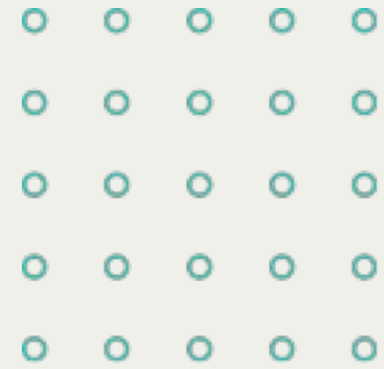


# 20th International Conference Europe-INBO



## PORTUGUESE RIVER RESTORATION STRATEGY





# PORTUGUESE RIVER RESTORATION STRATEGY

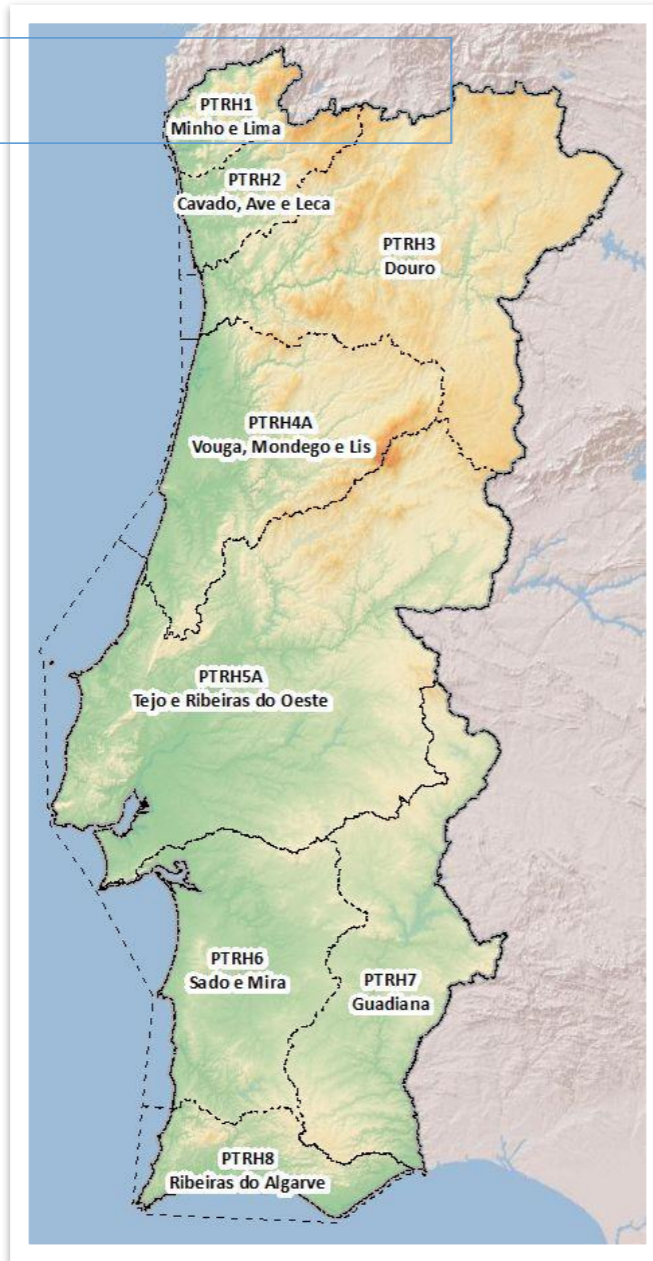
Shared basins | 42% in Portugal  
65% in Spain



