The Distribution Pattern and Conservation Gap of Spotted Seal in the Yellow Sea Ecoregion

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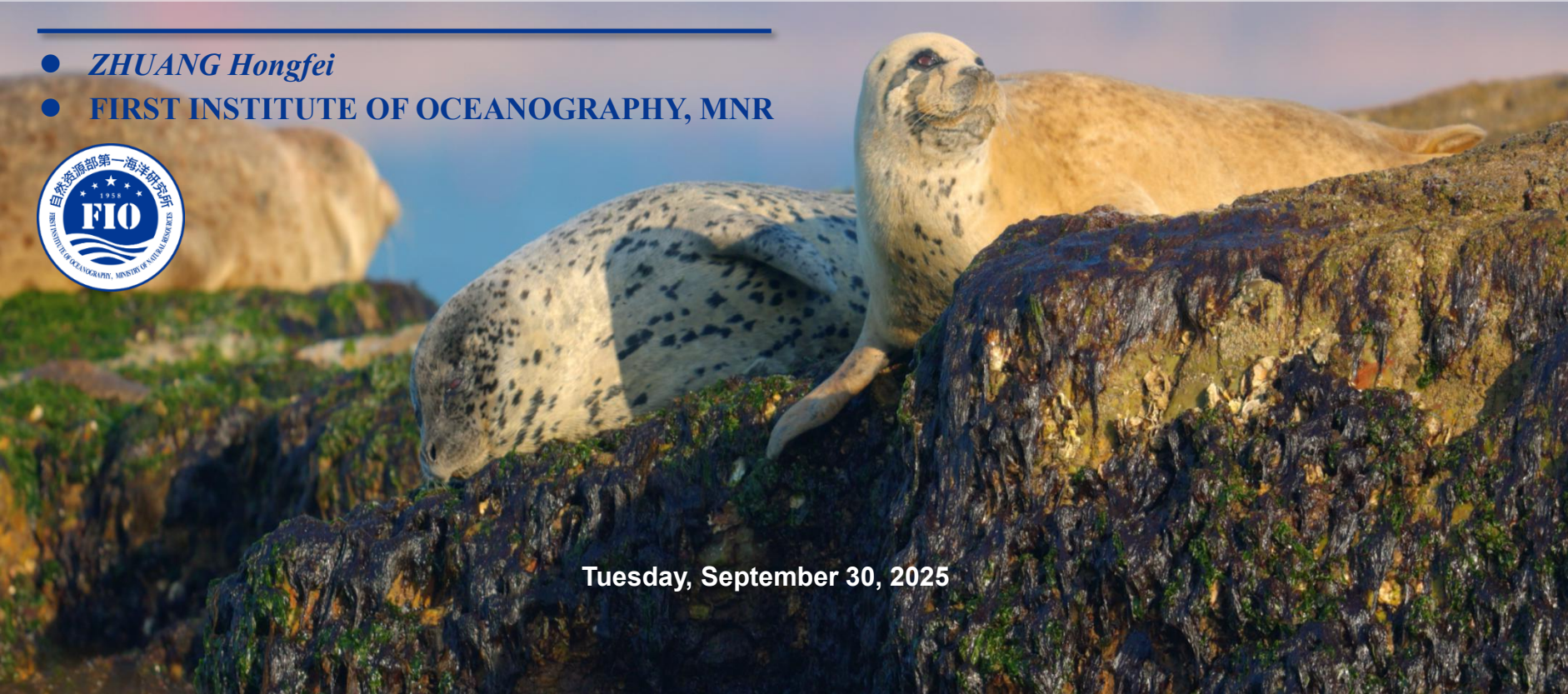
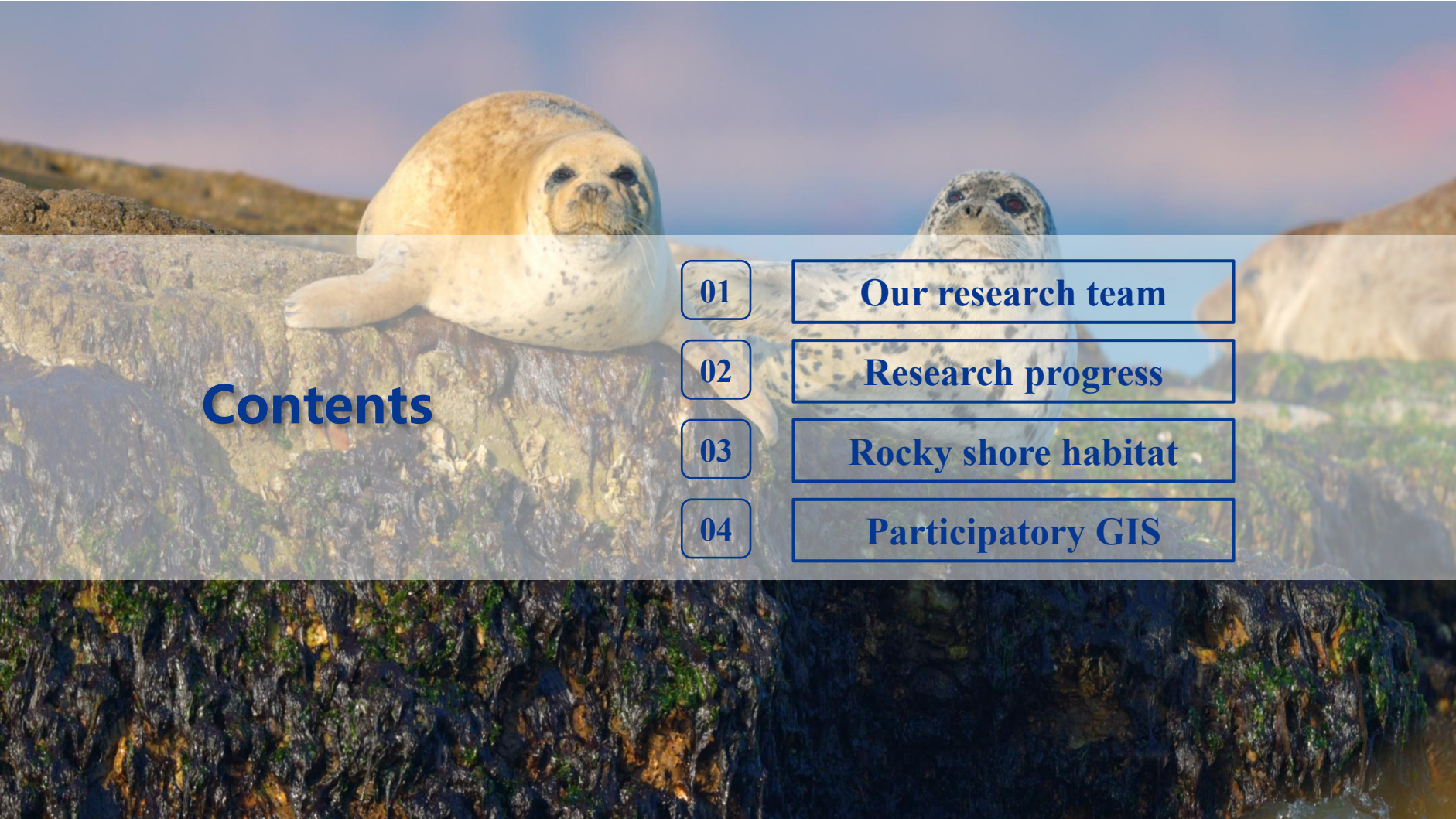
- FIRST INSTITUTE OF OCEANOGRAPHY, MNR



