

# Resurveying Mediterranean coastal dunes: insights from the ReSarDu database

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## INTRODUCTION

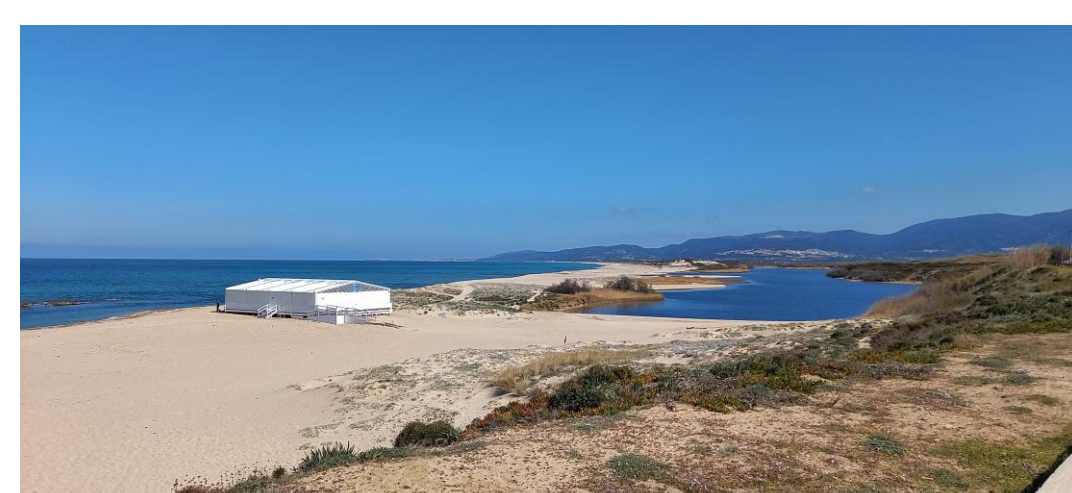
- ✓ The development of accessible databases is crucial to support ecological research and guide effective conservation strategies, addressing global biodiversity loss<sup>1,2</sup>.
- ✓ Vegetation resurvey is considered a valid approach for assessing how species compositions, abundances, and distributions have evolved in response to anthropogenic pressures, climate change, and habitat alterations over recent decades<sup>2</sup>.
- ✓ In Europe, the ecological importance of coastal dune systems is formally recognized under the Habitats Directive<sup>3</sup>, which designates several dune habitats of Community interest.
- ✓ Sardinia, a Mediterranean meso-hotspot of plant diversity, is internationally renowned for its coasts and beaches, many of which are in protected areas and despite their conservation and economic importance, most of dune systems have not been recently monitored to assess long-term changes in vegetation.

## Resurvey Sardinian Dunes (ReSarDu)

- ✓ A novel database, compiled from resurveys of coastal dune systems, including data from historical surveys dating back to the 1970s and from resurveys carried out at the same sites in 2023-2025.
- ✓ Essential for tracking long-term temporal trends in plant biodiversity and supporting successful conservation and restoration measures.

The standardized structure of **ReSarDu** ensures compatibility and interoperability with national and international vegetation databases, such as **ReSurveyDunes**<sup>6</sup> and **ReSurveyEurope**, thereby promoting data sharing and facilitating large-scale ecological analyses across Mediterranean coastal systems.

**418** resurveyed phytosociological relevés, mainly distributed along the northeastern and southwestern Sardinian coasts



