



IMARPE
INSTITUTO DEL MAR DEL PERÚ



Department of
Conservation
Te Papa Atawhai



Testing low coast mitigation measures to reduce albatrosses and petrels bycatch in the Peruvian artisanal longline fisheries targeting sharks in southern Peru.

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3rd Meeting of the Permanent Working Group on Ecosystem and Bycatch, 26 May – 27 May 2025.

Technical paper provided to IATTC

Situation of the artisanal longline fishery targeting sharks in southern Peru.

Small wooden boats (< 12 mt) with rear cabin, with open deck without using tori lines



The longline is deployed (04:00 to 07:00 pm) and recovered from 05:00 am to 08:00 a.m., no floats are used in the snoods, and the last section is steel wire with a swivel and lead.



The bait is hooked while the longline is being deployed



There are not good practices in offal discards.



Study Area

*Upper Slope: Up to 30 nm offshore, up to ~ 1,500 mt depth.

*Lower Slope: since 30 to 65 nm offshore (1,500 to 4,500 mt depth).

*Trench: Peruvian – Chilean Trench, from 4,500 up to > 7,000 mt east, and to 5,500 west.

*Abyssal Plain: from 5,500 mt westward up to the 200 nm of EEZ.

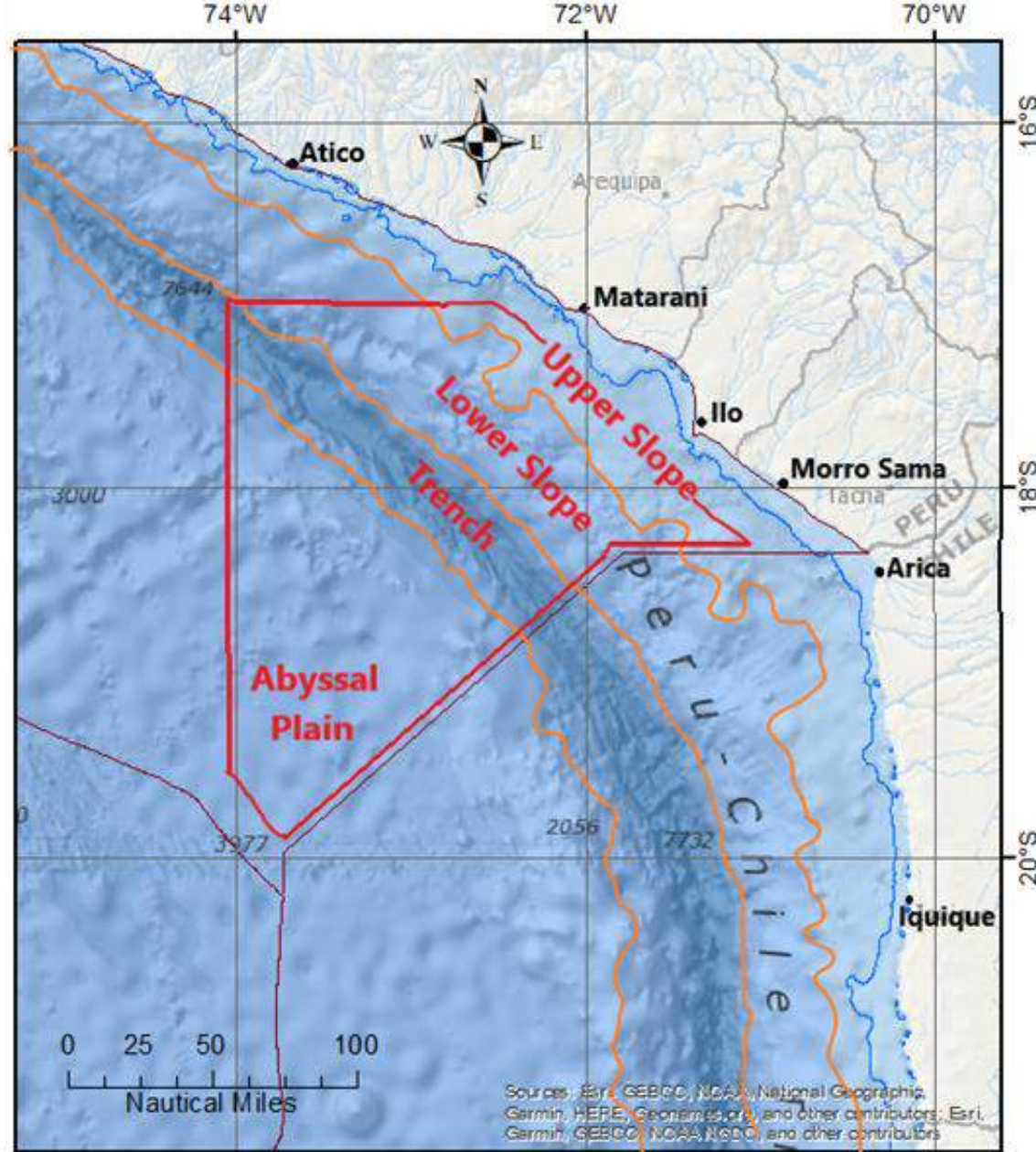


Fig 1. Study area represented by a red polygon, the continuous blue line represents the shelf break, the magenta continuous line represents the Peruvian and Chilean EEZ, and the continuous orange line, are the boundaries of the four habitats: Upper Slope, Lower Slope, Trench and Abyssal plain

On board seabirds sampling

Bycatch proxy

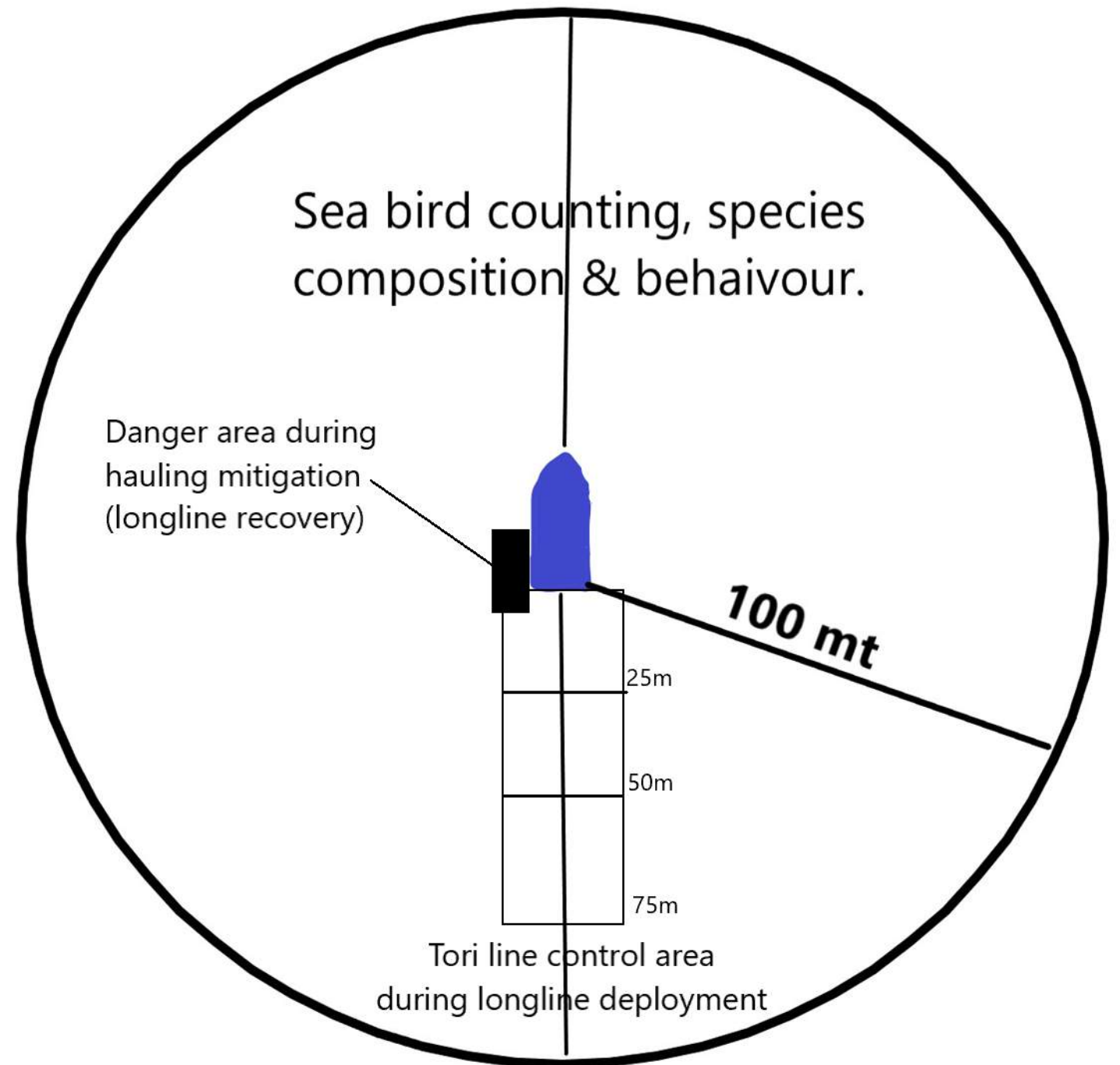
- 1.- N° of seabirds (air & surface)
- 2.- Species composition
- 3.- Seabird behaviour during fishing operability.