Tuesday, September 30, 2025



Contents

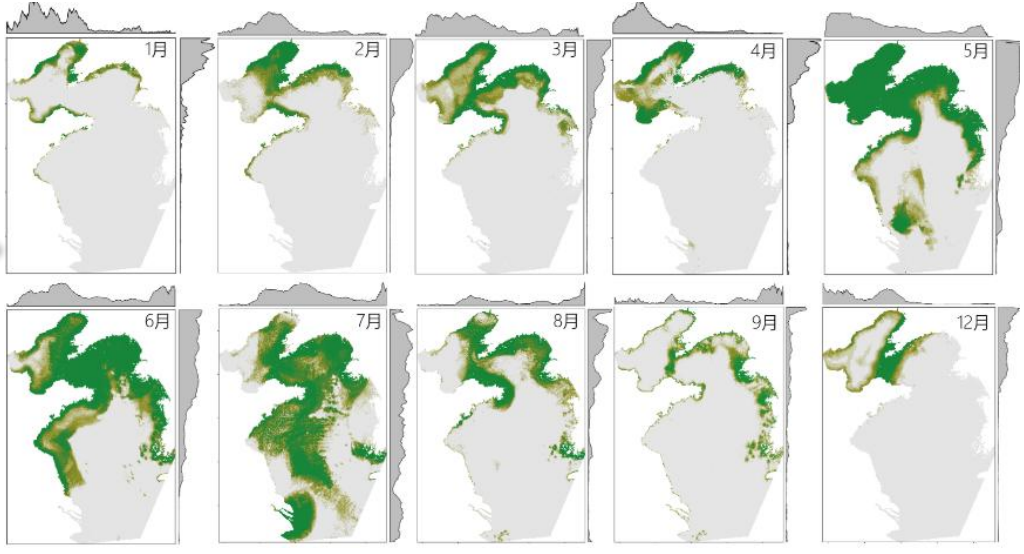
Our research team

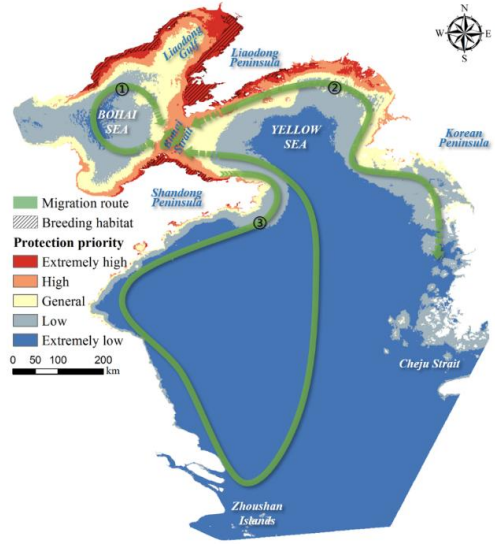
First Institute of Oceanography, MNR

- **FIO**, affiliated with the Ministry of Natural Resources of China, provides services for promoting scientific and technological progress in oceanography and enhancing the capacity for ocean governance.
- Our research team mainly focuses on marine biodiversity conservation and designation of marine protected areas. The spotted seal is my main research subject.

