



Recreation and natural resources



Topics

- Introduction – sustainable development, ecotourism;
- Portugal – geographic information, landscape units, nature conservation;
- Regional and land use planning in Portugal;
- Case study - “Nature sports plan” of the Natural Park of Tejo Internacional (PNTI).

Introduction

Sustainable Development

- (1) *"development which meets the needs of the present without compromising the ability of future generations to meet their own needs"* (Brundtland Report, 1987).
- (2) *"the right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations"*
(Rio Earth Summit, 1992).

Sustainable Development encourages the conservation and preservation of natural resources and of the environment, and the management of energy, waste and transportation. Sustainable Development is development based on patterns of production and consumption that can be pursued into the future without degrading the human or natural environment.

Eco-Tourism

Lodging

Environmental Recreation Activities

Rural tourism

“Nature houses”

Free time activities

Nature interpretation activities

Nature sports (outdoor sports)

Turismo habitação
Turismo rural
Agro-turismo
Turismo de aldeia
Casas de campo
Hotel rural
Parque campismo rural

Casas-abrigo
Centros de acolhimento
Casas-retiro

Food
Handicraft
Thematic path
Expeditions
Local goods
Events
Leisure

Observation:
Landscapes
Geological features
Plants
Animals
Habitats.
Human activities and traditions

Ballooning
Parapent
Windsurf
Hang gliding
Rock climbing
Horse riding
Mountain biking
Sailing
Surfing
Rafting
Rowing
Diving

Hydrospeed
Canoeing
Pedestrianism
Hiking
Orienteering
Speleology
Cycling

Other nature’s friendly sports

Portugal – Geographic information



Area: 92 345 sq km

Number of inhabitants: 10 848 692

Population density: 114 persons / sq km



Portugal is located in southwestern Europe, on the Iberian Peninsula. Being the westernmost country of mainland Europe, Portugal is bordered by the Atlantic Ocean to the west and south and by Spain to the north and east. The Atlantic archipelagos of the Azores and Madeira are also part of Portugal.

Climate



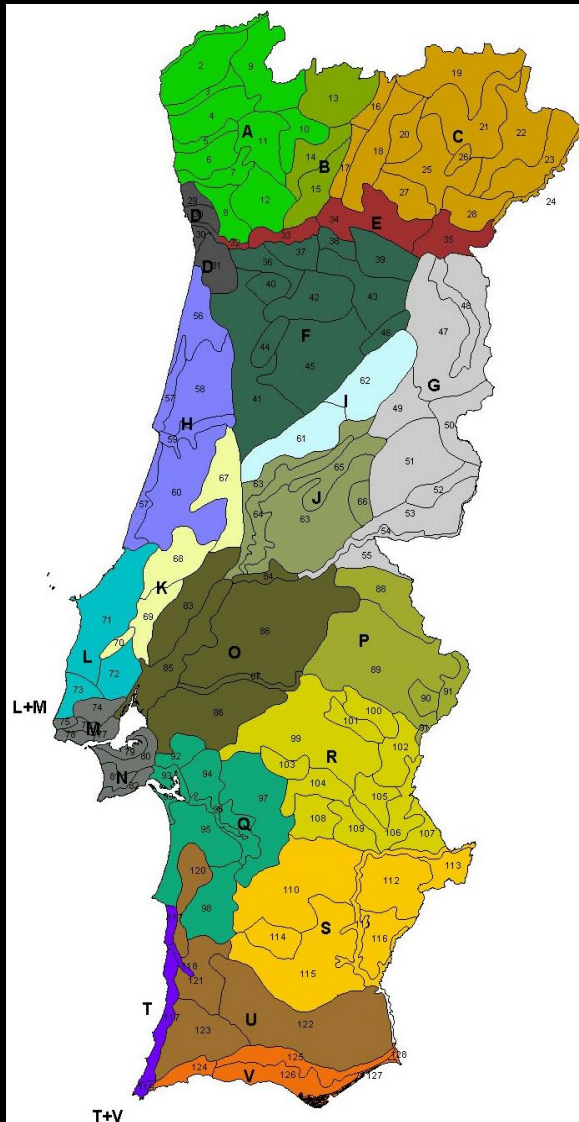
MEDITERRANEAN

Im	■	Inframediterranean
Tm	■	Thermomediterranean
Mm	■	Mesomediterranean
Sm	■	Supramediterranean
Om	■	Oromediterranean
Cm	■	Cryoromediterranean

TEMPERATE

It	■	Infratemperate
Ism	■	Infra-submediterranean
Tt	■	Thermotemperate
Tsm	■	Thermo-submediterranean
Mt	■	Mesotemperate
Msm	■	Meso-submediterranean
St	■	Supratemperate
Ssm	■	Supra-submediterranean
Ot	■	Orotemperate
Osm	■	Oro-submediterranean

Landscape units in Portugal



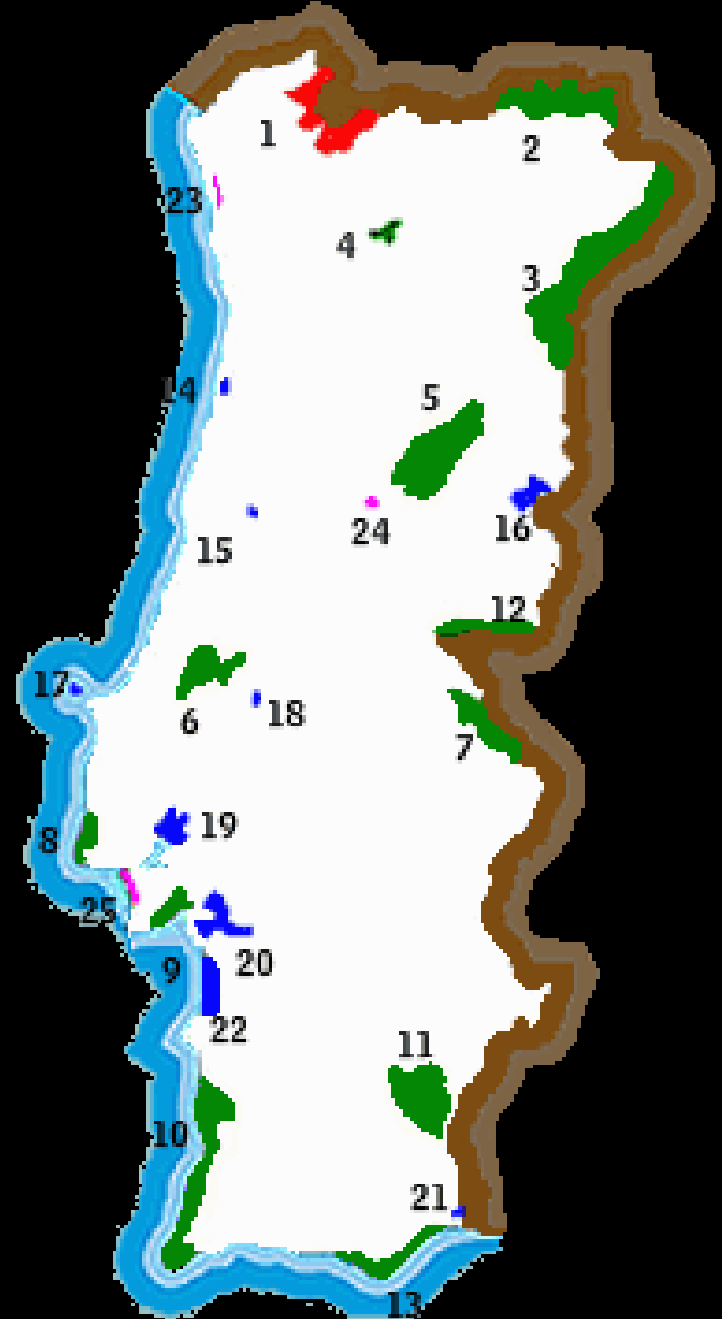
- A - Entre Douro e Minho
- B - Montes entre Larouco e Marã
- C - Trás-os-Montes
- D - Área Metropolitana do Porto
- E - Douro
- F - Beira Alta
- G - Beira Interior
- H - Beira Litoral
- I - Maciço Central
- J - Pinhal do Centro
- K - Maciço Calcário da Estremadura
- L - Estremadura – Oeste
- M - Área Metropolitana de Lisboa - Norte
- N - Área Metropolitana de Lisboa - Sul
- O - Ribatejo
- P - Alto Alentejo
- Q - Terras do Sado
- R - Alentejo Central
- S - Baixo Alentejo
- T - Costa Alentejana e Sudoeste Vicentino
- U - Serras do Algarve e do Litoral Alentejano
- V - Algarve

