ISPRA
Istituto Superiore per la Protezione e la Ricerca Ambientale

Sistema Nazionale per la Protezione dell'Ambiente

Assessing marine hot spots for the conservation of the Italian Scopoli's shearwater population breeding in the Northern Tyrrhenian Sea

GIREPAM

Jacopo G. Cecere

- ***Marine hot spots for the conservation of Scopoli's sherwaters breeding in Italy -> marine IBAs***

  - ***Overlap with the network of Protect Areas***

    - ***Foraging areas in the Northern Tirrhenian***

      - ***Take-home messages***

CIREAM

In 2008, LIPU carried out a project funded by Ministero dell'Ambiente, with the aim to identify the proper methodology for the assessment of marine IBAs in Italy

Since 2009 to 2013, LIPU continued its GPS telemetry activity on Scopoli's shearwaters thanks to English donors from LIPU-UK and to the collaboration with ISPRA

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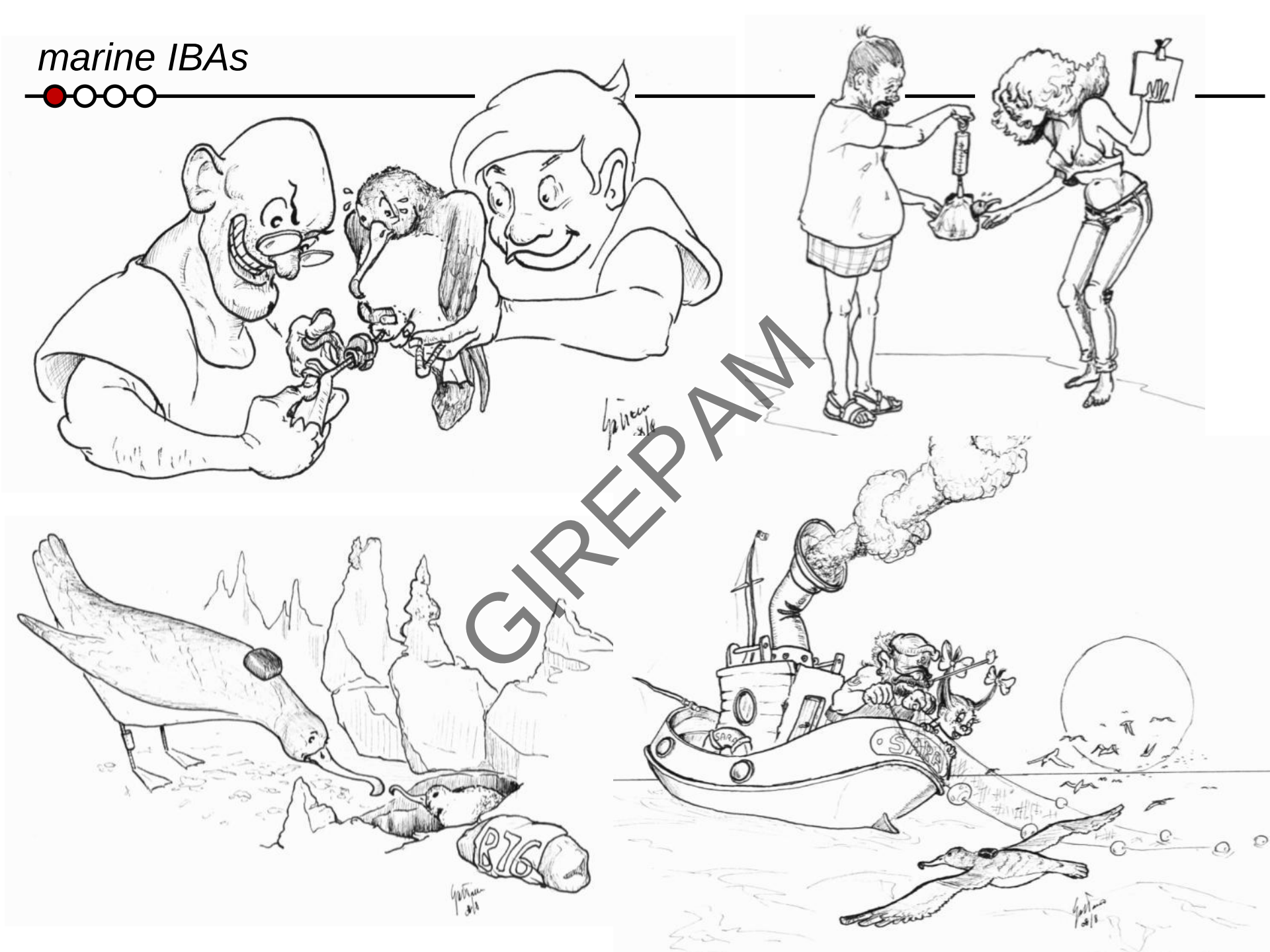
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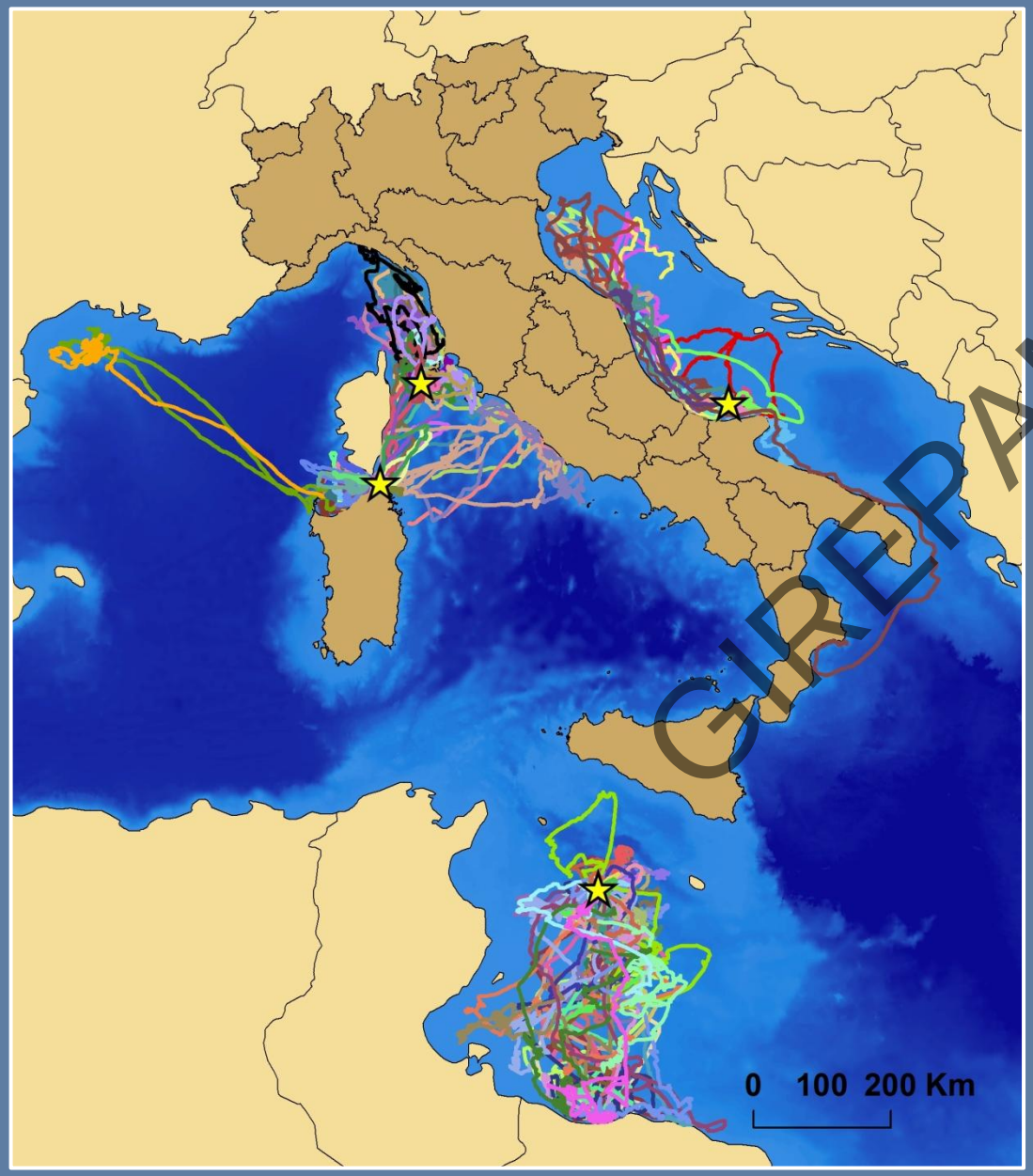

