



MINISTÈRE  
DE LA TRANSITION  
ÉCOLOGIQUE  
ET DE LA COHÉSION  
DES TERRITOIRES

*Liberté  
Égalité  
Fraternité*



# Séminaire du plan national d'actions en faveur du Puffin des Baléares

24 au 26 juin 2024



# Shearwater-fishery interactions based on GPS tracking and VMS data in the Western Mediterranean



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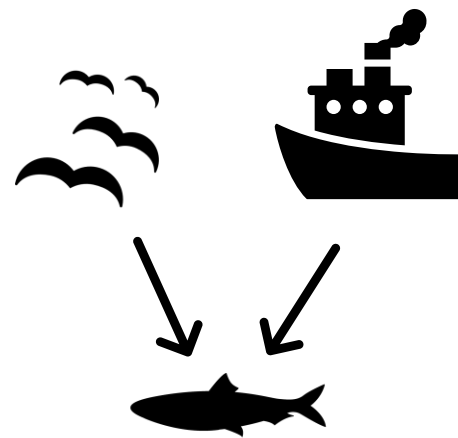
Seabird Ecology Lab



UNIVERSITAT DE  
BARCELONA

Séminaire du  
**plan national d'actions**  
en faveur du Puffin des Baléares

# SEABIRD-VESSEL INTERACTIONS: AN INEVITABLE COEXISTENCE



Fishing resources

## IMPACTS OF SEABIRD-FISHING INTERACTIONS



- Discards can be unhealthy



Heavy metals  
(Arcos et al., 2002)



Low caloric values  
(Grémillet et al., 2018)

- Reliance on discards increases vulnerability to discard policies (Sherley et al., 2019)



- Incidental bycatch (Lewison et al., 2014)



Collision



Entanglement

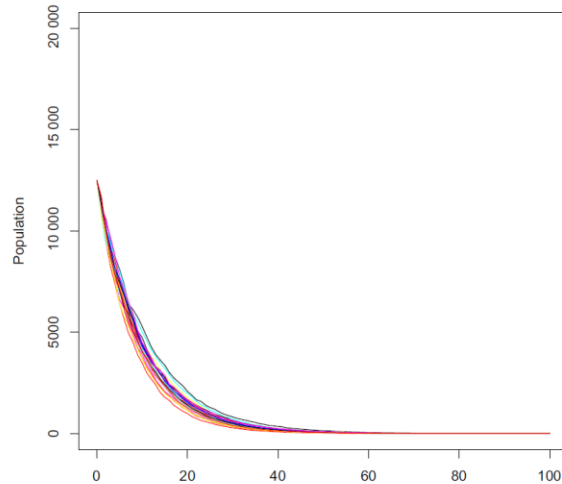


Hooked

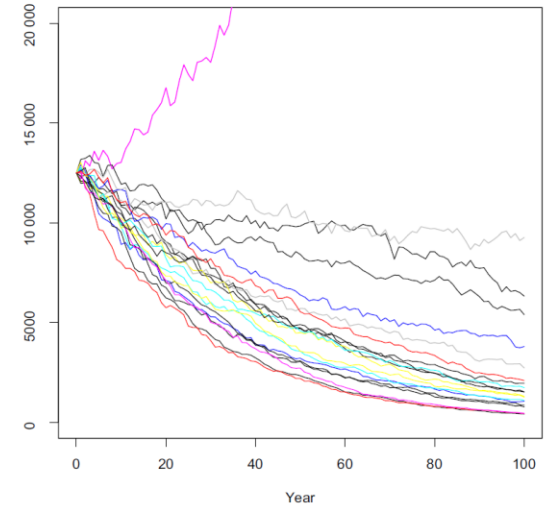
## IMPACTS OF SEABIRD-FISHING INTERACTIONS



Current scenario



Bycatch reduced



Genovart et al. 2016

# CONCURRENT ANALYSIS OF SEABIRDS AND VESSEL TRACKING DATA

- Encrypted System for regulatory compliance of fishing vessels.
- Access to and resolution of the data depend on each country.

