



AESOP 2025 CONGRESS

Istanbul, 7-11 July



TRACK 05 - ENVIRONMENT AND CLIMATE | Nature-based Solutions and Ecosystem-based Resilience

From Vulnerability to Resilience: Coastal Heritage as Environmental Infrastructure

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Research Framework



COSTA I Med

Catching Opportunities for Strategic Transformation
and Adaptation of Mediterranean coasts

Ministero dell'Università e della Ricerca – MUR
PROGETTO DI RICERCA DI RILEVANTE INTERESSE NAZIONALE - Bando PRIN 2022

UdR – Dipartimento di Architettura, Università degli Studi Roma Tre

PI: Prof.ssa Maria Grazia Cianci

UdR – Dipartimento di Architettura, Università degli Studi "G. d'Annunzio" Pescara

Prof. Matteo di Venosa



RESEARCH OBJECTIVE

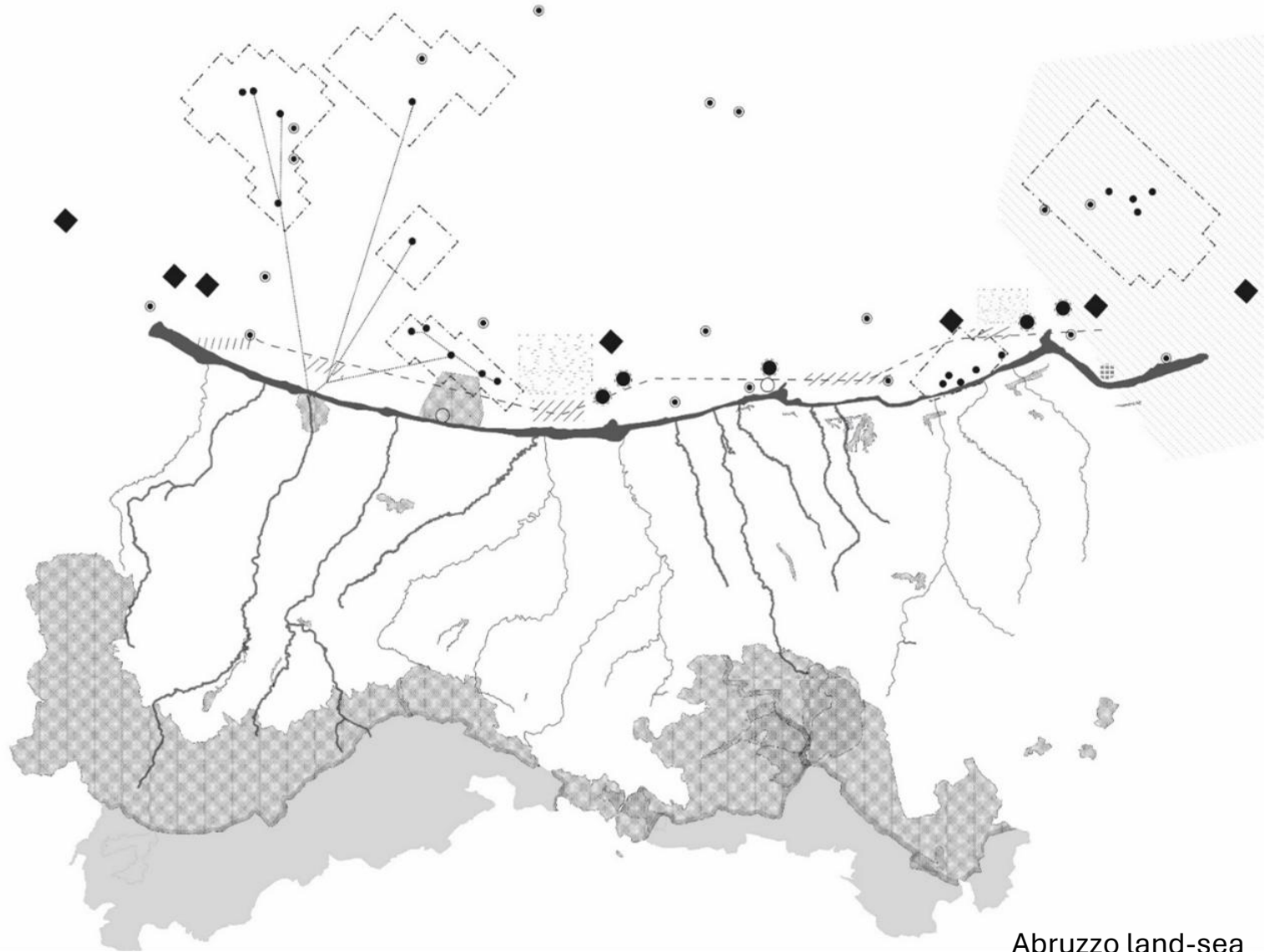
To explore and test innovative and resilient approaches for the recognition, adaptation, and enhancement of coastal heritage (both cultural and natural) under the new conditions of vulnerability—environmental, social, and economic—brought about by climate change and ongoing emergencies.

*This PRIN research is conducted by the Research Unit of “RomaTre” University (*national coordinator Prof. Maria Grazia Cianci*) and the Research Unit of “G. d’Annunzio” University of Chieti-Pescara (*coordinator Prof. Matteo di Venosa*). The authors are involved in Pescara Research Unit (UdR Pescara), which include: prof. Matteo di Venosa (coord.), Mattia De Luca, Andrea Di Cinzio, Lia Fedele, Michele Manigrasso, Lorenzo Morelli, Angelica Nanni.

Research Framework

The research activity in Pescara focuses on experimenting with innovative ways of recognising and enhancing **coastal cultural heritage** as a **strategic tool** for observing coastal transformations and designing degrees of **resilience**.

The contribution specifically focuses on the analysis of selected **Adriatic** coastal stretches as case studies.



Abruzzo land-sea

Conceptual foundations _ from vulnerability

Defining vulnerability to climate change

IPCC, AR4 (2007) –

VULNERABILITY

$$V = f(E, S, AC)$$

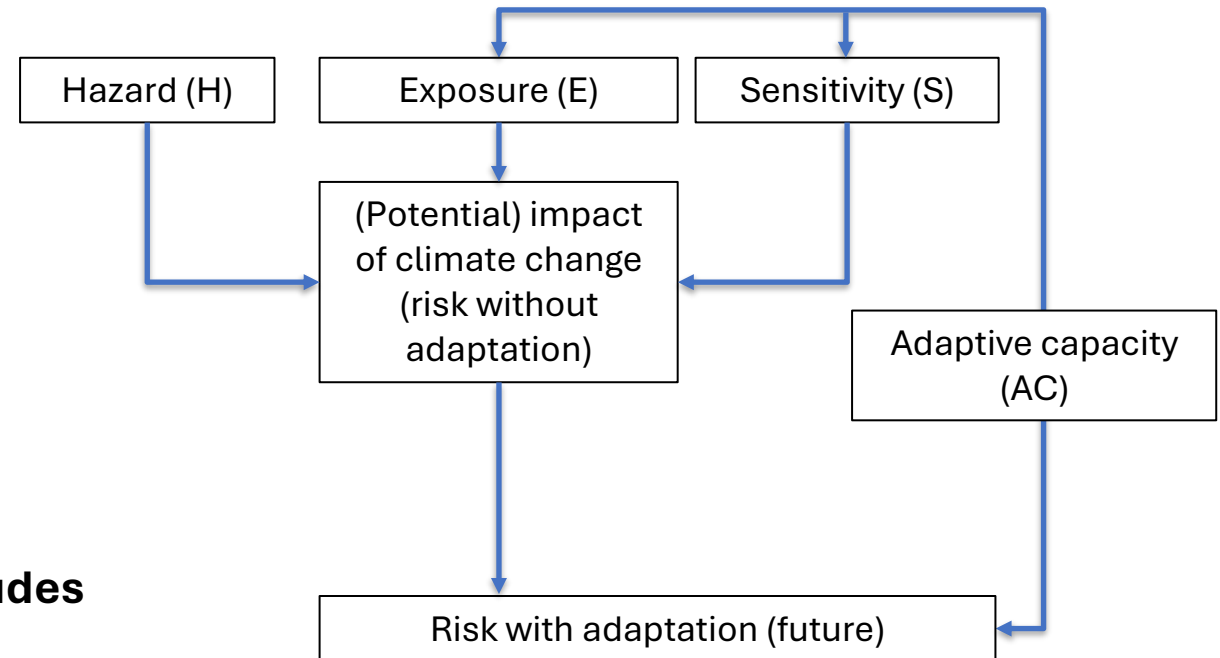
Vulnerability is a function of the character, magnitude and speed of climate change and variation to which a **system is exposed, its sensitivity and adaptive capacity.**

IPCC, AR5 (2014) – RISK

$$R = f(H, E, V), V = f(S, AC)$$

Risk results from the interaction between vulnerability, exposure and danger.