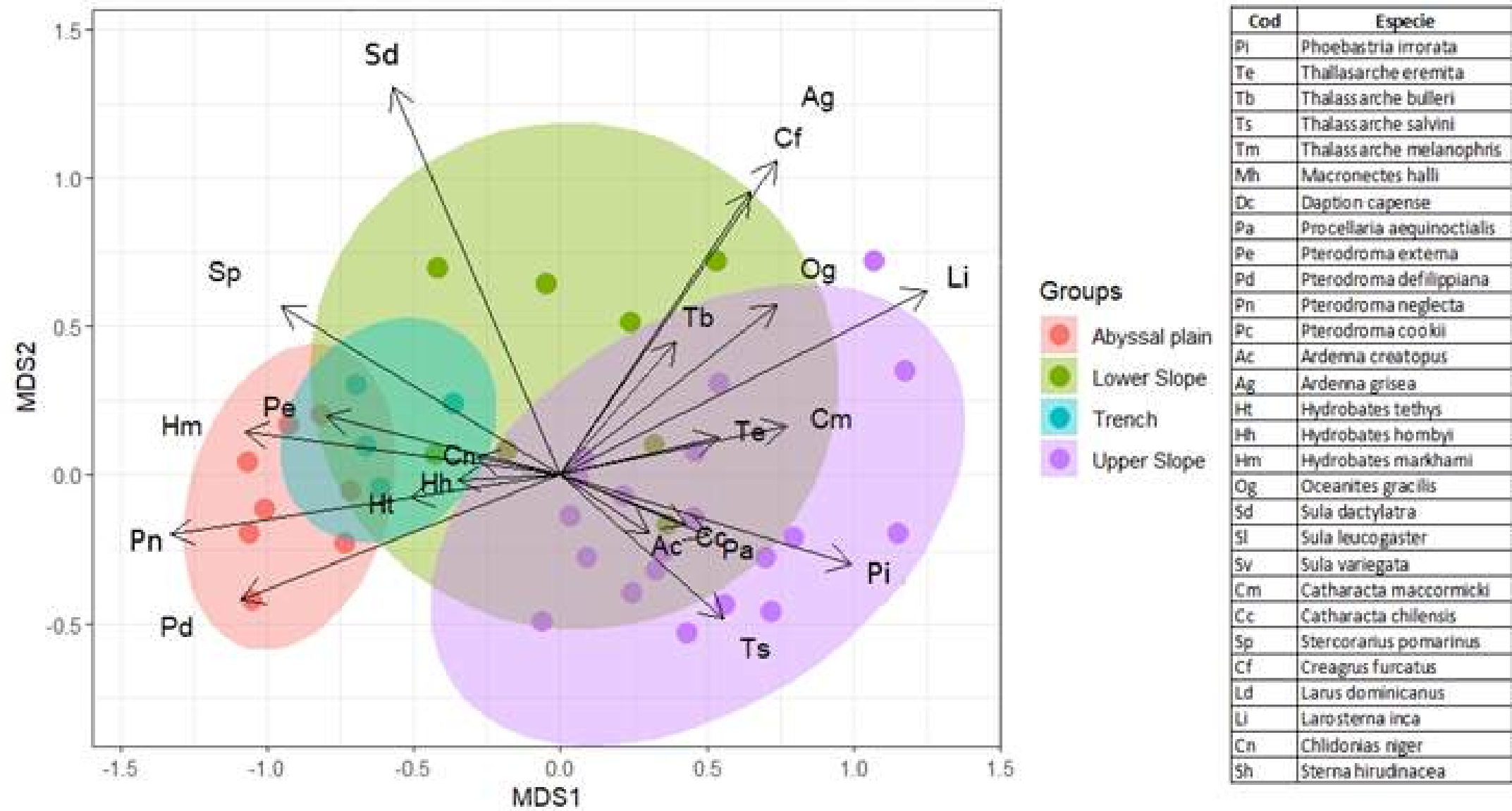
Evaluación areas

- 1.- 360° seabirds counting
- 2.- Danger áreas.

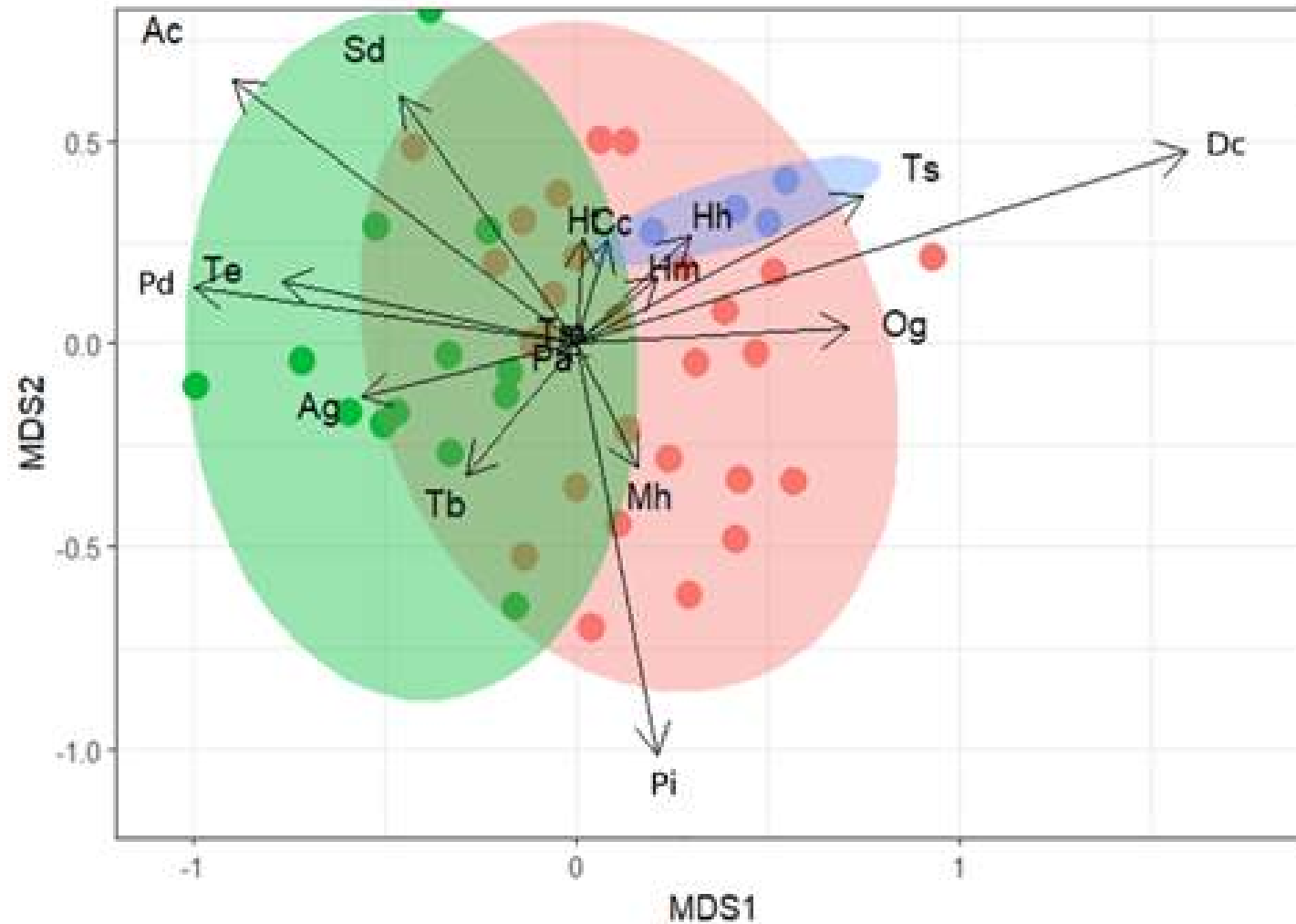
Sampling

- 1.- during deployment (04:00 – 07:00 pm)
- 2.- durante soaking time is imposible, since is totally dark.
- 3.- durante recovery (05:00 – 08:00 am).





MDS analysis between the species clusters in the "Upper Slope", "Lower Slope", "Trench", and "Abyssal Plain" during April 2024 in southern Peru.



Groups

- Lower Slope
- Trench
- Upper Slope

Cod	Especie
Pi	<i>Phoebastria irrorata</i>
Te	<i>Thalassarche eremita</i>
Tb	<i>Thalassarche bulleri</i>
Ts	<i>Thalassarche salvini</i>
Tm	<i>Thalassarche melanophrys</i>
Mh	<i>Macronectes halli</i>
Dc	<i>Daption capense</i>
Pa	<i>Procellaria aequinoctialis</i>
Pe	<i>Pterodroma externa</i>
Pd	<i>Pterodroma defilippiana</i>
Pn	<i>Pterodroma neglecta</i>
Pc	<i>Pterodroma cookii</i>
Ac	<i>Ardenna creatopus</i>
Ag	<i>Ardenna grisea</i>
Ht	<i>Hydrobates tethys</i>
Hh	<i>Hydrobates hornbyi</i>
Hm	<i>Hydrobates markhami</i>
Og	<i>Oceanites gracilis</i>
Sd	<i>Sula dactylatra</i>
Sl	<i>Sula leucogaster</i>
Sv	<i>Sula variegata</i>
Cm	<i>Catharacta maccormicki</i>
Cc	<i>Catharacta chilensis</i>
Sp	<i>Stercorarius pomarinus</i>
Cf	<i>Creagrus furcatus</i>
Ld	<i>Larus dominicanus</i>
Li	<i>Larosterna inca</i>
Cn	<i>Chlidonias niger</i>
Sh	<i>Sterna hirudinacea</i>

MDS analysis between the species clusters in the “Upper Slope”, “Lower Slope”, “Trench”, during June 2024 in southern Peru.

