

# VULNERABILITY AND RESILIENCE OF SARDINIAN COASTAL ECOSYSTEMS TO CLIMATE CHANGE: A RISK-BASED APPROACH

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## INTRODUCTION

Climate change is increasing adverse impacts, prompting international and European policies to call for **vulnerability and risk assessments** to support adaptation planning.

According to the Intergovernmental Panel on Climate Change (IPCC) risk results from the interaction of **vulnerability, exposure, and hazard**; where vulnerability itself includes two components: sensitivity (ecological susceptibility of ecosystems) and capacity (societal ability to anticipate, respond, and adapt) (IPCC, 2022).

## METHODS

### Study areas

The study area includes the coastal zones of Sardinia (Italy), encompassing 13 distinct biotopes (Angelini et al., 2009).



## AIMS

To evaluate the vulnerability of coastal biotopes to the risk of terrestrial biodiversity loss:

1

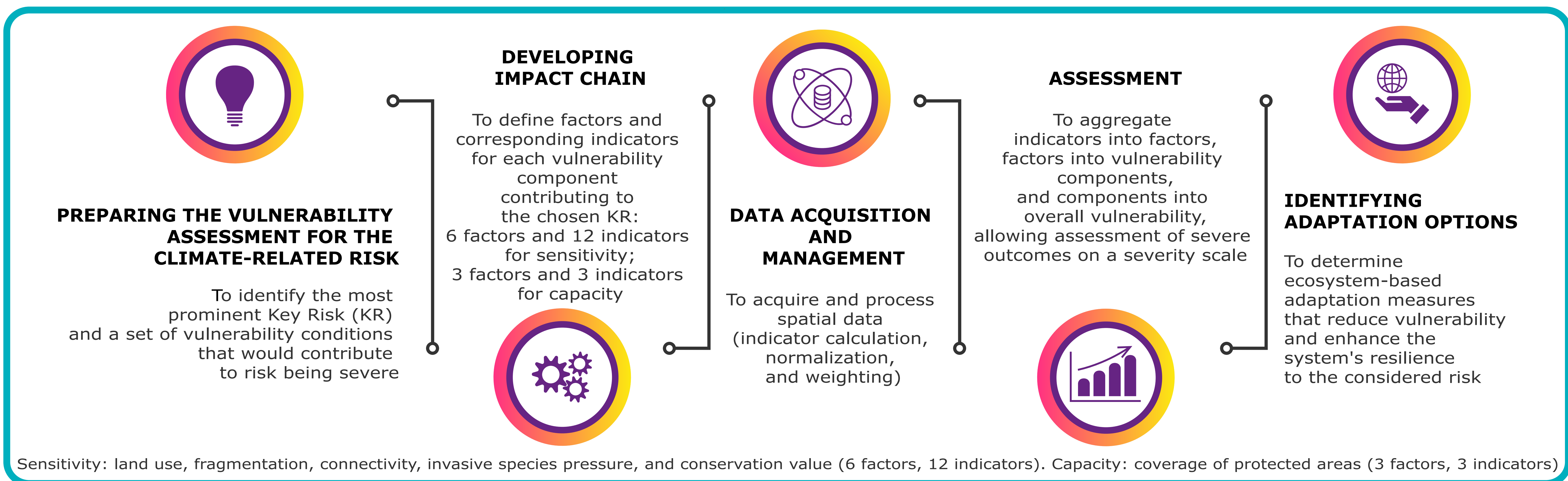
● by identifying key drivers of vulnerability

2

● by assessing interactions between sensitivity and capacity

To identify ecosystem-based adaptation options and support the design and implementation of strategies tailored to regional needs.