Vulnerability includes susceptibility or susceptibility to harm and lack of coping and adaptation.



Source: **UNI EN ISO 14091:2021** | Adaptation to climate change – Guidelines on vulnerability, impacts and risk assessment

Conceptual foundations _ from vulnerability

Defining vulnerability to climate change

IPCC, AR5 (2014) – RISK

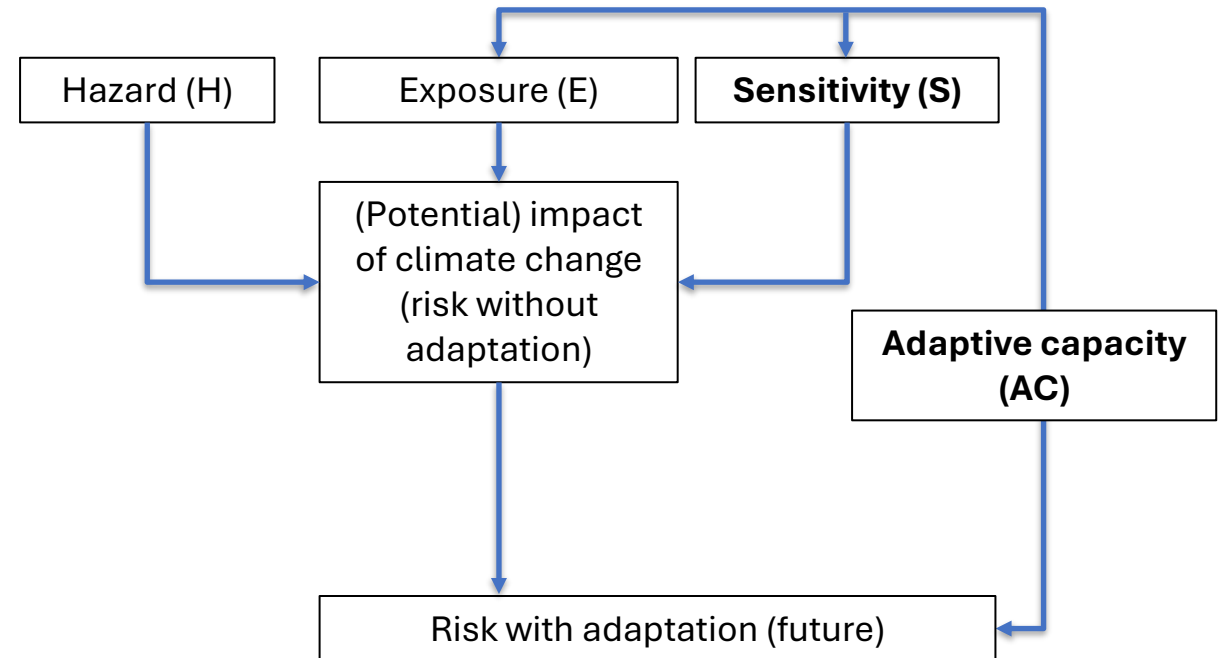
$R = f(H, E, V)$, $V = f(S, AC)$

Sensitivity

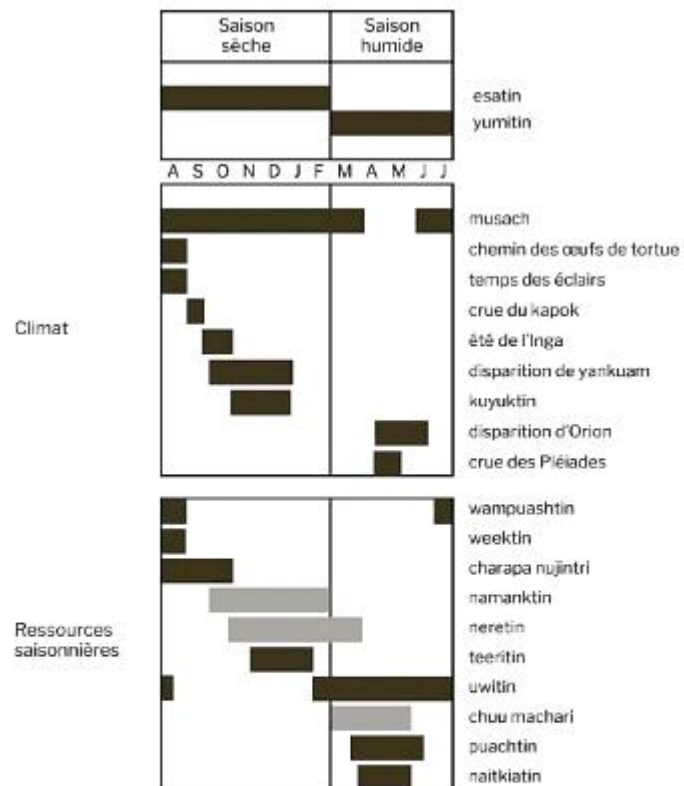
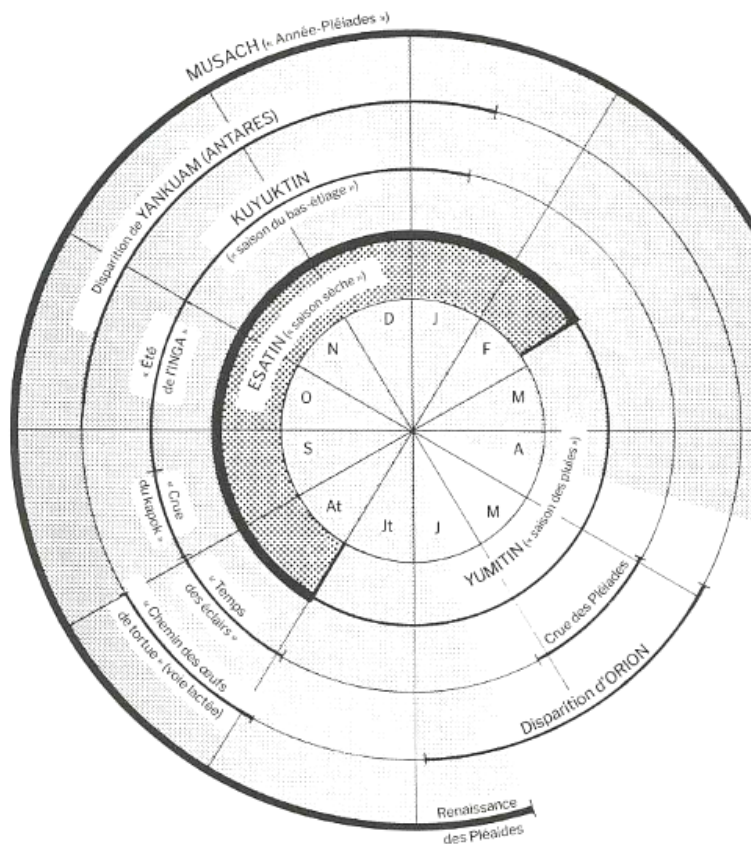
Degree to which a system or species is affected, **either adversely or beneficially**, by climate variability or climate change

Adaptive capacity

Ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of **opportunities**, or to **respond** to consequences

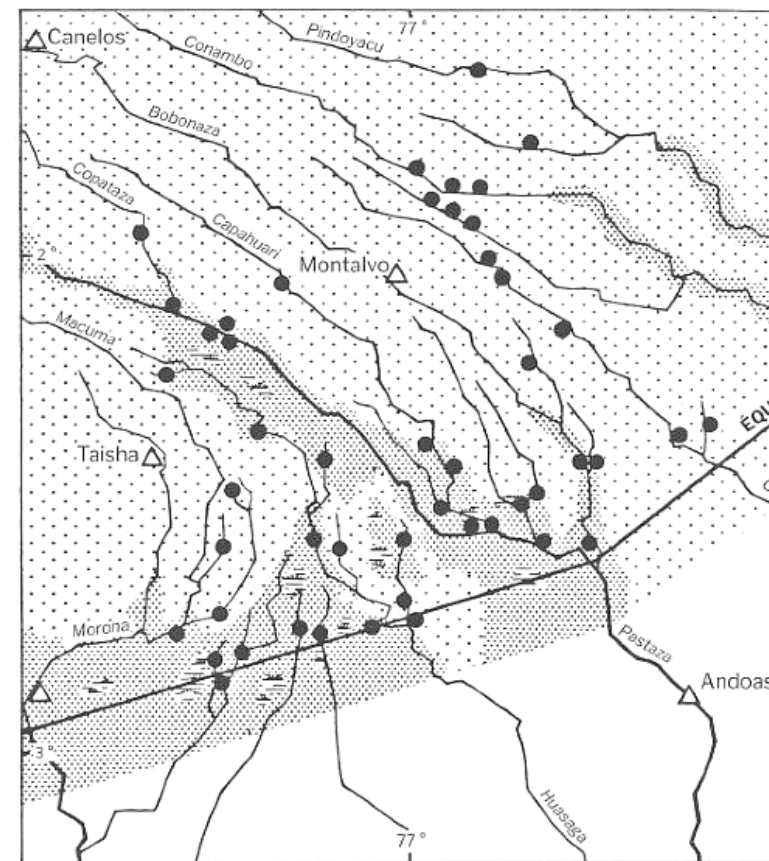


Source: **UNI EN ISO 14091:2021** | Adaptation to climate change – Guidelines on vulnerability, impacts and risk assessment