Protected areas



Portuguese network for Nature Conservation

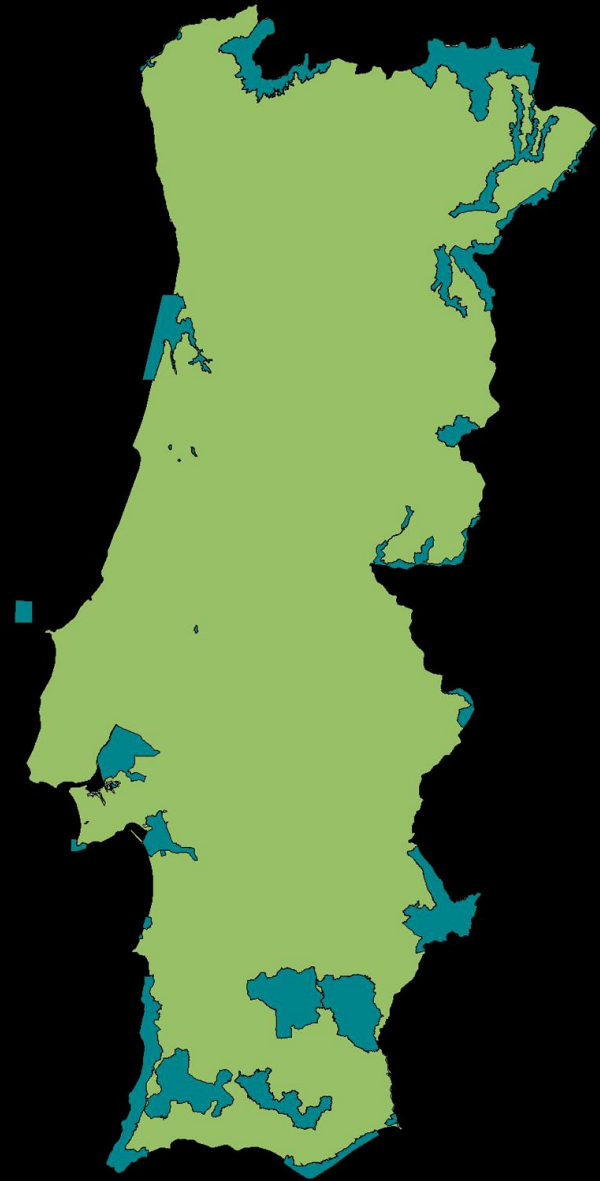
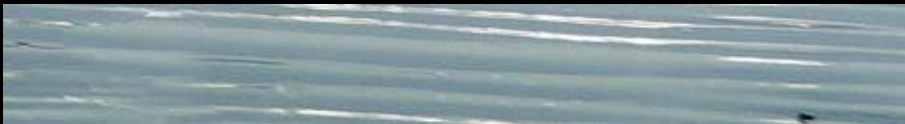
25 in Portugal (Continental)



Zonas de Protecção Especial (ZPE)



**Important areas for Birdlife
29 in Portugal (Continental)**

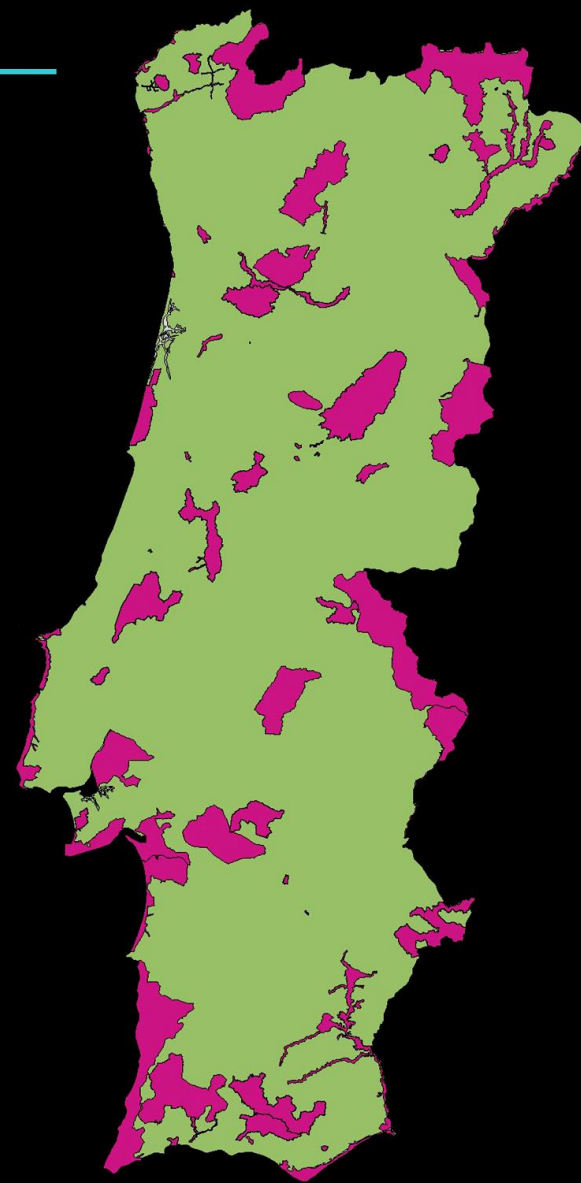


Sítios de Importância Comunitária (SIC)



**Important areas to other animal
and plant species and habitats**

60 in Portugal (Continental)





