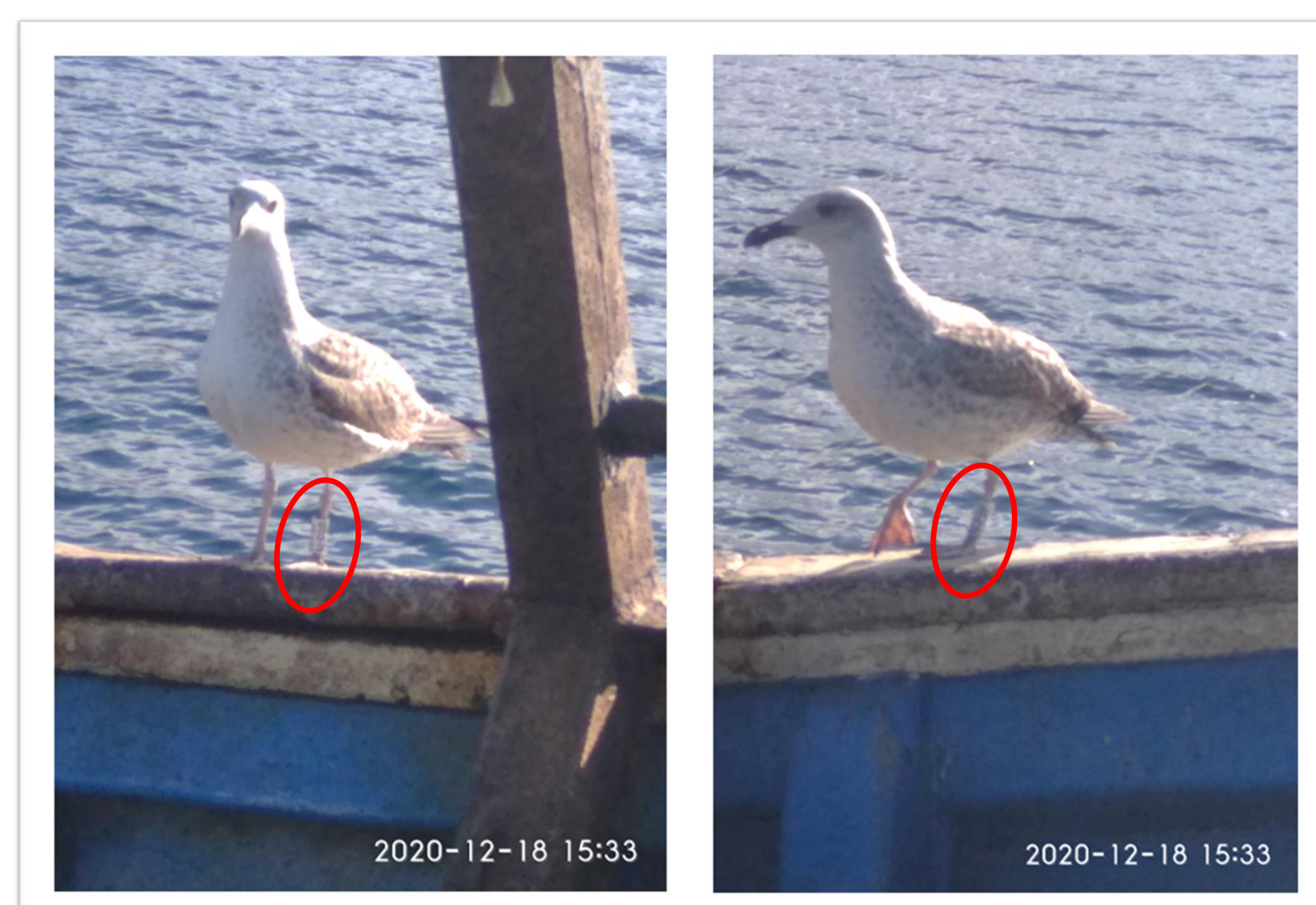


Figure 2: Some pictures of marks on *Larus michahellis* (Number of white band N: F9P)

Table 1: Data from individual *Larus michahellis* observations

Date	Circumstances report	Location	Country	Lat	Long	Km traveled	Days elapsed	Observer
01/06/2020	Color and metal banding	Port of Fuengirola/Malaga	Spain	-	-	-	-	Grupo anillamiento LUSCINIA
26/06/2020	Released in Fuengirola Port	Port of Fuengirola/Malaga	Spain	36,54	-4,62	-	-	Grupo anillamiento LUSCINIA
11/08/2020	Color ring observation	Port of Portimao	Portugal	37,13	-8,53	353	46	Guillaume Réthoré
03/09/2020	Color ring observation	Marismas de Isla Cristina Natural Park /Ayamonte	Spain	37,21	-7,33	252	69	David Cerezo
25/11/2020	Color ring observation	La Marchina. Nador	Morocco	35,26	-2,92	209	152	Said Azaouaghe (Grepom / birdlife Morocco)
18/12/2020	Color ring observation	On board a fishing trawler/ Jebha/ Al Hoceima	Morocco	35,25	-4,54	143	175	Faysal Lissaoui

CONCLUSION

Standardizing approaches is paramount to obtaining consistent data on the impact of fishing activities on seabird populations and monitoring coastal bird migrations across regions. Monitoring seabirds aboard fishing vessels is particularly vital due to their significant role as a primary food source for many species. Developing an observation program and increasing outings on fishing boats are essential for collecting high-quality scientific data, guiding conservation measures, and promoting sustainable management of marine ecosystems in the Mediterranean.

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