



Selpal Project



## By-catch monitoring programme in the French Bluefin tuna longline fishery operating in the Mediterranean Sea



**Poisson F., Arnaud-Haond S., Demarq H., Cornella D., Wendling B.**

## A fishery strictly monitored

- Total Allowable Catch (TAC) : **2,917 tonnes in 2015**
- Atlantic /Mediterranean Sea
- Purse seine: 79 % TAC
- Longline : 9 % TAC (252 t)
- Recreational fisheries: 2% TAC
- Fishing Licences: ICCAT and EU (AEP)

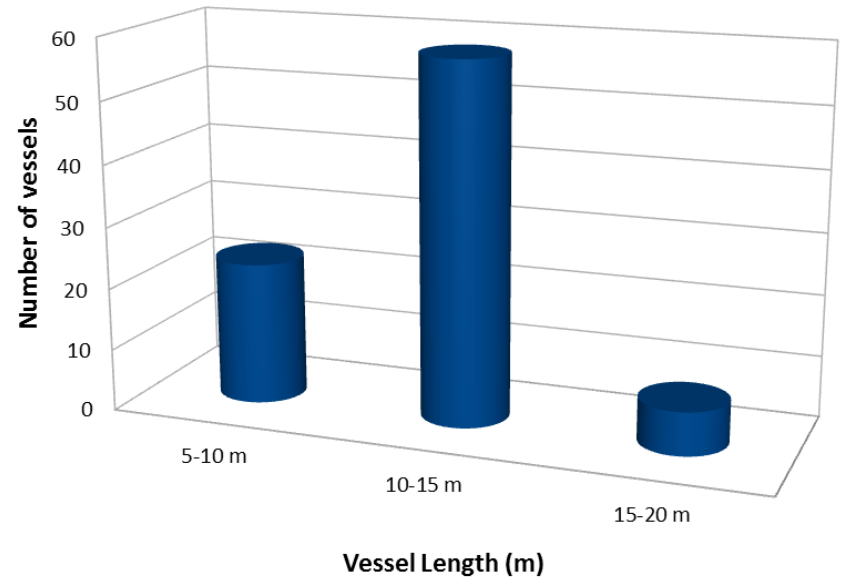
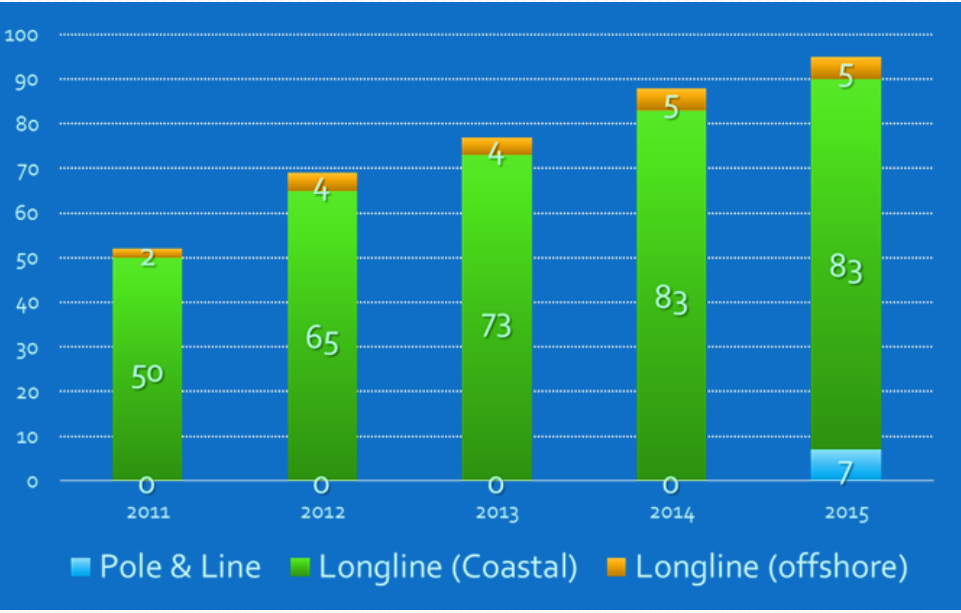


# A dynamique fishery

- 2015 : 88 longliners
- Fishing Season : from April to December
- Fishing ground: continental shelf