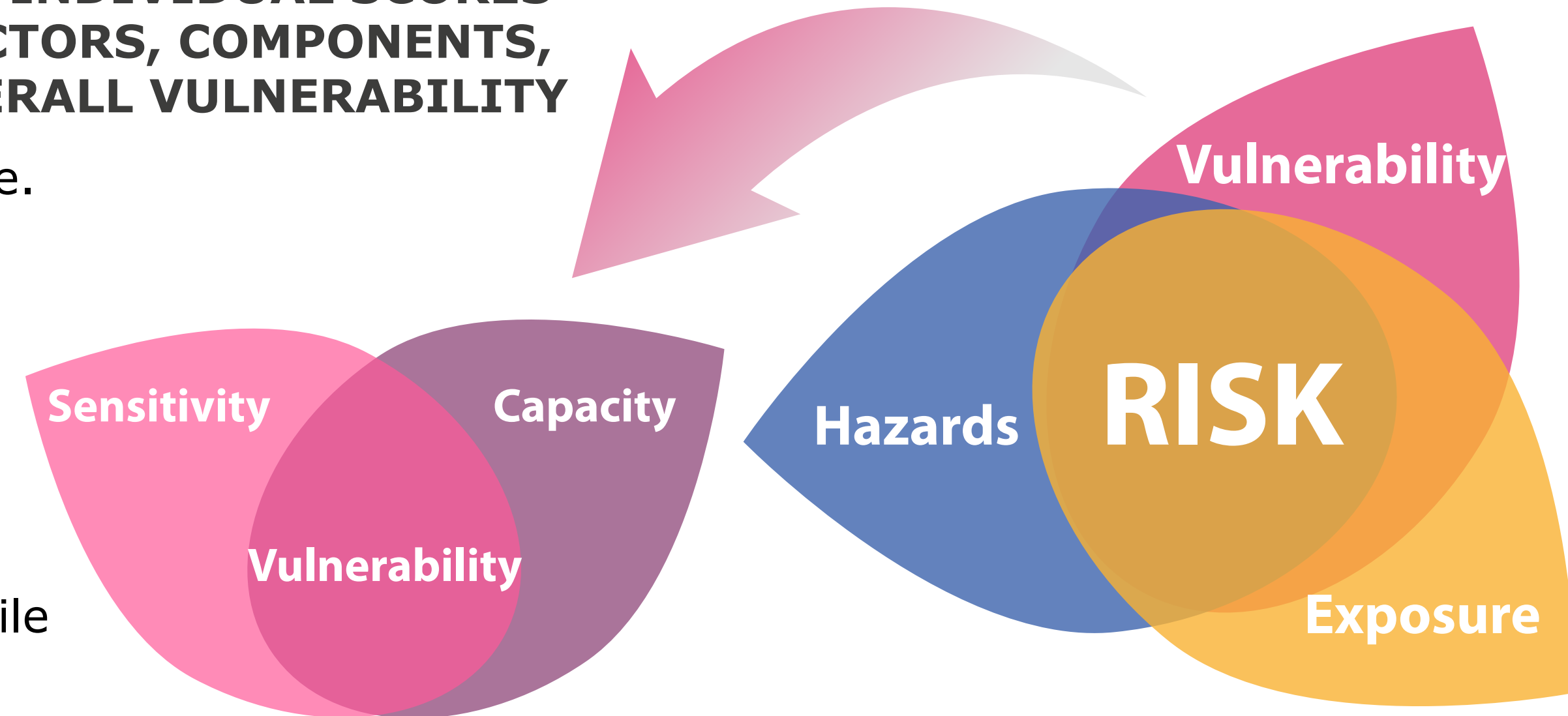
## IPCC risk assessment framework using the impact chain method