Research progress

Distribution Pattern and Conservation Gap

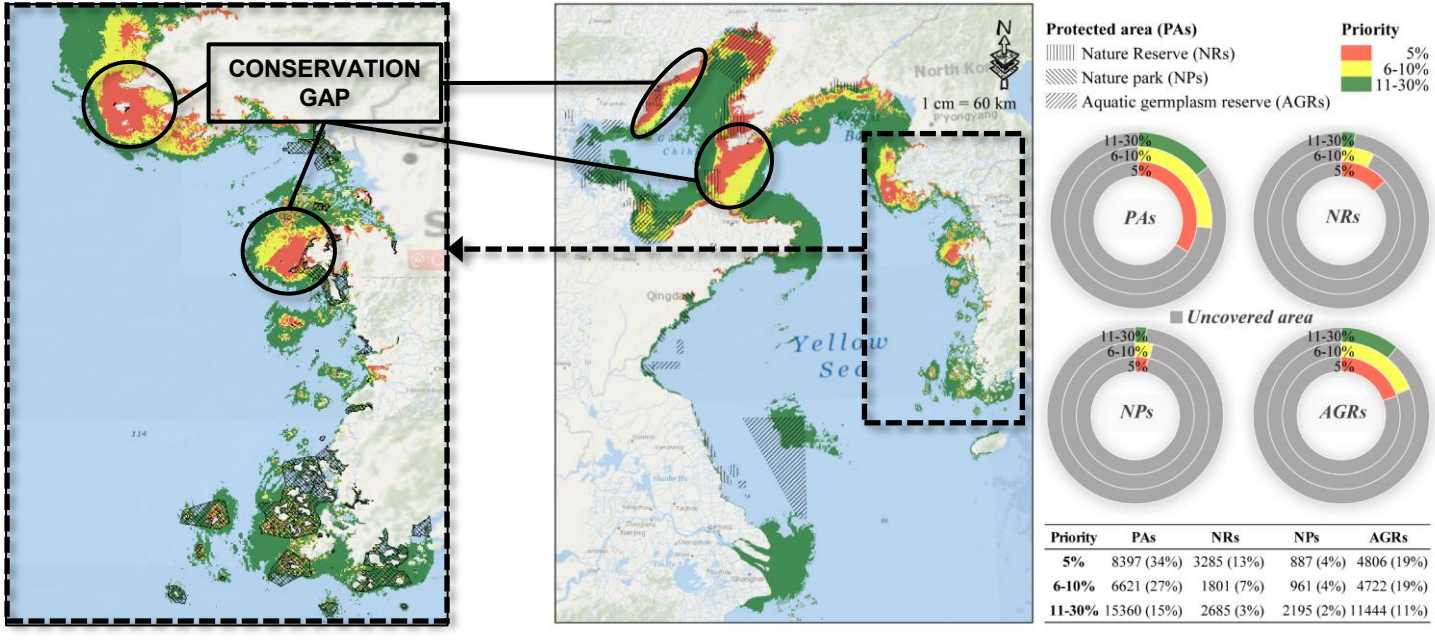




- Using the SDM and Zonation models to identify the habitat each month and the priority conservation areas for spotted seals in the Yellow Sea ecoregion.
- From December to May of the following year, they mainly inhabited the Bohai Sea, and from June to September, they mainly inhabited the Yellow Sea (including the west coast of the Korean Peninsula). And their migration routes are generally close to coastal areas.

Research progress

Distribution Pattern and Conservation Gap



Priority	PAs	NRs	NPs	AGRs
5%	8397 (34%)	3285 (13%)	887 (4%)	4806 (19%)
6-10%	6621 (27%)	1801 (7%)	961 (4%)	4722 (19%)
11-30%	15360 (15%)	2685 (3%)	2195 (2%)	11444 (11%)

- Spatial overlay analysis with existing marine protected areas (MPAs) was conducted to assess conservation coverage.

- More than 70% of the priority conservation areas are the conservation gap.
- They are mainly distributed in the **Liaodong Bay**, the **Bohai Strait** and the **west coast of the Korean Peninsula**.

☐ Rocky shore habitat

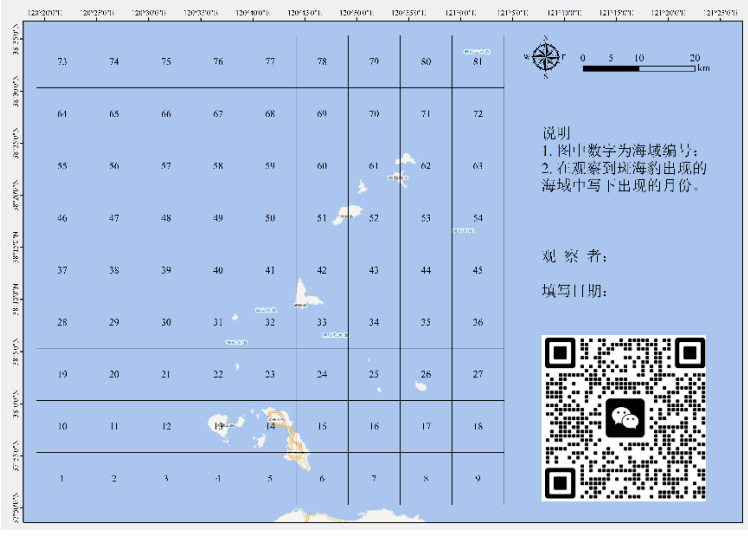
Key habitat for the survival of the spotted seal

Habitats		Suitability	Major importance
9. Marine Neritic	9.1. Marine Neritic - Pelagic	Suitable	Yes
10. Marine Oceanic	10.1. Marine Oceanic - Epipelagic (0-200m)	Suitable	Yes
12. Marine Intertidal	12.1. Marine Intertidal - **Rocky Shoreline**	Suitable	Yes
13. Marine Coastal/Supratidal	13.1. Marine Coastal/Supratidal - Sea Cliffs and **Rocky Offshore Islands**	Suitable	Yes

- As a pinniped species, the spotted seal is highly dependent on rocky shore habitats.
- However, they are the most vulnerable to human activities (accessible & abundant).
- We have found that MPAs often fail to take into account this type of habitats during their design.