**Vessel  
Monitoring  
System**



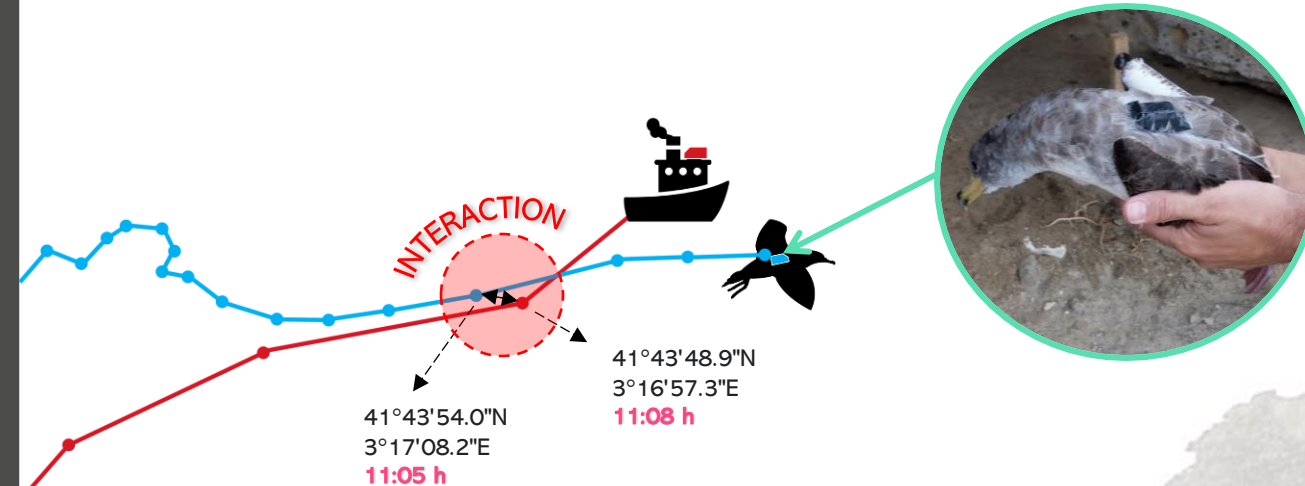
**Automatic  
Identification  
System**

- Open System to prevent collisions for shipping, cruise and industrial fisheries.
- Generally high resolution.

41°43'48.9"N  
3°16'57.3"E  
11:08 h



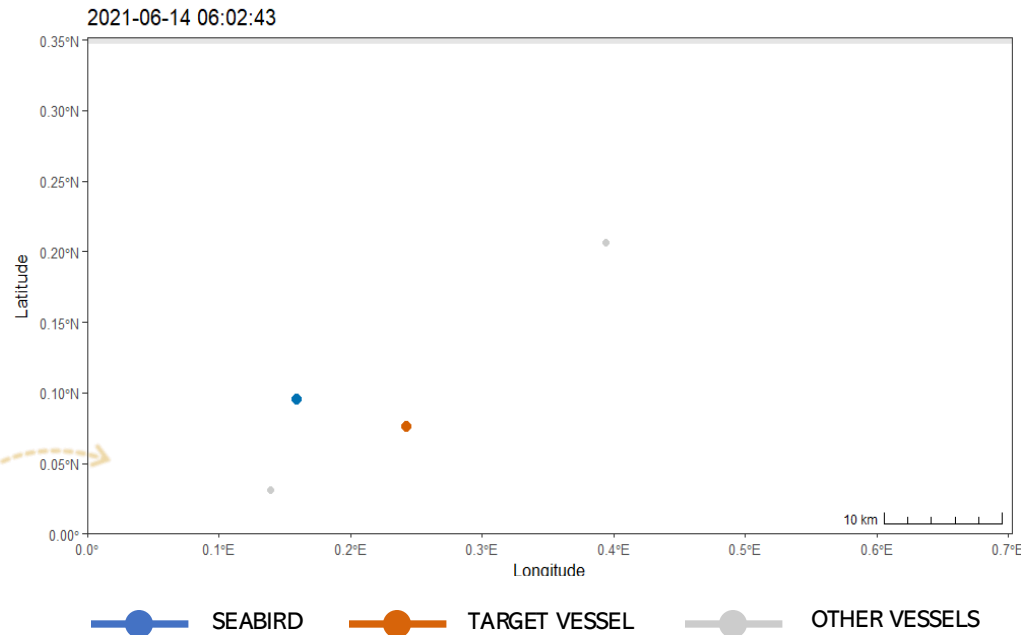
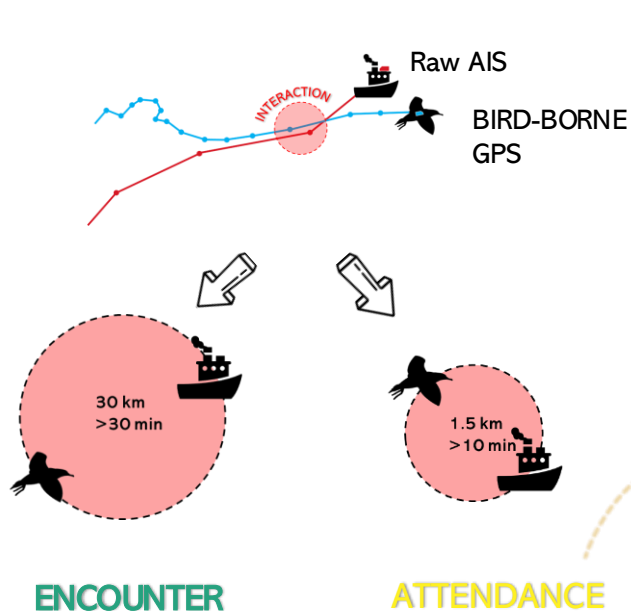
# CONCURRENT ANALYSIS OF SEABIRDS AND VESSEL TRACKING DATA