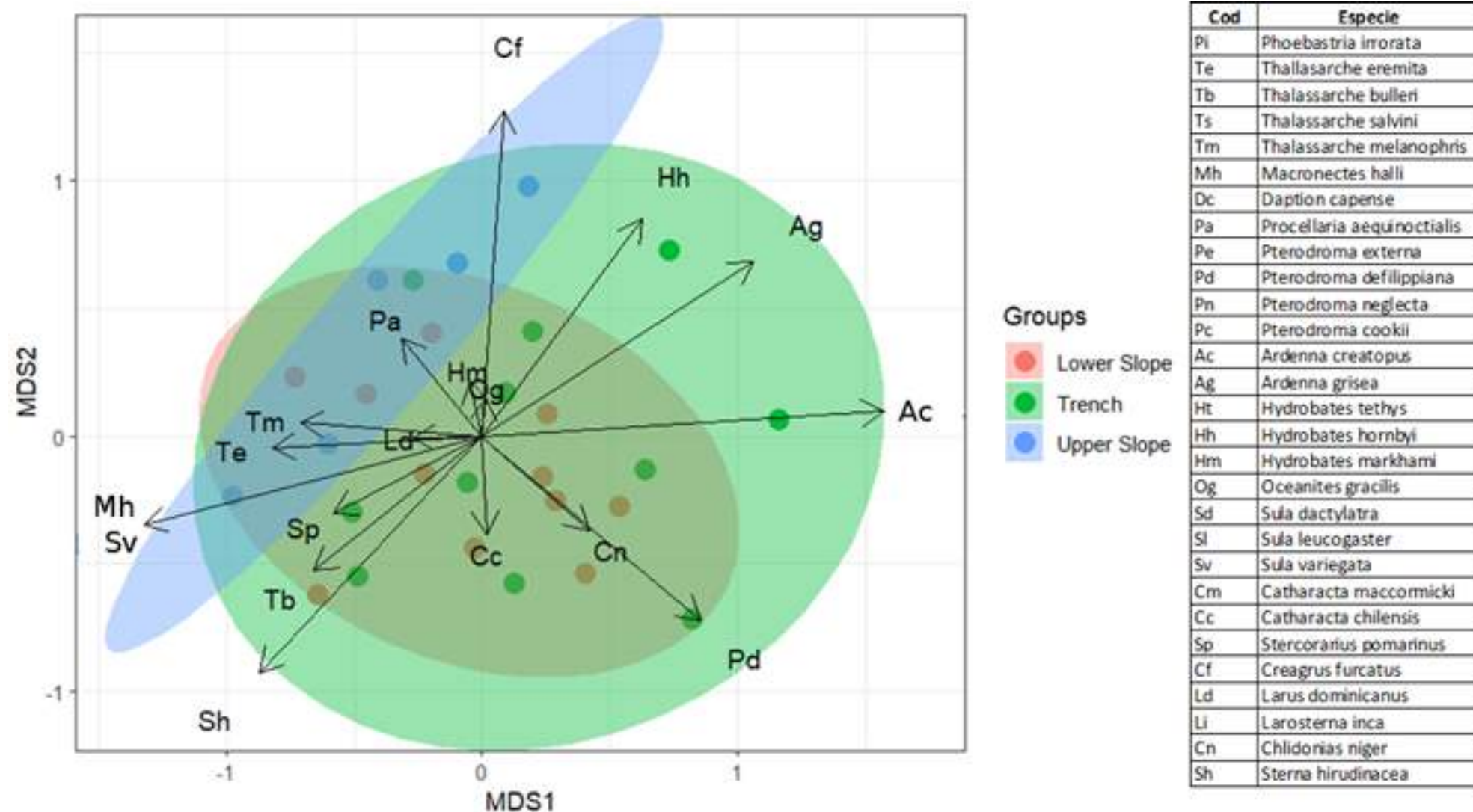


Fig X. MDS analysis between the species clusters in the “Upper Slope”, “Lower Slope”, “Trench”, during October 2024 in southern Peru.

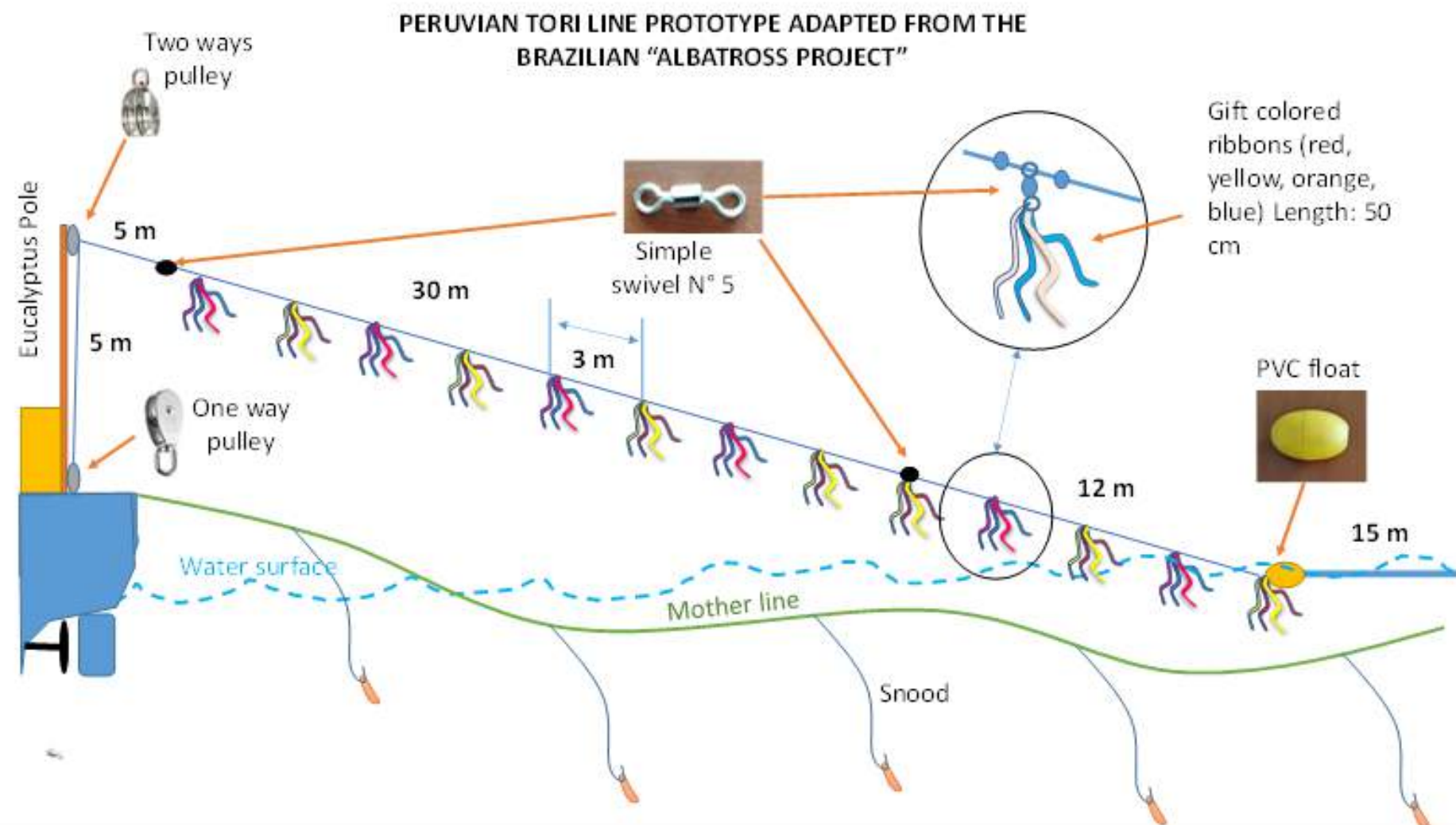


Fig. 2. Peruvian low coast prototype, adapted from the Brazilian "Albatross Project", Gabriel Canani send us the original Brazilian model used in Rio Grande do Sul.