Longline fleet



# Environmental conditions

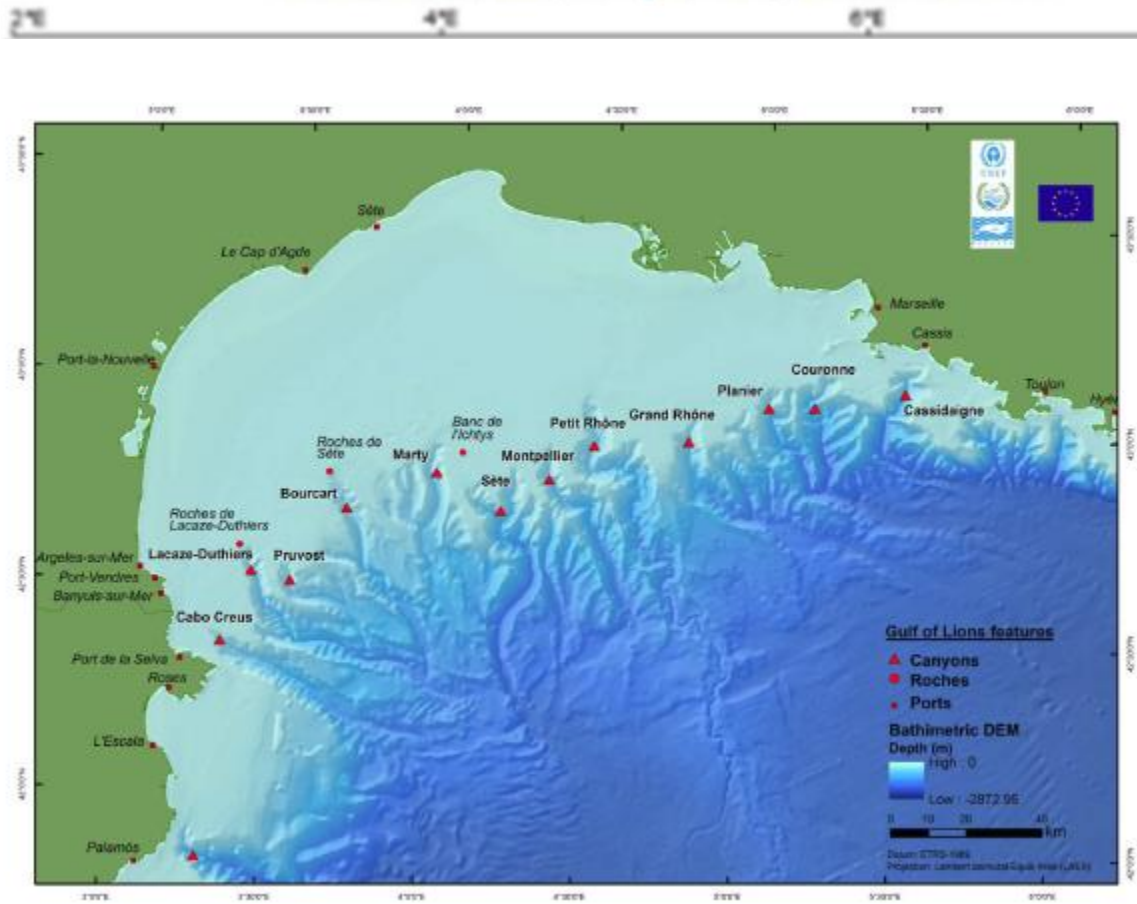
Sea Surface

46°



3

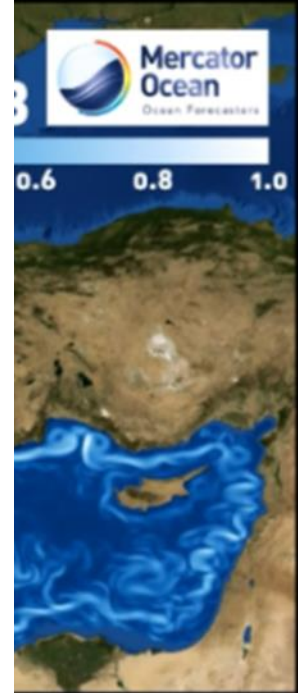
Direction et intensité des courants de surface  
le 27/03/2014 10:00 (heure légale) mise à jour du 26/03/2014 16:00



Moy: 0.27 m/s - Min: 0.00 m/s / Max: 1.03 m/s

Max: 0.51 m/s - Min: 0.00 m/s / Max: 1.03 m/s

→ 1 m/s



12

41°N



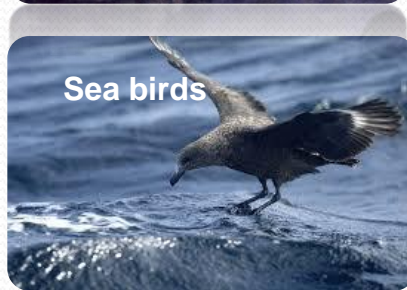
Pelagic stingray



Blue shark



Juvenile swordfish



Sea birds



Sea turtle: Loggerhead

## Multi taxon approach

- 2- year pilot programme
- cooperative/collaborative approach
- To document the fishery activity
  - Fishing technic & strategy,
  - Effort
  - Cpue
- To identify the impact of the fishery on the potential by catch groups
- To propose technical mitigations directed at avoiding interaction and/or reducing mortality levels of bycatch
- To know better the biology & ecology of the by-catch



# Logbook system

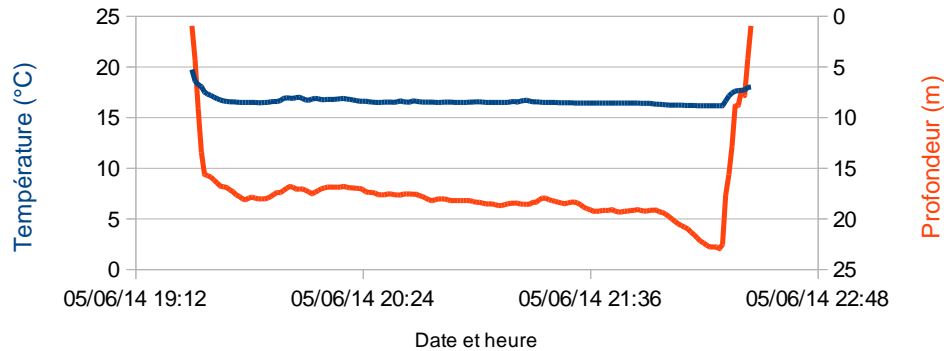
- Gear specification (Hook: size, shape; length of the leaders)
- Location
- Soaking time (setting /hauling time)
- Catch per species (number, status, size, released/kept on board)
- Interactions (Sea birds)
- + Observers data (ICCAT)

		Latitude	Longitude		Oiseaux: <input type="checkbox"/> OUI <input type="checkbox"/> NON			
Début filage					Heure d'arrivée des oiseaux:			
Fin filage					Heure de départ des oiseaux:			
Début virage					Nombre d'oiseaux:			
Fin virage					Espèces d'oiseaux présentent:			
					<input type="checkbox"/> Puffins		<input type="checkbox"/> Sternes	
					<input type="checkbox"/> Mouettes		<input type="checkbox"/> Goélands	
					<input type="checkbox"/> Autres:			
Nombre d'hameçons:		Type d'hameçons:		Type d'appâts:				
Rais pastenagues capturés	Plus de 5kg		Moins de 5kg		Vivants		Morts	
	Vivantes	Mortes	Vivantes	Mortes	Rejetés	Conservés	Rejetés	Conservés
Regins peau-bleue capturés	Plus de 5kg		Moins de 5kg		Vivants		Morts	
	Vivantes	Mortes	Vivantes	Mortes	Rejetés	Conservés	Rejetés	Conservés
Précisez le nombre, s'il s'agit de mâles et Femelles (si vous le savez) et si elles sont rejetées				Précisez le nombre, s'il s'agit de mâles et de Femelles (si vous le savez)				

# Behaviour of the gear

- Instrumentation of the gear
- Temperature-Depth Recorder

Capteur 1 : Evolution de la température de l'eau et de la profondeur de la palangre du Dochris le 5/06/14