Numerous studies have employed this approach (Bernard et al., 2021; Corbeau et al., 2020; Votier et al., 2010; etc.)

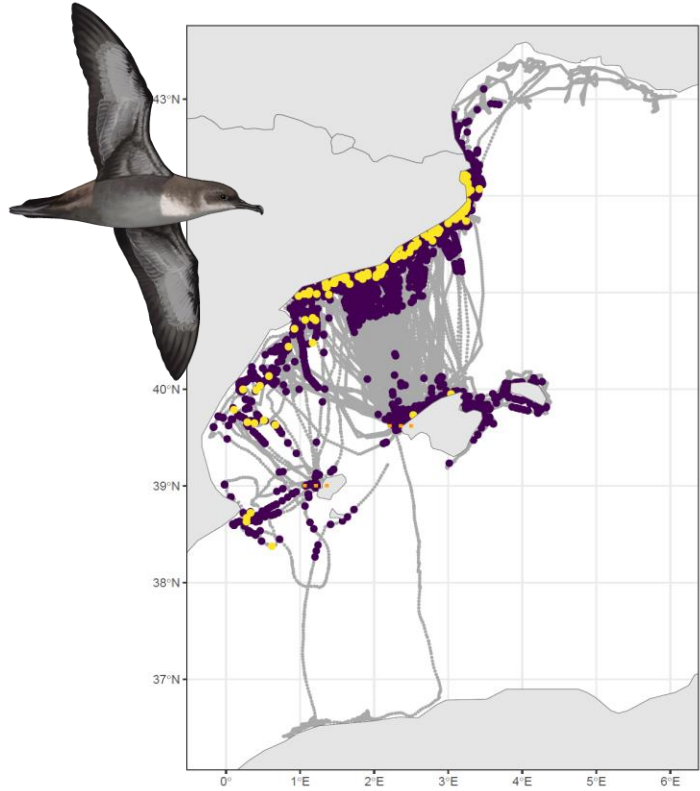
# CONCURRENT ANALYSIS OF SEABIRDS AND VESSEL TRACKING DATA

## DISTINGUISHING TWO TYPE OF SEABIRD-VESSEL INTERACTIONS





# CONCURRENT ANALYSIS OF SEABIRDS AND VESSEL TRACKING DATA



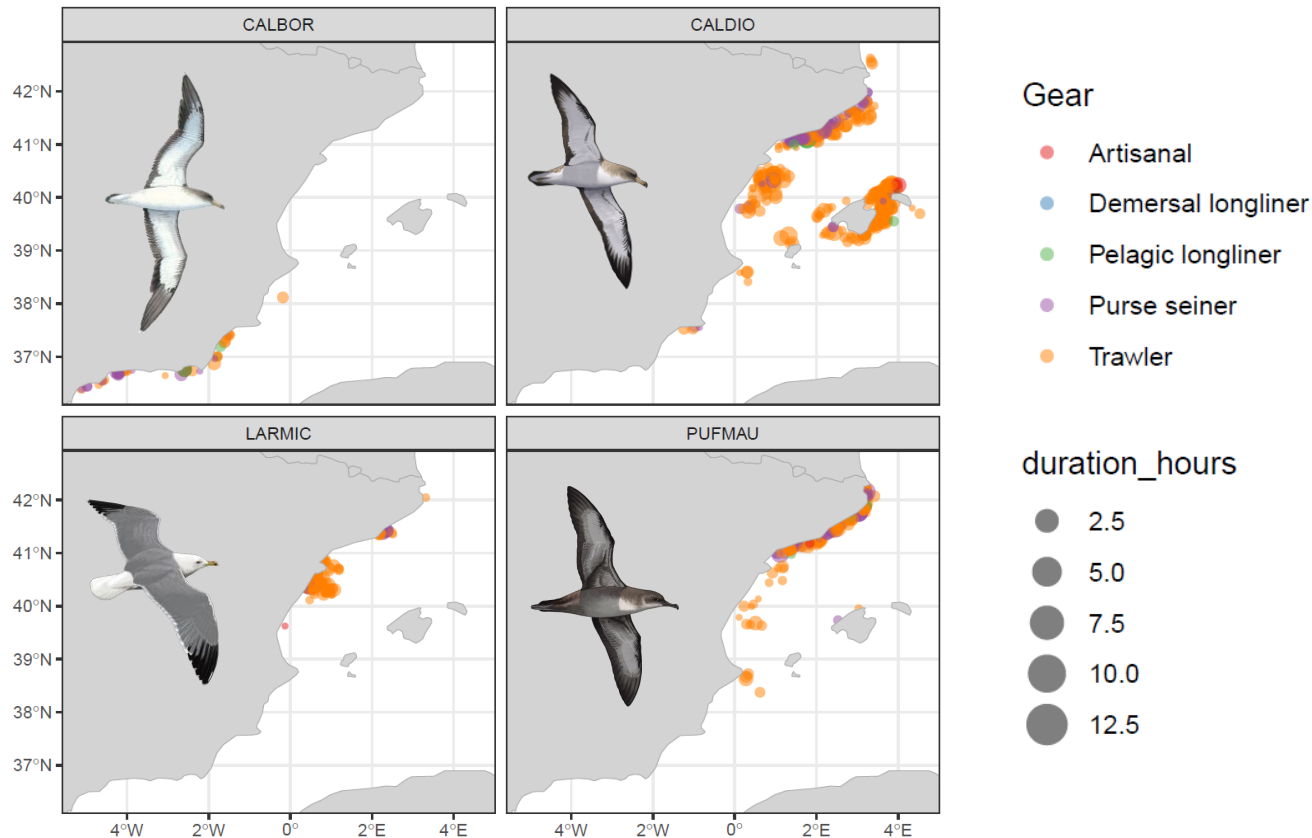
- Encounter
- Attendance

GPS tracking data from the Oxford Navigation Group (Tim Guilford, Oliver Padgett, etc)