■ Périodes les plus favorables à la pêche, à la chasse et à la cueillette

- NAMANKTIN : « saison du poisson »
- TEERITIN : « saison des œufs du poisson »
- CHARAPA NUJINTRI : « saison des œufs du poisson »
- CHUU MACHARI : « saison de la graisse de singe laineux »
- WEEKTIN : « saison des fourmis volantes »
- PUACHTIN : « saison des grenouilles »
- NERETIN : « saison des fruits »
- NAITKIATIN : « saison des fruits tardifs »
- WAMPUASHTIN : « saison du kapok »
- UWITIN : « saison de la chonta »



- Habitat interfluvial (altitudes généralement comprises entre 300 m et 500 m)
- Habitat riverain (altitudes généralement inférieures à 300 m)
- Aguajal (cuvette marécageuse où domine le *Mauritia flexuosa*)
- Site de peuplement achuar (période 1977-1978)
- Mission catholique
- Frontière

Achuar – calendari astronomici/climatici e tecniche di agroforestazione

Source: Descola P. (2019), *La nature domestique. Symbolisme et praxis dans l'écologie des Achuar*, Ed. De la Maison des Sciences de l'homme, Parigi.

Descola P. (2021), *Oltre natura e cultura*, Raffaello Cortina, Milano.



to resilience

Coastal landscapes as dynamic
social-ecological systems,
where natural processes and
human activities interconnect.

“Endogenous Ways of Knowing”
(ICOMOS 2019)

Relevance of the issues

Fragility of coastal areas

REGIONI	Entro 300 m		Tra 300 e 1.000 m		Tra 1 e 10 km	
	2020	Var % su 2019	2020	Var % su 2019	2020	Var % su 2019
Veneto	10,8	-0,08	10,4	-0,07	12,7	0,30
Friuli-Venezia Giulia	12,6	0,15	13,6	0,04	12,3	0,11
Liguria	47,0	0,03	29,2	0,09	8,0	0,10
Emilia-Romagna	35,8	0,14	33,5	0,39	12,1	0,52
Toscana	20,7	0,00	15,6	0,02	8,5	0,11
Marche	46,1	0,18	29,9	0,25	12,0	0,18
Lazio	31,0	0,03	21,2	0,09	10,7	0,25
Abruzzo	36,8	0,20	32,0	0,21	11,2	0,72
Molise	20,2	0,34	16,9	0,21	5,4	1,05
Basilicata	34,9	0,05	30,1	0,06	16,3	0,13
Campania	29,5	0,04	21,6	0,21	9,9	0,45
Puglia	6,1	0,00	5,1	0,06	3,8	0,22
Calabria	29,2	0,08	19,8	0,21	5,0	0,11
Sicilia	27,9	0,10	22,6	0,16	9,3	0,27
Sardegna	9,7	0,02	8,3	1,06	4,4	0,45
ITALIA	22,8	0,06	18,9	0,22	8,7	0,29

Fonte: Ispra

Land consumption by distance class from the coast to the region (2020)

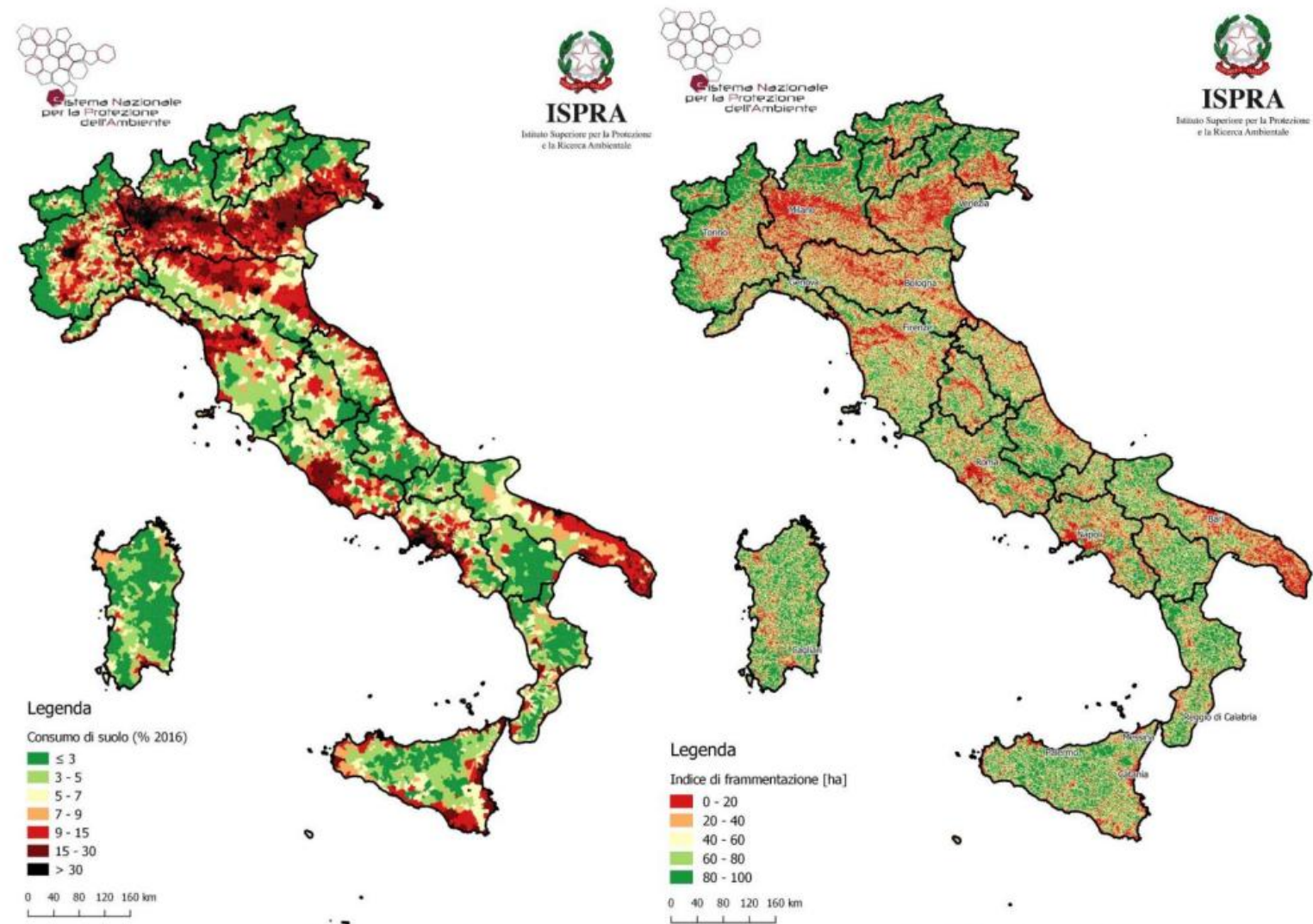


Fig. 16 - Consumo di Suolo (sinistra) e Indice di Frammentazione (destra) in Italia nel 2016

Fonte: ISPRa (2017)