10 million inhabitants

8 Basin Regions

5 Water Basin Districts



Portugal depends on 50% of water resources come Spain

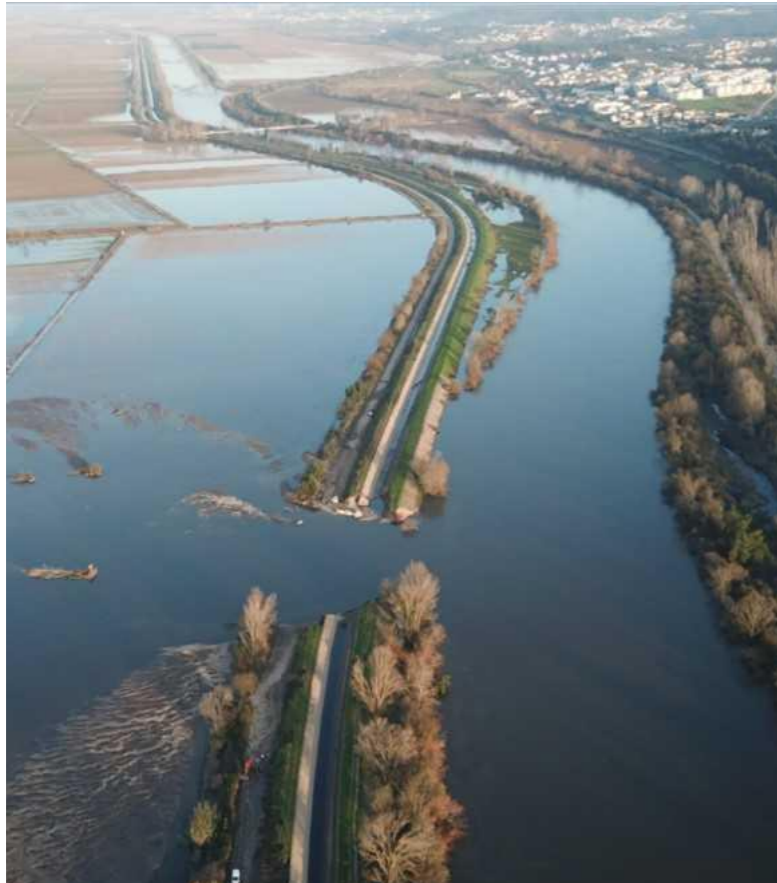
1. North
2. Center
3. Tejo
4. Alentejo
5. Algarve



# PORTUGUESE RIVER RESTORATION STRATEGY

## Climate change – impacts on water resources

Floods on the Mondego River  
2016 and 2019



- Floods on the River Mondego in Coimbra
- Collapse of some hydraulic structures
- Recovery: Investment > 30M€

Droughts in Portugal  
2022



- Empty reservoirs – Lindoso (rio Lima)
- Suspension of hydroelectric energy production
- Exclusive use of reservoir water for human consumption

Massive forest fires  
2017 and 2022



- Fires on Natural Parks
- 520.000 ha burned area in 2017
- 109.714 ha burned in 2022

(average per year 86.000 ha)