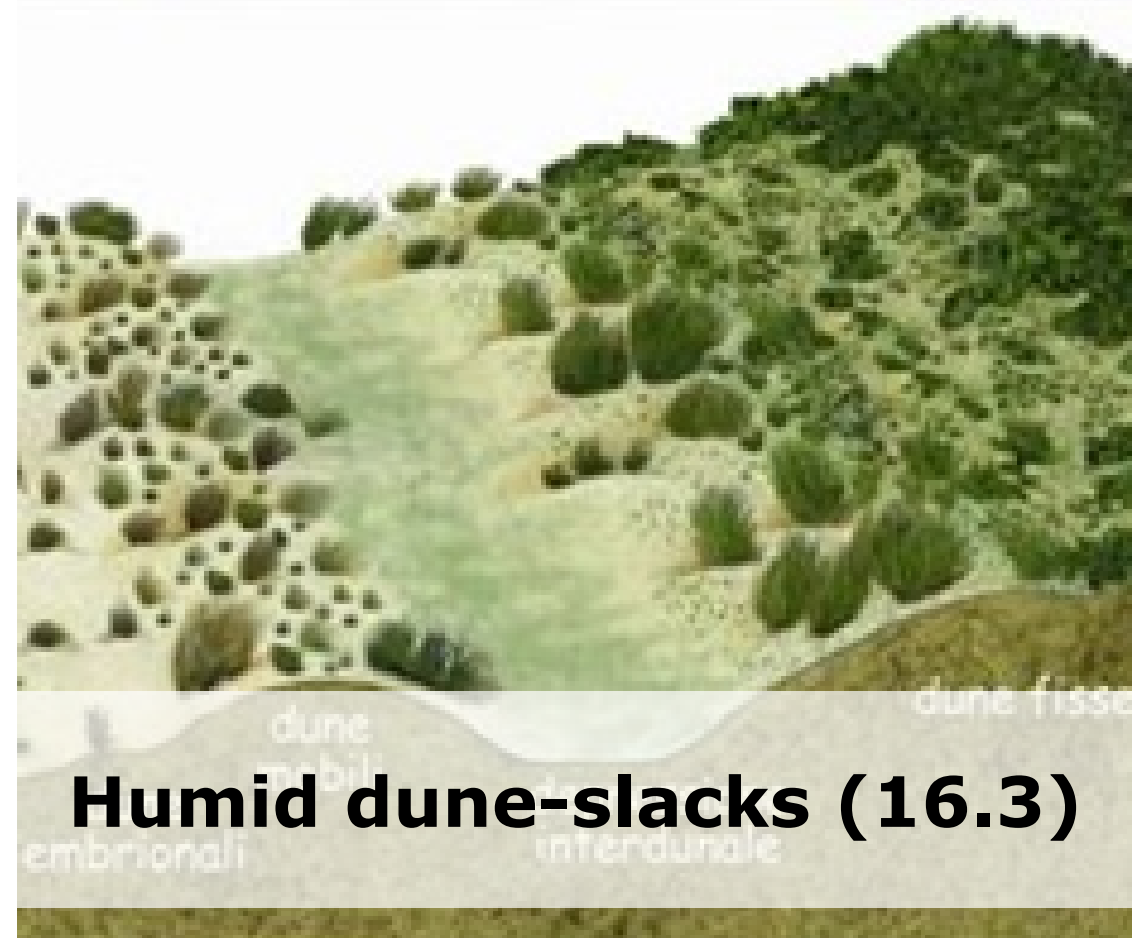
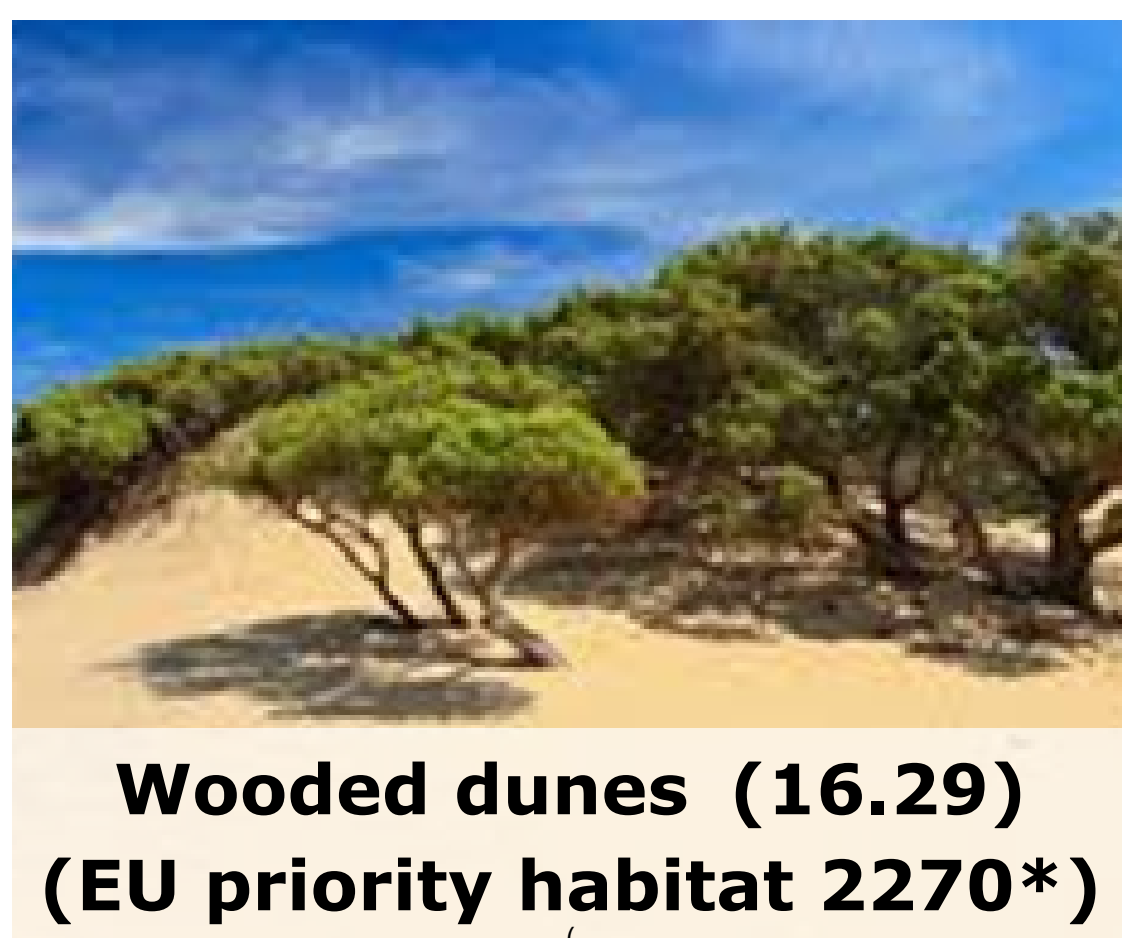
## RESULTS