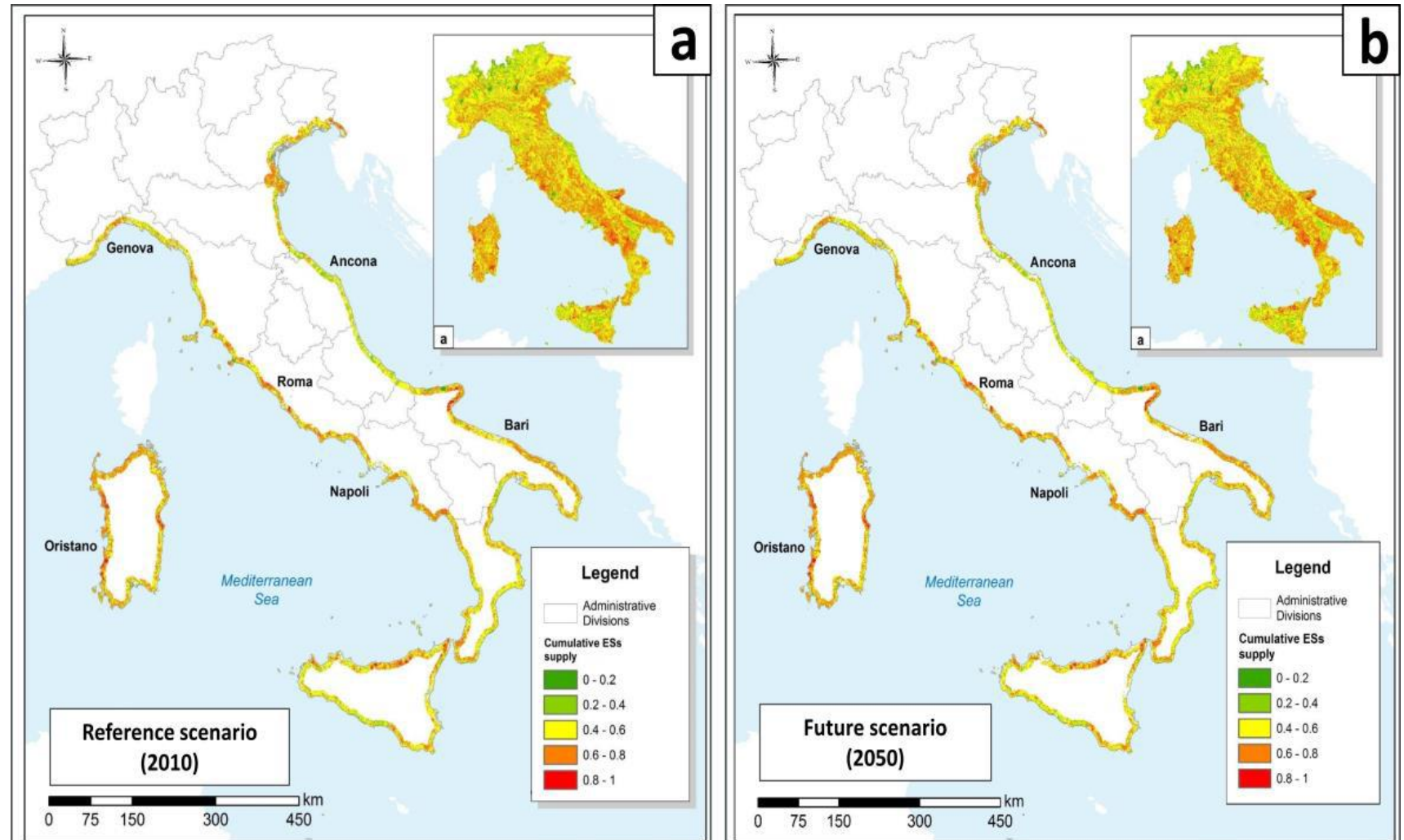
Sources: **ISTAT Report:** Human Activities and Coastal Health. Territorial Risk and Sustainability Indicators for Coastal and Island Areas in Italy and the European Union

Relevance of the issues

Fragility of coastal areas

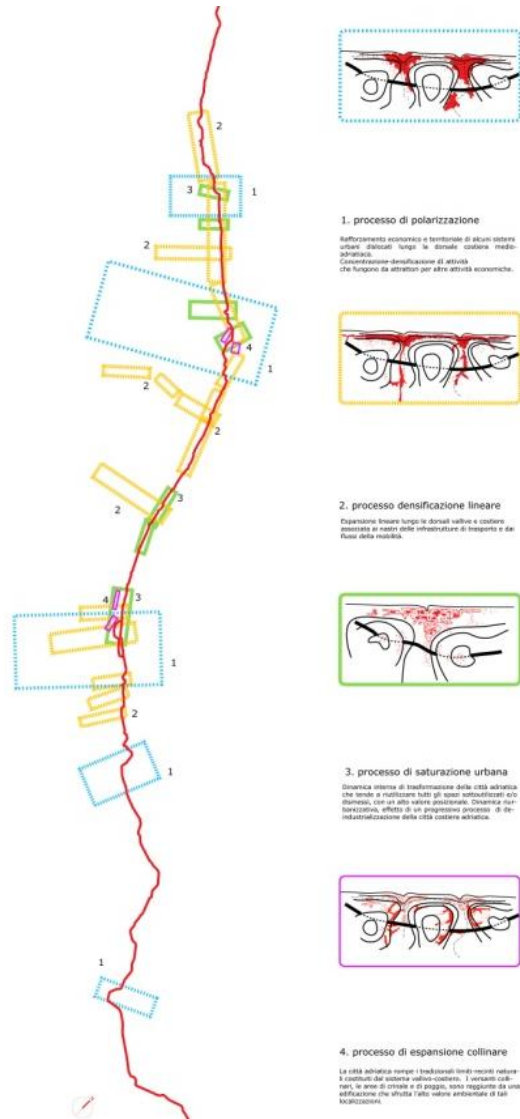
The protagonists of heritage-making processes are not only individual assets, but also **other resources** threatened by climate risks, such as environmental ones.

Some studies highlight the growing relevance of considering the risk exposure of so-called ecosystem services.

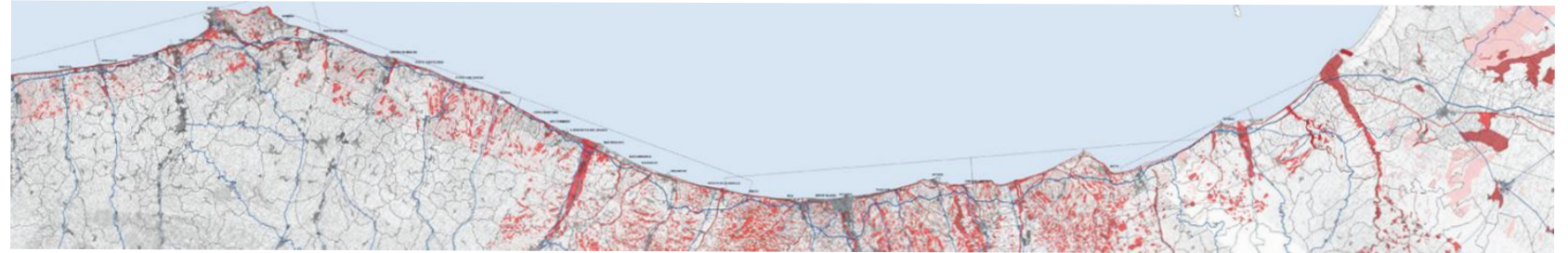


Source: Furlan E., Derepasko D., Torresan S., V. Pam H., Fogarin S., Critto A. (2022) - *Ecosystem services at risk in Italy from coastal inundation under extreme sea level scenarios up to 2050: A spatially resolved approach supporting climate change adaptation.*

Case study - Mid Adriatic Coast



enviromental risks



degradation, abandonment and ecological fractures



environmental constraints



Overlapped risks along the Adriatic Coast and urbanization dynamics

Case study

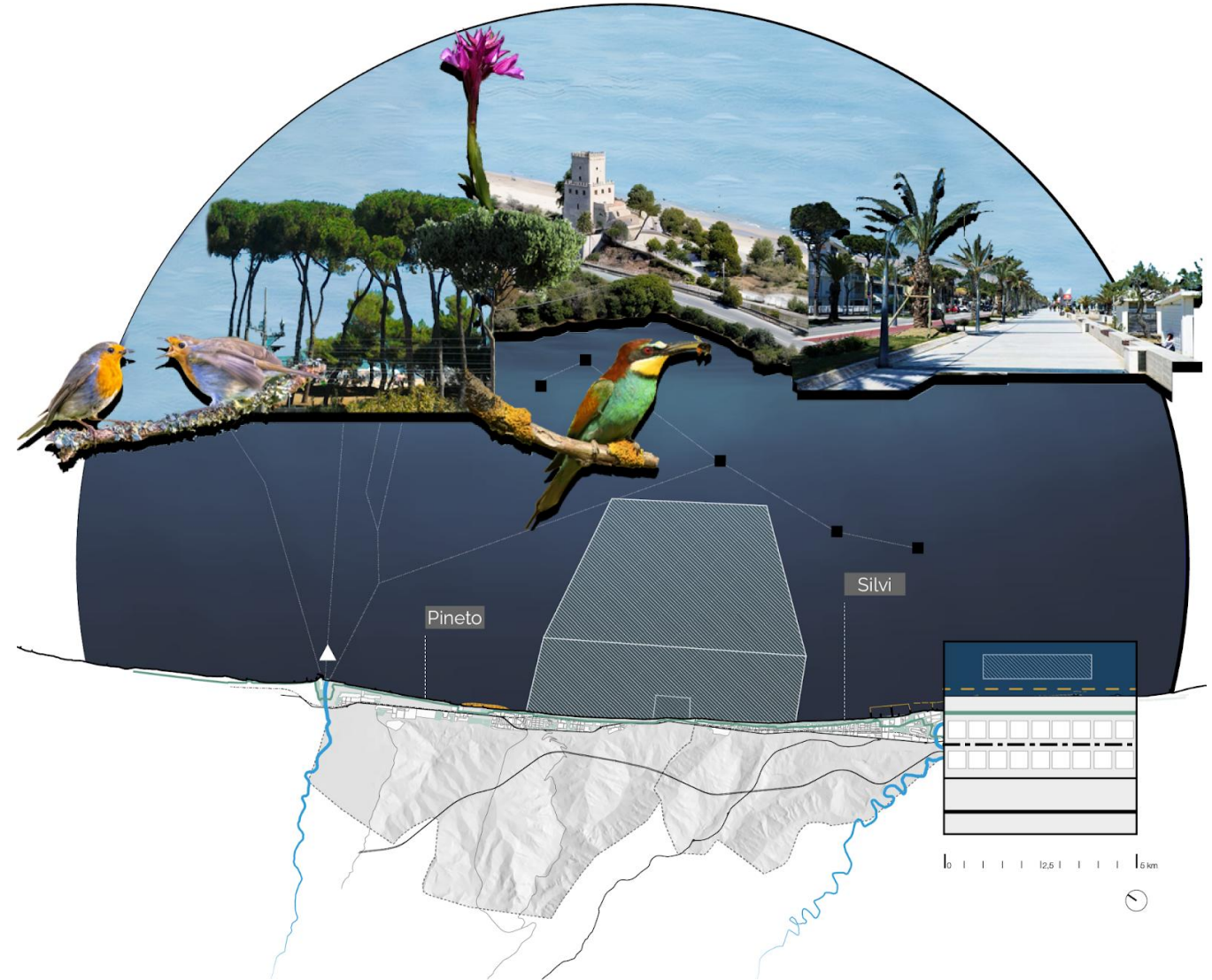
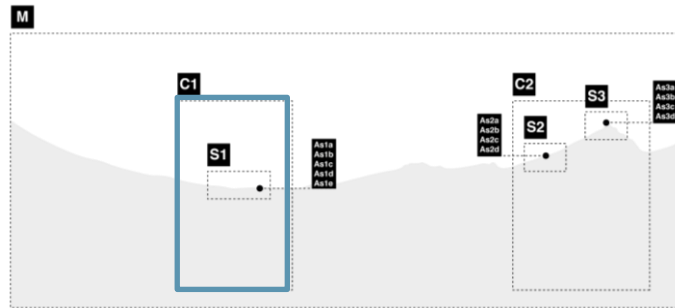
Mid Adriatic Coast