PERUVIAN TORI LINE PROTOTYPE ADAPTED FROM THE NEW ZEALAND FISHERIES

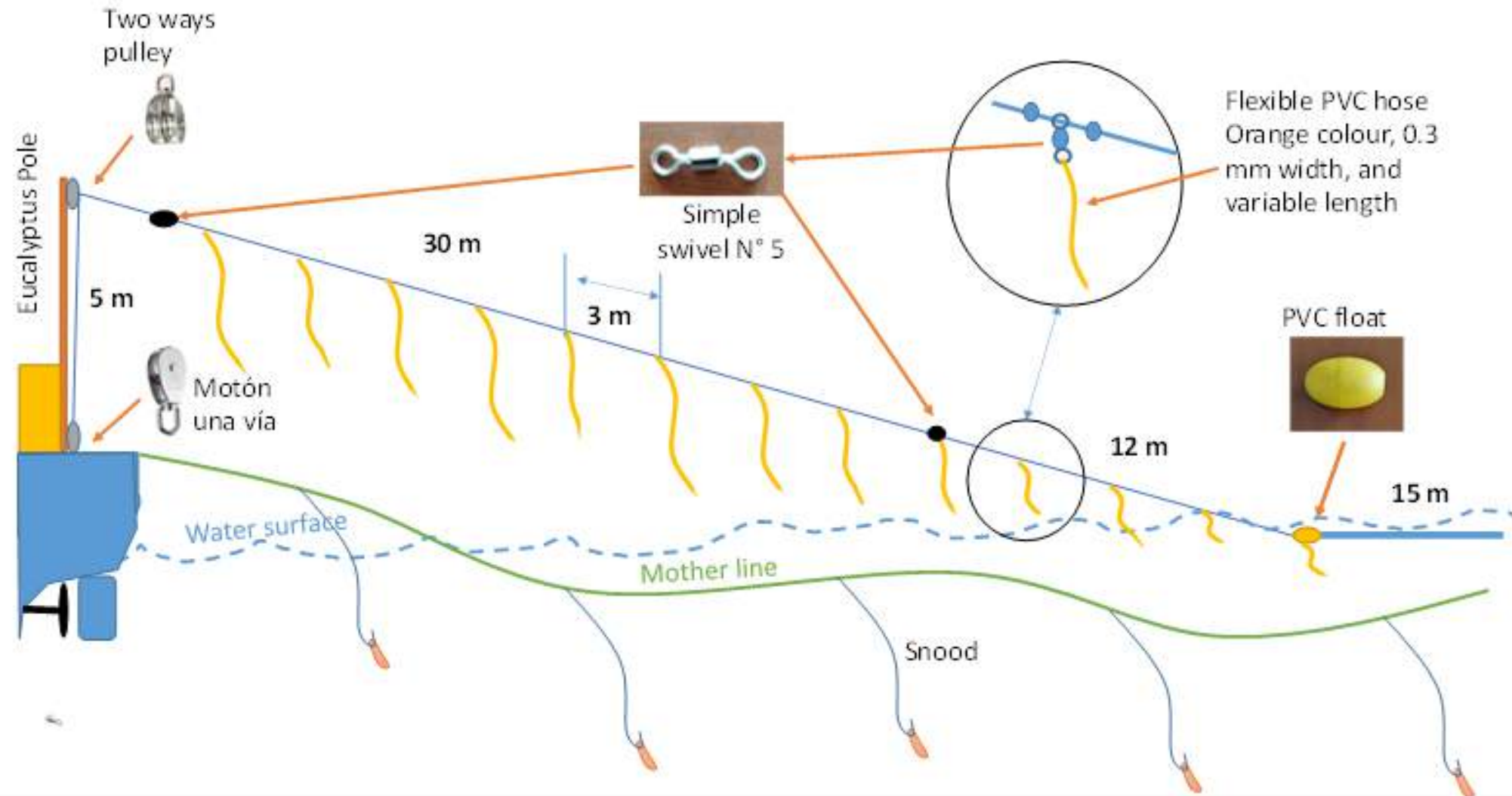


Fig. 3. Peruvian low coast prototype, adapted from the small scale New Zealand longline fisheries targeting Bluefin tuna, original sent by Dave Goad, from the Department of Conservation.

Used materials to build the peruvian tori line



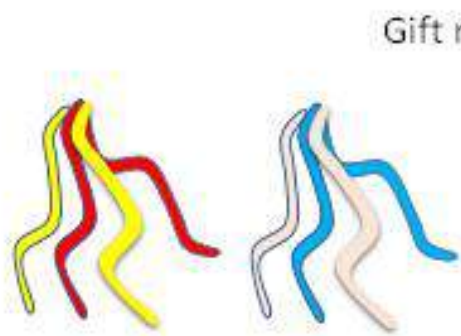
Simple swivel
Nro 5



Security seals,
cutter, pliers



Insulating
tape



Gift ribbons

Red, yellow, blue, orange,
length 50 cm.



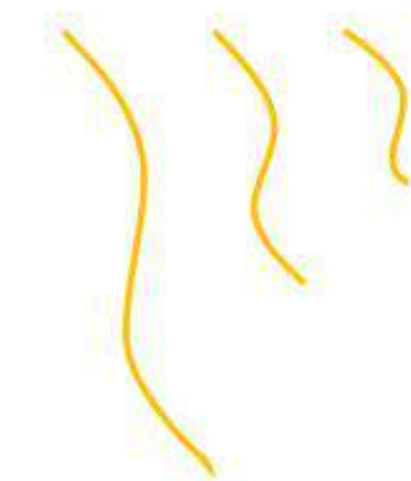
PVC floats



Tubería flexible de PVC
Color : Anaranjado



Motón
una vía



Flexible PVC hose
Orange colour

Length: 0.35 ~ 4 m



Polyethylene &
polyamide mother
line, 6 mm Ø



Gift
ribbons



Two ways
pulley

*5 m eucalyptus stick:	6 US\$
*Flexible PVC 4 cm diameter (20 m):	7 US\$
*Polyethylene mother line 4 mm (3 kg):	8 US\$
*simple swivel (15):	7 US\$
*two way pulley (2):	8 US\$
*Gift Ribbons (6 rolls):	5 US\$
*Old rope (for drag section)	10 US\$
*Security seals & cutter:	7 US\$
TOTAL	58 US\$

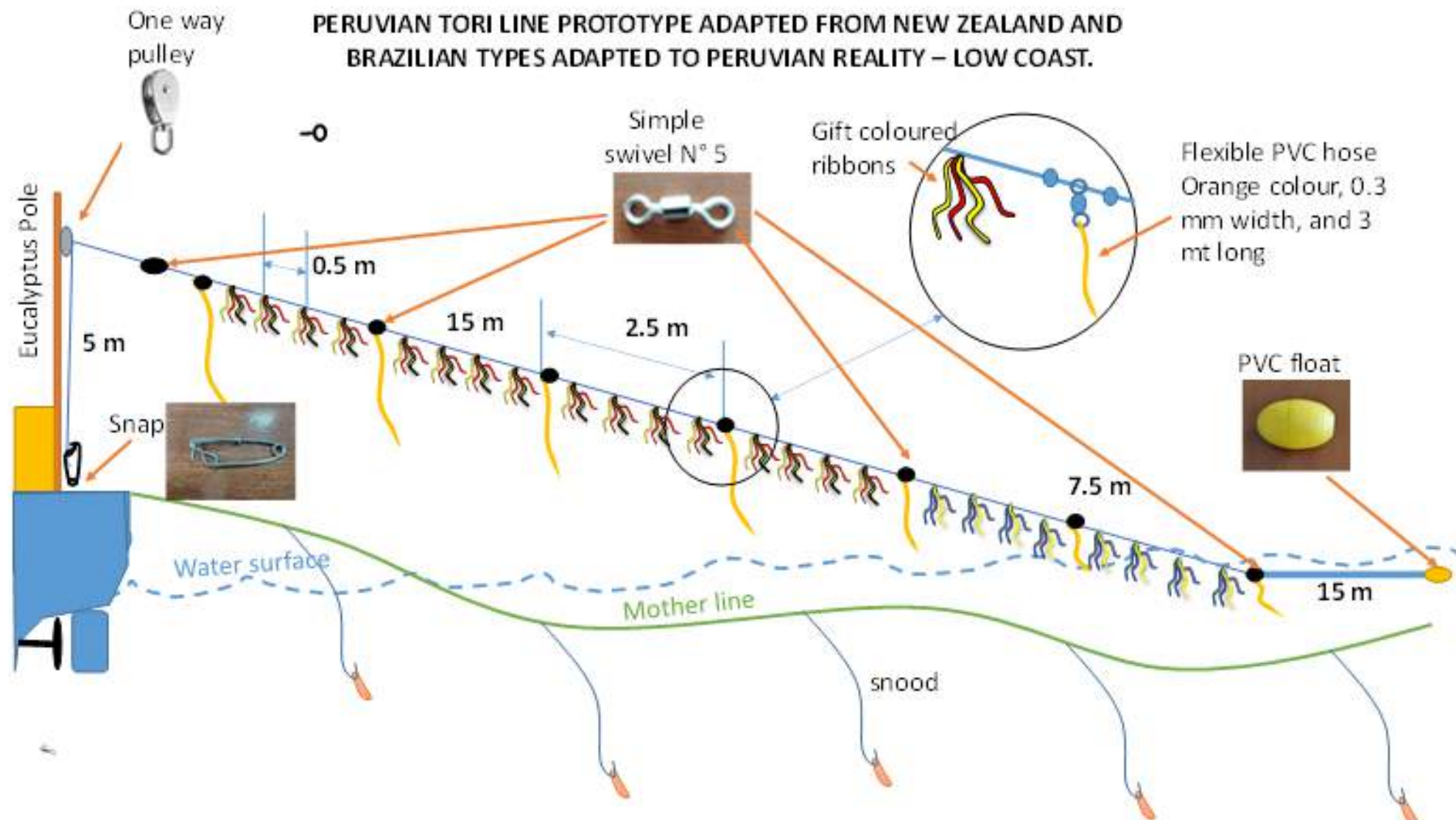


Fig. 4. Peruvian low coast prototype, adapted from the small scale Brazilian and New Zealand longline fisheries targeting swordfish and Bluefin tuna respectively, this is the final design being tested in Peru, since is well adapted to the vessels size and engine power.