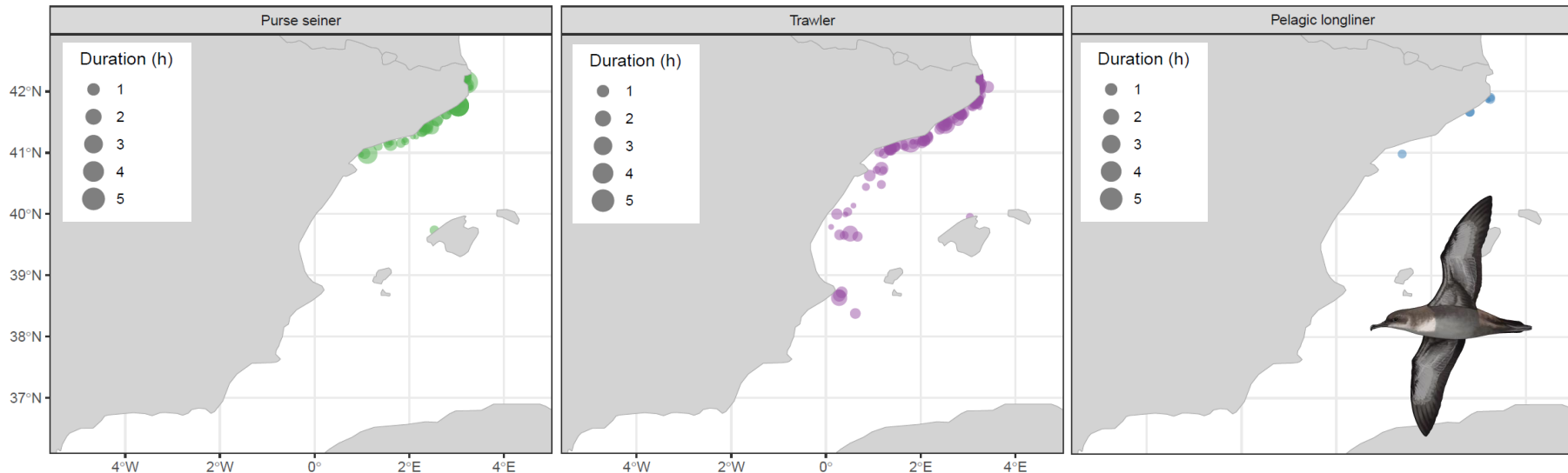
GPS Data from: Sa Cella 2011-14, 2016-17, 2019 and Sa Conillera 2012

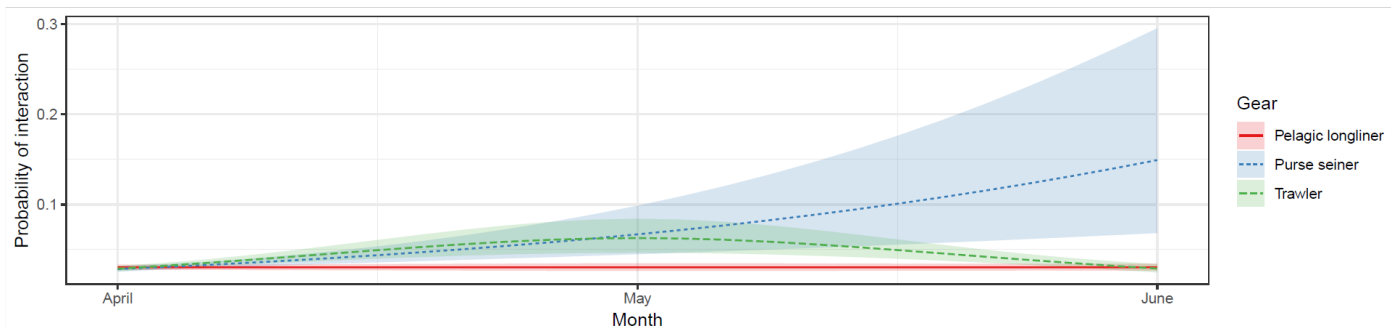