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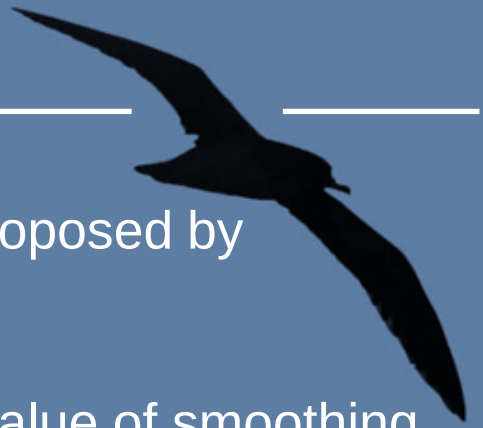
- ✓ 188 individuals were GPS-tagged
- ✓ 50 tracked during incubation
- ✓ 138 tracked during chick-rear.
- ✓ 219 foraging trips
- ✓ 4 large colonies (yellow stars):

  Linosa island
  Tremiti Archip.
  Tuscan Archip.
  La Maddalena Archip.

- ✓ Period: 2008 – 2013



Marine hotspots were identified following the framework proposed by Lascelles et al. 2016

First Passage Time (FPT) was used to assign the proper value of smoothing factor for each foraging trip. These values were averaged and used to perform KDE analysis to determine core use areas (KDE 50%) of each foraging trip.

To avoid inconveniences related to the use of several trips from the same bird, the variance between multiple trips from an individual was compared with multiple trips from multiple individuals using a Mann-Whitney U test.

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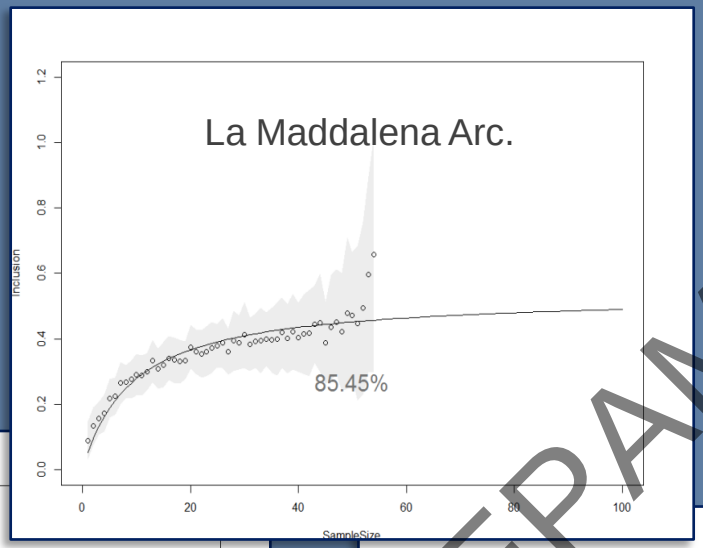
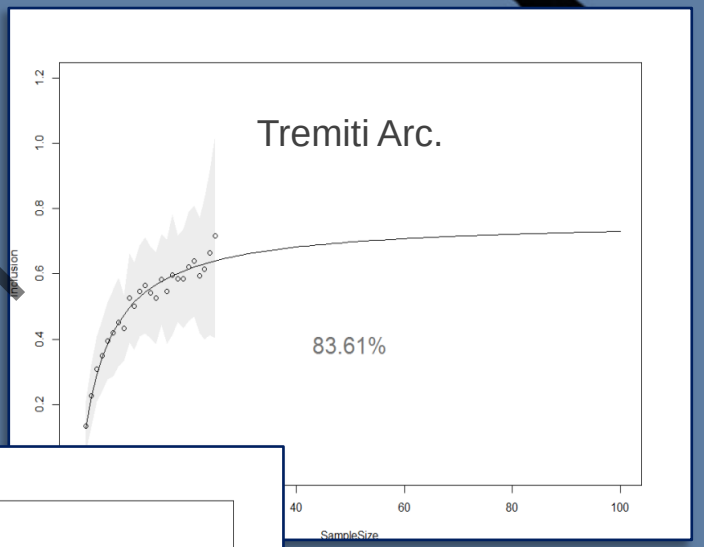
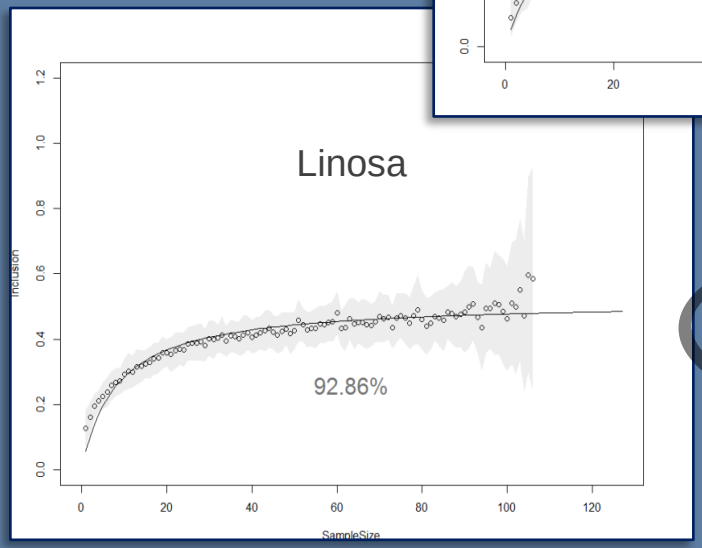
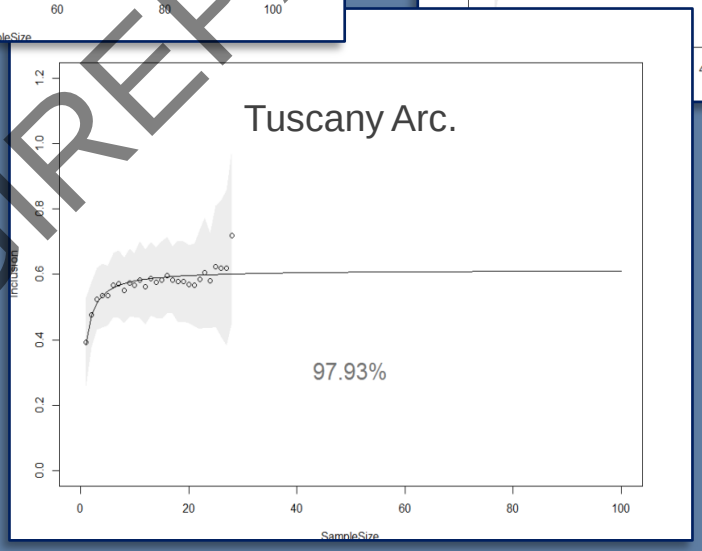
The framework also assesses how representative each data group (colony) was, indicating how much each trip adds to the distribution and how inclusion increases with sample size.