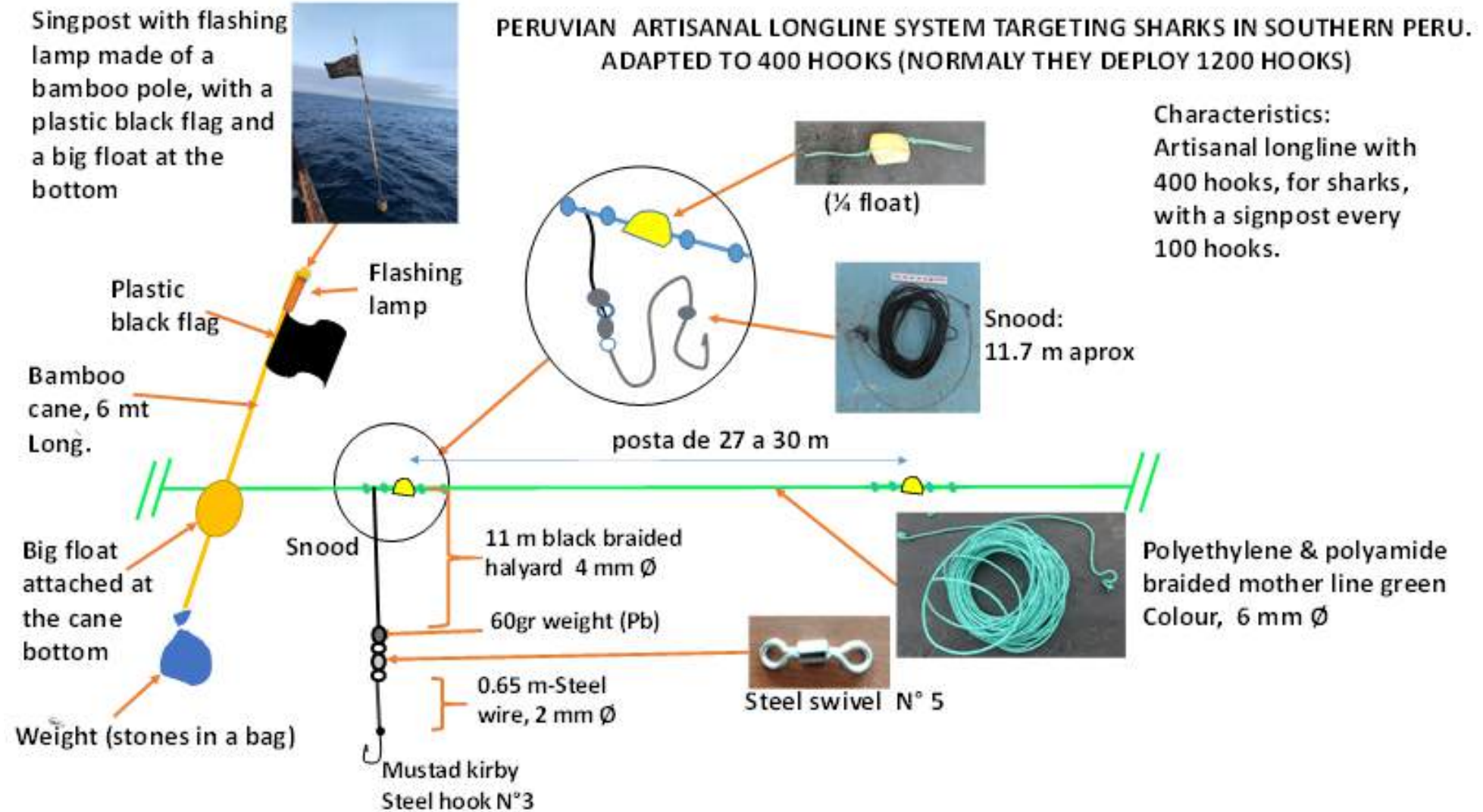
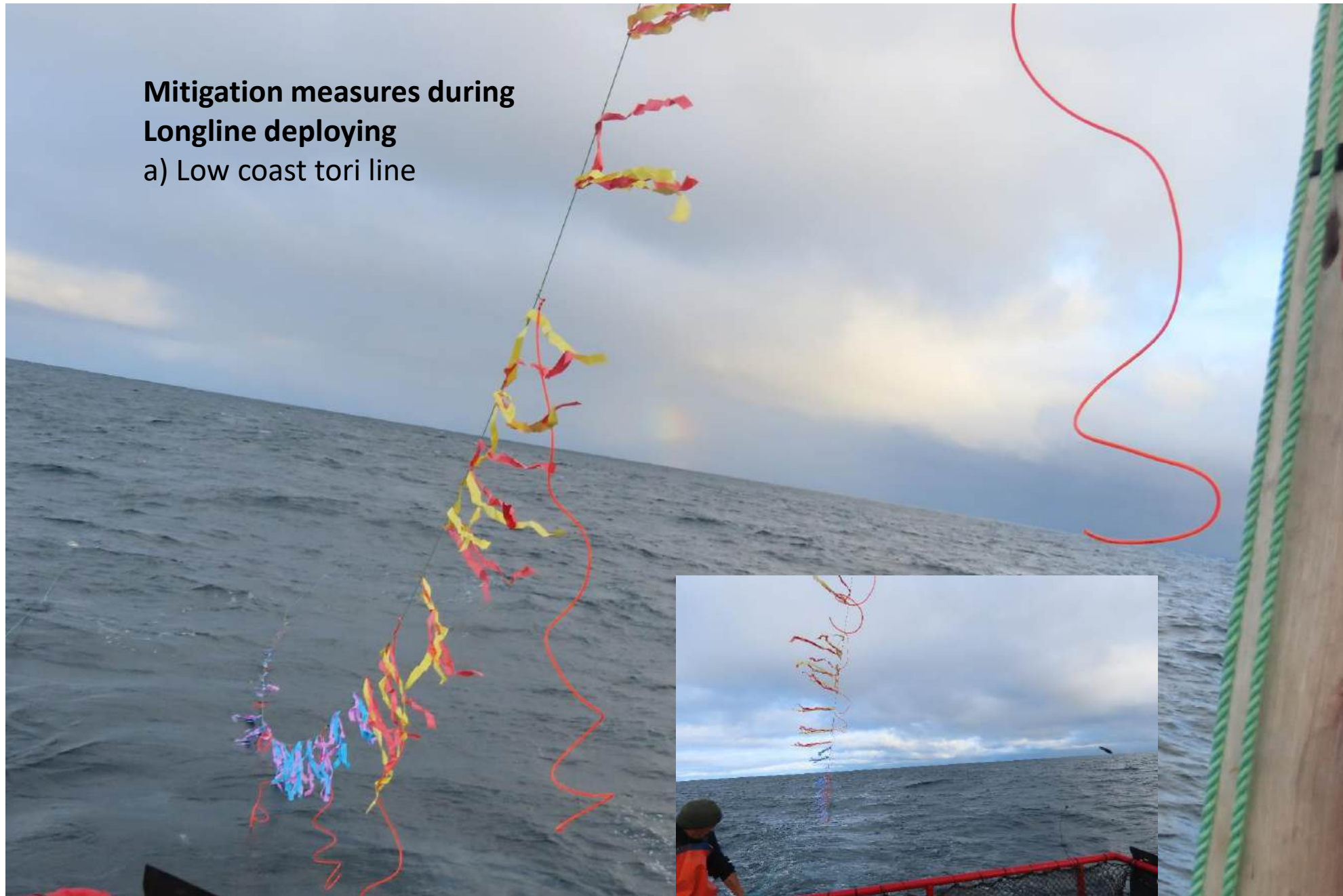
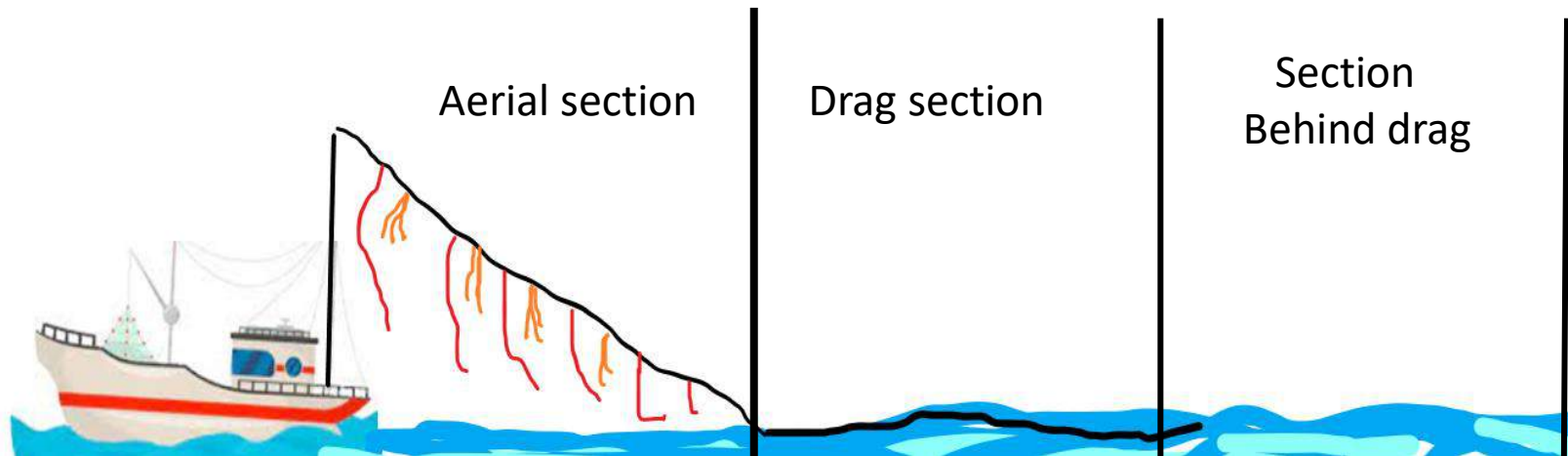


Fig. 7. Design of the artisanal Peruvian longline targeting sharks, materials, measures, and structures used by local fisherman in southern Peru.