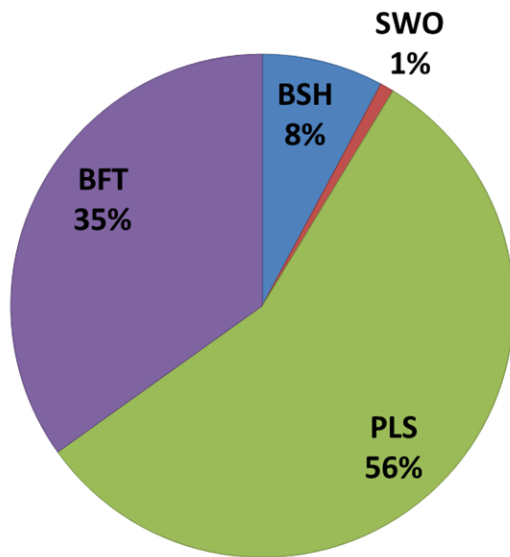
Hook depth between 15 and 30 meters



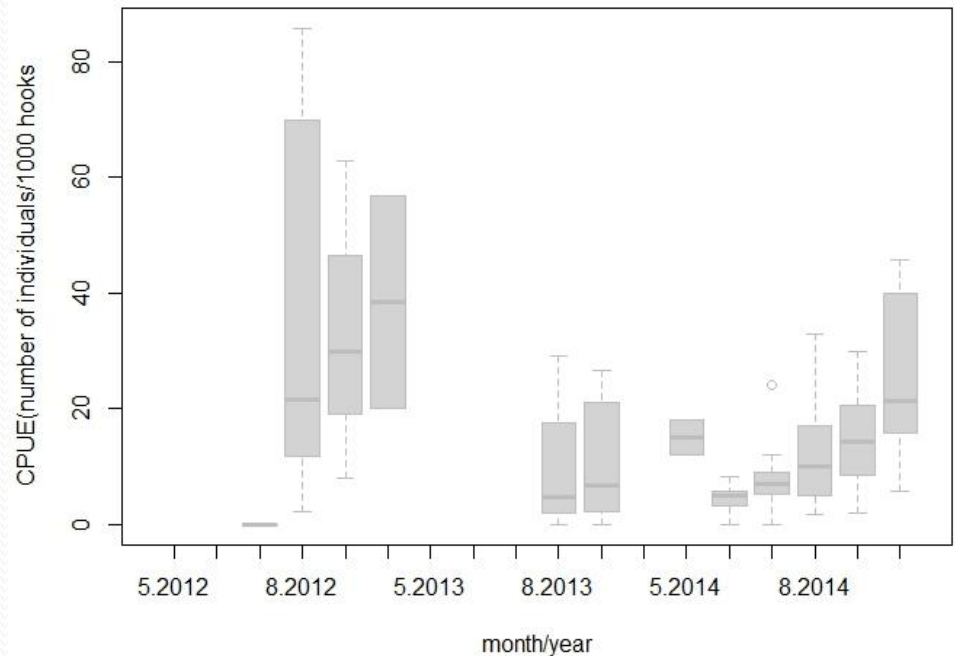
# First seasons

- 100 fishing operations documented
  - Low participation
  - Missing data
  - Trends to be confirmed

Catch in number of individuals



Blue fin tuna

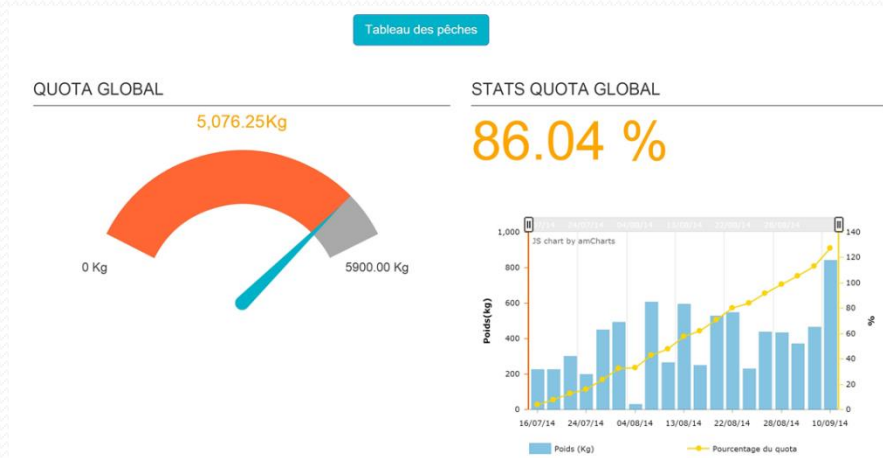


Month

2 4 6 8 10



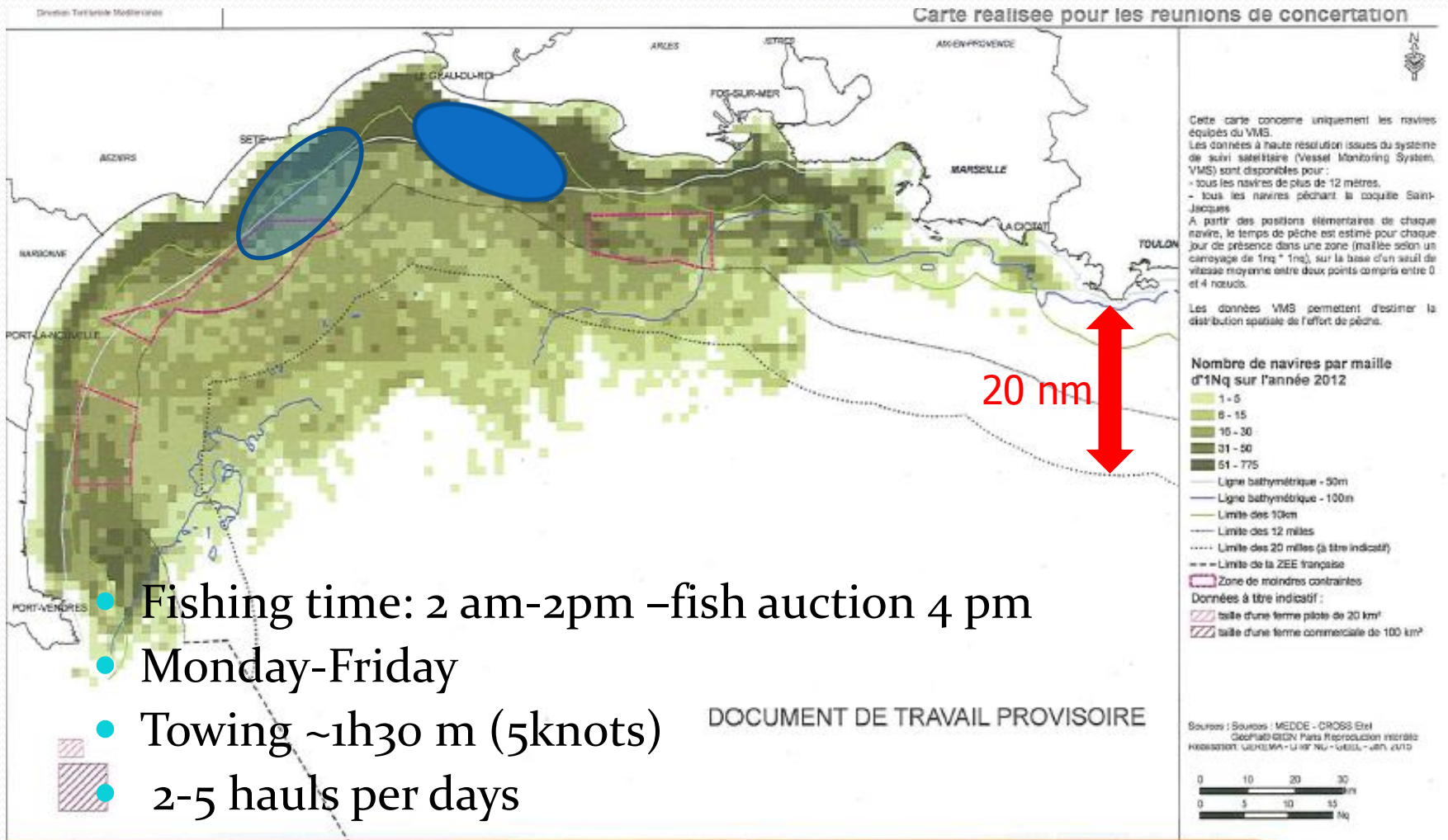
# By-catch App...soon




# What we have learnt !

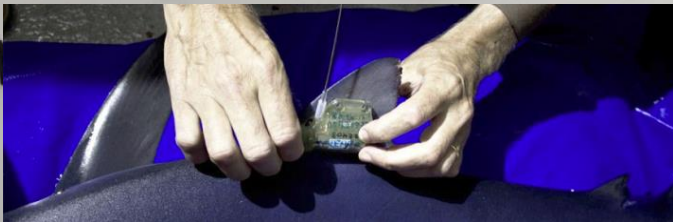
- Moderate number of hooks deployed ~ 600 h/set
- No precise strategy
- High catches of pelagic stingrays
- Night setting mostly (before sunset....)
- Day setting *during the week ends*
- Hauling around 9 o'clock
- Short soaking time (2-5 hours)
- Space use conflict of with demersal trawlers fishery