# PORTUGUESE RIVER RESTORATION STRATEGY

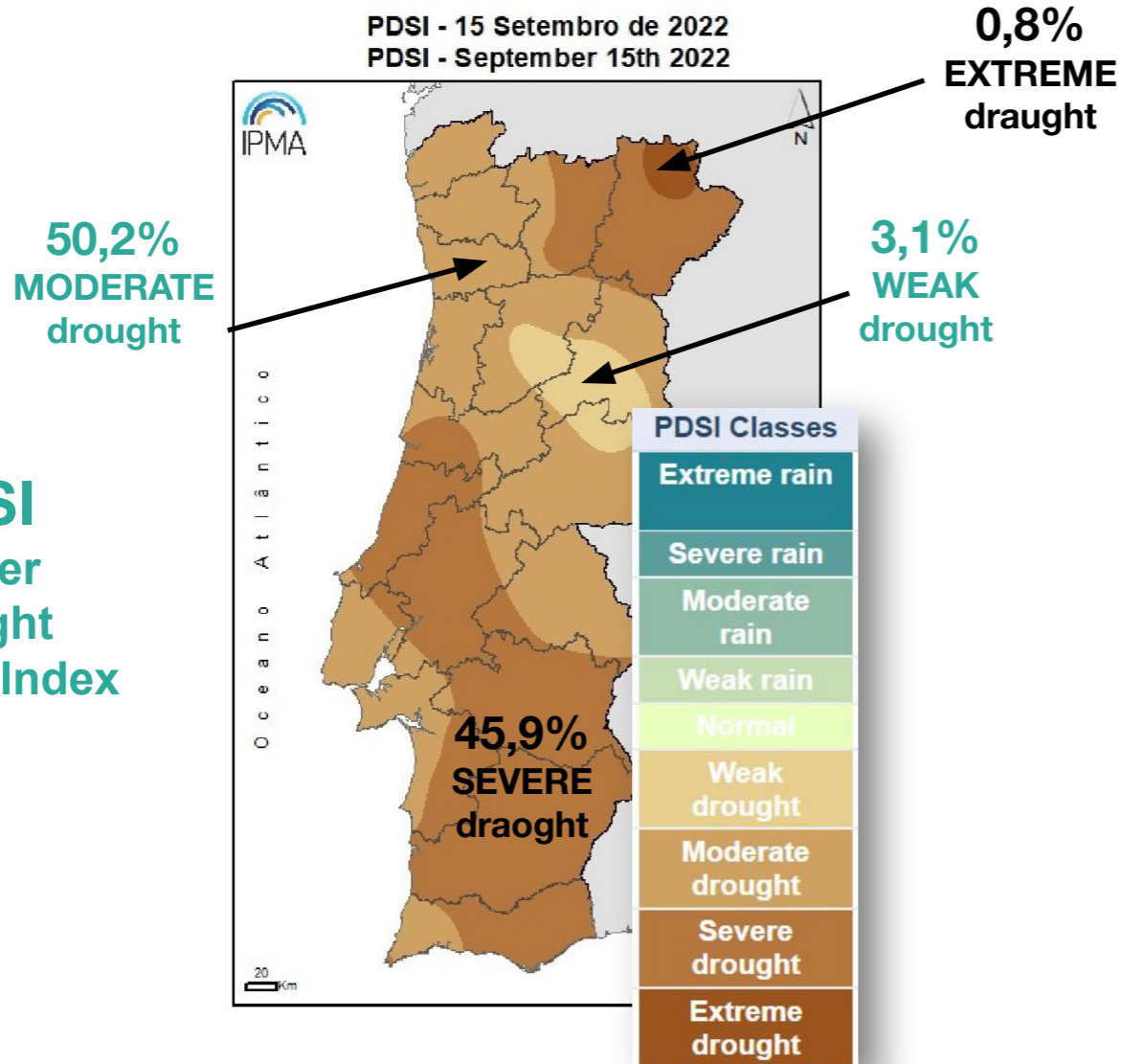


## Water resources actually challenge

- Precipitations loss
- Temperature rise
- Increased demand
- Water scarcity



- Efficiency of water use
- Water desalination
- Water reuse



**PDSI**  
Palmer  
Drought  
Severity Index

Last 20 years  
**precipitation** REDUCED  
20-30%

Monthly rainfall accumulated  
in the hydrological year:

ABOUT  
50 %  
OF NORMAL

2nd lowest value  
since 1931/32

2022: OCTOBER TO  
15 TH SEPTEMBER





# PORTUGUESE RIVER RESTORATION STRATEGY



## What have we already done?

### Ecological river continuity



Vertical-slot fish pass in Coimbra Dam

### Dams removal



Dams selected for removal

### River Restoration



Nature-based solutions applied after forest fires



# PORTUGUESE RIVER RESTORATION STRATEGY

ENBr



Rib. De Pera - Castanheira de Pera

Grade viva



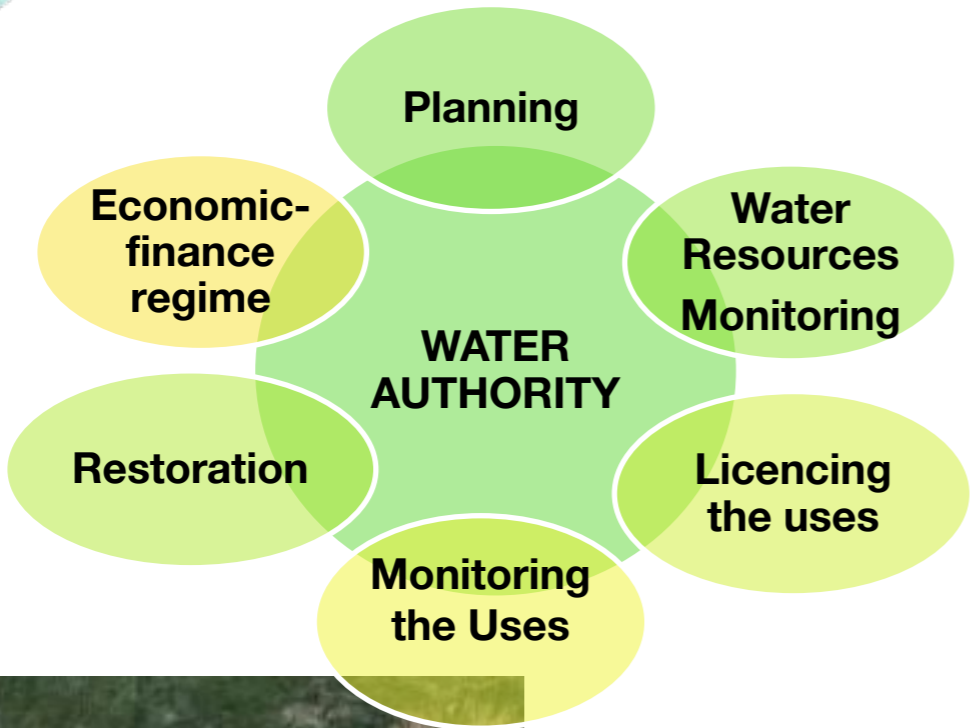
Pedrogão Grande



Rib. Das Azenhas - Penela



# PORTUGUESE RIVER RESTORATION STRATEGY



## Continental Portugal

**120 000  
Km  
water courses**





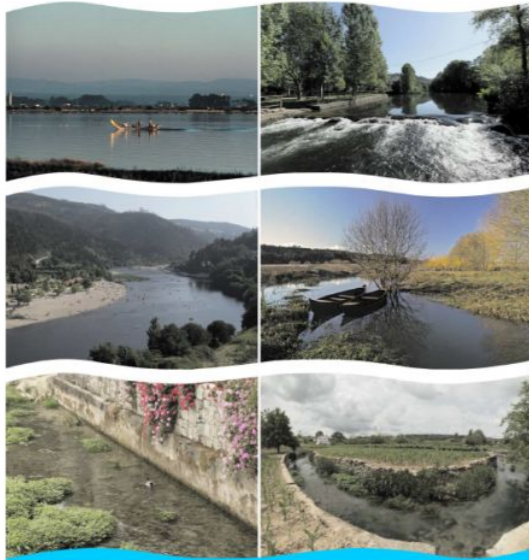
# PORTUGUESE RIVER RESTORATION STRATEGY



## River Basin Management Plan



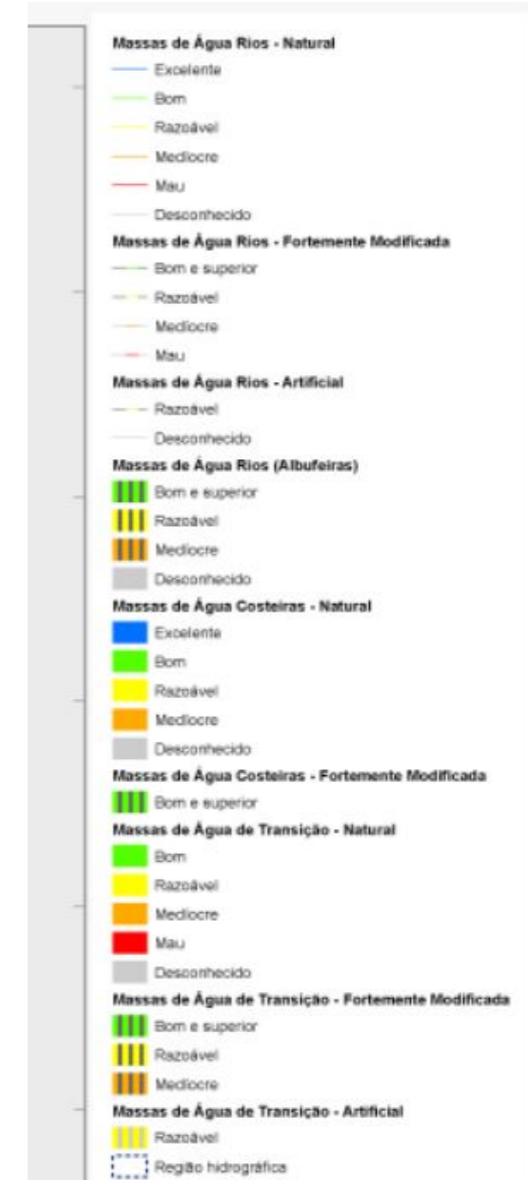
PLANO DE GESTÃO DAS BACIAS HIDROGRÁFICAS DOS RIOS VOUGA, MONDEGO E LIS INTEGRADAS NA REGIÃO HIDROGRÁFICA 4



RELATÓRIO SÍNTESE



## Water body status



## 6 years cycle



Classe de Qualidade	Rios		Albufeiras		Águas de transição		Águas costeiras		Total	
	N.º	Km	N.º	Km2	N.º	ha	N.º	ha	N.º	%
Excelente	14	192,1	-	-	-	-	6	230150,1	20	1,09
Bom	747	8818,3	62	434,3	17	30864,5	14	539028,1	840	45,82
Razoável	560	9287,2	57	285,0	21	48810,8	9	27095,1	647	35,30
Mediocre	206	3215,4	9	69,3	8	3599,9	1	160,3	224	12,22
Mau	94	1546,9	5	19,5	2	267,8	1	102,0	102	5,56
	<b>1621</b>	<b>23063,2</b>	<b>135</b>	<b>813,5</b>	<b>48</b>	<b>83543,1</b>	<b>31</b>	<b>796535,8</b>	<b>1833</b>	





## OBJECTIVES

1. To achieve the goals of public water policies
2. To improve the safety of people and goods and simultaneously to undertake the environmental recovery of the territories
3. To increase the community commitment to achieve a good status of the water bodies
4. To develop and apply tools that allow the river restoration