If representativeness > 90%, an area used by more than 10% of sampled population was highlighted as marine hotspot (80-90% -> 12.5%).









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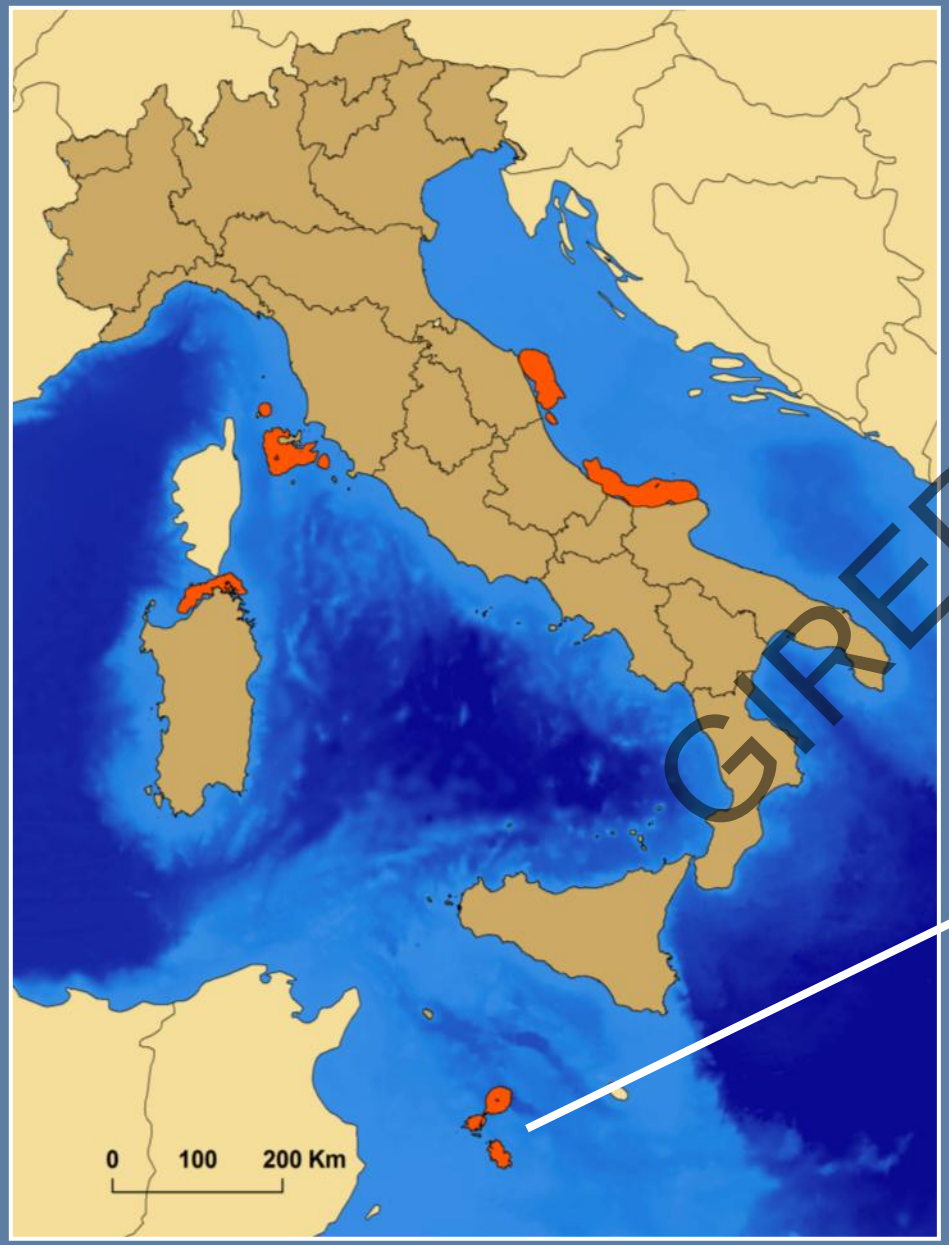
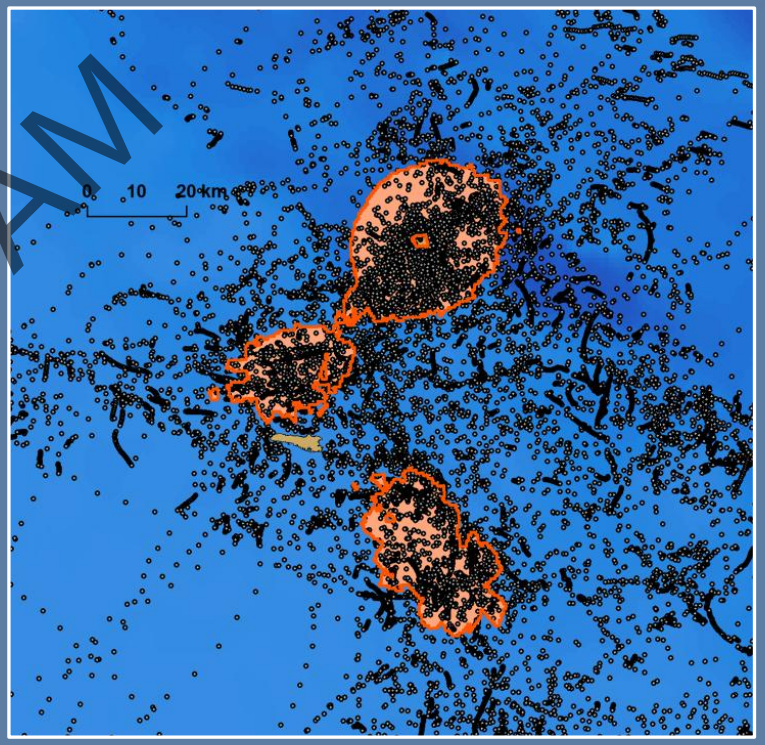
The test of representativeness showed that all sample sizes were able to well represent the investigated populations.