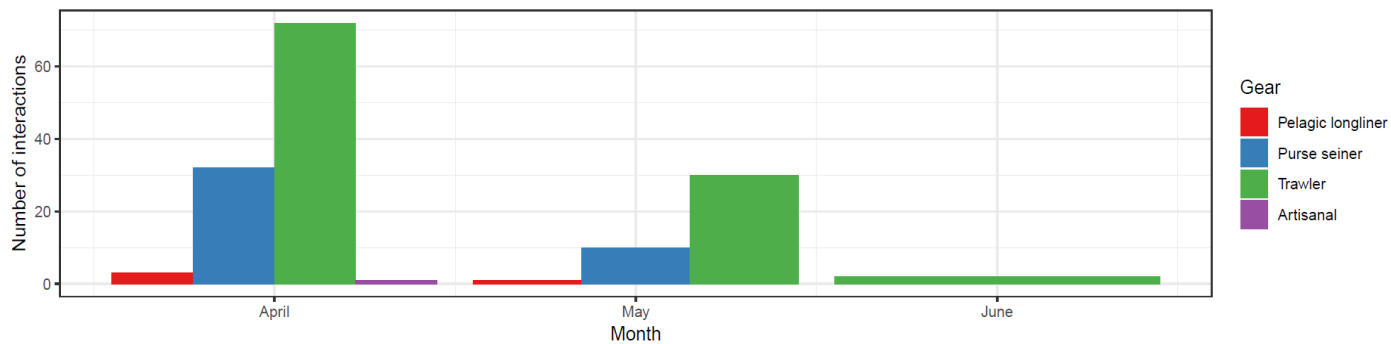
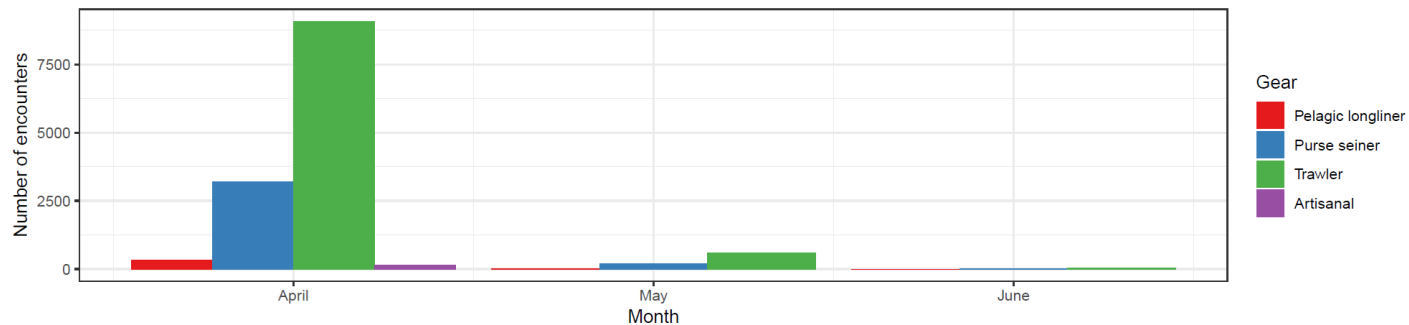
# CONCURRENT ANALYSIS OF SEABIRDS AND VESSEL TRACKING DATA