Significant presence of tensions between environmental values and urbanised areas.

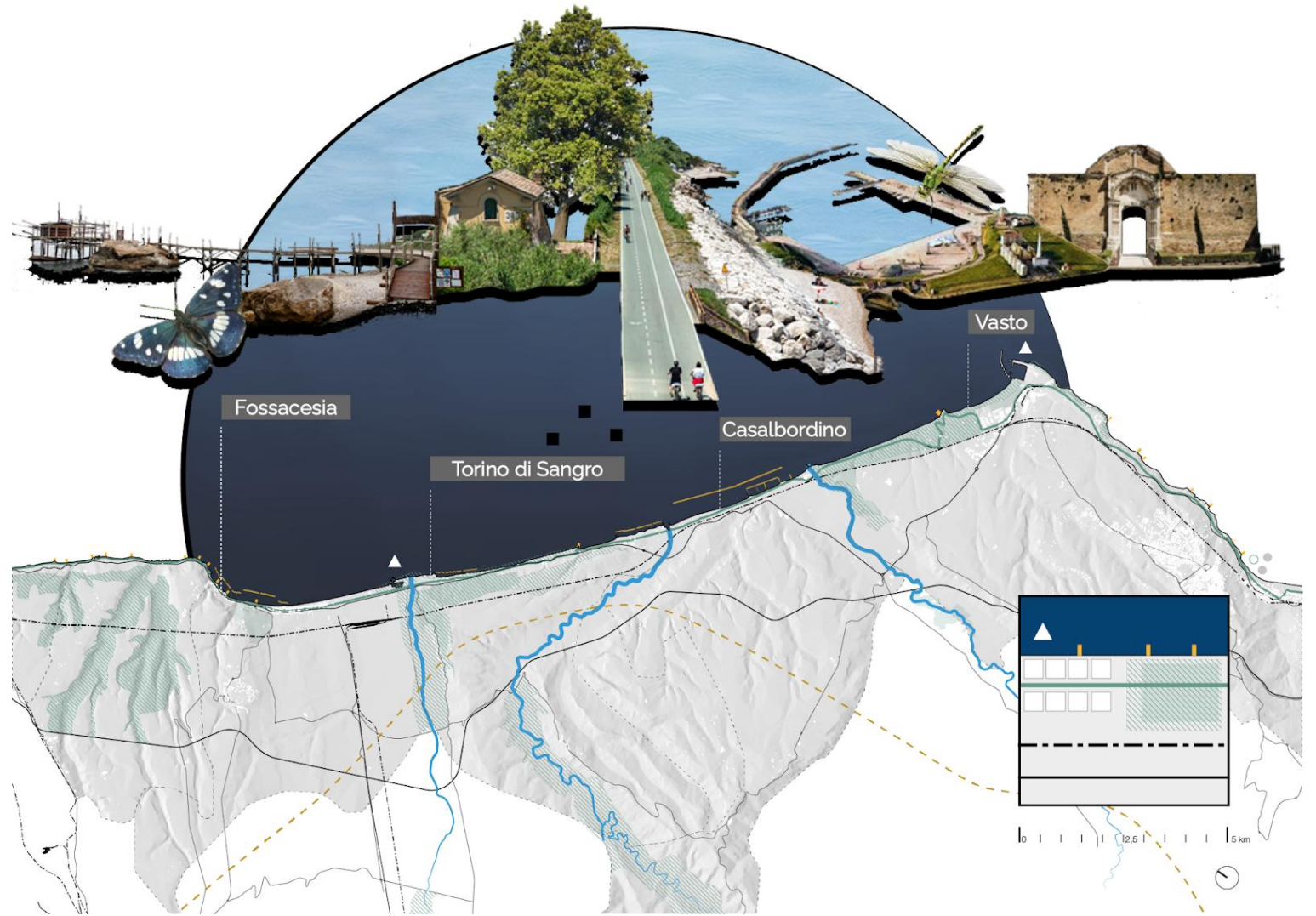
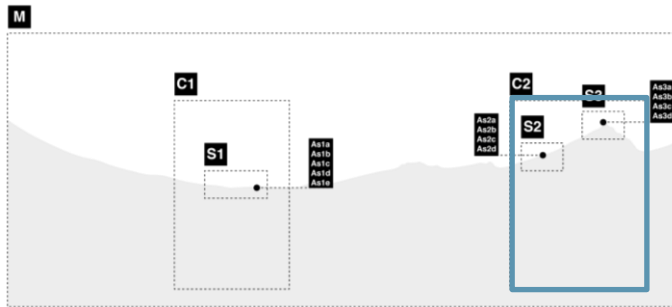
Case study

C1 - Silvi-Pineto system urban continuity and ecological fragility



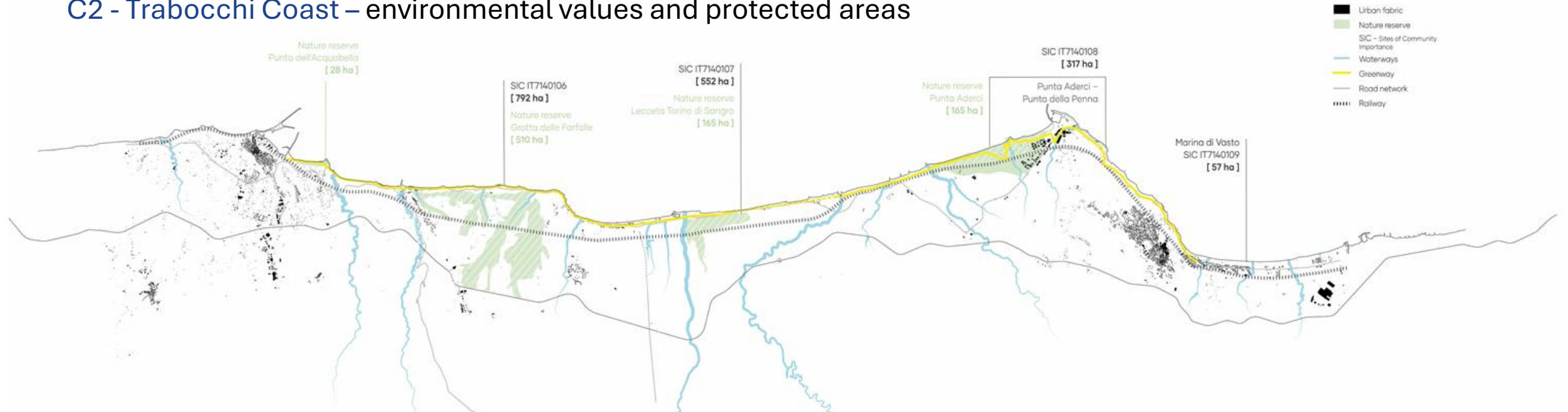
Case study

C2 - Trabocchi Coast:
intermittent landscapes and
vulnerability in transformation