marine IBAs





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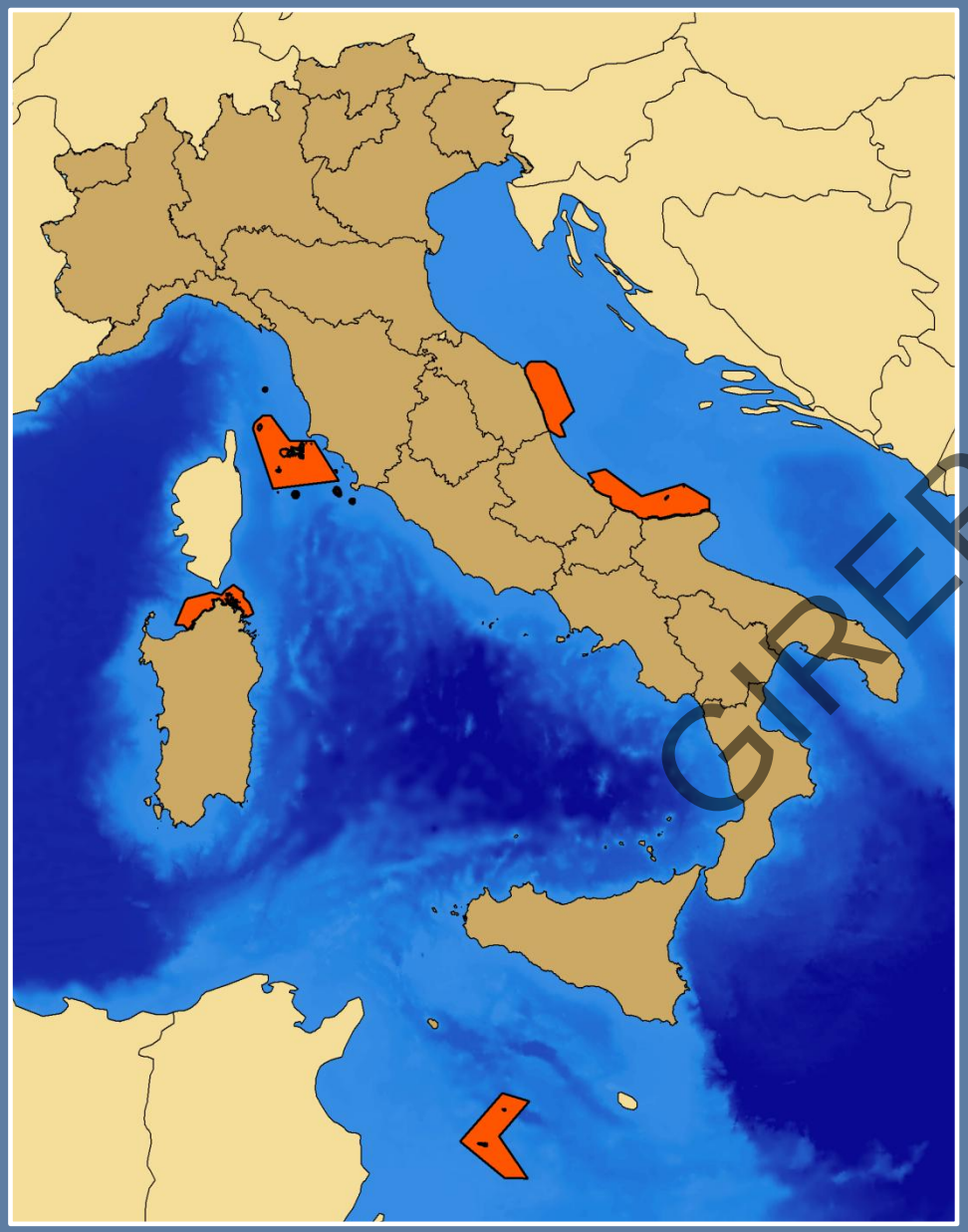
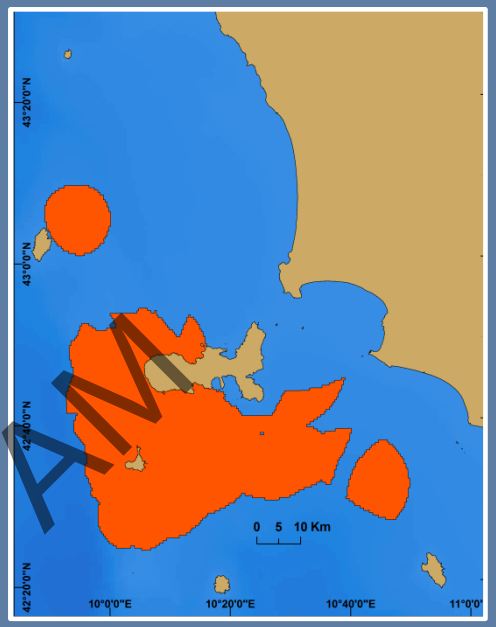
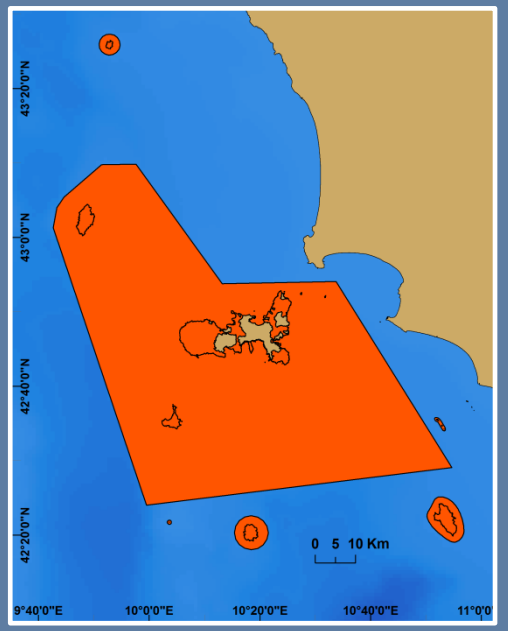
Identified marine hot spots ranged from 1355 km^2 to 5404 km^2

marine IBAs







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- ***Marine hot spots for the conservation of Scopoli's sherwaters breeding in Italy -> marine IBAs***

  - ***Overlap with the network of Protect Areas***

    - ***Foraging areas in the Northern Tirrhenian***

      - ***Take-home messages***

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overlap with PAs

The network of Protect Areas (PAs) is recognized as one of the most important tools for the conservation of biodiversity

However, its effectiveness in protecting marine areas for seabirds is a poor investigated issue.