Pollution



Invasive species



Watercourse artificialization



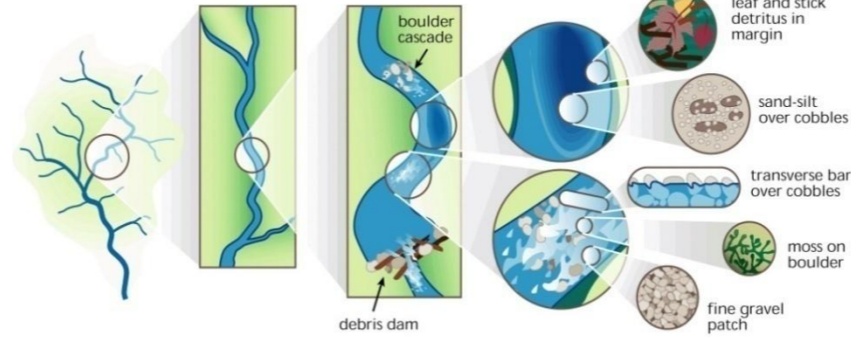
# PORTUGUESE RIVER RESTORATION STRATEGY



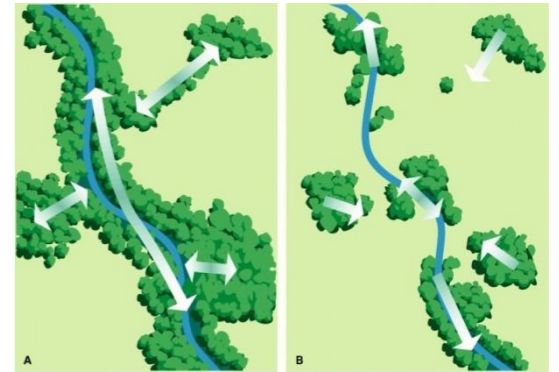
## PRINCIPLES

- ecological integrity
- free river
- sustainable use
- functional connectivity
- tangibility and measurability
- adaptation based on riparian ecosystems
- multidisciplinary
- participation
- integrated management