Falco peregrinus



Rhinolophus ferrumequinum

Mauremis leprosa



Callimorpha quadripunctaria



Salmo salar

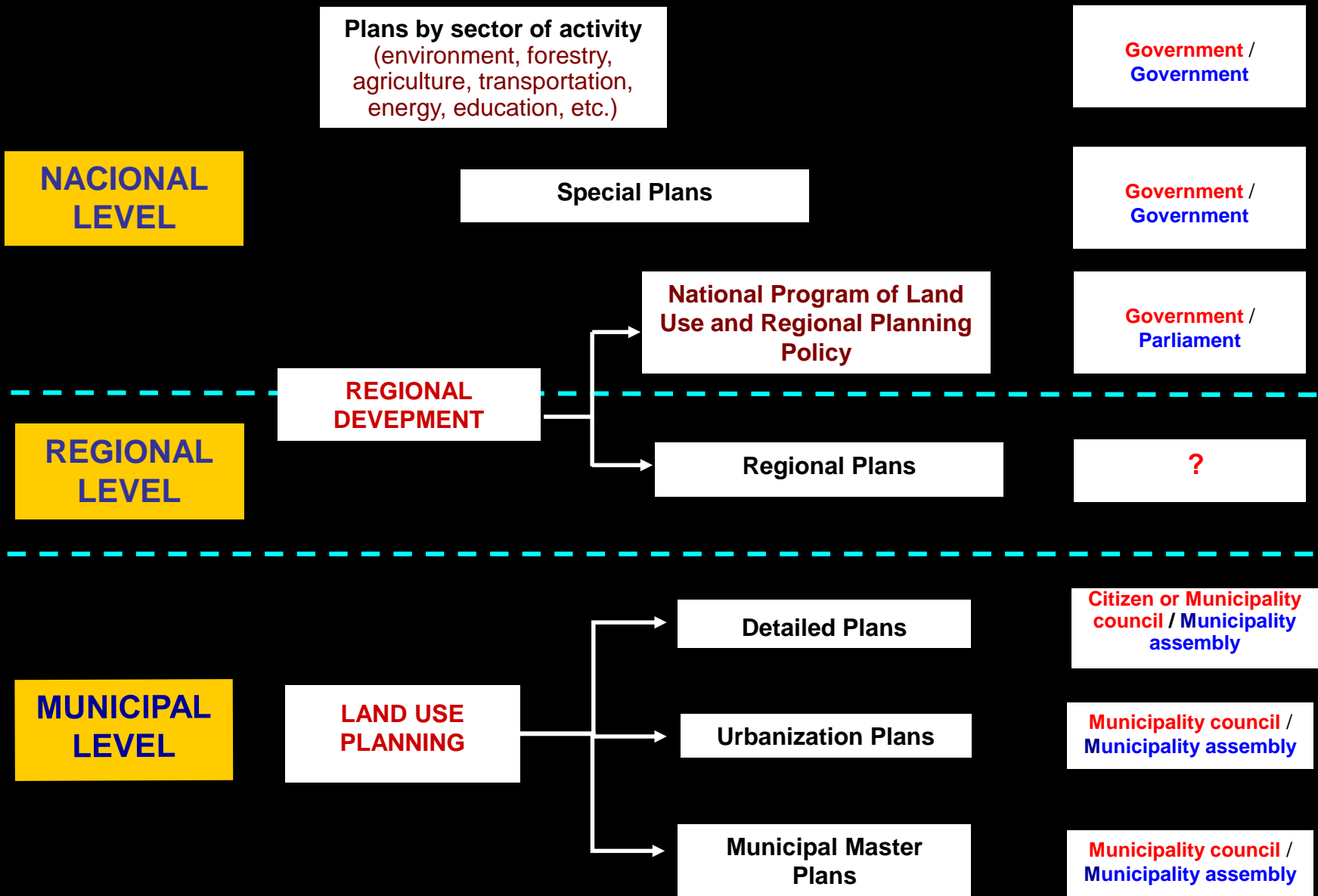
Lacerta schreiberi





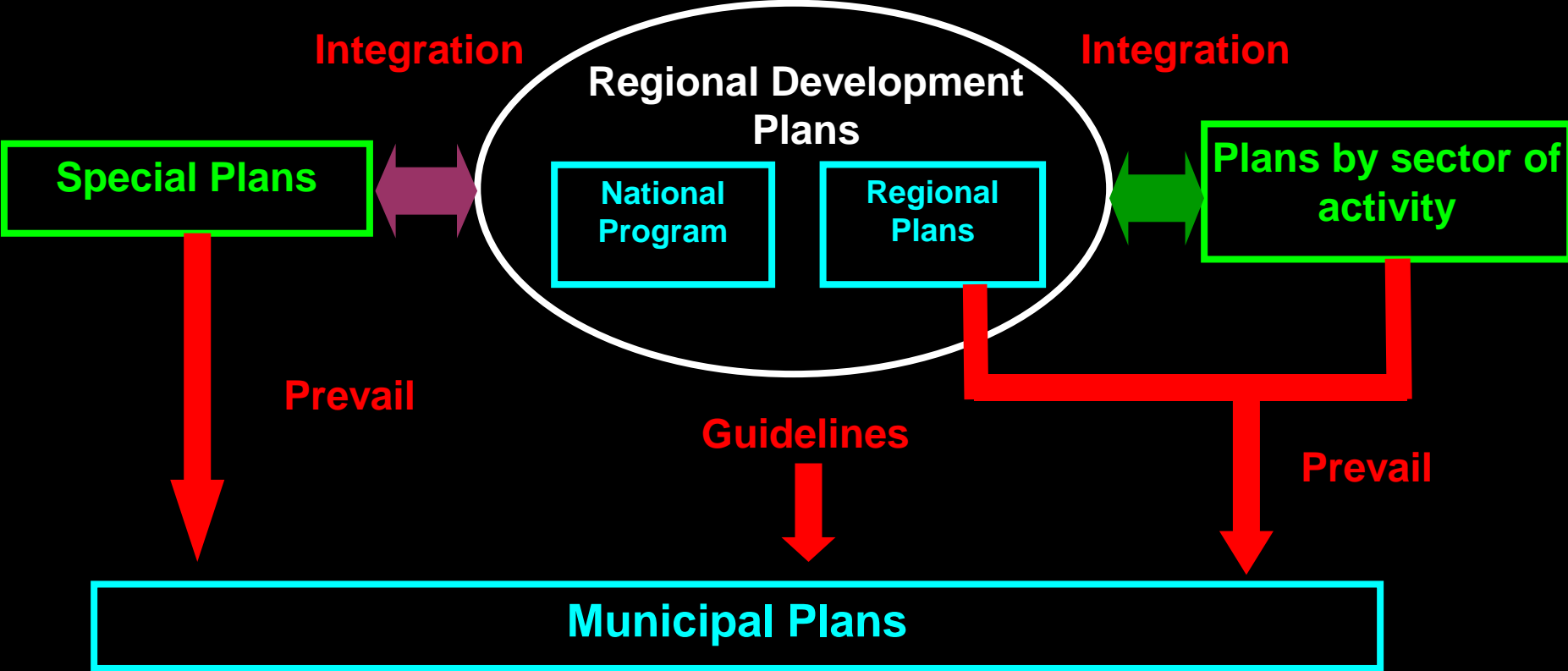
TOOLS FOR REGIONAL AND LAND USE PLANNING

Initiative Approval



Recreation and Natural Resources

RELATIONS BETWEEN LAND MANAGEMENT PLANS



**National Strategy for Nature
Conservation and Biodiversity**

National Program of Ecotourism



**Necessity of Protected Areas to elaborate
“Nature Sports Plans”**



Contribute to the “Nature Sports Plan” of the Natural Park of Tejo Internacional (PNTI)

Objectives

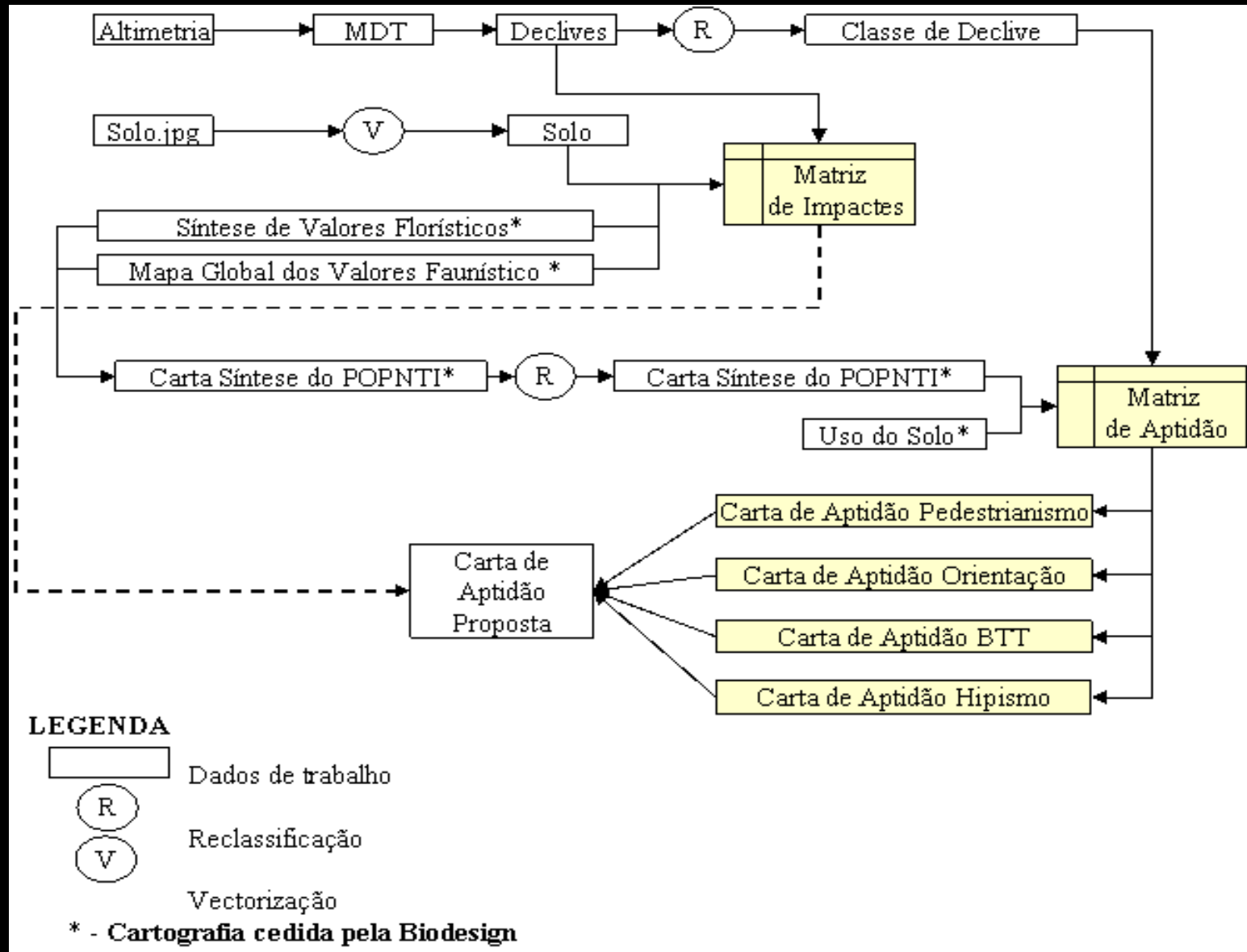
- To give useful information in order to plan and manage outdoor sporting activities in the Protected Area (PNTI).
- To identify the best areas to practice nature sport activities, considering the impacts associated and its needs.
- To develop a GIS methodology in order to combine different biophysical data useful to define suitability for sports.