We focused on the Scopoli's shearwater breeding in Italy with the aim to first assess marine hotspot for its conservation and then the overlap of such hotspots with the existing marine protected areas network .

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© Bruno D'Amicis 2008

overlap with PAs

Foraging sites ?
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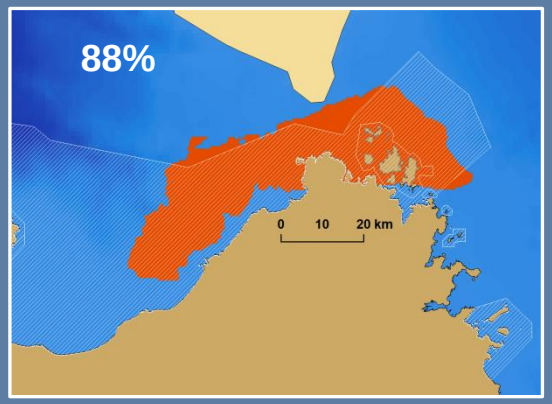
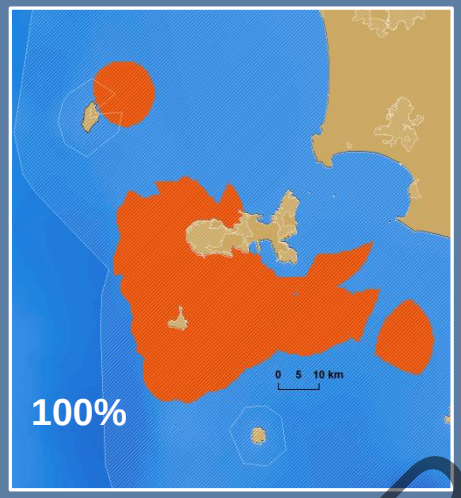
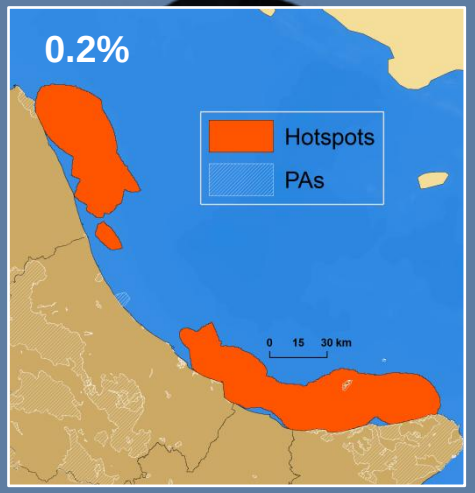
© Michele Mendi 2012

overlap with PAs







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- ✓ 2 marine hotspots are only marginally covered by marine Protected Areas (mPAs).
- ✓ 2 are highly covered, thanks to a single very large marine mPA, whose Management Plan seems to not foresee specific measures for the conservation of seabirds (Santuario dei Cetacei).
- ✓ This figure highlights the limited role of Italian mPAs in protecting marine hotspots for the conservation of the Scopoli's shearwaters and it is likely due to the temporal mismatch between the designation of mPAs and the development of tracking technologies allowing the identification of such hotspots.

overlap with PAs

At the same time, we have to acknowledge that:

Parco Nazionale Arcipelago Toscano is fostering rat eradication actions at colony sites; it is (lead) partner of a number of successfully LIFE projects

both Parco Nazionale Arcipelago di La Maddalena and Parco Nazionale Arcipelago Toscano are actively fostering projects aimed at assessing at-sea hot spots for the conservation of Scopoli's shearwater, even if they are located beyond their borders

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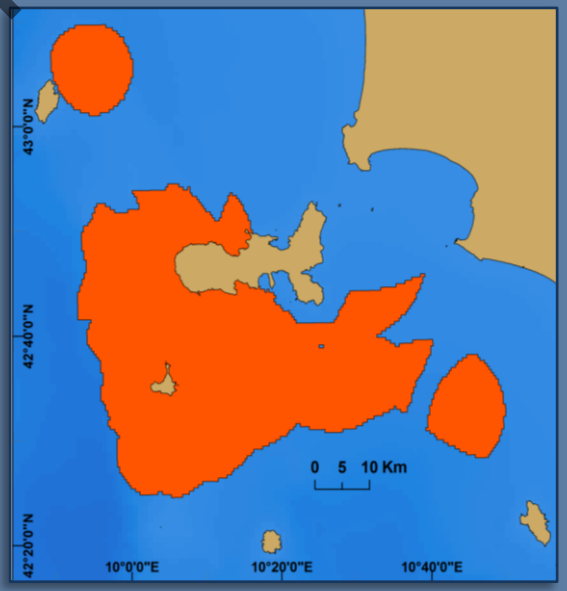