**Mitigation measures during
Longline deploying**
a) Low coast tori line

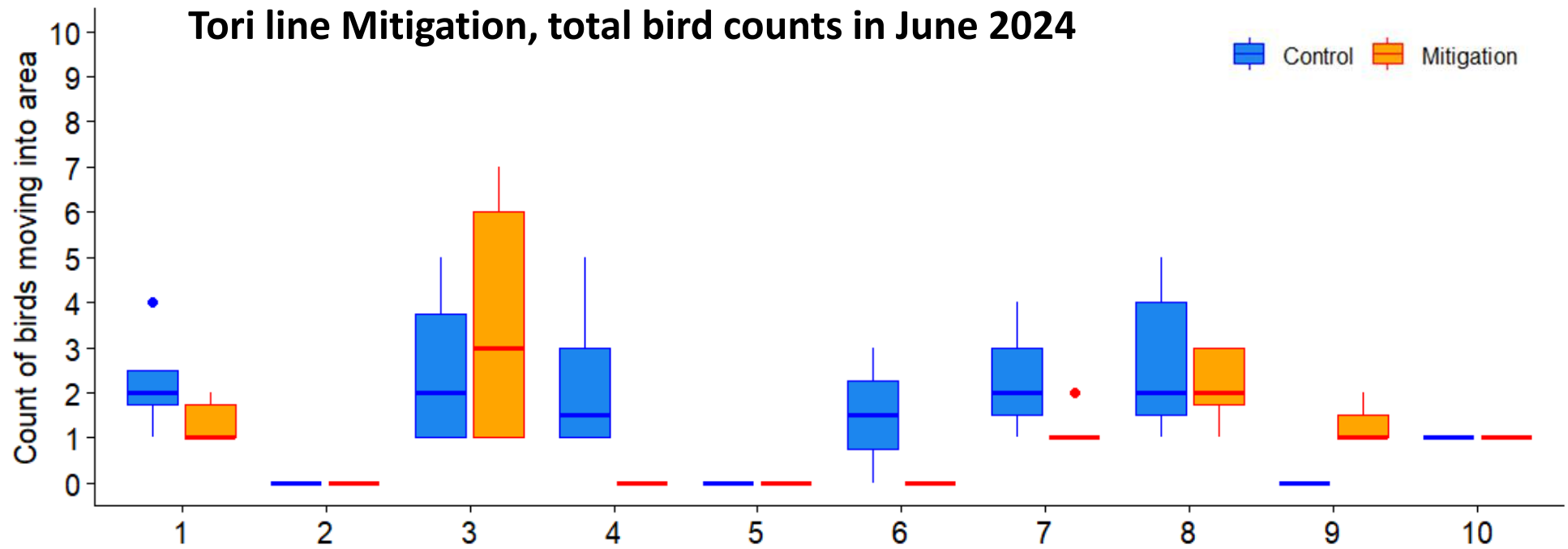






With tori line

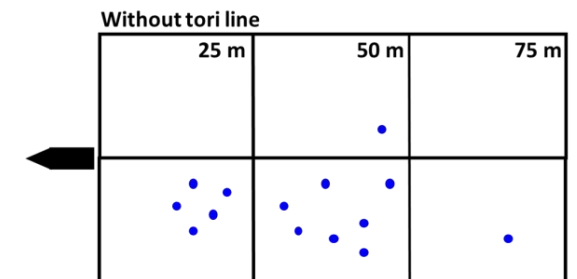
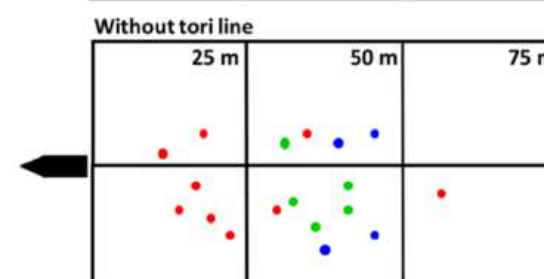
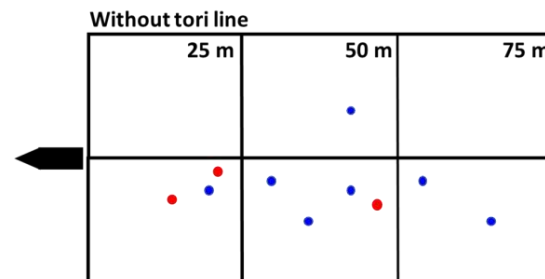
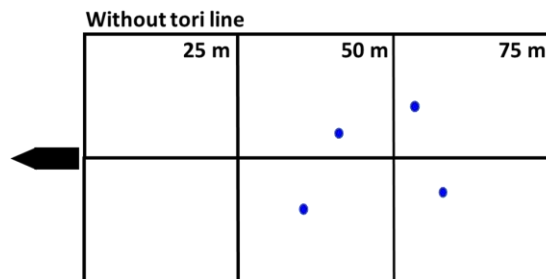
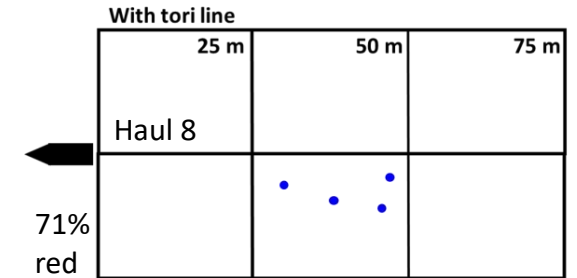
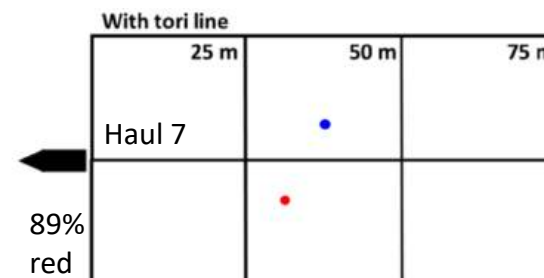
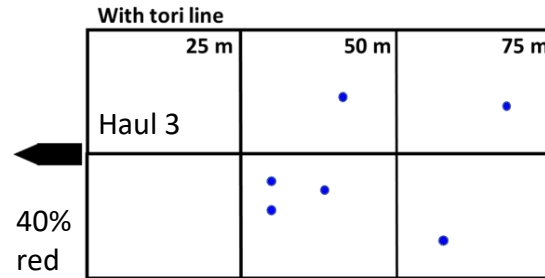
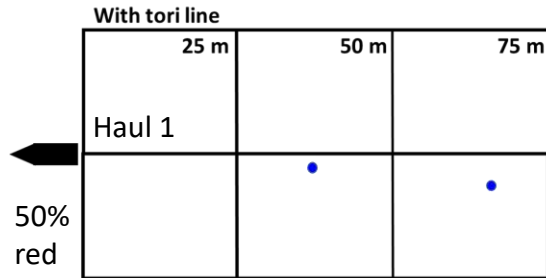
25 m	50 m	75 m



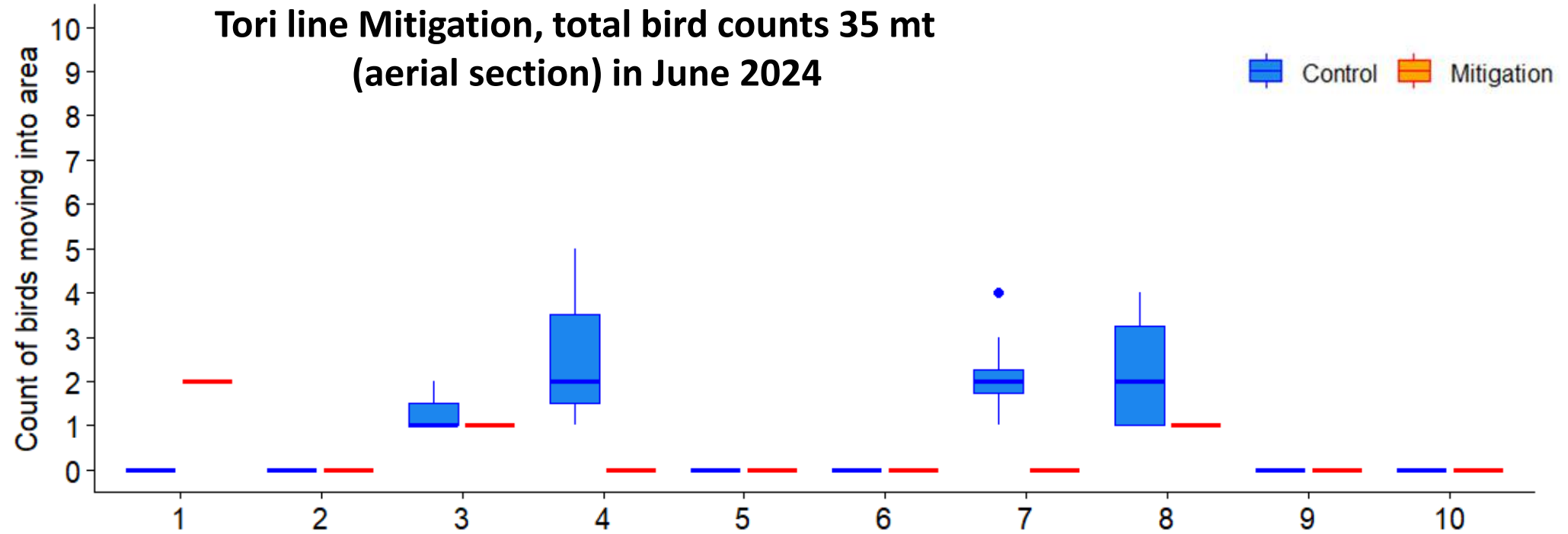
• *Procellaria aequinoctialis*

• *Thalassarche melanophris*

• *Catharacta chilensis*



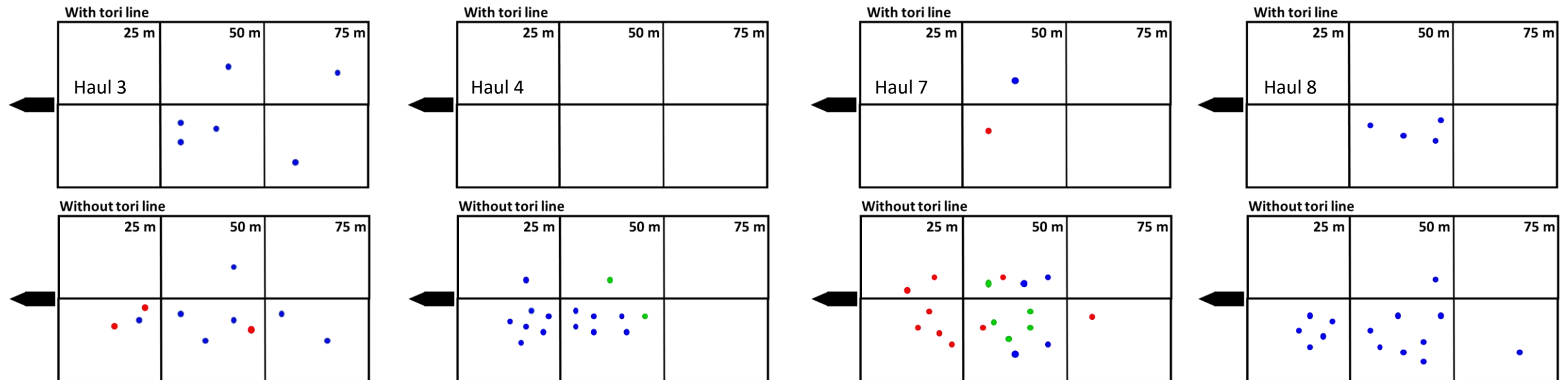
Tori line Mitigation, total bird counts 35 mt (aerial section) in June 2024