# Space-use conflicts with trawlers



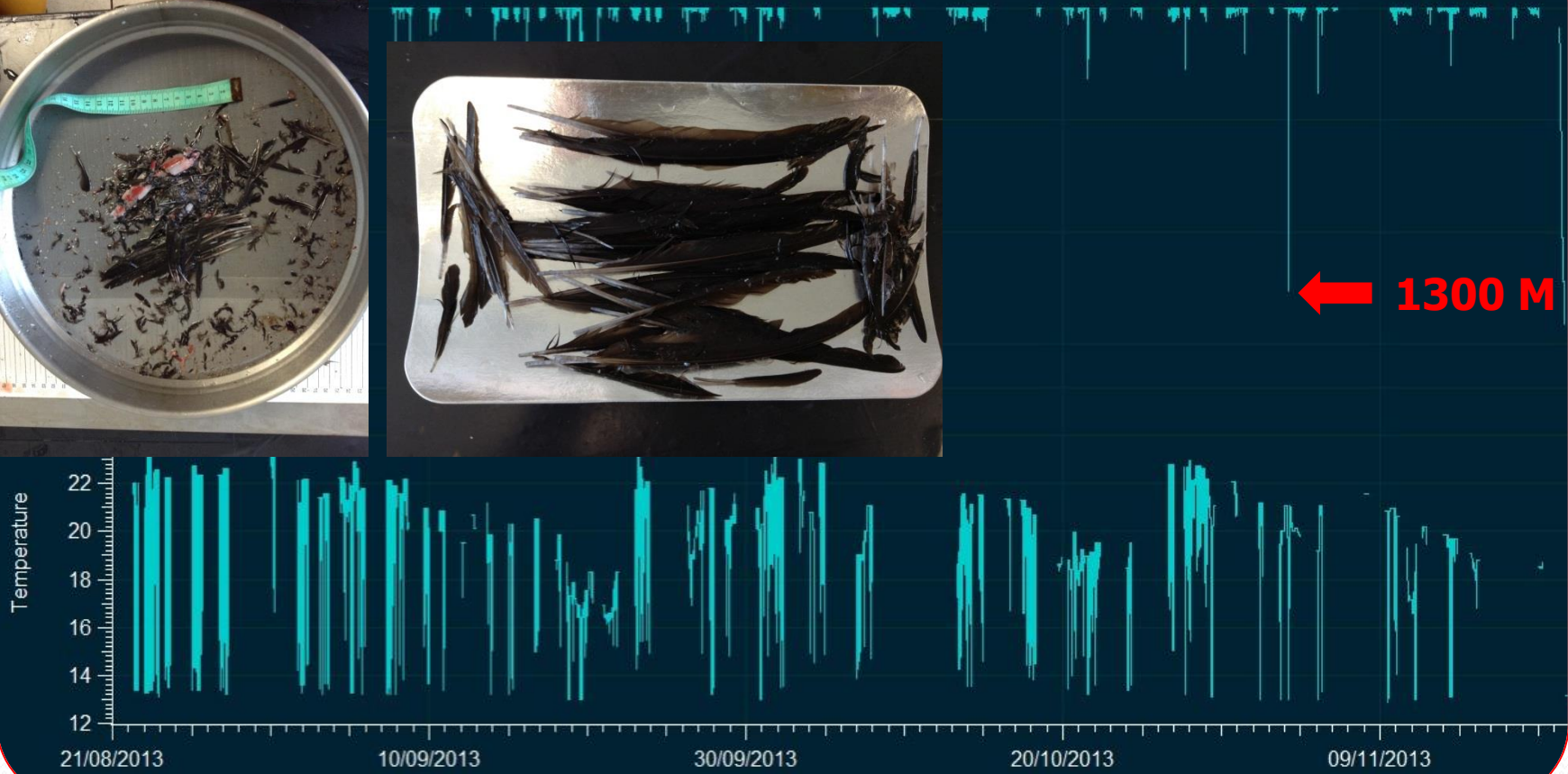
# Blue shark migration

- To investigate on habitat occupancy, residency times and migratory pathways
- To provide behavioural data on temperature experience and swimming depth of pelagic sharks
- satellite tag technology is used 



# Blue shark behaviour

BSH Male (9445), FL:1,18 m/110 days at liberty



511081S013

101001S013

301001S013

501101S013

001111S013

15

14

10

# Blue shark Fishing mortality

- Mortality at gear hauling (5%)
- Post-release Survival (high)



Type	#	sexe	FL	last	Days	Survival
Splash	1	F	1.22	28/01/2014	160	yes
Splash	2	F	1.5	13/09/2014	43	?
Spot	3	F	1.19	22/11/2013	93	yes
Spot	6	M	1.44	28/12/2013	129	yes
Spot	4	F	1.44	29/01/2014	161	yes
Spot	5	M	1.27	15/11/2013	86	yes
Spot	6	F	1.36	12/01/2015	164	yes
Spot	7	F	1.25	27/01/2015	163	yes
Minipat	8	M	1.18	9/02/2014	110	yes
Minipat	9	F	1.35	27/02/2014	190	yes
Minipat	10	F	1.28	17/08/2014	20	?
Spat	11	M	1.14	18/08/2014	1	NO
Spat	12	F	1.21	06/10/2014	50	yes

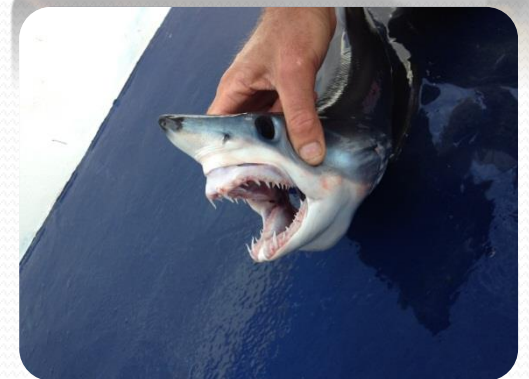
# Nursery ground?

3 criteria to be met for an area to be identified as a nursery:

(1) Young of-the-year sharks are more abundant than in other areas,

(2) They have the tendency to remain or return for extended periods

(3) The area is repeatedly used across years



# Seaturtles heavily impacted in the Mediterranean

## Sea turtle by-catch in the Mediterranean

Paolo Casale<sup>1,2</sup>

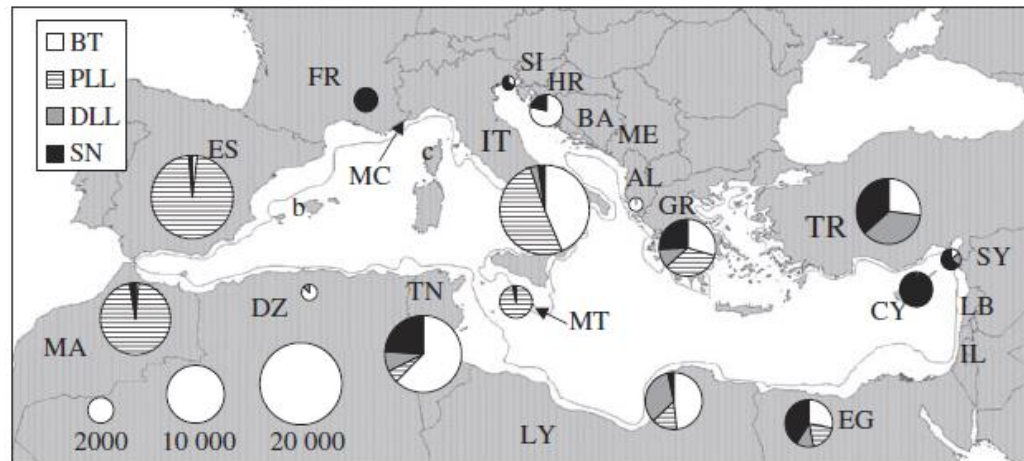
<sup>1</sup>Department of Biology and Biotechnologies 'Charles Darwin', University of Rome 'La Sapienza', Viale dell'Università 32, 00185 Roma, Italy; <sup>2</sup>WWF Italy, Via Po 25c, 00198 Roma, Italy