PARCO NAZIONALE dell' ARCIPELAGO DI LA MADDALENA

Parco Nazionale Arcipelago Toscano

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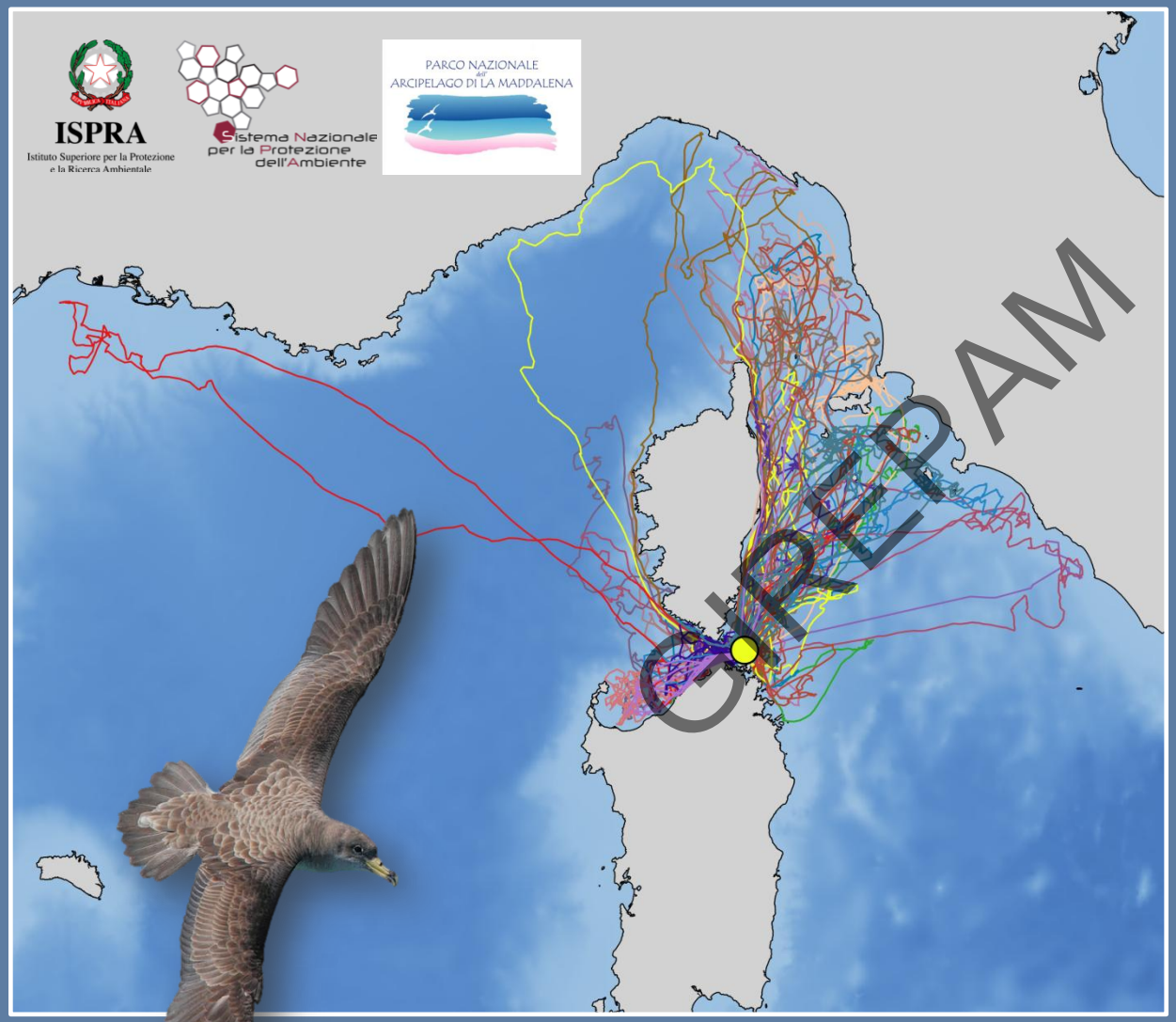
assessing forging areas



2018

Collaboration between

Parco Nazionale
Arcipelago di
La Maddalena
and
ISPRA

44 birds tracked
for several days
during chick-rearing phase

265 foraging trips

Movements behaviours can be identified in a pelagic bird trajectory by assigning proper thresholds to velocity and turning behaviour

e.g. movements related to searching and foraging behaviour are the segments characterised by low velocities and large turning angles

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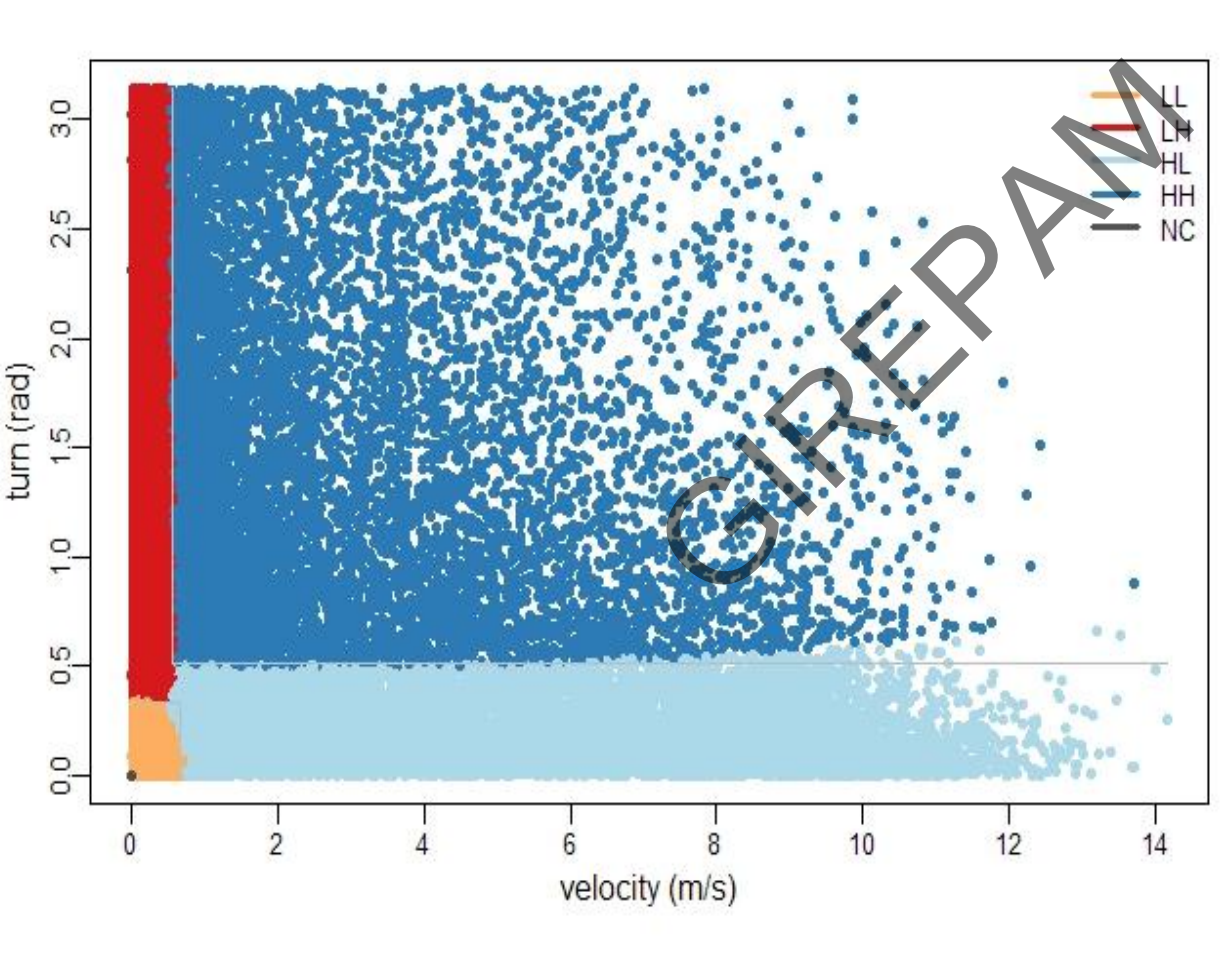
Expectation Maximization binary Clustering (EMbC)