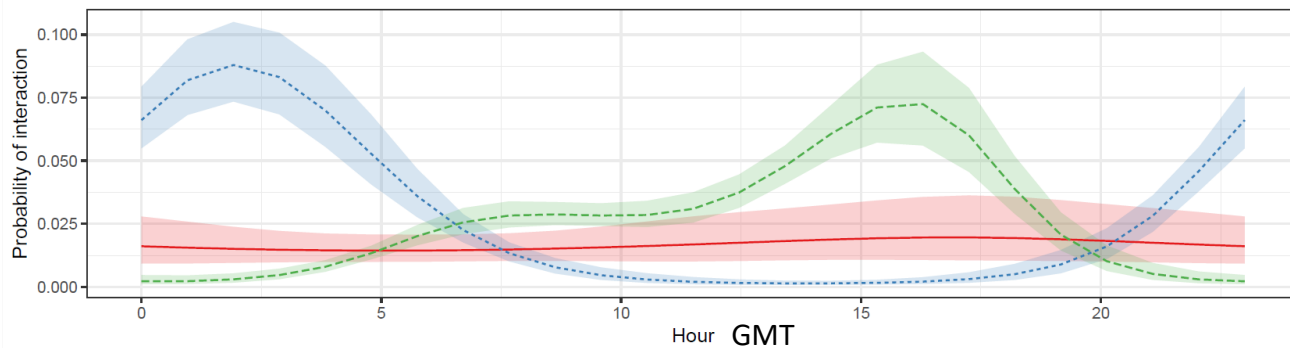
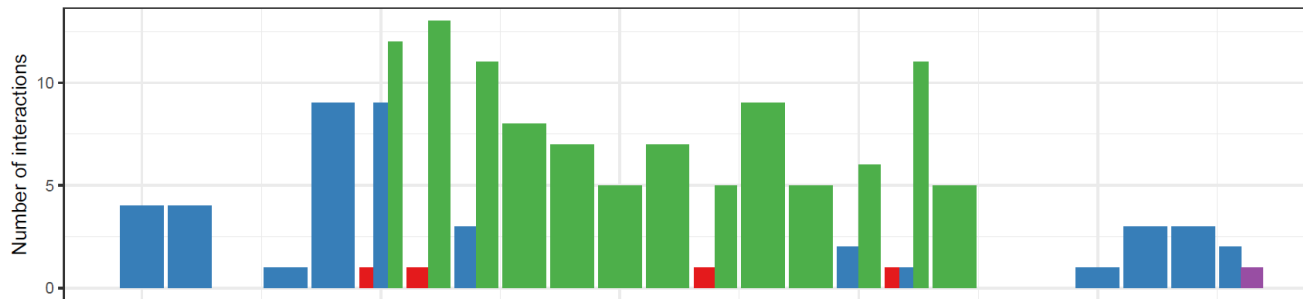
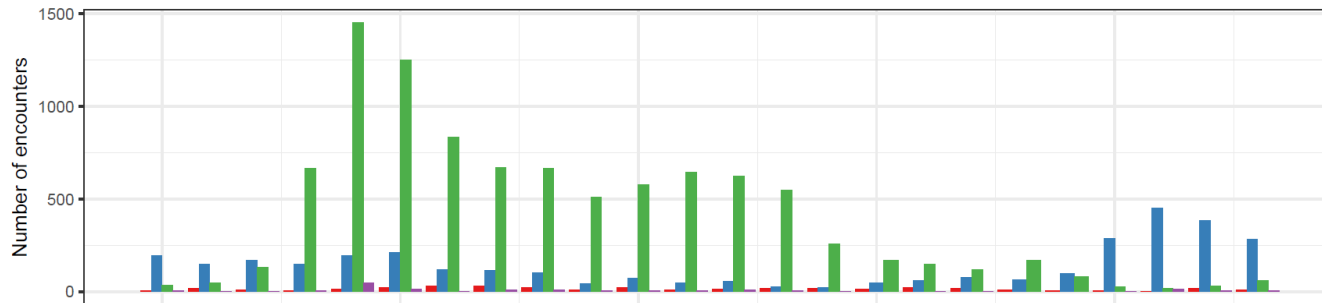