Methodology

Data obtained:

- Land use plan of PNTI (**Special Plan**)
- Bibliographical research
- Sporting federations and municipalities
- GIS (data).

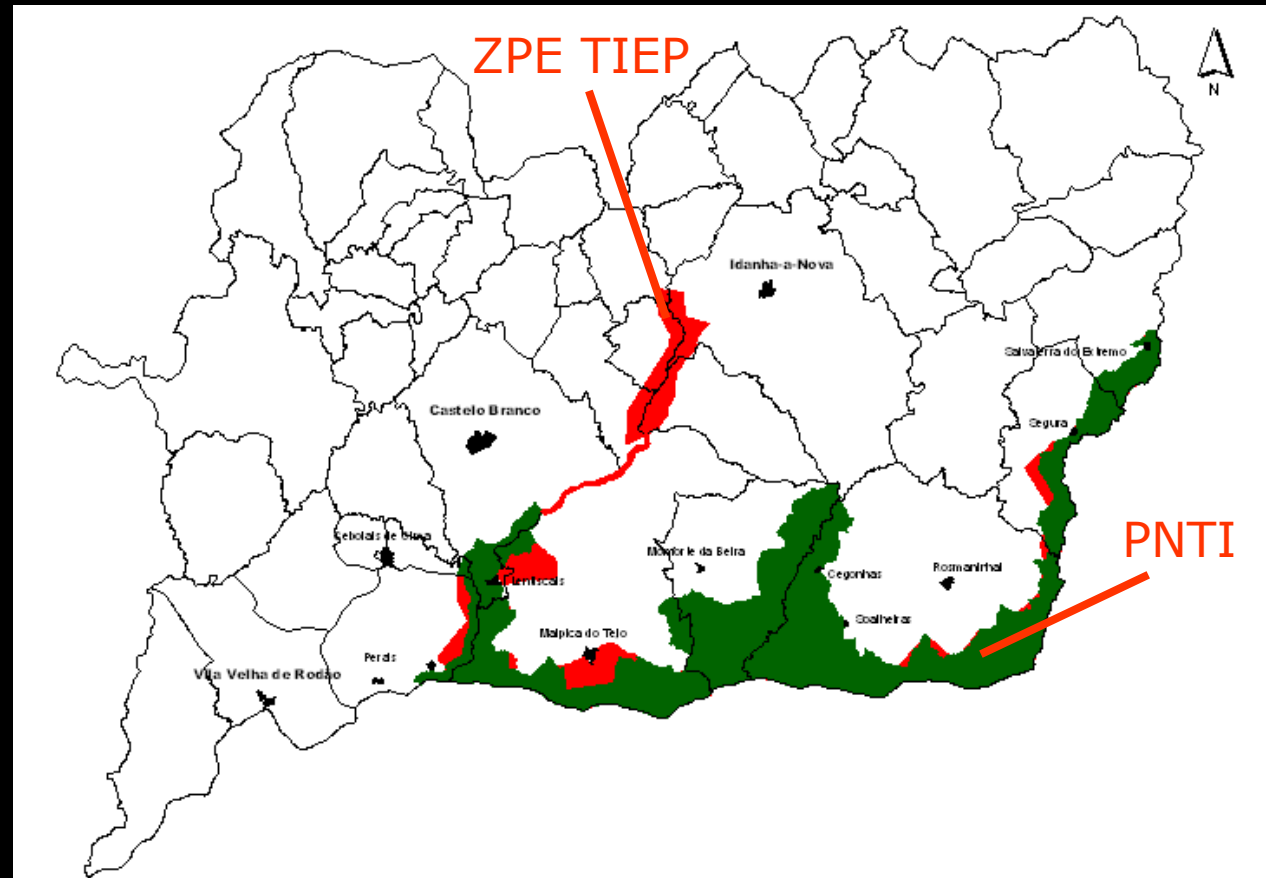
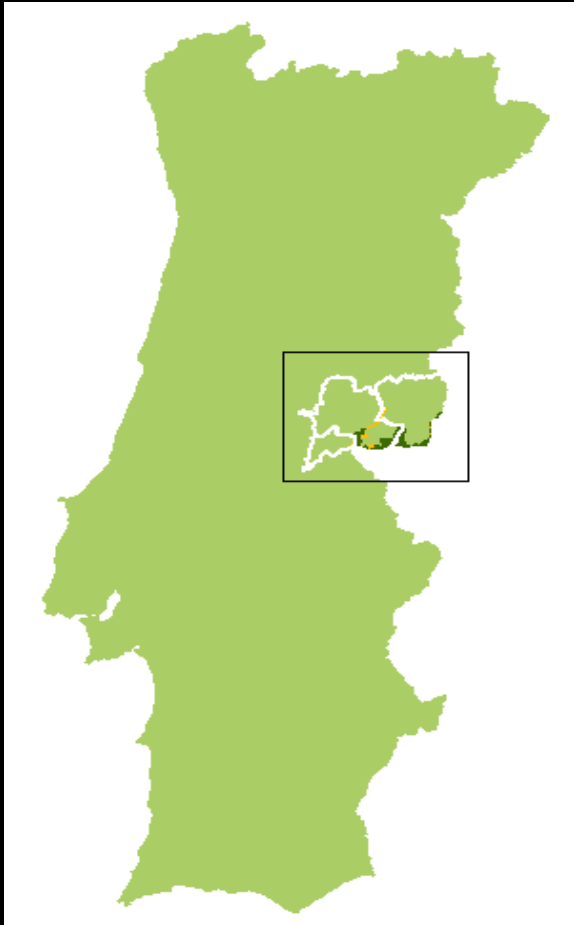
Methodology