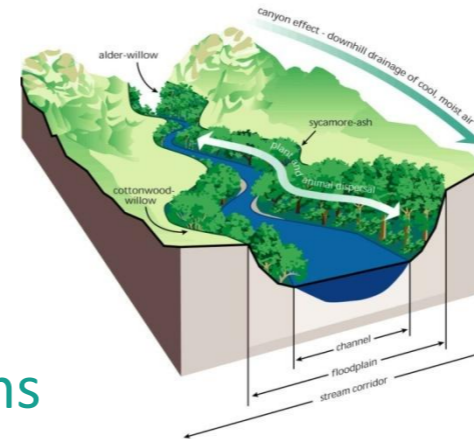
### Ecosystems protection



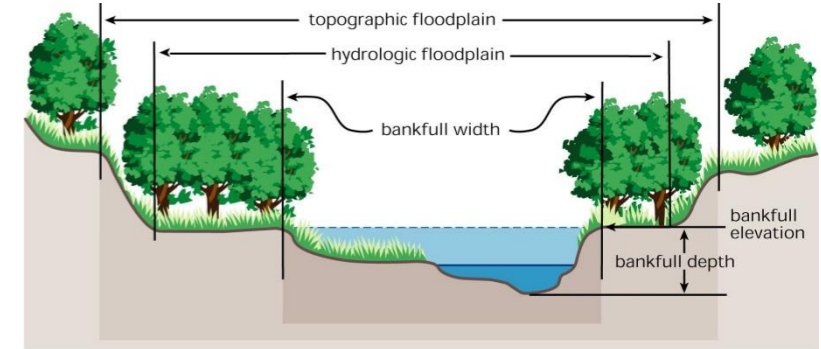
### Ecological corridor



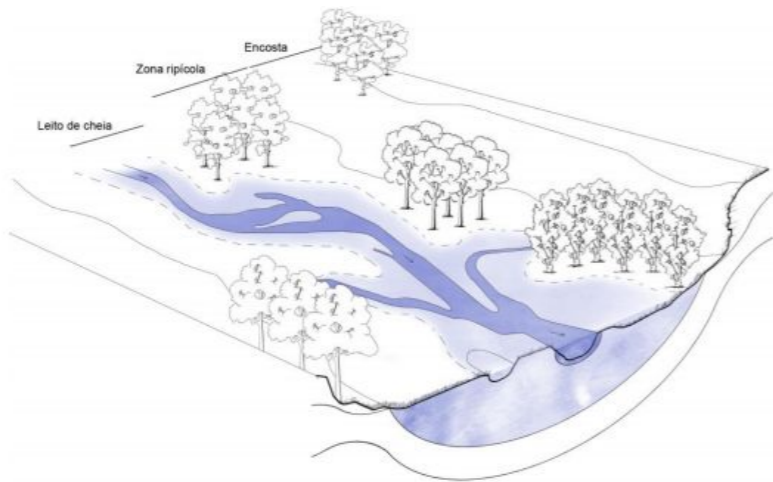
### Fluvial continuum



### Appropriate planning of the riparian gallery



### Public participation





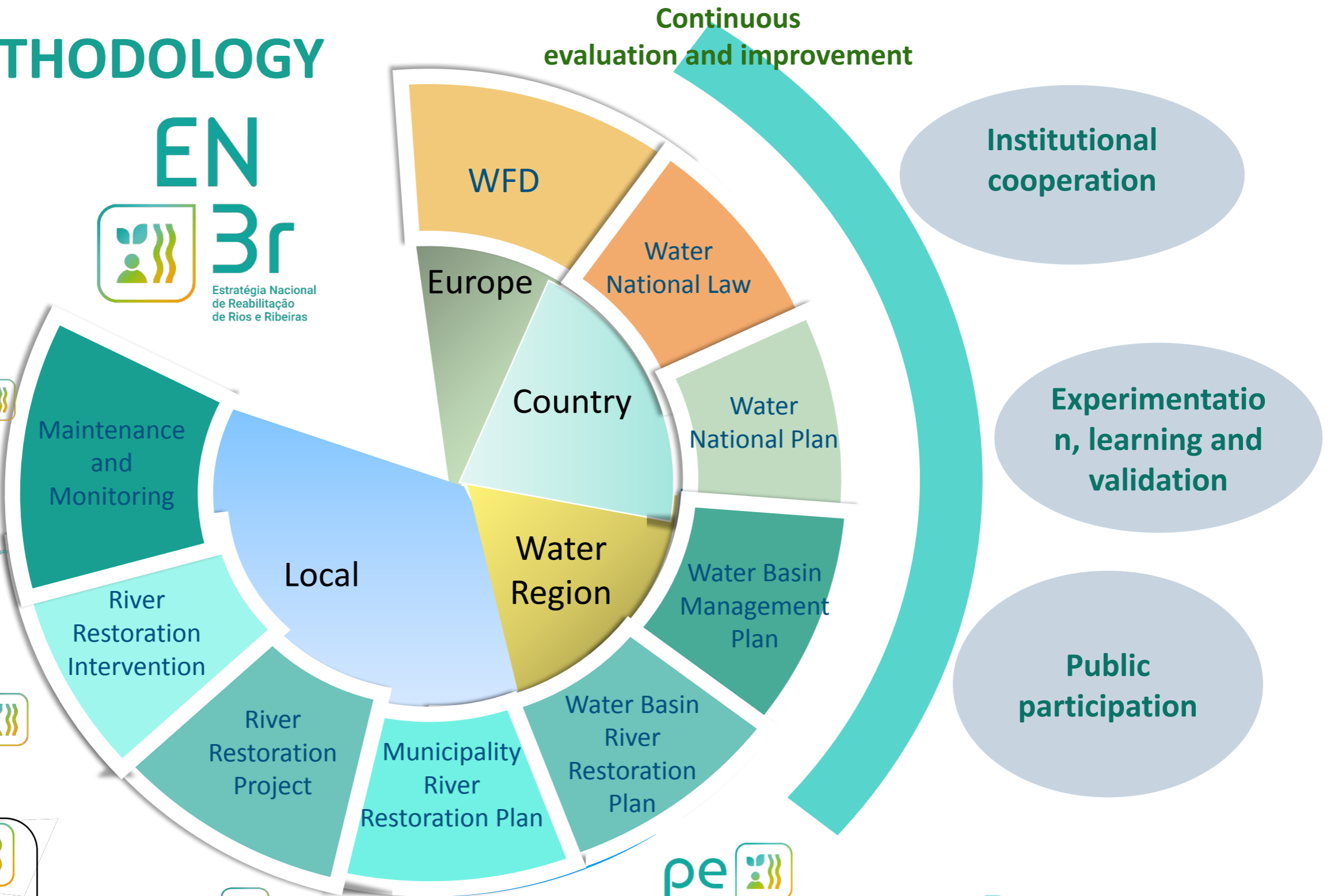
# PORTUGUESE RIVER RESTORATION STRATEGY



## METHODOLOGY

# EN 3r

Estratégia Nacional  
de Reabilitação  
de Rios e Ribeiras



Reserva  
fluvial  
River Course  
Reserve





## OPERATIONAL MEASURES

### HYDRAULIC

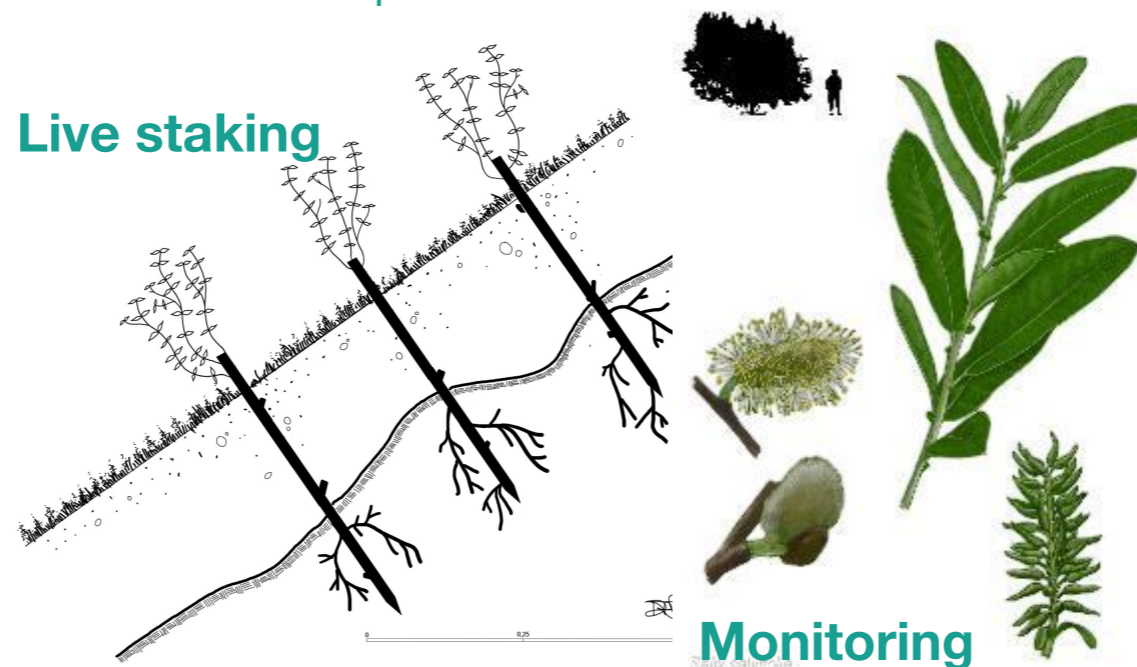
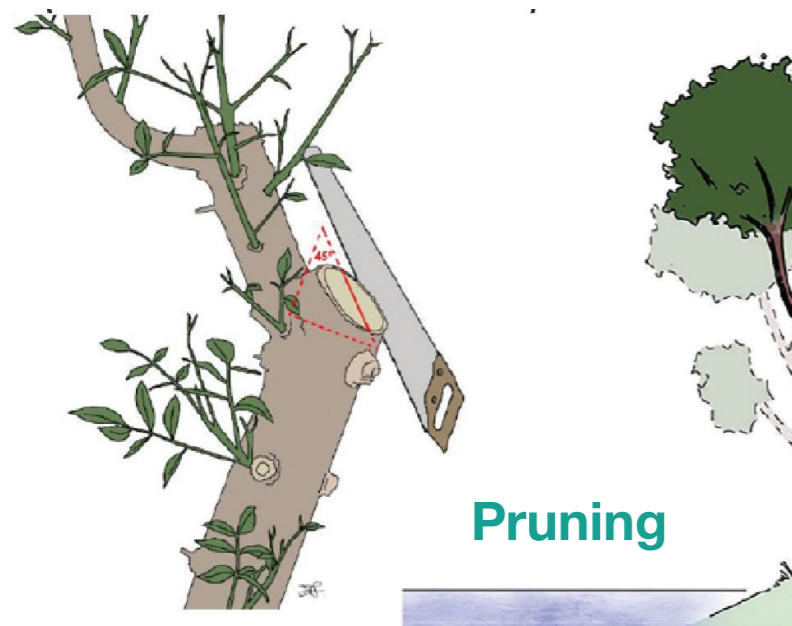
- Water course stabilization
- Water course reprofiling
- Requalification of hydraulic structures
- Improvement of river hydrodynamics
- Connectivity re-establishment
- Torrential correction
- Selective cutting and pruning of native species formation
- Formalization of preferential flood spaces

### ECOLOGICAL

- Removal of household waste and garbage
- Elimination of local and diffuse pollution
- Containment of invasive species
- Reintroduction of native species
- Improvement of heterogeneity conditions and support for biodiversity
- Promotion of biodiversity of target species (flora and fauna) namely with protection status

### SOCIAL

- Public communications
- Transfer of knowledge and skills to the community
- Technical teams training
- Control actions
- Environmental education



### Community





## ACHIEVEMENT INDICATORS

### GENERAL PARAMETERS

- Km of river courses operated in urban areas
- Km of river courses operated in non-urban areas
- Number of NWRM applied, as classified by the European Commission
- Km of River courses in “River Reserves”
- Number of Formalized River Reserves
- Number of people living in the benefited hydrographic sub-basins
- % of Water Bodies in the area of influence of the PE3R/ PERLA/ River
- Number of Rehabilitation Projects in which there was an improvement in the State/Ecological Potential.