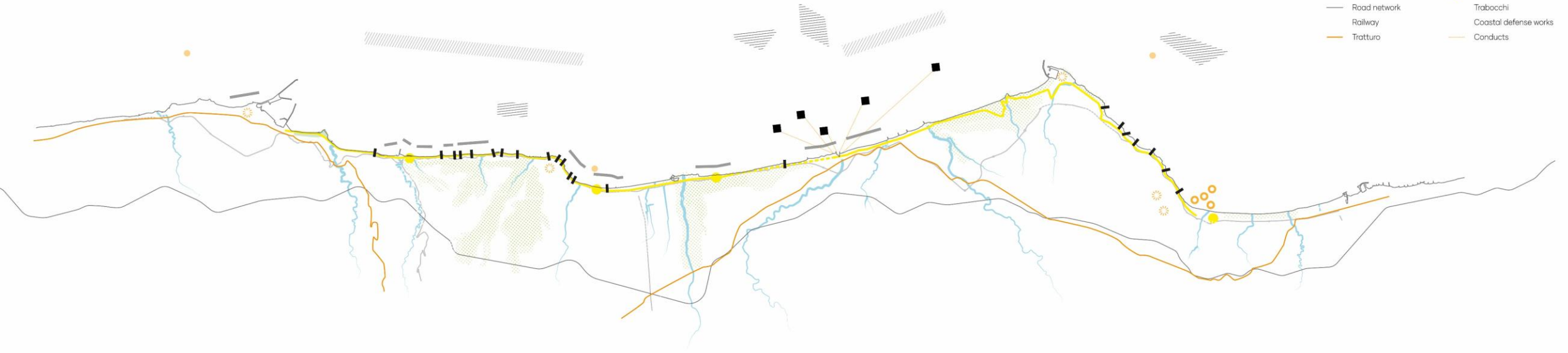
Case study

C2 - Trabocchi Coast – environmental values and protected areas



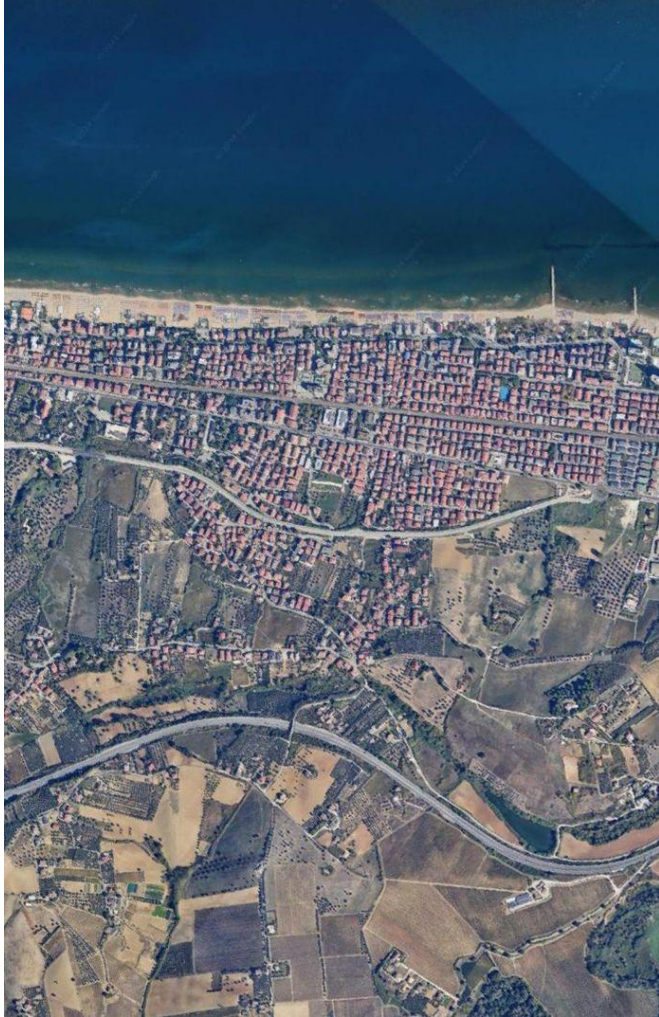
Case study

C2 - Trabocchi Coast – sea uses and heritage sources

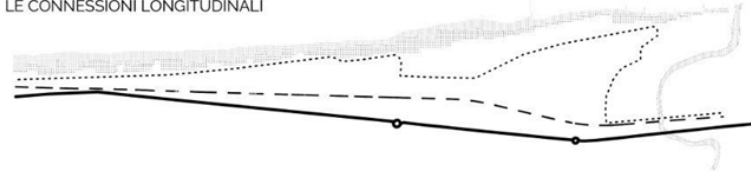


Case study - Experimental design approaches

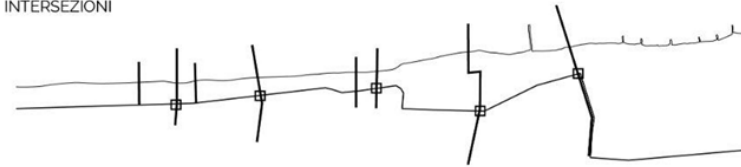
C1 - Silvi



LE CONNESSIONI LONGITUDINALI



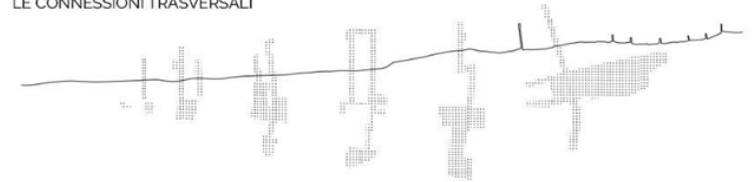