Study Area

Center East of Portugal, District of Castelo Branco, near the border with Spain

Area: 26490 ha



Legislative frame

- **Dec. Reg n.º 9/2000, 18th August**

Implementation of Natural Park of Tejo Internacional

- **RCM n.º 33/2004, de 20th March**

Determines the necessity of a land use plan

- **Dec. Reg. n.º 21/2006, de 27th December**

Publication of the new limits of PNTI

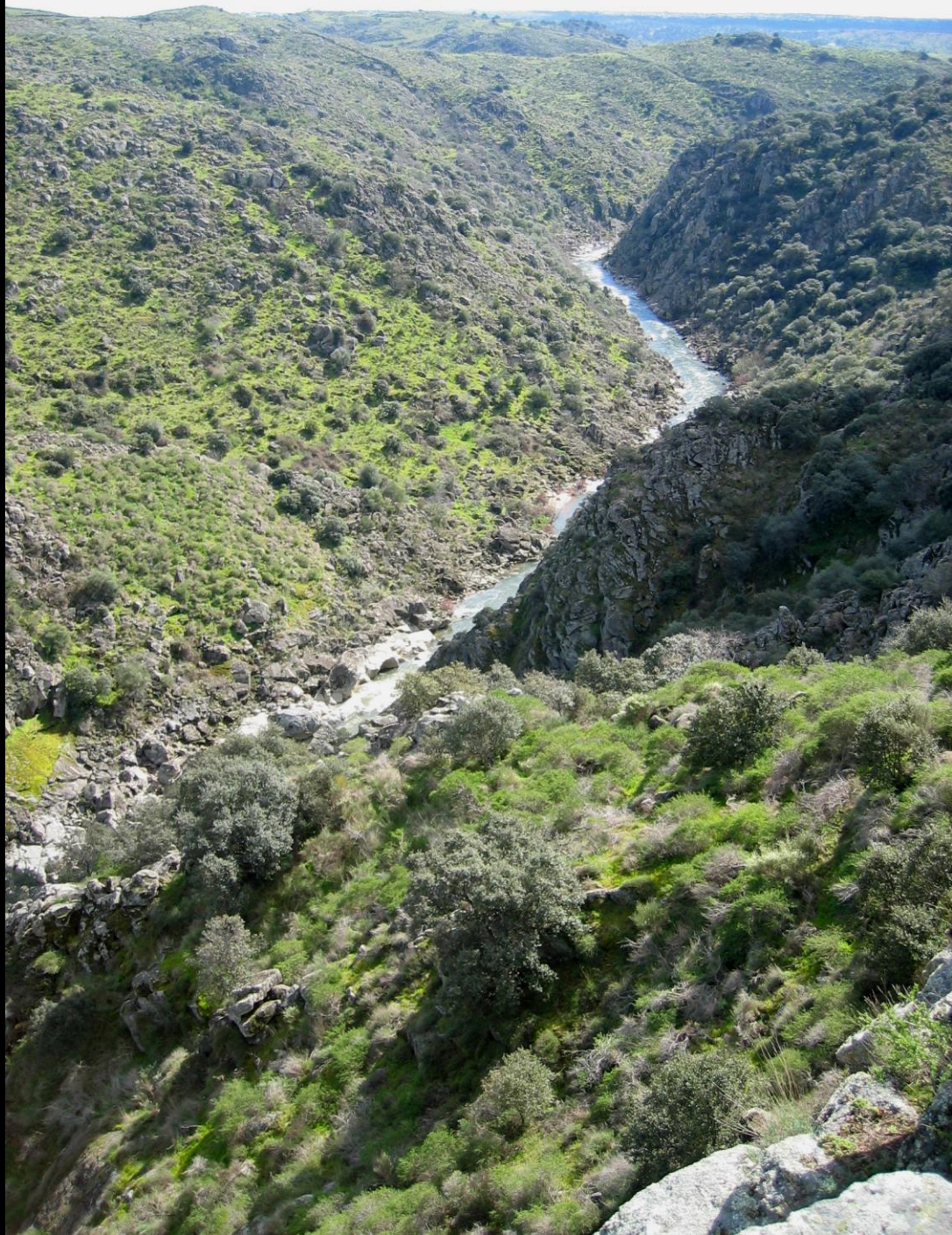
Physical characteristics

- Geology dominated by schist with small granite formations
- Plateau with some undulation, with canyon valleys
- Dense hydrographic network
- Mediterranean climate with some continental influence

Human presence

- Population density of approximate 4 persons / km²
- Decrease in population of about 23% between 1981 and 2001
- Working population represents only 15% of all population
- 50% of working population works in agriculture

















FLORA

Identified 610 species belonging to
92 families





Dianthus lusitanus



Digitalis thapsi



Rosmaninhal (*Lavandula stoechas*)



Esteval (*Cistus ladanifer*)

FAUNA

Black Stork (*Ciconia nigra*)

Population in Portugal: 102-112 couples

Regional population: 59-63 couples

**PNTI - 20 couples
(20% of population in Portugal)**

**Protected area with highest number of
individuals**



Paulo Monteiro

FAUNA

Egyptian Vulture (*Neophron percnopterus*)

Population in Portugal: 120-121 couples

Regional population: 23-24 couples

PNTI: 20-21 couples
(17% of population in Portugal)

2nd most important protected area for
the species



FAUNA

Griffon Vulture (Gyps fulvus)

Population in Portugal: 524-532 couples

Regional population: 172-174 couples

PNTI: 110 couples
(21% of population in Portugal)

2nd most important protected area for the species



Paulo Monteiro

FAUNA

Eurasian Black Vulture (*Aegypius monachus*)

Population in Portugal: 0-3
couples (breeds occasionally)

Once abundant, nowadays extinct
as breeding species

PNTI - Frequent

In 2002 a couple bred in PNTI



FAUNA

Spanish Imperial Eagle (*Aquila adalberti*)

Population in Portugal: 2 couples in
PNTI

World population: 187 couples

Extinct as breeding species
in Portugal since 1977

It's the 7th most threatened bird
species in the world



FAUNA

Golden Eagle (*Aquila chrysaetos*)

Population in Portugal: 61-66 couples

Regional population: 10 couples

PNTI: 7 couples

(11% of population in Portugal)

2nd most important protected area for
the species



FAUNA

Bonelli's Eagle (*Hieraaetus fasciatus*)

Population in Portugal: 85-100 couples

Regional population: 10-11 couples

PNTI: 7 couples

(8% of population in Portugal)

2nd most important protected area for the species



FAUNA

Pin-tailed Sandgrouse (*Pterocles alchata*)

Population in Portugal: 3-6 couples

Considered as extinct species one decade ago

In PNTI occurs the only portuguese population



Selected Sports



Pedestrianism



Mountain biking



Orienteering



Horse riding

Actions that create impacts

- Staying outside tracks and paths
- Fire ignition
- Walking on tracks and paths
- Car circulation outside roads
- Deposition of debris and garbage
- Cutting vegetation
- Putting tents by organizing staff 🕒
- Putting controls (orienteering) 🕒
- Using lights 🕒 ☾
- Bicycle cleaning 🕒
- Noise (sound equipment) 🕒
- Parking

Environmental Impacts

- ❑ Direct disturbance (noise, simple presence,...)
- ❑ Trampling and soil erosion in sloppy areas
- ❑ Being run over by cars
- ❑ Plant cover destruction
- ❑ Pollution of surface and ground waters

	Parâmetros do meio	Variáveis	ACÇÕES											
			Permanência de Pessoas ou animais fora de caminhos ou trilhos (queste)	Ignição e libertação de materiais de combustão	Circulação de pessoas em trilhos e caminhos	Circulação de viaturas fora de caminhos	Deposição de detritos fora de contentores apropriados	Remoção de vegetação	Montagem de tendas pela organização ☉	Montagem de Balizas ☉	Utilização de fontes luminosas (faróis das bicicletas e focos frontais) ☉ ☾	Lavagem bicicletas (após provas BTT) ☉	Emissão de Ruído (equipament o sonoro) ☉	Estacion/ meio transp.
Biosféricas Naturais	Pedologia (tipos solos FÁC)	Regossolos	- 2 T	0	- 1 T	- 3 T	0	- 2 T	- 2 T	- 1 T	0	- 2 T	0	- 2 T
		Cambissolos	- 1 T	0	- 1 T	- 2 T	0	- 2 T	- 1 T	- 1 T	0	- 1 T	0	- 1 T
	Recursos Hídricos	Qualidade da água	0	0	0	- 1 T	- 1 T	0	0	0	0	- 2 T	0	- 1 T
		Erosão (declive)	0-3%-Plano	0	0	0	- 1 T	0	- 1 T	- 1 T	- 1 T	0	0	0
	3-8%-Suave		- 1 T	0	- 1 T	- 2 T	0	- 2 T	- 1 T	- 1 T	0	- 1 T	0	- 2 T
	8%-16%-Moderado		- 2 T*	0	- 2 T	- 3 T	0	- 3 T	- 2 T	- 2 T	0	- 2 T	0	- 3 T
	16%-20%-Acentuado		- 3 T*	0	- 2 T	- 3 T	0	- 3 T	- 2 T	- 2 T	0	- 2 T	0	- 3 T
	> 20%-Muito acentuado		- 4 T*	0	- 2 T	- 4 T	0	- 4 T	- 3 T	- 3 T	0	- 3 T	0	- 4 T
	Flora (Carta síntese de valores florísticos)	Excepcional	- 2 T	0	0	- 3 T	- 1 T	- 4 P	- 3 T	- 1 T	0	- 1 T	0	- 2 T
		Alto	- 2 T	0	0	- 3 T	- 1 T	- 4 P	- 3 T	- 1 T	0	- 1 T	0	- 2 T
		Médio/Baixo	- 1 T	0	0	- 1 T	- 1 T	- 2 T	- 1 T	- 1 T	0	- 1 T	0	- 1 T
	Fauna (Mapa global de valor faunístico do PNTI)	Excepcional	- 3 T	- 1 T	- 3 T ●	- 4 P ●	- 1 T	- 3 T	- 2 T ●	- 1 T ●	- 4 T	0	- 4 T ●	- 2 P ●
		Alto	- 2 T	- 1 T	- 2 T ●	- 3 T ●	- 1 T	- 2 T	- 1 T ●	- 1 T ●	- 3 T	0	- 4 T ●	- 1 P ●
		Médio/Baixo	- 1 T	- 1 T	- 1 T	- 2 T ●	0	- 1 T	- 1 T ●	0	- 2 T	0	- 3 T ●	- 1 P ●
Ar	Qualidade	0	- 2 T	0	- 1 T	0	0	0	0	0	0	0	- 1 T	
Variáveis Socio-económica	Paisagem	Impacte visual	- 1 T	- 2 T	- 1 T	- 2 T	- 2 T	- 2 T	- 1 T	- 1 T	- 1 T	- 2 T	0	- 1 T
	Sociedade	Sector económico	0	0	+ 2 T	0	0	0	0	0	0	0	0	0
	Património construído	Valorização	+ 2 P	0	0	0	- 1 T	0	0	- 1 T	0	0	0	- 1 T

Legenda: Sinal: Positivo (+), Negativo (-)