### Abstract

Sea turtle by-catch data in the Mediterranean were reviewed and analysed with fishing effort. The results indicate over 132 000 captures per year, with probably over 44 000 incidental deaths per year, while many others are killed intentionally. Small vessels using set net, demersal longline or pelagic longline represent most of the

### Correspondence:

Paolo Casale,  
Department of  
Biology and  
Biotechnologies  
'Charles Darwin'

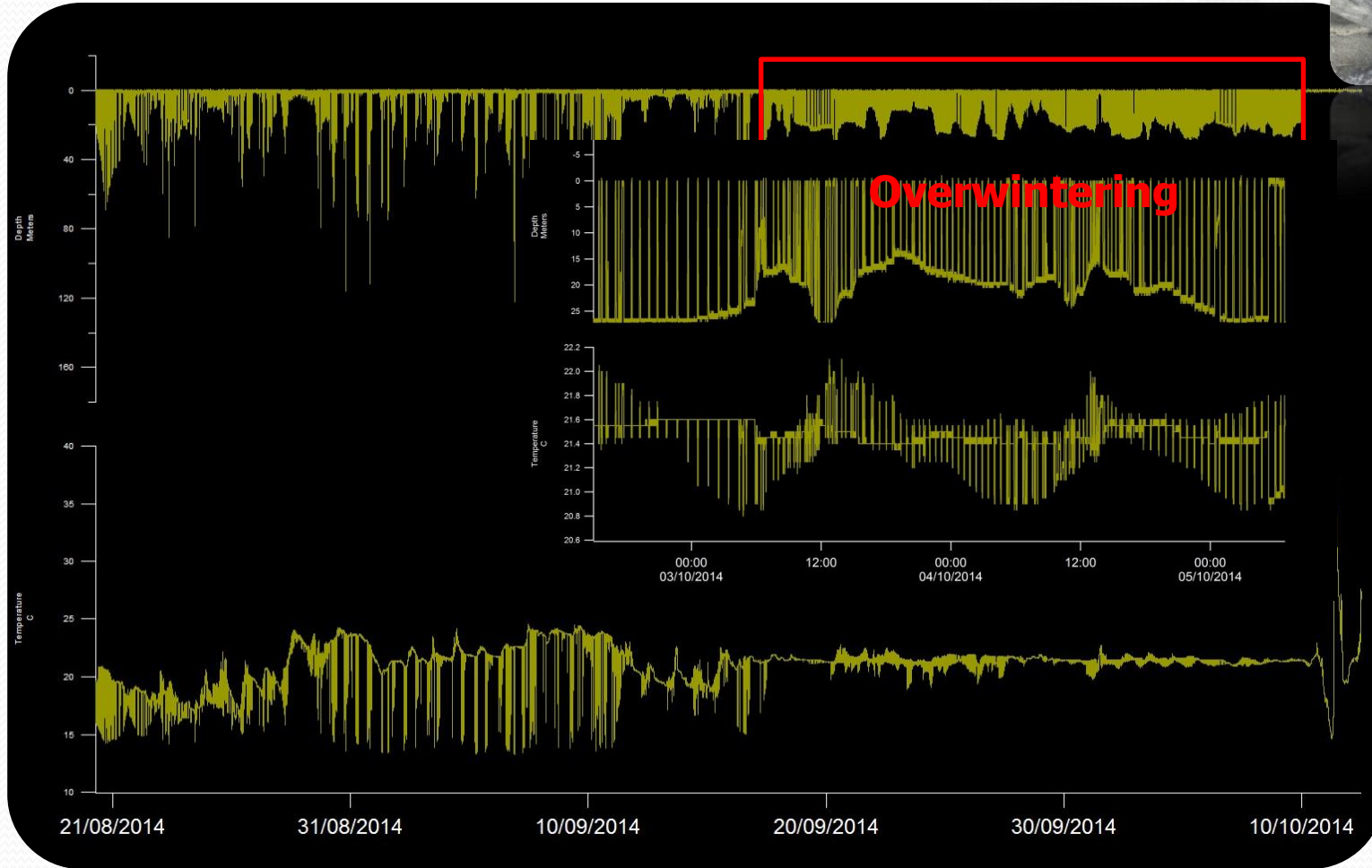
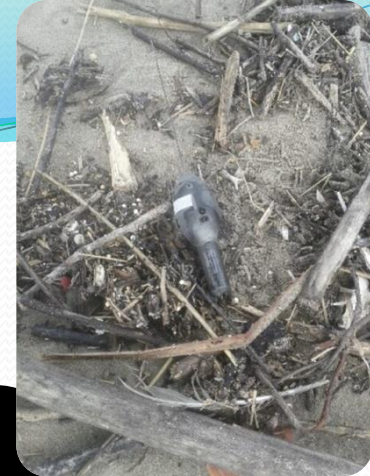


**Figure 1** Proportions of turtles captured annually in the Mediterranean by country, and fishing gear estimated from fishery statistics and catch rates. BT, bottom trawl; PLL, pelagic longline; DLL, demersal longline; SN, set net. Country codes according to the International Organization for Standardization (ISO). AL, Albania; DZ, Algeria; BA, Bosnia, and Herzegovina; HR, Croatia; CY, Cyprus; EG, Egypt; FR, France; GR, Greece; IL, Israel; IT, Italy; LB, Lebanon; LY, Libya; MT, Malta; MC, Monaco; ME, Montenegro; MA, Morocco; SI, Slovenia; ES, Spain; SY, Syria; TN, Tunisia; TR, Turkey. Islands: b



# Swimming depth loggerhead 50 days

High resolution archived data (miniPat)