INTERSEZIONI



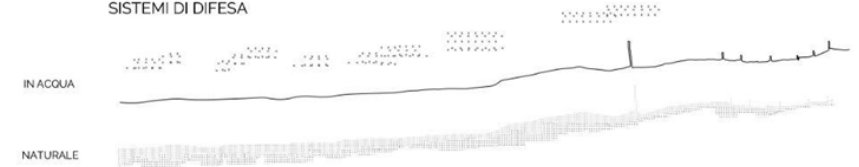
SISTEMA DELLO SPAZIO PUBBLICO



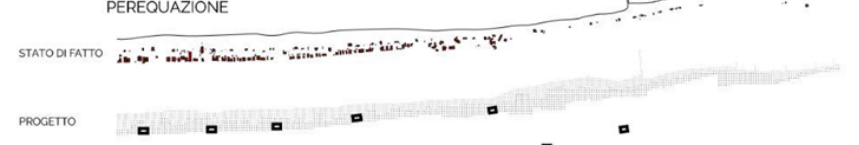
LE CONNESSIONI TRASVERSALI



SISTEMI DI DIFESA

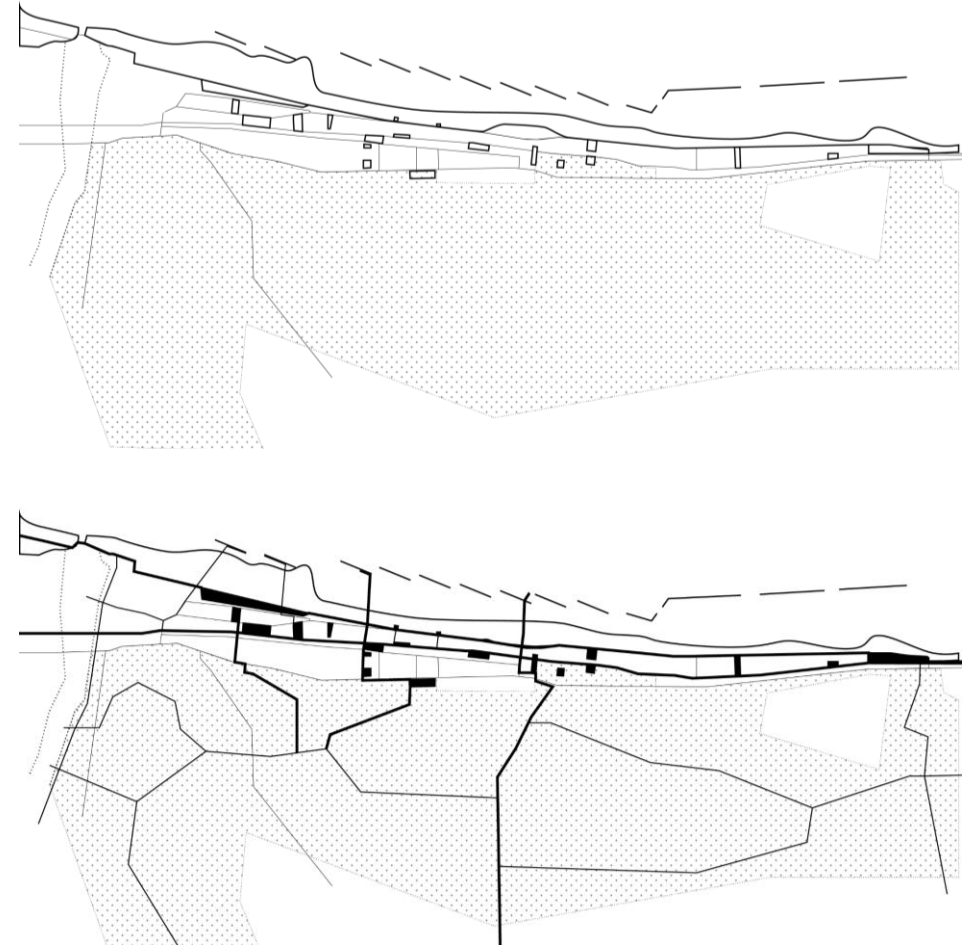


PEREQUAZIONE



Case study - Experimental design approaches

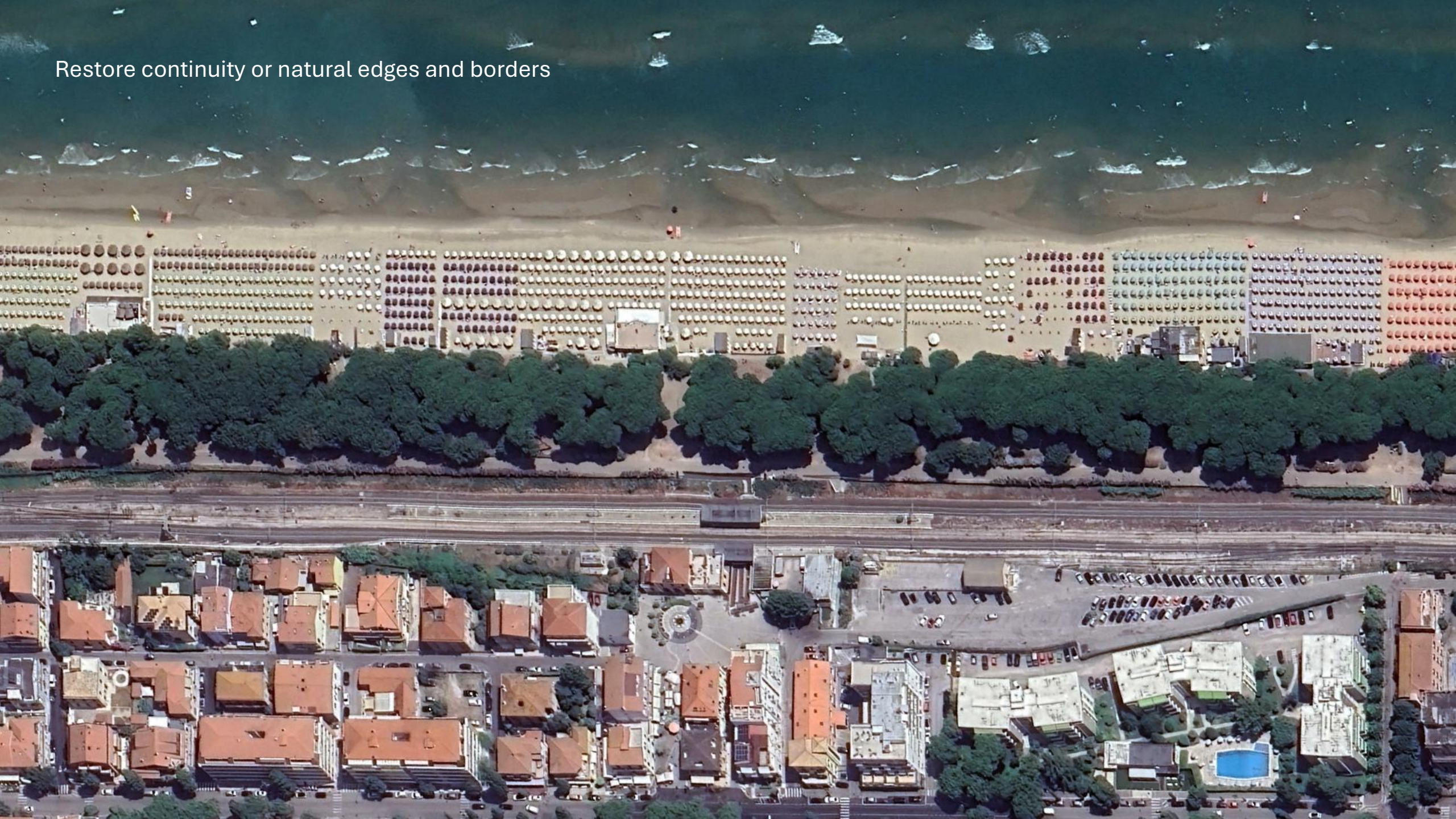
C2 – Torino di Sangro



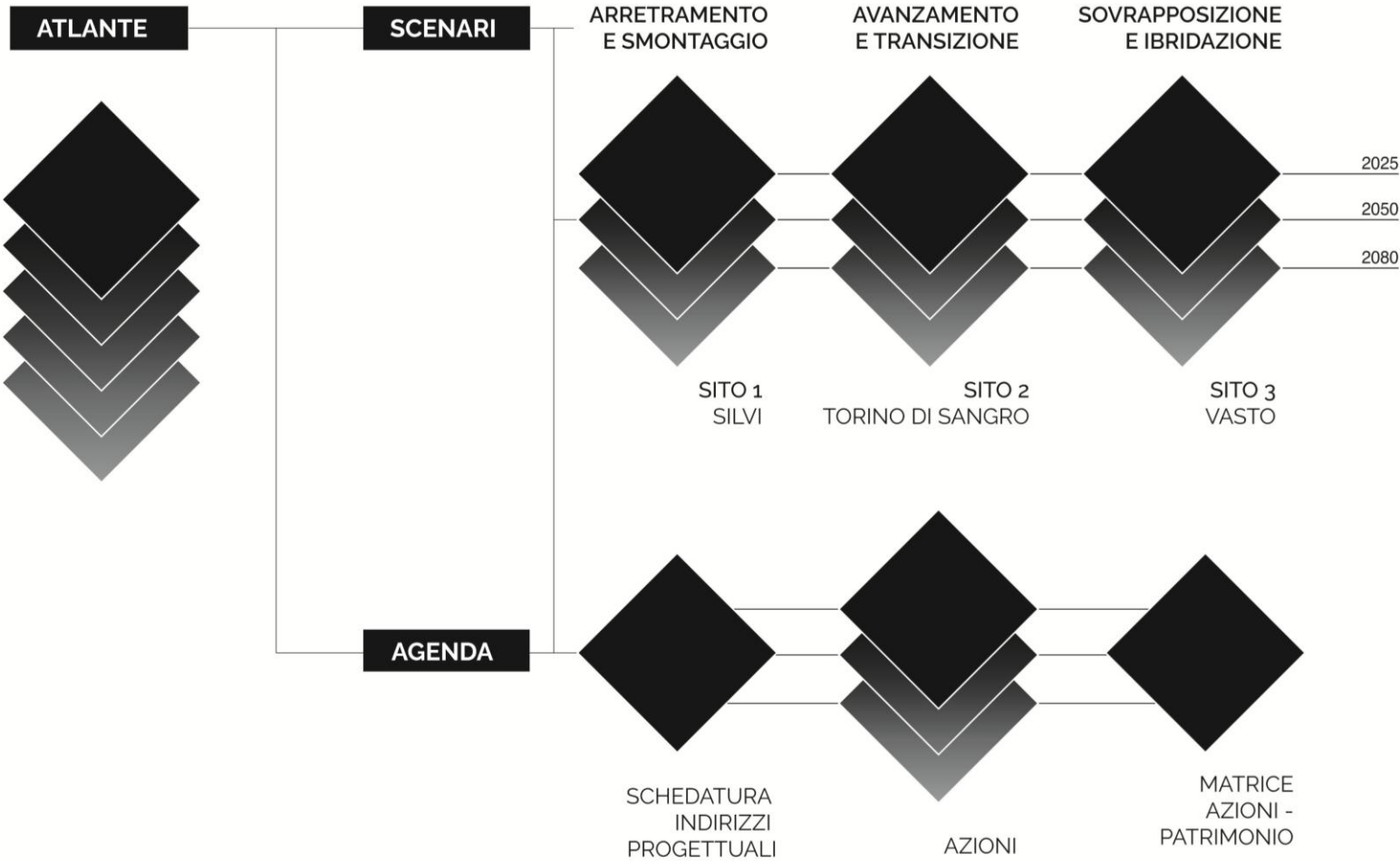
Activating and restore temporary uses and spaces.