* Actividades equestres

☉ - Vertente competitiva

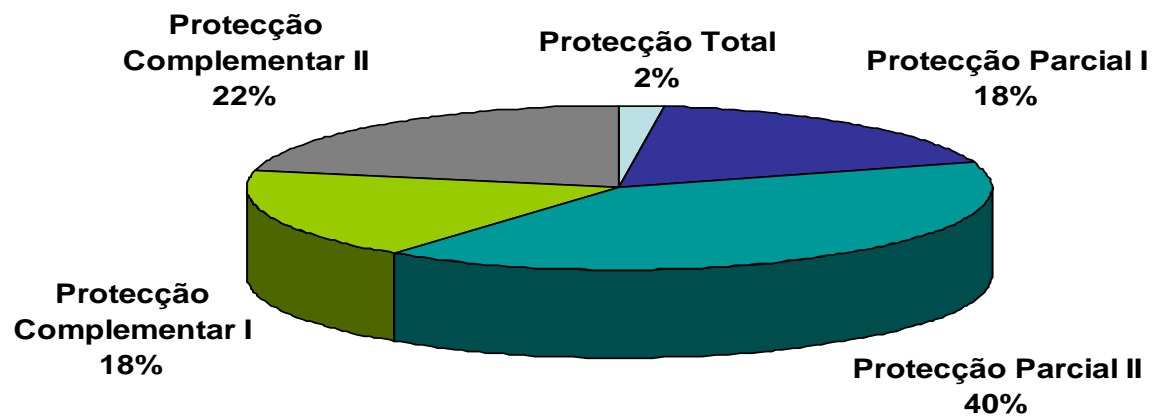
Duração: Temporário (T), Permanente (P)

● Época nidificação da avifauna

☾ - Durante actividades nocturnas

Magnitude / Significado					
0 Impacte nulo	1 (-) Reduzida	2 (+) Moderada	2 (-) Moderada	3 (-) Elevada	4 (-) Muito Elevada

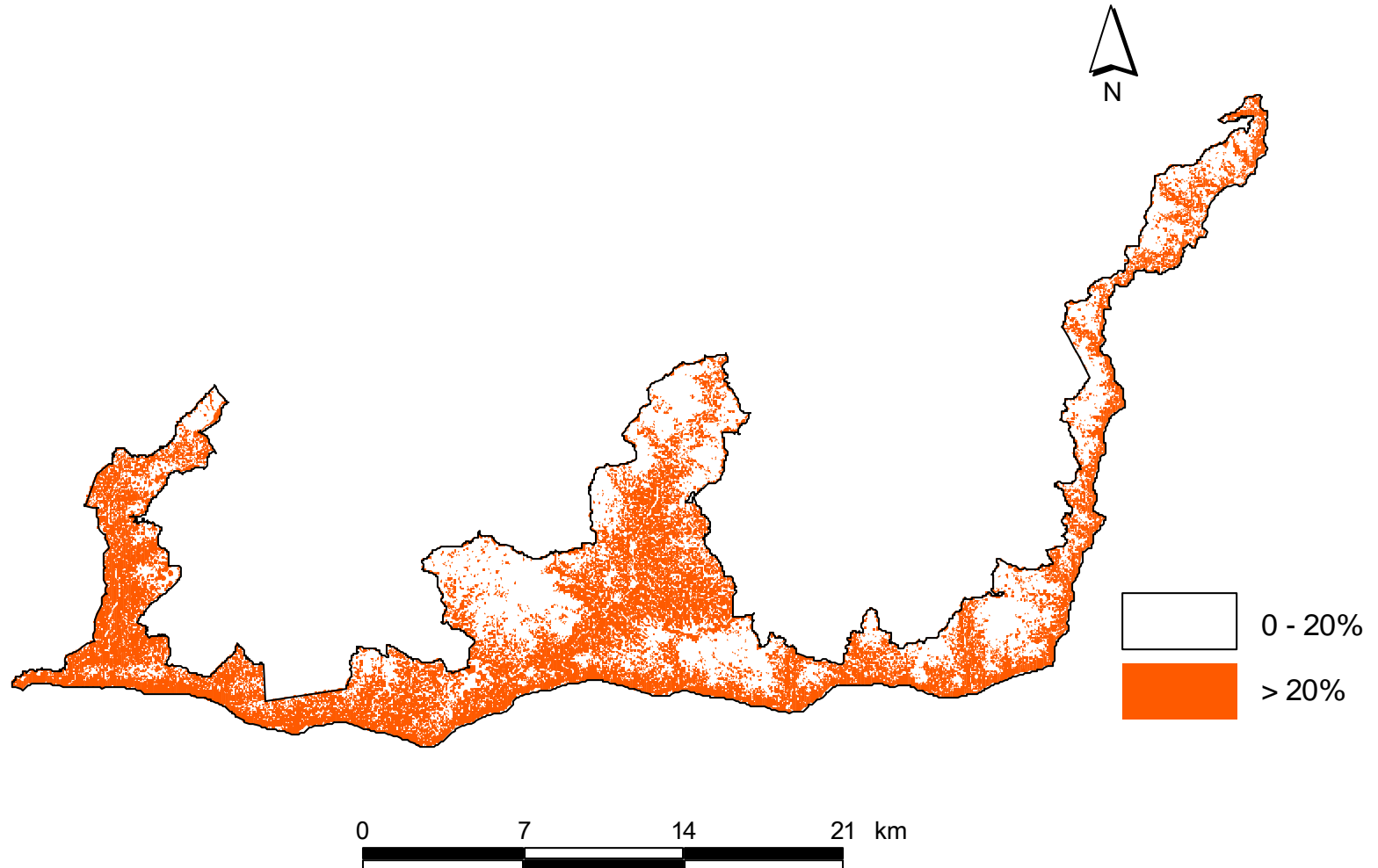
Protection regimes in PNTI



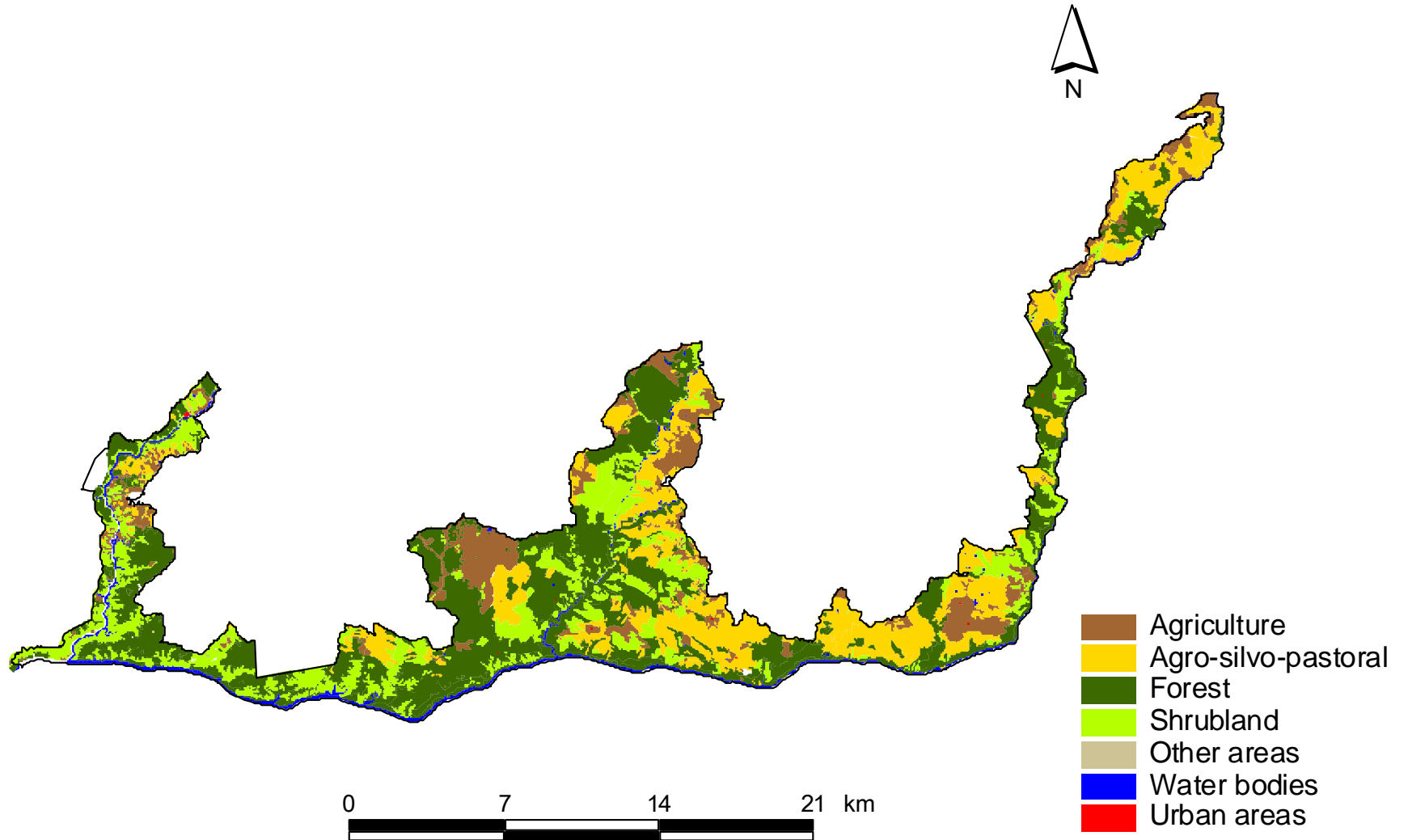
Potentialities and constrains (Sport activities)		Pedestrianism	Orienteering	Mountain bike	Horse riding
Annual intensity of demand	Spring / Fall	👍	👍	👍	👍
	Summer	👉	👉	👉	👉
	Winter	👉	👉	👉	👉
Slopes	0 - 20%	👉	👉	👉	👉
	> 20%	👋	👋	👋	👋
Compatibility with the land use regime	Agriculture	👉	👉	👉	👉
	Agro-silvo-pastoral	👉	👉	👉	👉
	Matorral	👍	👉	👍	👍
	Forest	👉	👉	👉	👉
	Urban areas	👍	👉	👉	👉
	Others	👉	👉	👉	👉
Protected Spaces in PNTI Land use plan	Total protection	👋	👋	👋	👋
	Partial protection (Type I and II)	👉	👋	👉 ¹	👉 ¹
	Complementary protection (Type I and II)	👍	👍	👍	👍