Resurveying was conducted between 2023 and 2025

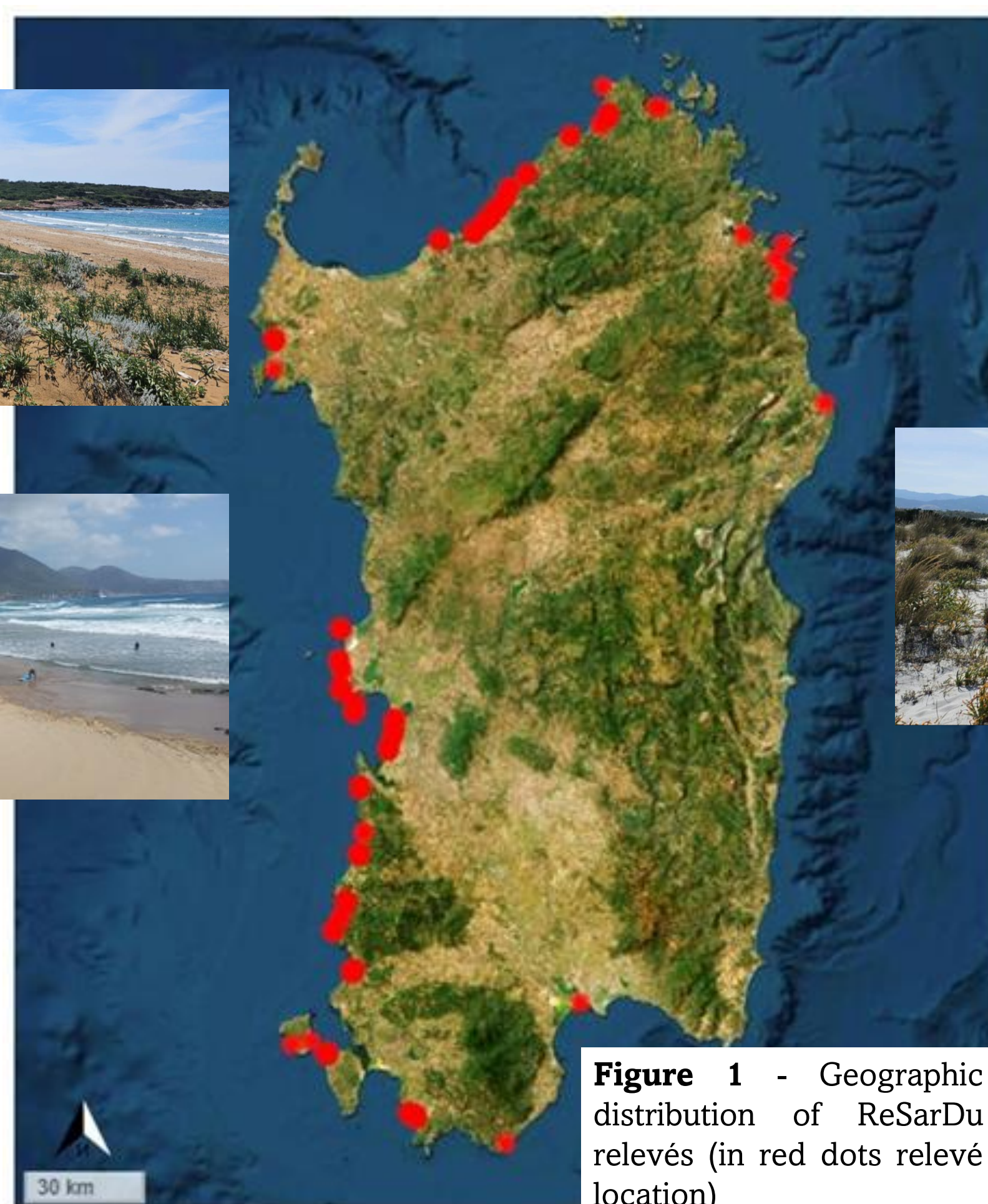


Figure 1 - Geographic distribution of ReSarDu relevés (in red dots relevé location)

The relevés selected for resurveying, originally conducted between 1975 and 2005 (Fig. 2), were extracted from VegDunes database<sup>4</sup>



A total of **188 historical relevés** were resurveyed:  
**73** plots exhibited low relocation uncertainty (quasi-permanent plots)  
**115** plots, lacking plot-specific location information (non-traceable plots)<sup>5</sup>