21/08/2014

31/08/2014

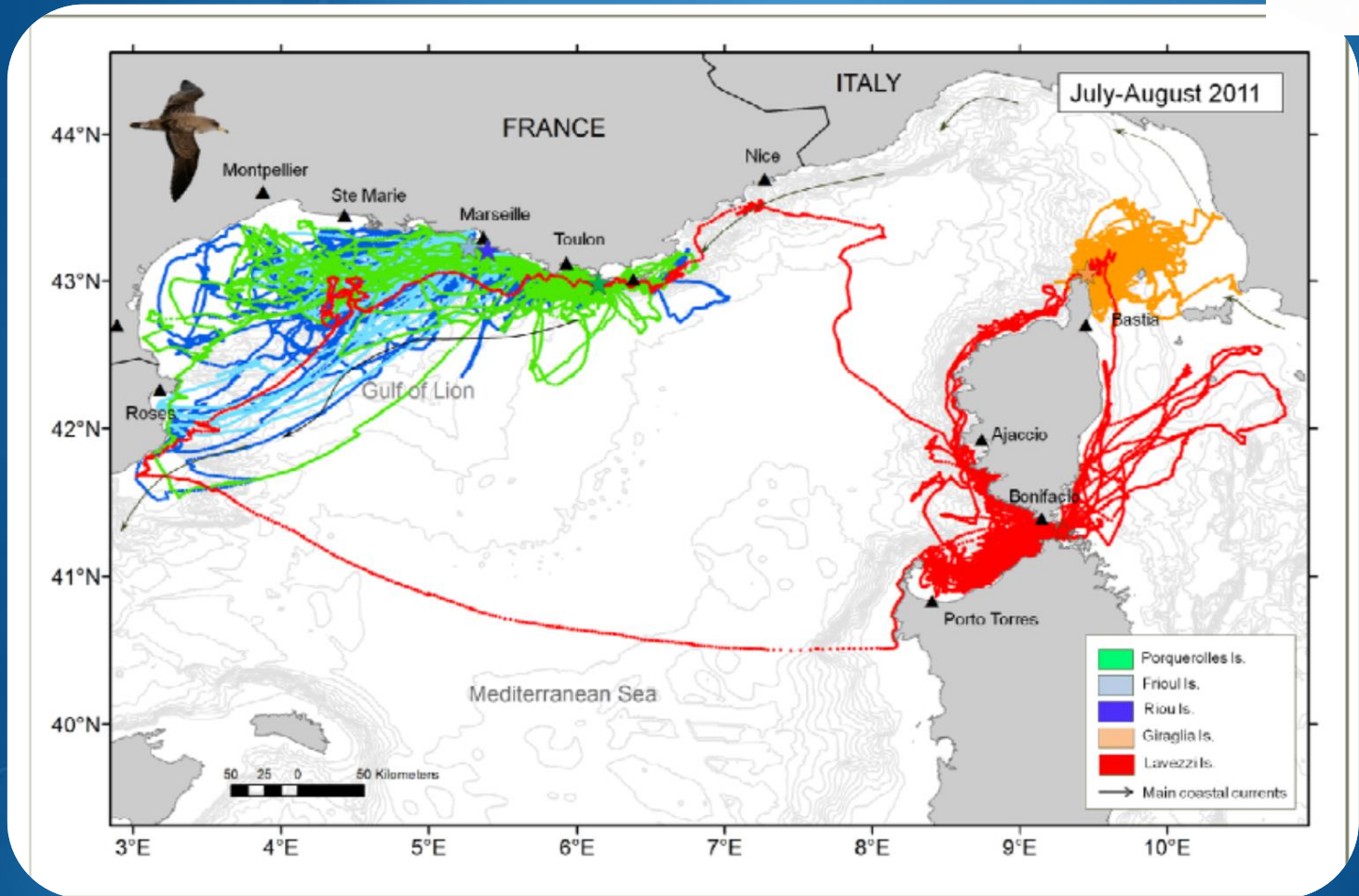
10/09/2014

20/09/2014

30/09/2014

10/10/2014

# Sea birds interaction (2)



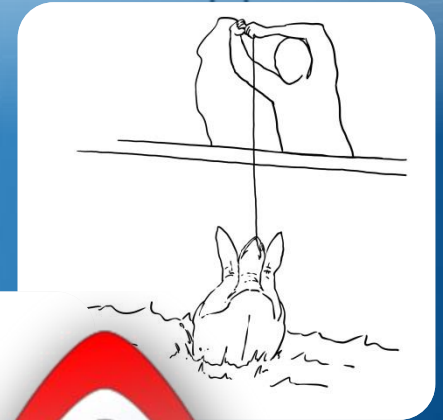
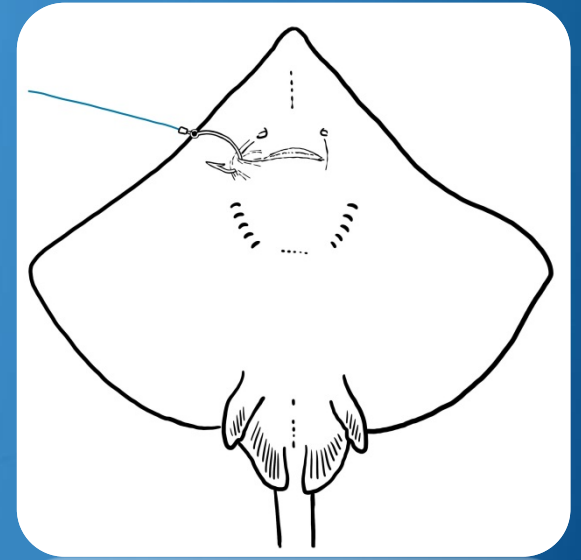
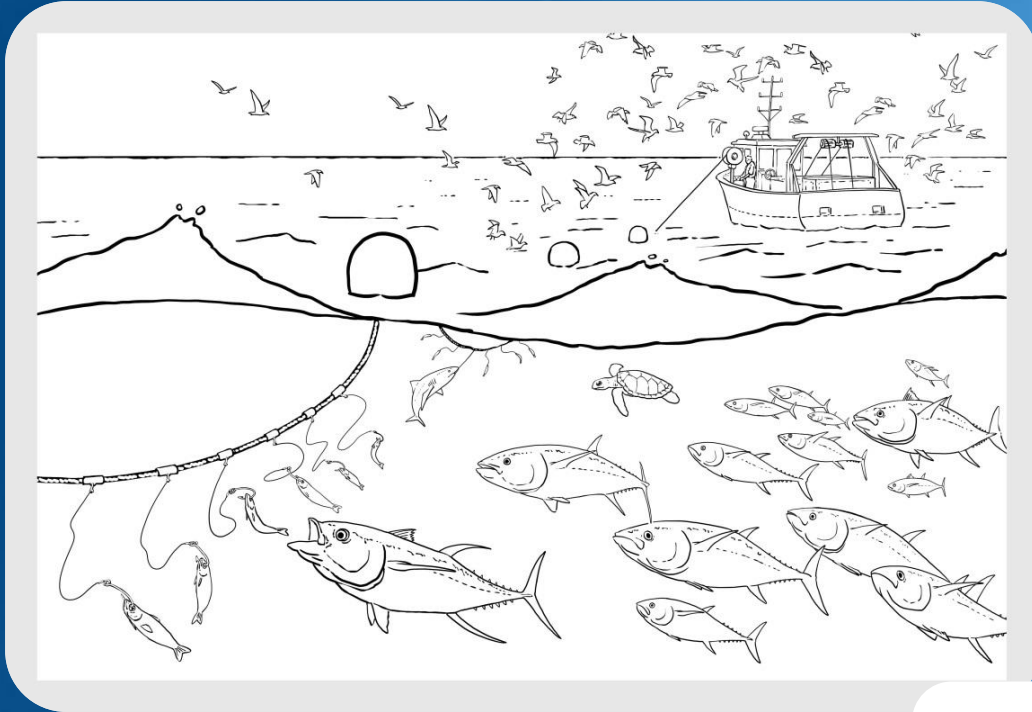
- GPS tracks (135) of cory's shearwaters during foraging trips during July-August (Péron&Grémillet 2011)