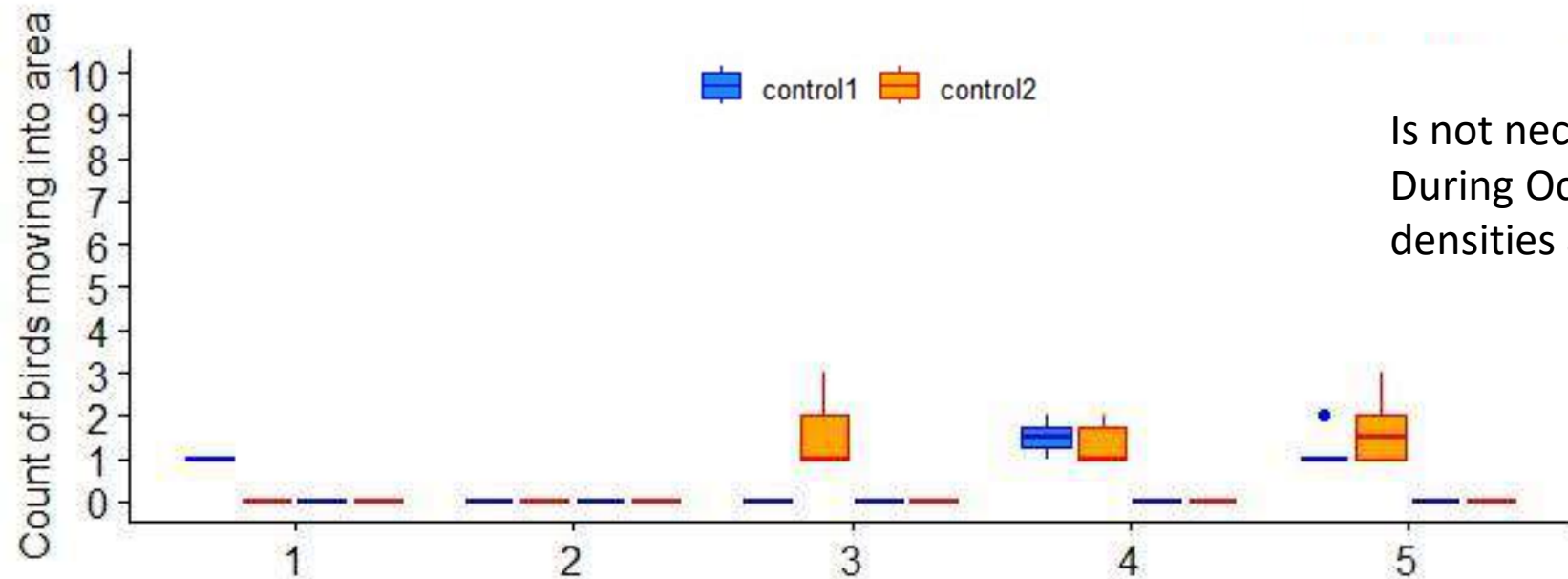


● *Procellaria aequinoctialis*

● *Thalassarche melanophrys*

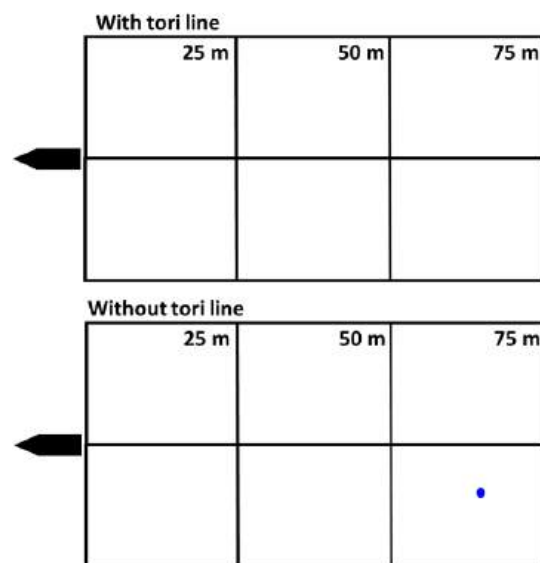
● *Catharacta chilensis*



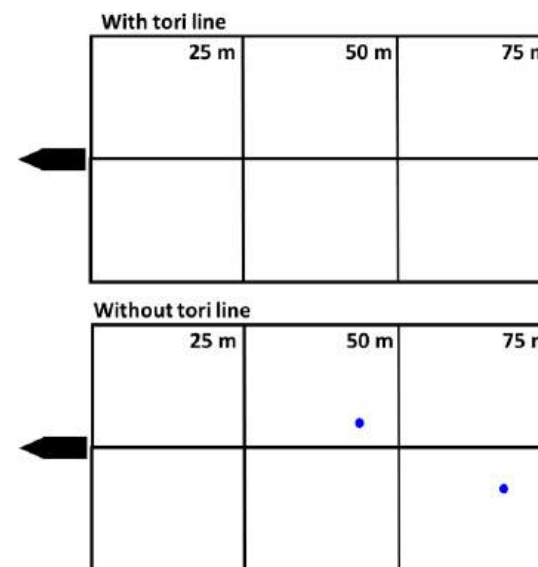
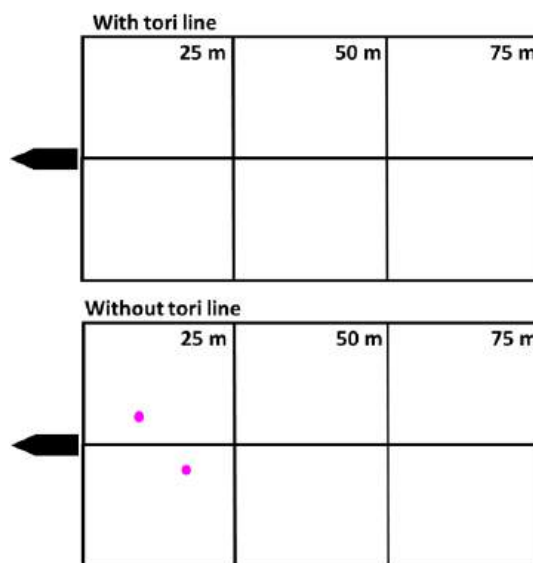


Is not necessary to use tori lines
During October, since seabirds
densities are very low.

• *Procellaria aequinoctialis*



• *Larus dominicanus*



Mitigation measures during longline recovery:

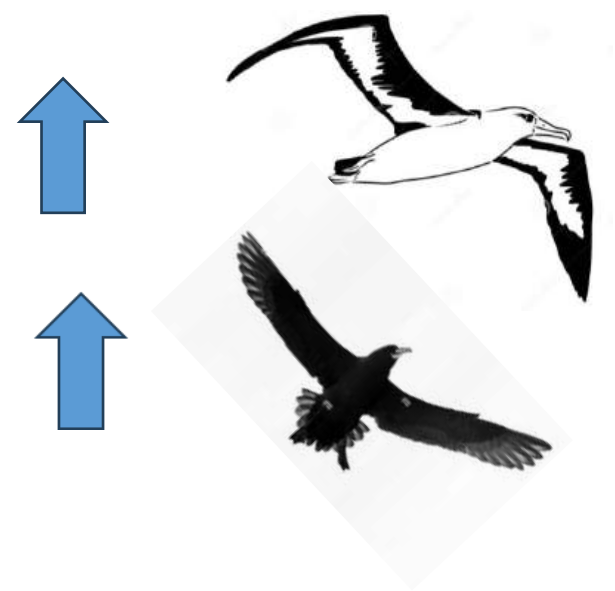
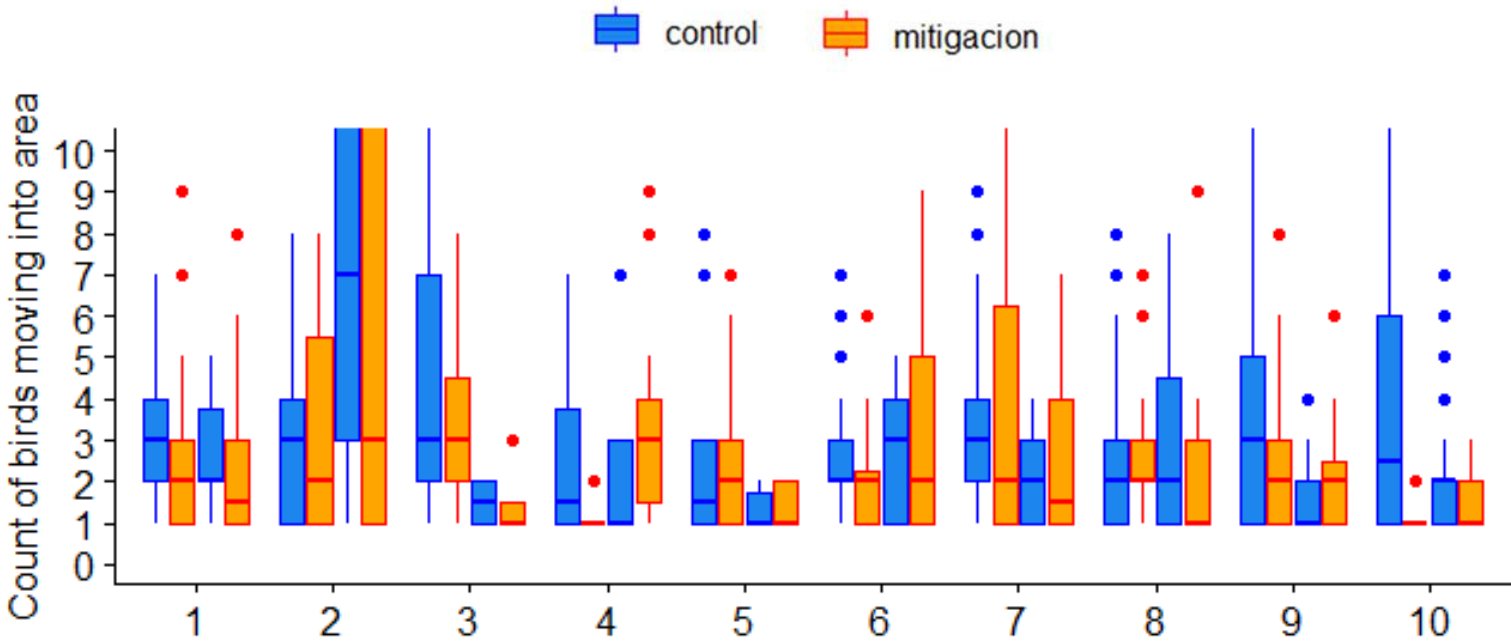
- a) Hauling mitigation
 - b) Retention of second used baits
 - c) Good practices in offal discards
- (ALL TOGETHER)