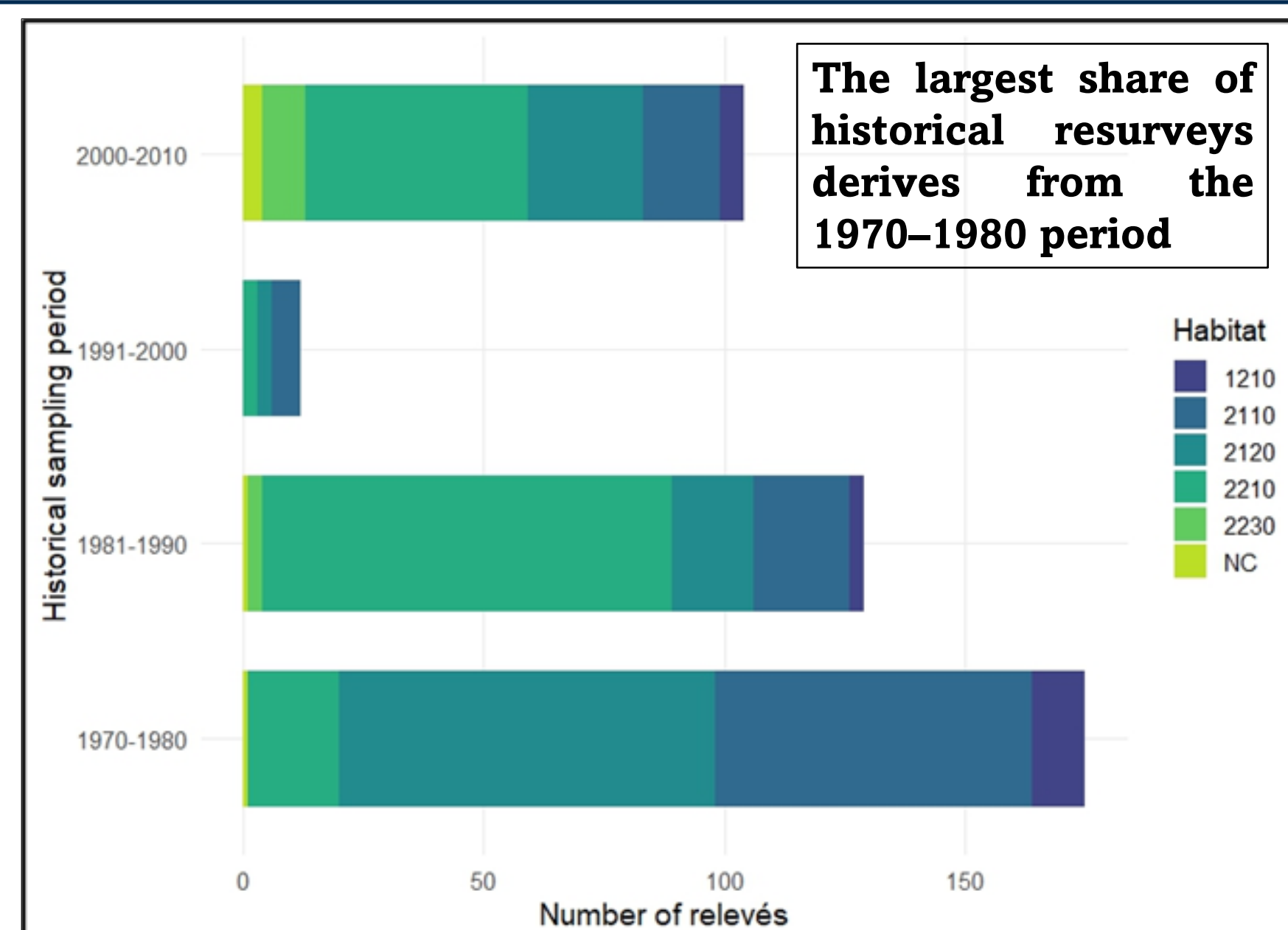


Figure 2 - Number of resurveyed relevés in Sardinia (Italy) grouped by historical sampling periods and habitat types as defined in the Annex I of Habitat Directive (92/43/EEC)