👍 -optimal; 👉 - good; 👉 - reasonable; 👋 - not good; 1-leisure mode

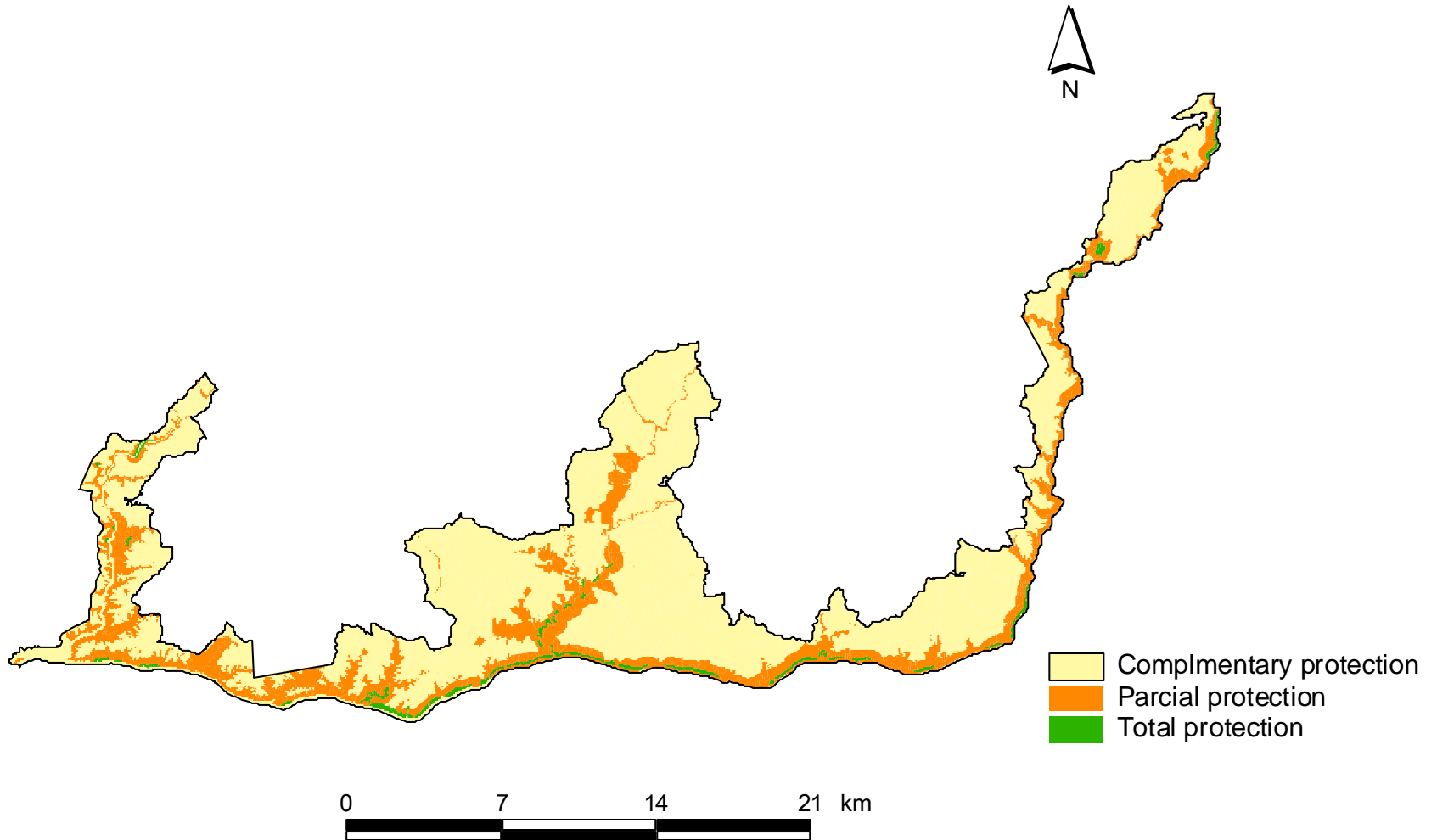
Slope map



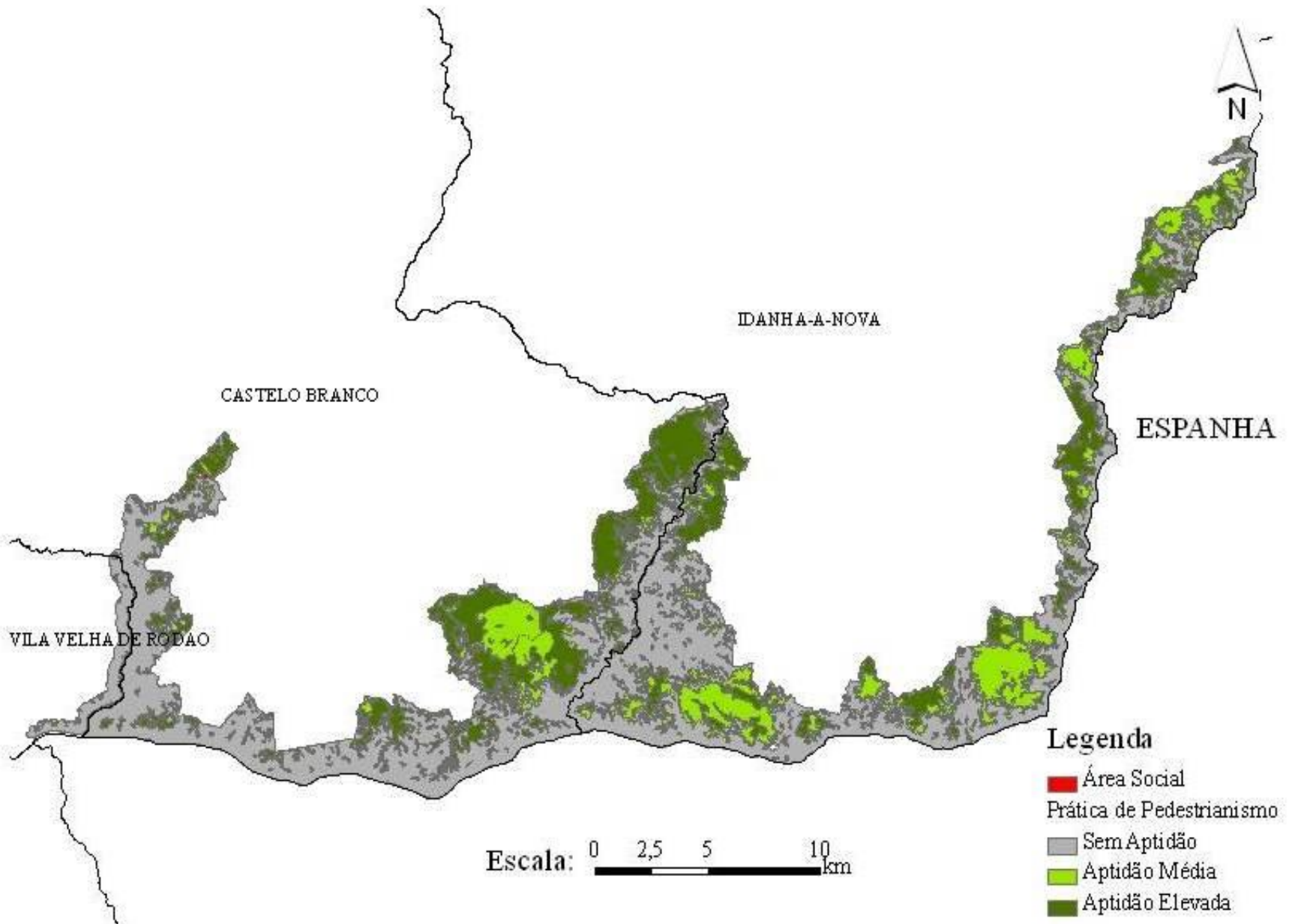