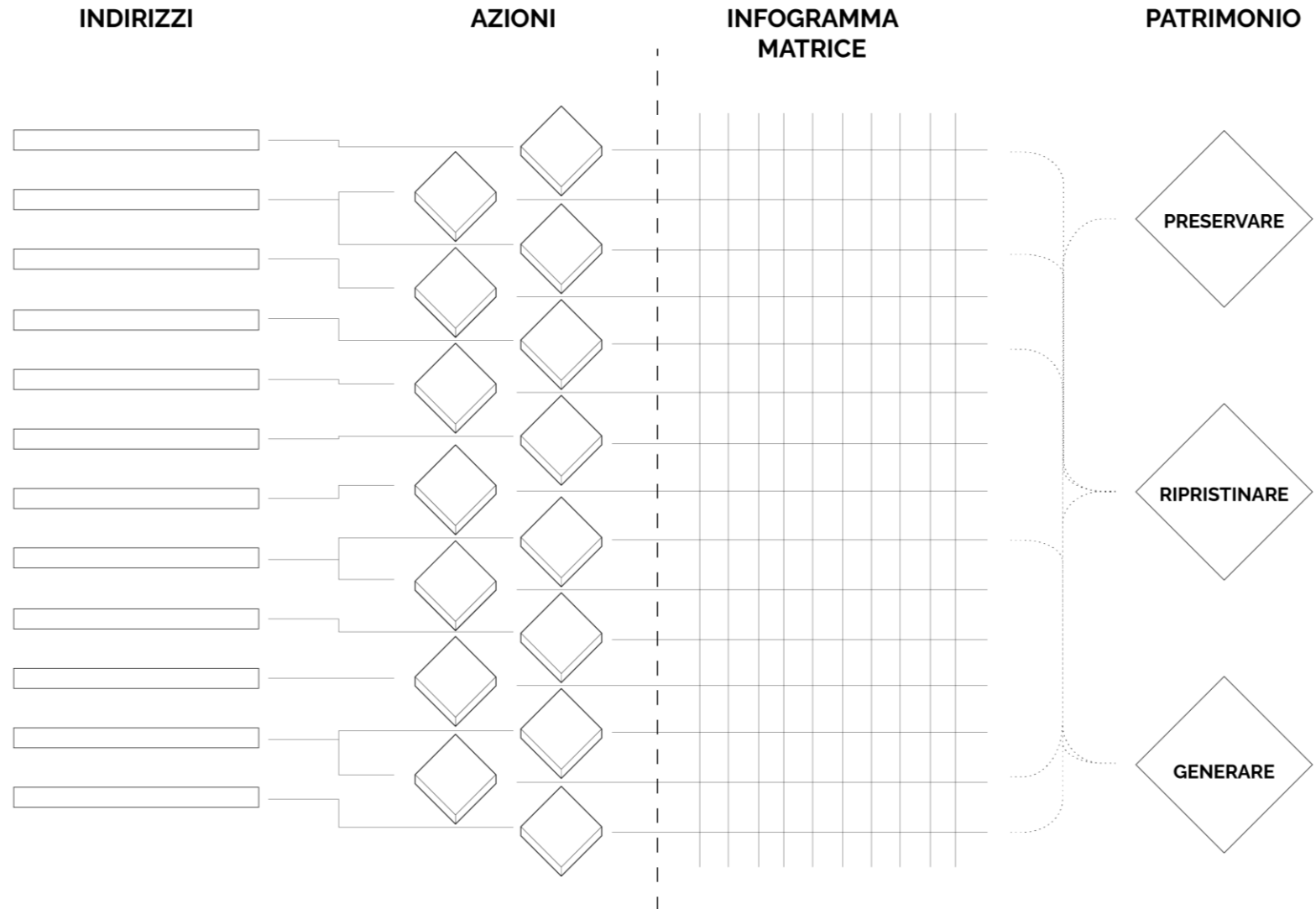
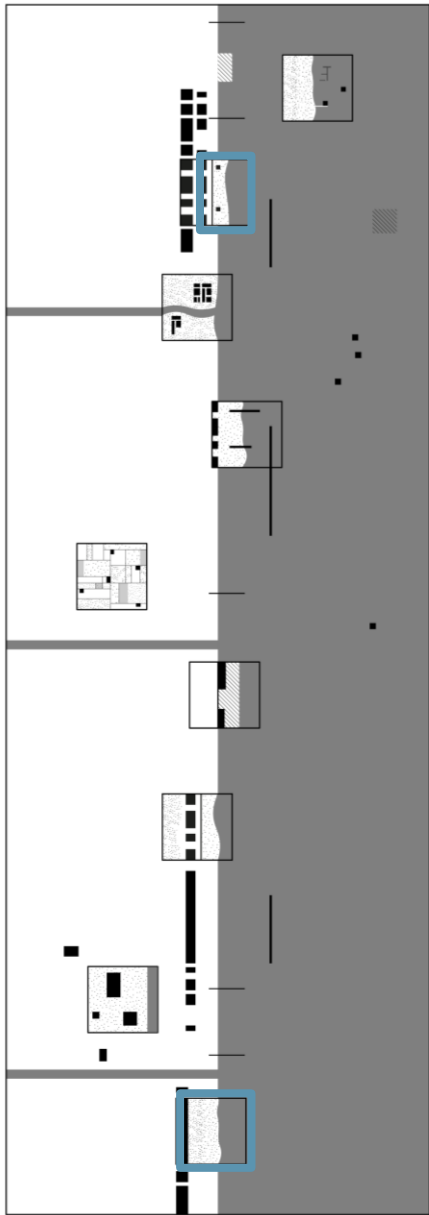


Restore continuity or natural edges and borders

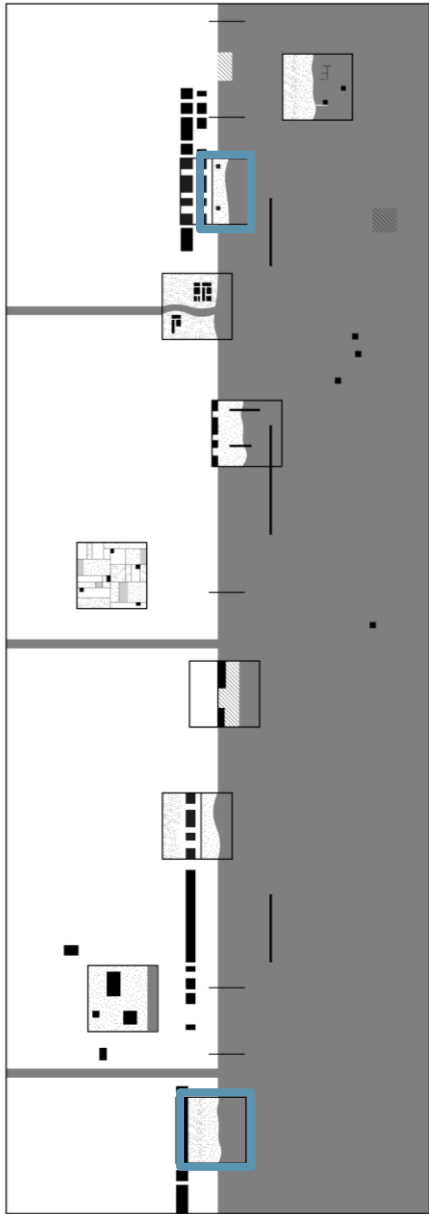


Towards an agenda of design guidelines





Working on **transferability** and induction of strategic approaches
studying **recurrent** situations



INDIRIZZI

RIPRISTINO E QUALIFICAZIONE DELLE RETI ECOLOGICHE, ATTRAVERSO LA RICONNESSIONE DELLE MATRICI AMBIENTALI ESISTENTI.

VALORIZZAZIONE, CONSOLIDAMENTO E TUTELA DI MARGINI NATURALI ACQUATICI E TERRESTRI

RIQUALIFICAZIONE E RICONVERSIONE DI OPERE RIGIDE DI DIFESA COSTIERA

ATTIVAZIONE, NATURALIZZAZIONE E CONNESSIONE DI VUOTI URBANI E SPAZI INTERSTIZIALI

RIPRISTINO, ATTIVAZIONE E TUTELA DI RETI CAPILLARI DI MOBILITÀ LENTA

RIDUZIONE DELLA PRESSIONE ANTROPICA LEGATA ALLA FRUIZIONE TURISTICO BALNEARE DELLE AREE DEMANIALI MARITTIME

INNESTO DI NUOVI CIRCUITI ECONOMICO-SOCIALI LEGATI ALLA PRODUZIONE AGRICOLA E DI ENERGIA DA FONTI RINNOVABILI

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STRUTTURA DELLA SCHEDA

- ☐ OBIETTIVI
- ☐ SCENARI
- ☐ PROPOSIZIONI COMPARATIVE
- ☐ LAND-SEA
- ☐ INQUADRAMENTO
- ☐ BUONE PRATICHE
- ☐ AZIONI

Attraversare lo spessore, Spiaggia di Maimoni, Oristano
Foto di Davide Simoni, 2021



Thank you!



Istanbul, 7-11 July