Participatory GIS

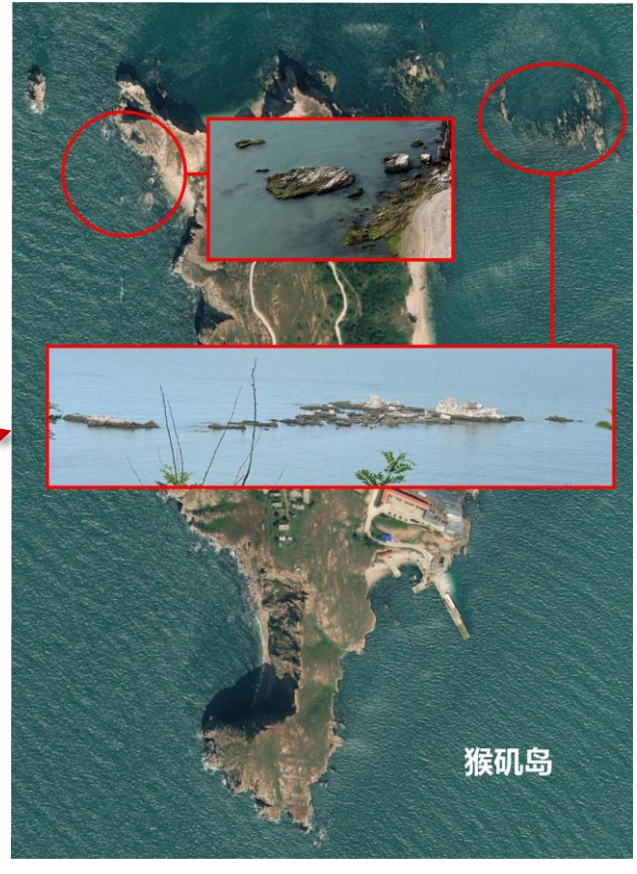
Identification of rocky shore habitats



- We designed a participatory GIS map that allows Changdao Island (Yantai City, Shandong Province, China) residents to mark where they observed spotted seals resting on rocks.
- All respondents are local residents and have been engaged in offshore fishing or aquaculture for a long time.

Participatory GIS

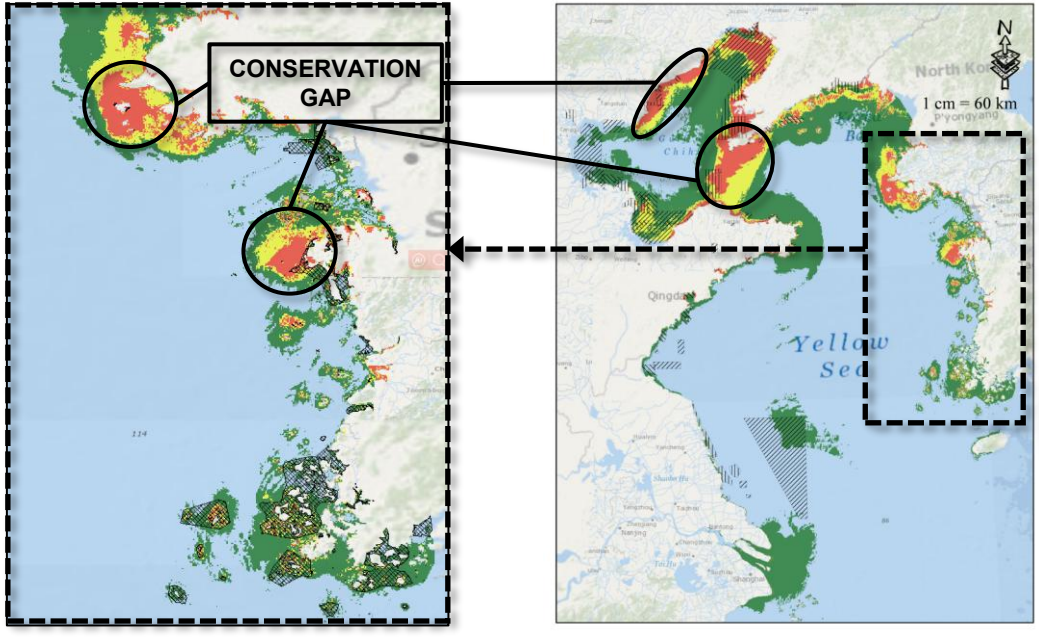
Identification of rocky shore habitats



- Research shows that in addition to known rocky shore habitats where spotted seals rest on Changdao Island, **13 new preferred rocky shore habitats** have been identified, located across 4 inhabited and 5 uninhabited islands.
- The on-site investigation showed that they were indeed suitable for the resting of the spotted seals.

Participatory GIS

Suggestion



- Participatory Geographic Information System surveys could be conducted first in the conservation gap areas, especially in the rocky shore areas where human activities are frequent, in order to give priority to protecting these habitats.

Paper links

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Look forward to cooperation!

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