- an algorithm based on the maximum likelihood estimation of a Gaussian mixture model (Garriga et al. 2016)

we applied this clustering method based on speed and turning angles to the 265 GPS tracks using the EMbC package *(Garriga et al. 2016) in R ver. 3.2.3*

assessing foraging areas

Following Louzao et al. (2014),
we interpreted the labelling as follows:



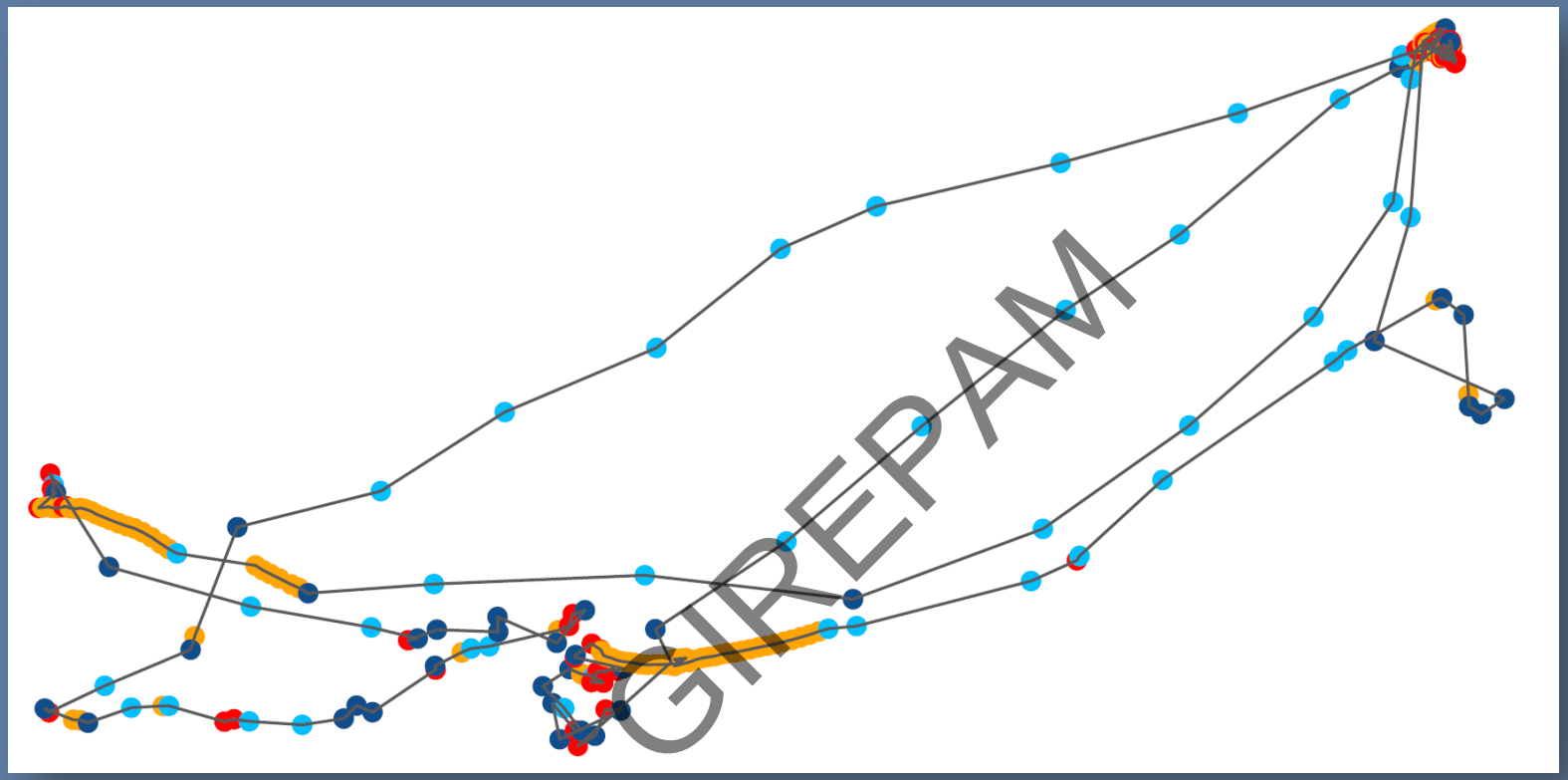
low velocities and low turns as
resting on the water **LL**