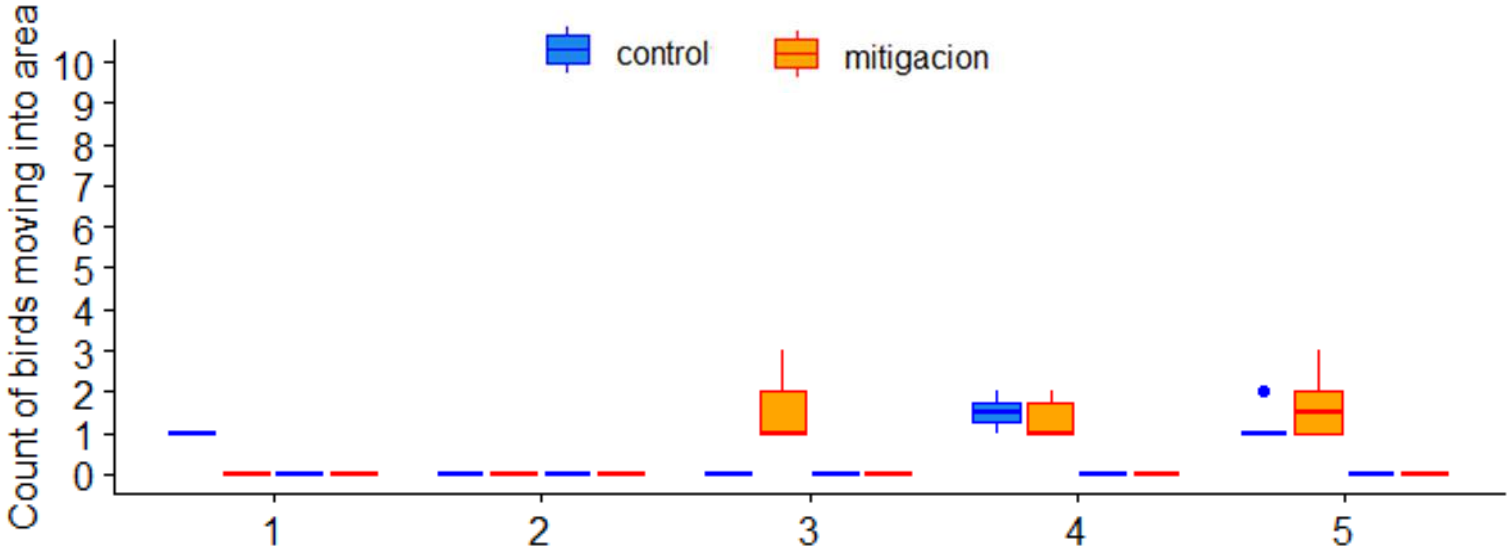
M I T I G A T I O N

H O U L I N G

Total birds entering in danger area during recovery in June 2024

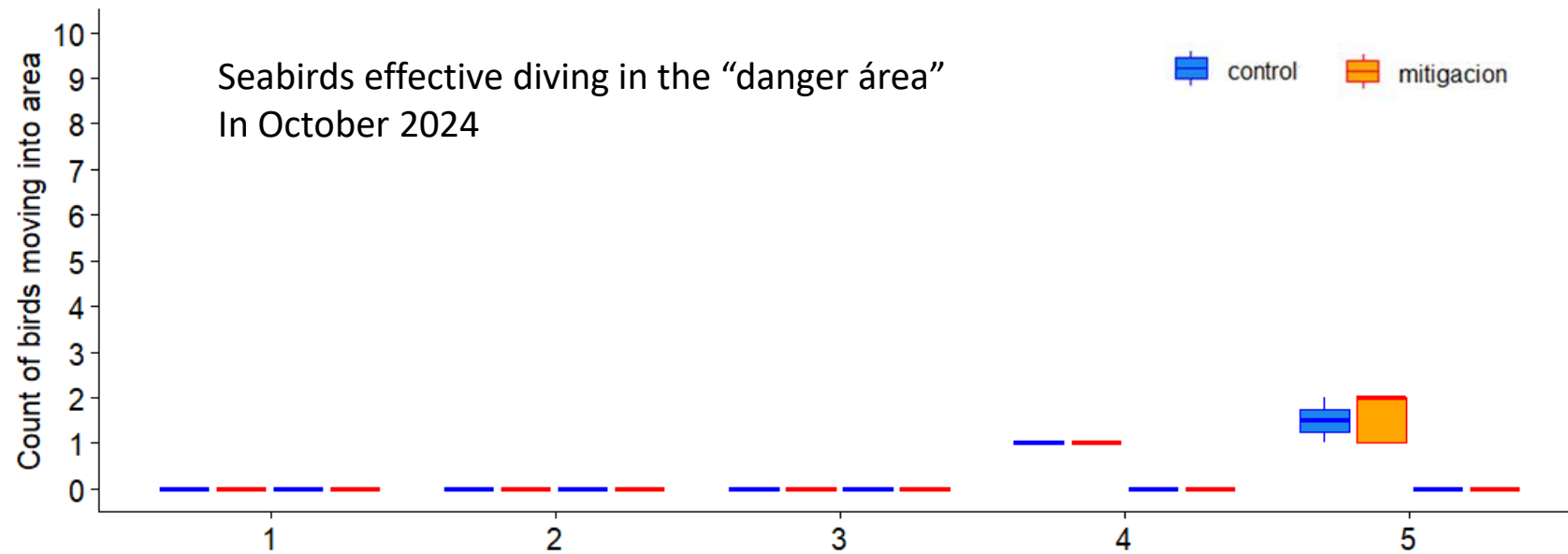
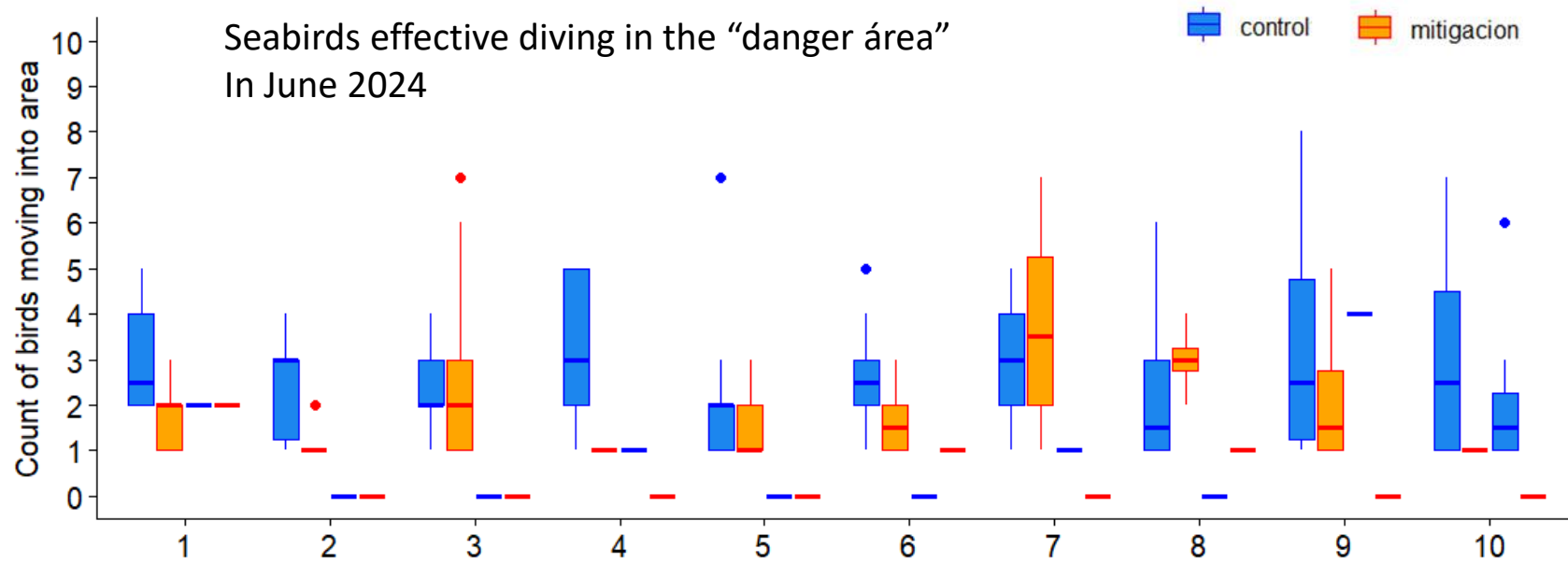


Total birds entering in danger area during recovery in October 2024



In October more than one
Order of magnitude less
Abundances of albatrosses
And petrels, since the great
Majority were already back
To their breeding grounds.

All mitigation measures during longline recovery.



Thank You



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