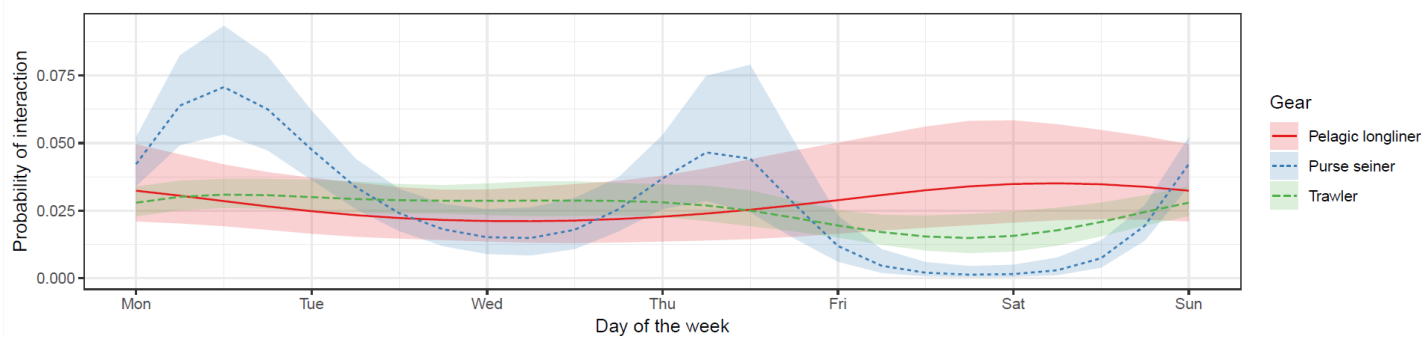
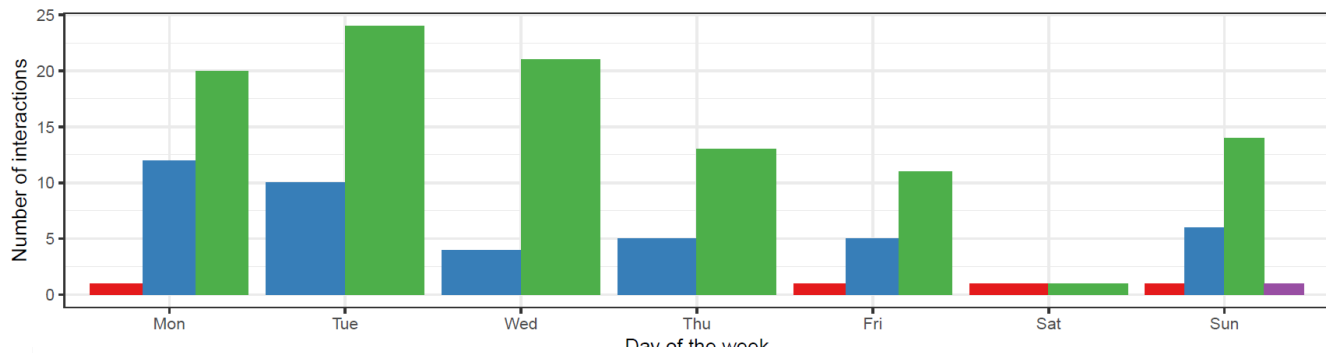
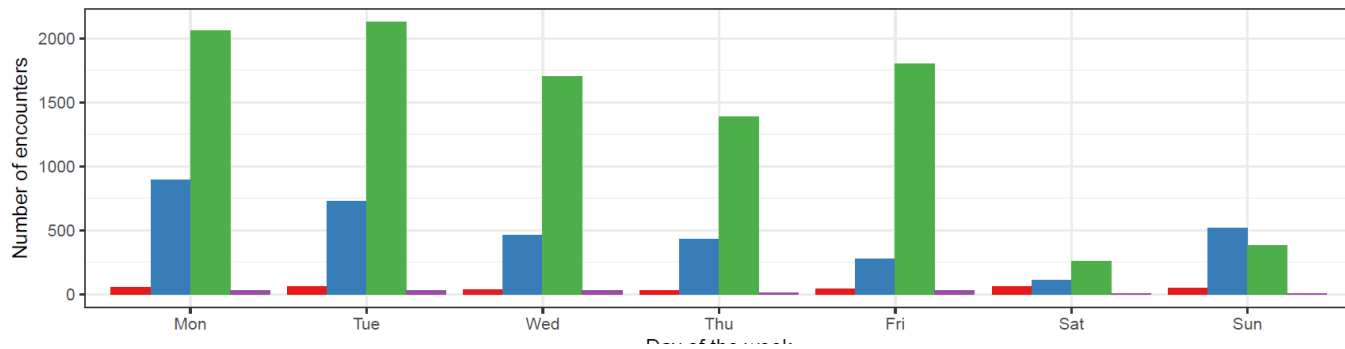
# CONCURRENT ANALYSIS OF SEABIRDS AND VESSEL TRACKING DATA

## Balearic shearwater









# Summary of the results

## Regarding attendances of Balearic shearwaters to fishing vessels during breeding

- Mainly occurs in April and May along the Catalan coast.
- Mainly occurs with trawlers, particularly during the week and early afternoon.
- Mainly occurs with purse-seine during the second half of the night.
- Attendance to pelagic longliners is scarce but increases during the weekend.
- Most demersal longliners do not have VMS, so this fishery escapes from this analysis.

# Conclusion and Future steps

- Attendance of Balearic shearwaters to fishing vessels is common across all fisheries.
- Most attendances occur with trawlers, indicating susceptibility to the ban of discards.
- Bycatch risk could be reduced if longlining is prohibited when trawlers are not operating.
  
- It is important to continue collecting GPS tracking data from this species.
- It is urgent to implement a vessel monitoring system for artisanal fisheries in Catalonia.
- We need to incorporate information from AIS and GPS tracks collected from artisanal fisheries.
- With the concurrent analysis of seabirds and vessel tracking data, it is possible to analyze potential factors driving attendances and bycatch risk.



**Thank you for your attention**