## Sea birds interaction (3)

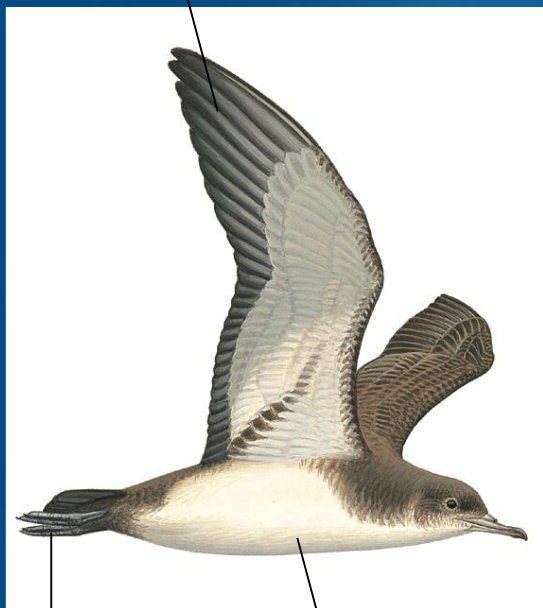
- Tests of bird scaring line “tori lines” with fishermen’s school students
  - build by trainees
  - deployed at sea on-board commercial vessels



# Good Practices manual



Rémiges grises



© François Desbordes/LPO

Pattes dépassant  
de la queue

Ventre blanc

## **Puffin de Yelkouan (*Puffinus Yelkouan*)**

**Statut:** Espèce protégée en France et en Europe

**Quelques mesures:**

\*Taille : 40 cm

\*Envergure : 76 - 93 cm.

\*Poids : 330 - 480 gr

**Description:** Le puffin yelkouan est plus petit et moins profilé que le puffin cendré. Il est très voisin du puffin des Baléares mais légèrement plus contrasté- plumage gris foncé sur le dessus et blanc sur le dessous. Son bec est noir et légèrement recourbé au bout.

**Longévité :** 23 ans

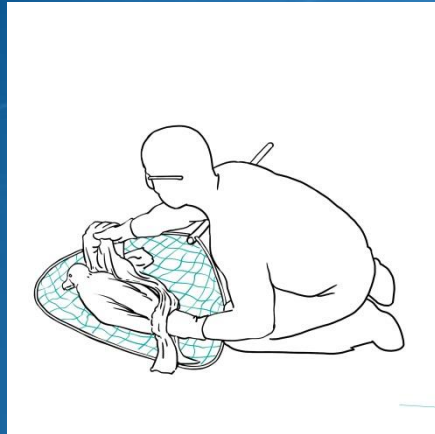
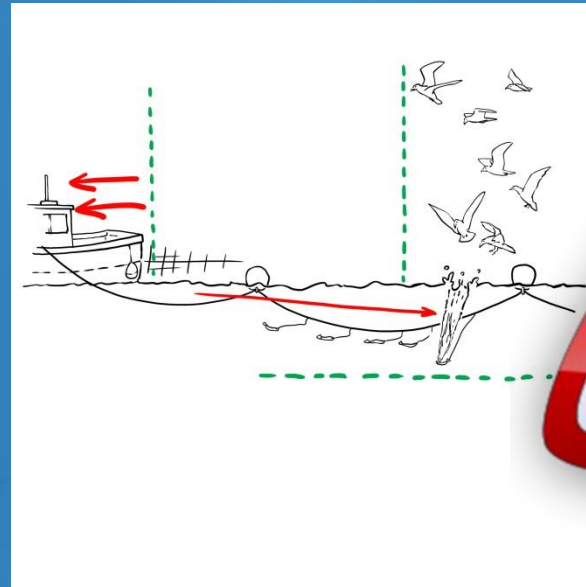
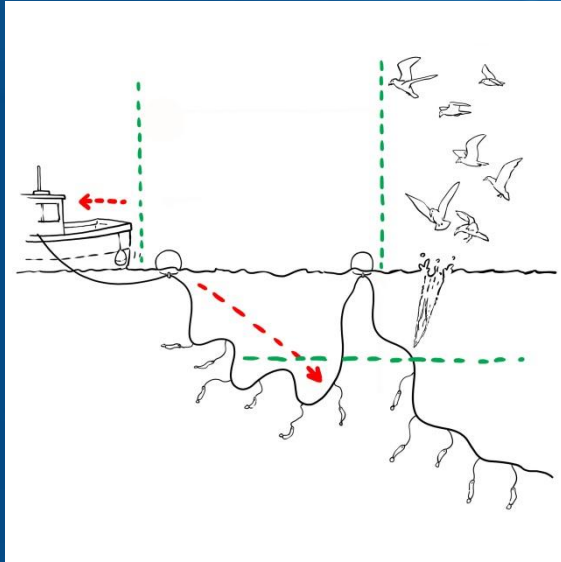
**Reproduction:** La ponte dure 1 mois et demi, de mi-mars à début mai. La période d'éclosion et de l'élevage du poussin s'échelonne de mi-mai à fin juillet. Les parents se relaient environ tous les 3-4 jours pour alimenter leurs Puffin yelkouan poussins. Ils peuvent parcourir plusieurs centaines de kilomètres par jour pour aller chercher de la nourriture