low velocities and high turns as
intensive search **LH**

high velocities and low turns as
relocation **HL**

high velocities and high turns as
extensive search **HH**

assessing forging areas



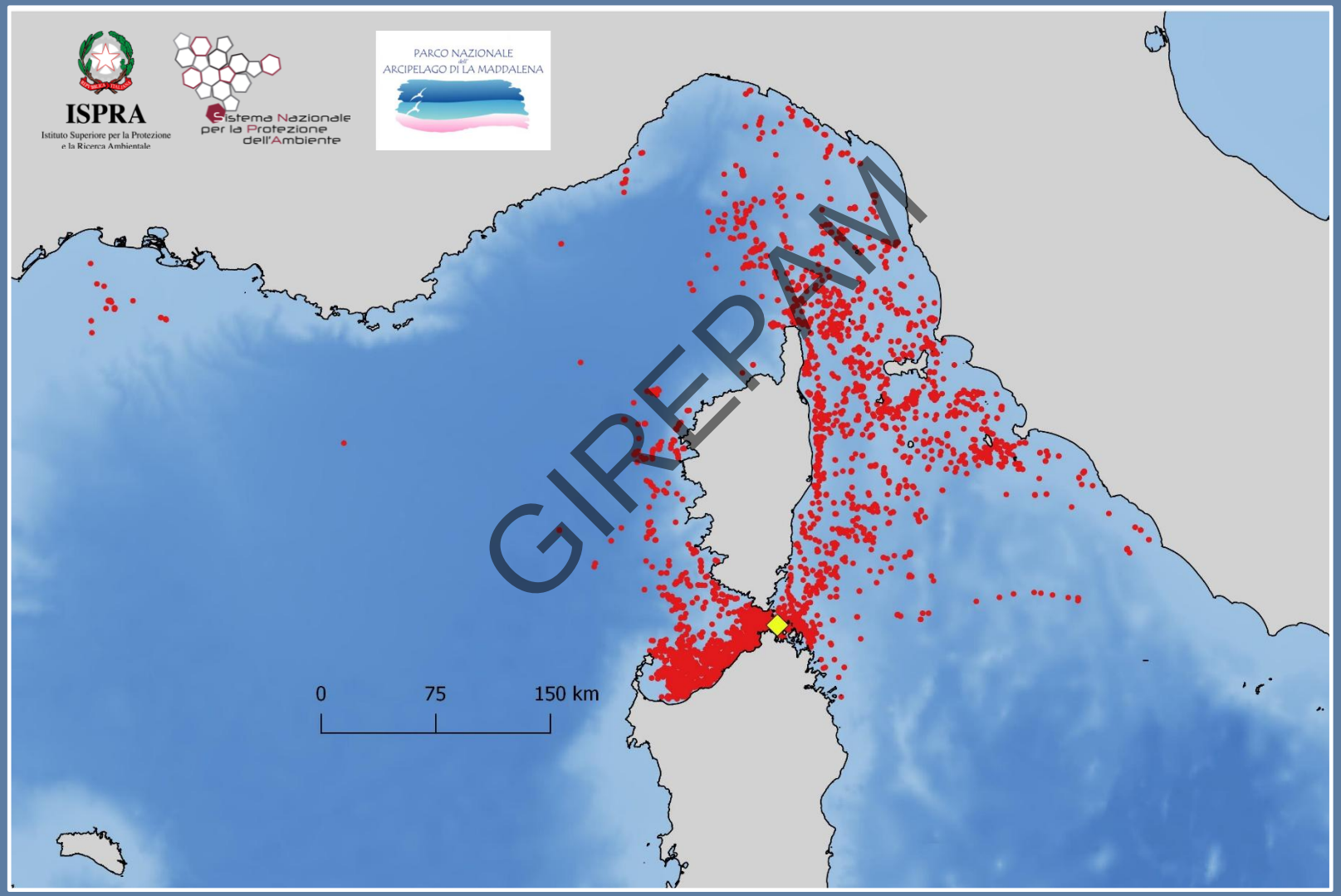
low velocities and low turns as **resting** on the water

high velocities and low turns as **relocation**

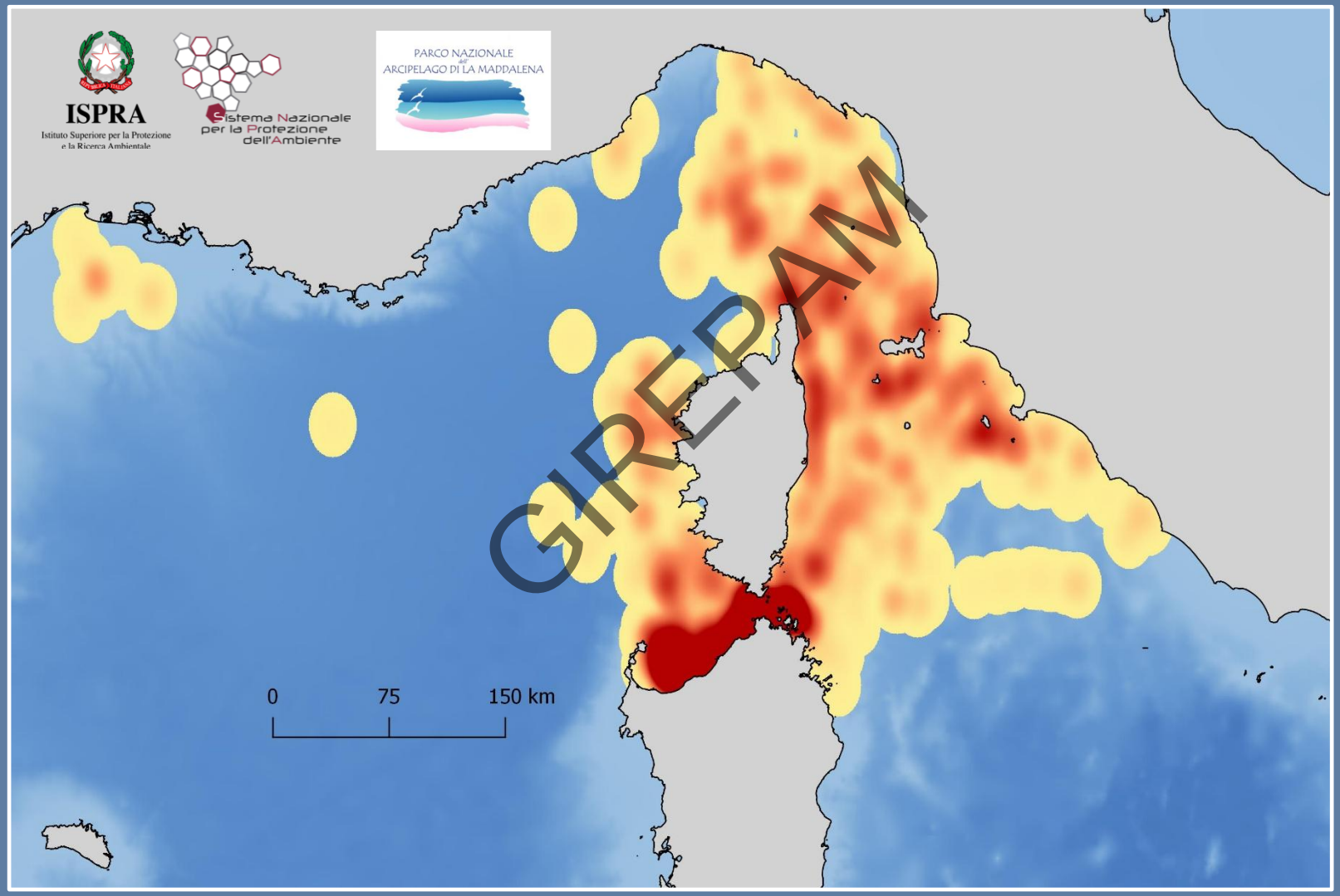
low velocities and high turns as **intensive search**

high velocities and high turns as **extensive search**

assessing forging areas



assessing forging areas



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Take-home messages

1. GPS-telemetry activity can provide useful information for planning conservation actions.

2. At the moment, the network of Protected Areas is inadequate in protecting marine areas used by Scopoli's shearwater breeding in Italy.

3. Collaboration among local administrations, parks and researchers is crucial.

4. Seabirds (and animals in general) do not recognize national borders: a transnational approach is crucial for effective conservation efforts.

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many many thanks to

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Linosa: LIPU, Giorgia Gaibani, Pedro Geraldes, Carlo Catoni, Ivan Maggini, Simona Imperio, Giacomo Dell'Omo, Marco Cianchetti e tanti altri volontari

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