### HYDRAULIC

- Km with NWRM applied
- Number of hydraulic structures intervened to guarantee the flow capacity
- Number of dams rehabilitated
- Number of connective ecological flow structures
- Number of transverse and longitudinal barriers removed
- Number of preferential flood spaces formalized
- Km of riverbed and bank reprofiling

### ECOLOGICAL

- m<sup>3</sup> of waste and rubble removed
- Number of native flora species planted
- Number of trees
- % of the plantation area compared to the total area of the project
- Number of structures passages built or rehabilitated for fish and other fauna
- Number of invasive species contained
- Tons of CO<sub>2</sub> Capture
- Improvement of the classification of the State/Ecological Potential of surface water bodies

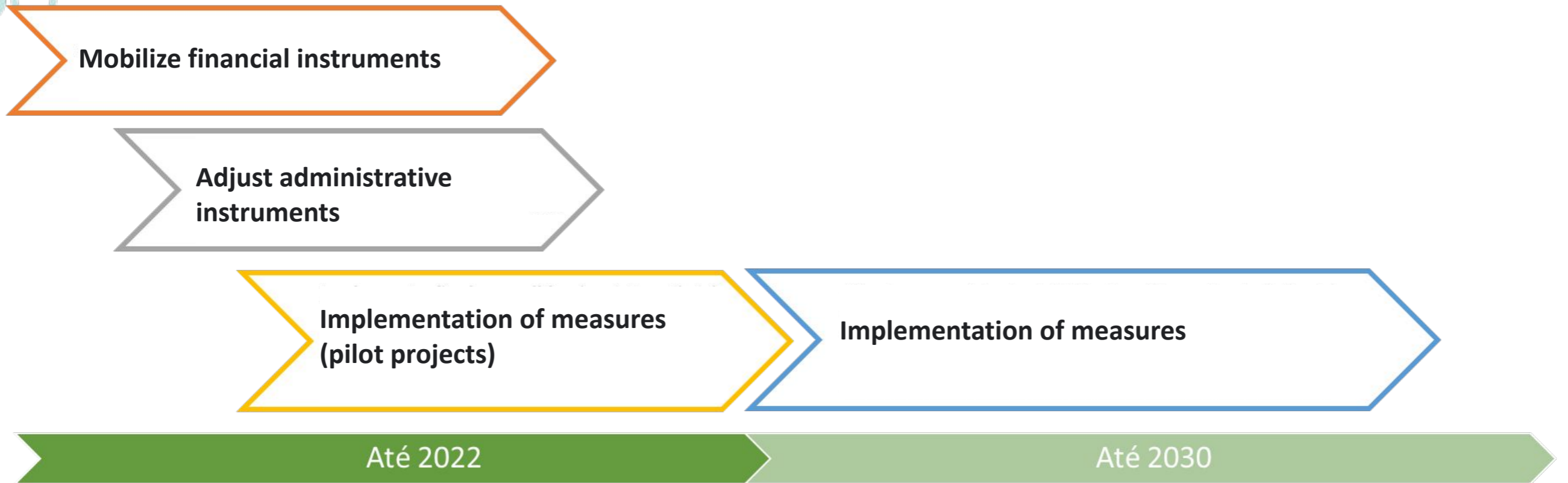
### SOCIAL

- Number of public participation sessions
- Number of technical training actions
- People involved
- People benefited from the implementation of interventions
- Number of institutions involved

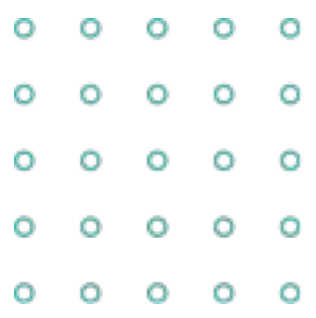




## IMPLEMENTATION SCHEDULE



UNITED NATIONS DECADE ON  
**ECOSYSTEM  
RESTORATION**  
2021-2030



**Thank you  
for your attention**