### ALL 13 BIOTOPES RECEIVED INDIVIDUAL SCORES FOR INDICATORS, FACTORS, COMPONENTS, AND OVERALL VULNERABILITY

- Most biotopes showed neutral sensitivity; saltmarsh scrubs and cliff communities were less susceptible.
- About 80% of biotopes displayed neutral to optimal capacity, mainly due to legal protections.
- Some biotopes (e.g. salt meadows, sand and shingle beaches, dune juniper woods) had negative capacity values.
- Overall, ecosystems showed neutral vulnerability, but dune juniper woods were more susceptible, while dune sclerophyllous scrubs were more resilient.



### BIOTOPES WITH CRITICAL CAPACITY



### BIOTOPES WITH CRITICAL SENSITIVITY OR VULNERABILITY



21 ecosystem-based adaptation measures were proposed, each targeting specific sensitivity or capacity factors to reduce vulnerability



## CONCLUSION

1

Not all biotopes show the same degree of capacity, sensitivity and vulnerability.

2

Site-specific assessments are needed to evaluate the vulnerability degree of individual biotopes.

3

Targeted ecosystem-based adaptation measures can reduce vulnerability to specific drivers and factors.

## REFERENCES

Angelini et al., 2009. The Nature Map Project on a scale of 1:50,000. Guidelines for cartography and habitat assessment at the 1:50,000 scale. Handbooks and guidelines. ISPRA, Roma.  
IPCC, 2022. Climate Change 2022: Impacts, Adaptation and Vulnerability. Working Group II Contribution to the IPCC Sixth Assessment Report. Cambridge University Press, Cambridge, UK; New York.