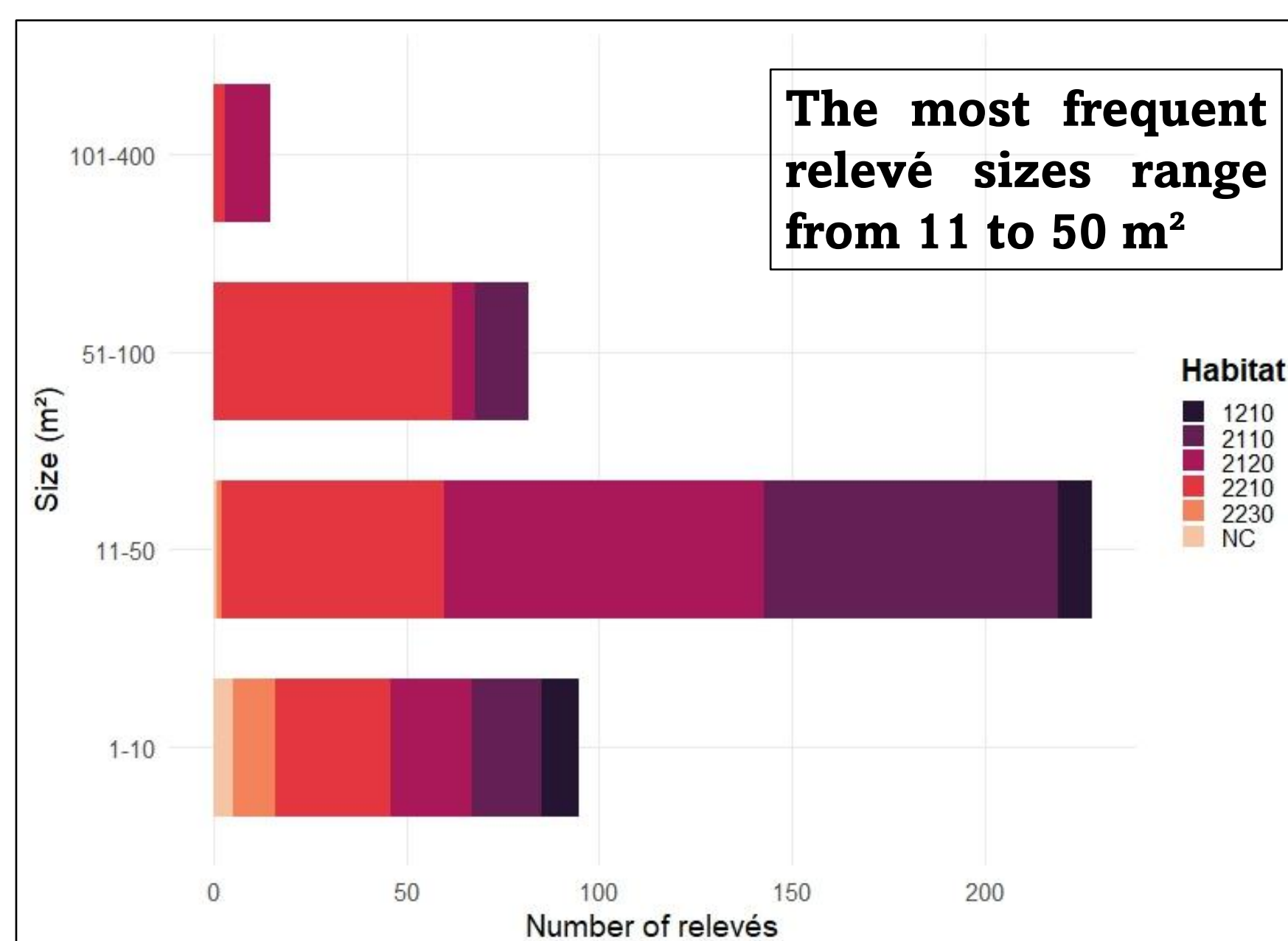


Figure 3 - Number of resurveyed relevés in Sardinia (Italy) grouped by size (m<sup>2</sup>) and habitat types as defined in the Annex I of Habitat Directive (92/43/EEC)

The **species abundance** was visually estimated using the **Braun-Blanquet cover scale**<sup>7</sup>

**Taxonomic nomenclature** was standardized according to the **Euro+Med PlantBase**

Each relevé was assigned to a specific habitat type according to the EU Habitats Directive (92/43/EEC):

- 1210** - annual vegetation of drift lines
- 2110** - embryonic shifting dunes
- 2120** - shifting dunes along the shoreline with *Ammophila arenaria*
- 2210** - *Crucianellion maritima* fixed beach dunes
- 2230** - *Malcolmietalia* dune grasslands
- NC** - Not Classifiable as habitat

The most represented habitat is **2120 (122 relevés)**, followed by **2110 (108 relevés)**

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