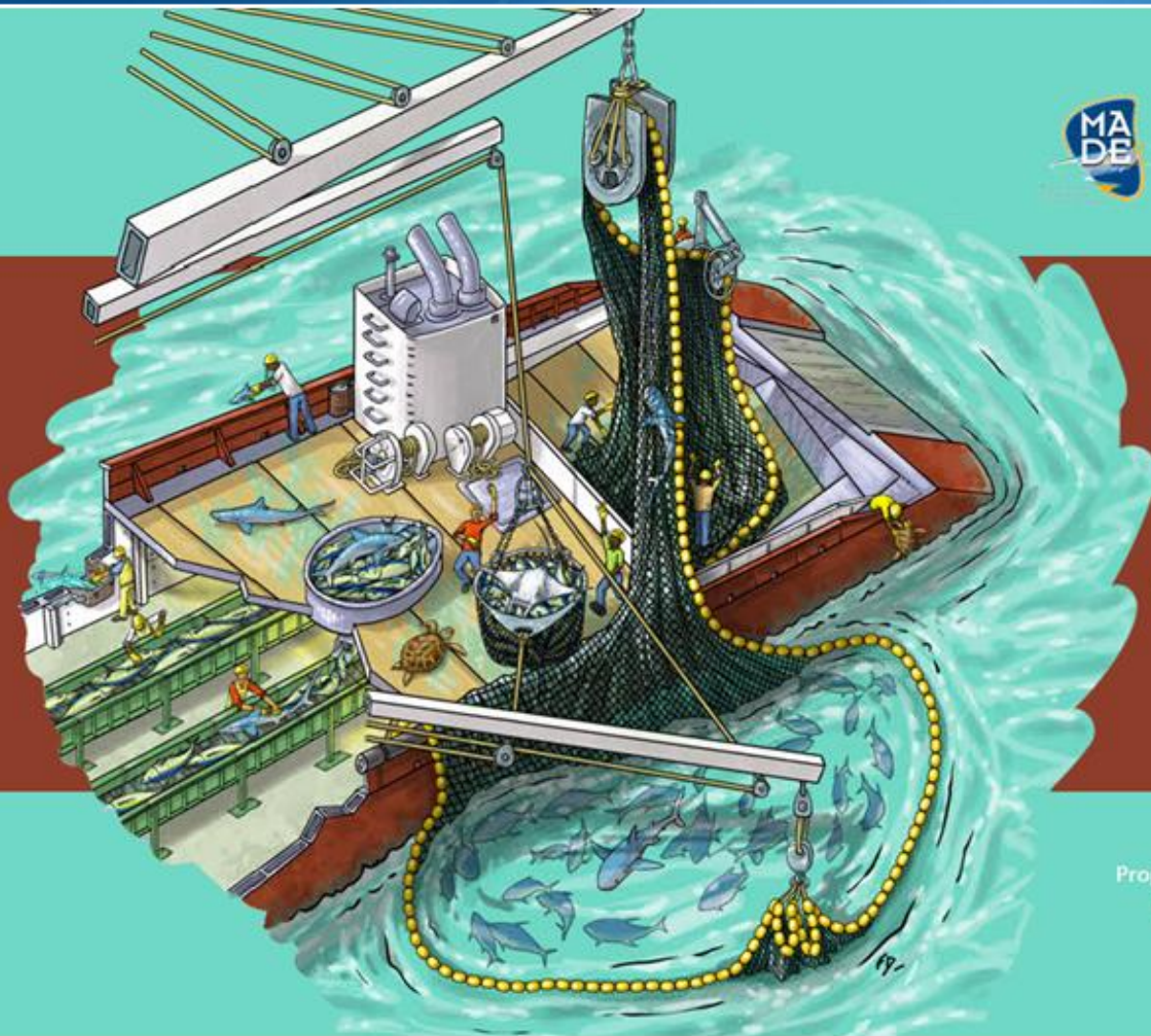
**Habitat:** L'espèce est endémique de Méditerranée et y hiverne également (golfe du Lion, mer Noire...). Elle est présente en France sur les îles d'Hyères, de Marseille et en Corse.

**Vol:** Le puffin yelkouan vole au ras de l'eau. Si la mer est calme et plate, il va alterner quelques battements d'ailes (3 ou 4) avec un vol plané. Son vol est droit dans ce cas.

**Alimentation :** se nourrit principalement de poissons, de céphalopodes, de crevettes et de rejets de pêche. Posé à la surface, il détecte ses proies visuellement en mettant la tête sus l'eau puis plonge en s'aidant de ses ailes comme de nageoires et de ses pattes palmées. Il peut plonger jusqu'à 40 m de profondeur.

**Comportement :** Le Puffin yelkouan vole parfois en troupes serrées, ce qui est rare chez les deux autres espèces. Ils sont pélagiques. Ils passent donc une grande partie de l'année en haute mer et rejoignent les îles en novembre pour prospecter les sites de reproduction





CAT « Requins »  
**ORTHONGEL**

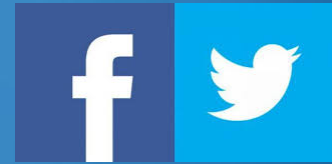
Good practices to  
reduce the  
mortality of sharks  
and rays caught  
incidentally by  
tropical tuna purse  
seiners.

Poisson F., Vernet A. L.,  
Séret B., Dagorn L.

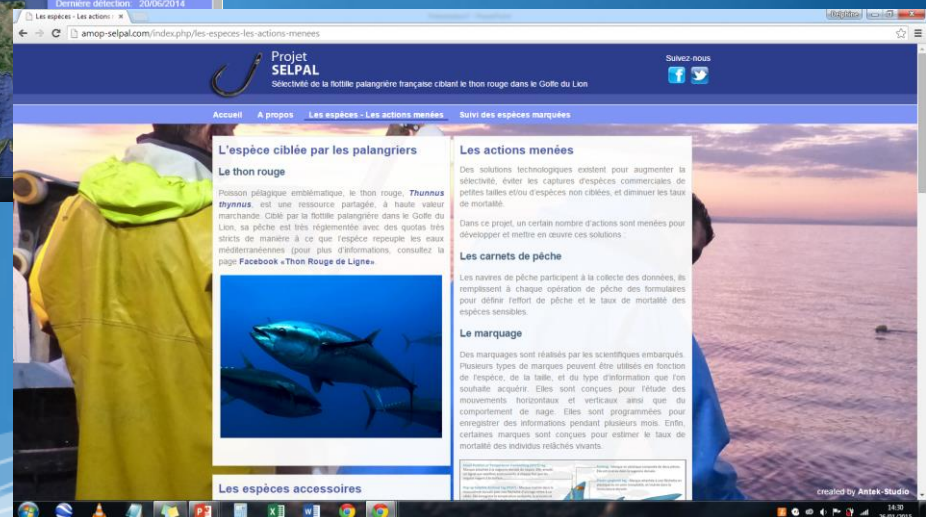
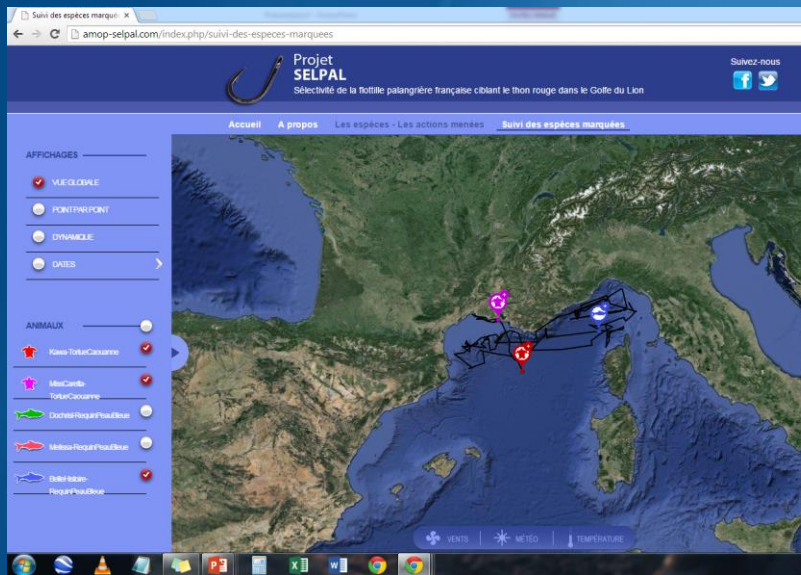
Programs funded by  
European Union  
FEP – FP7



# communication



## A dedicated Web site for fishers



www.amop-selpal.com



# Acknowledgements

- Malcom Francis, Greg Nowel, Serge Planes , Julian Peperrel and Rick, Keith Bigelow , Daniel Curran , Simona clo, Evgeny Romanov, Emanuel Tessier , Sebastian Biton, Stellaris association, Charlene and Wendy.....
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