Land use map



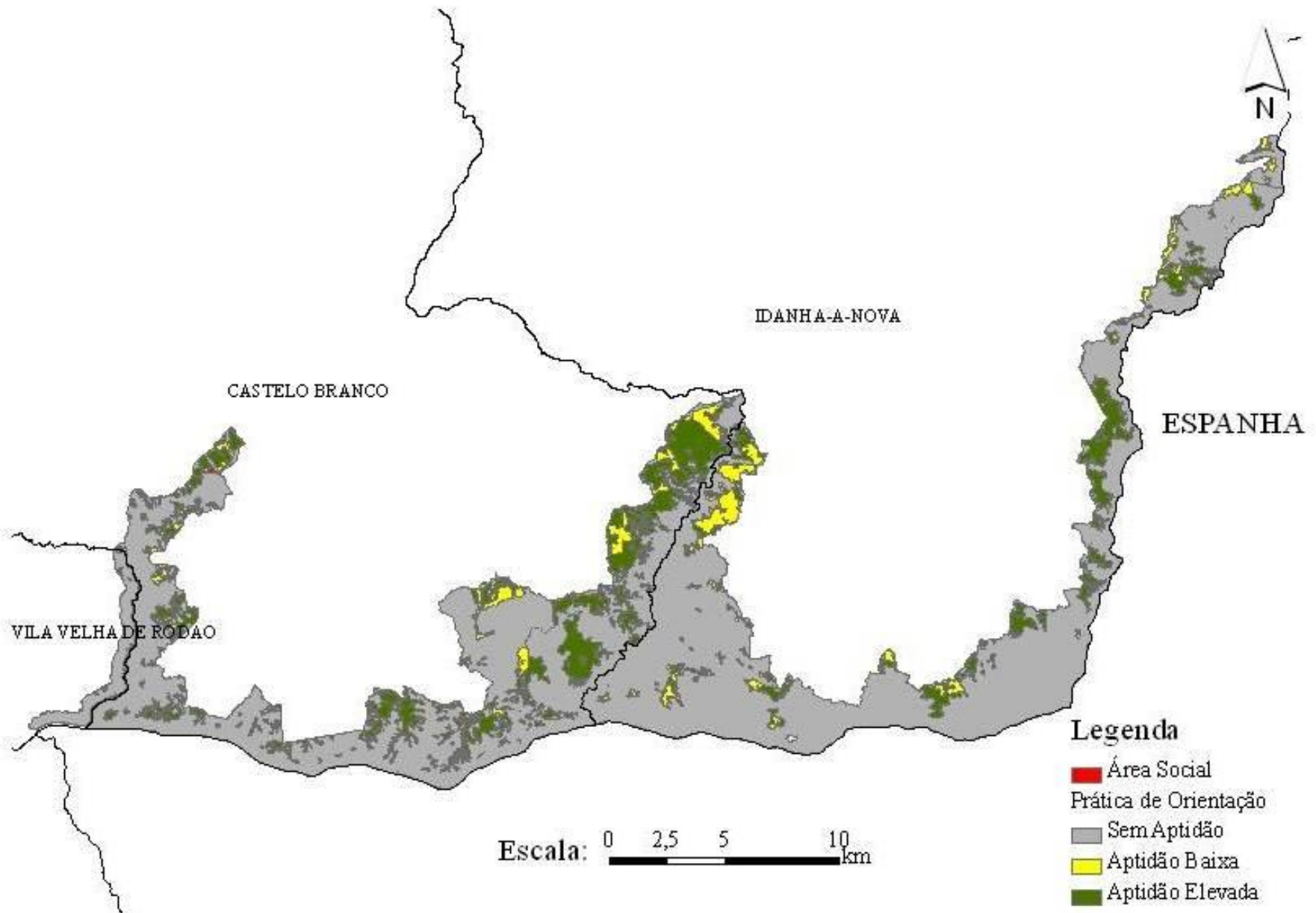
Protection status map



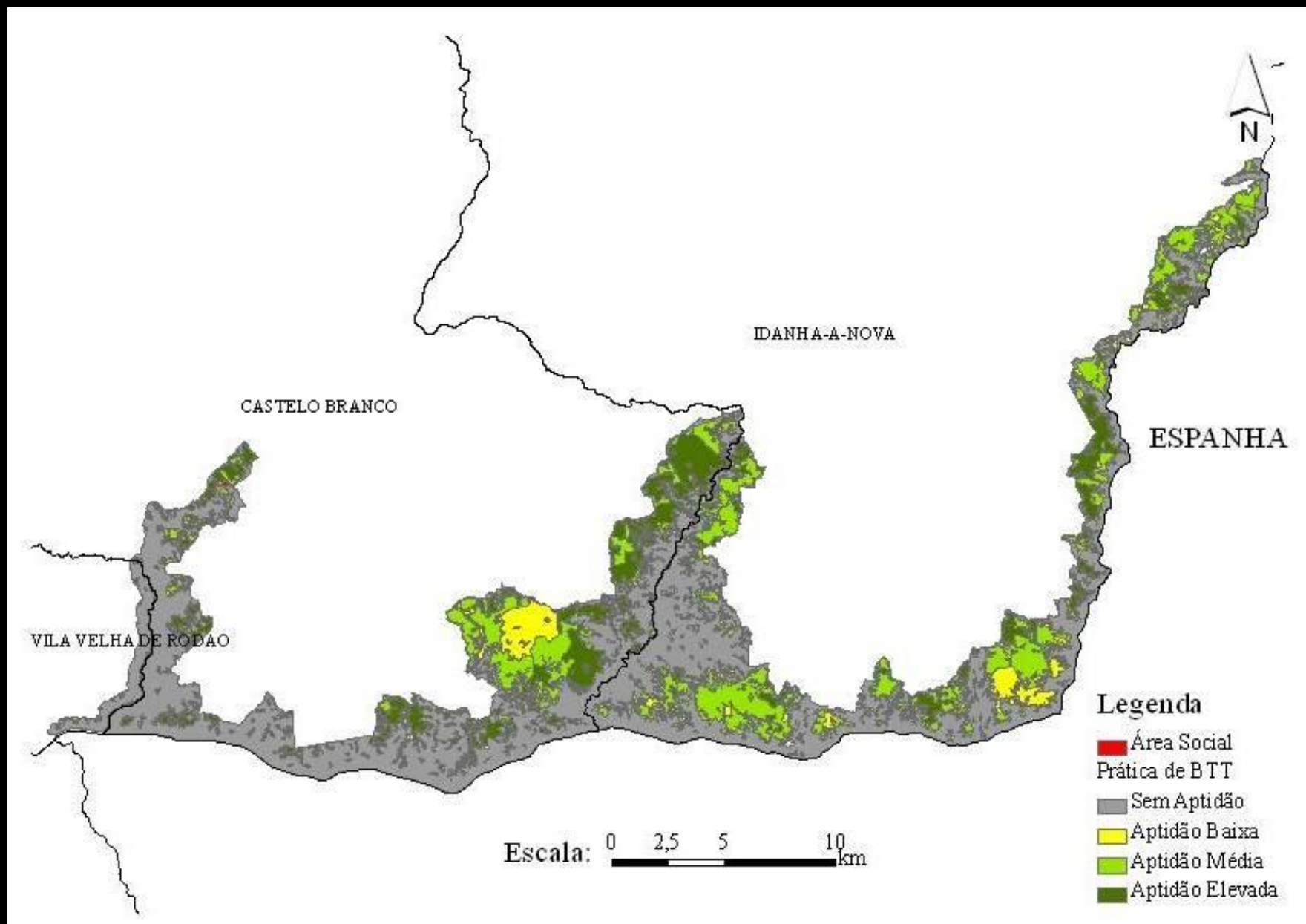
Suitability Map - Pedestrianism



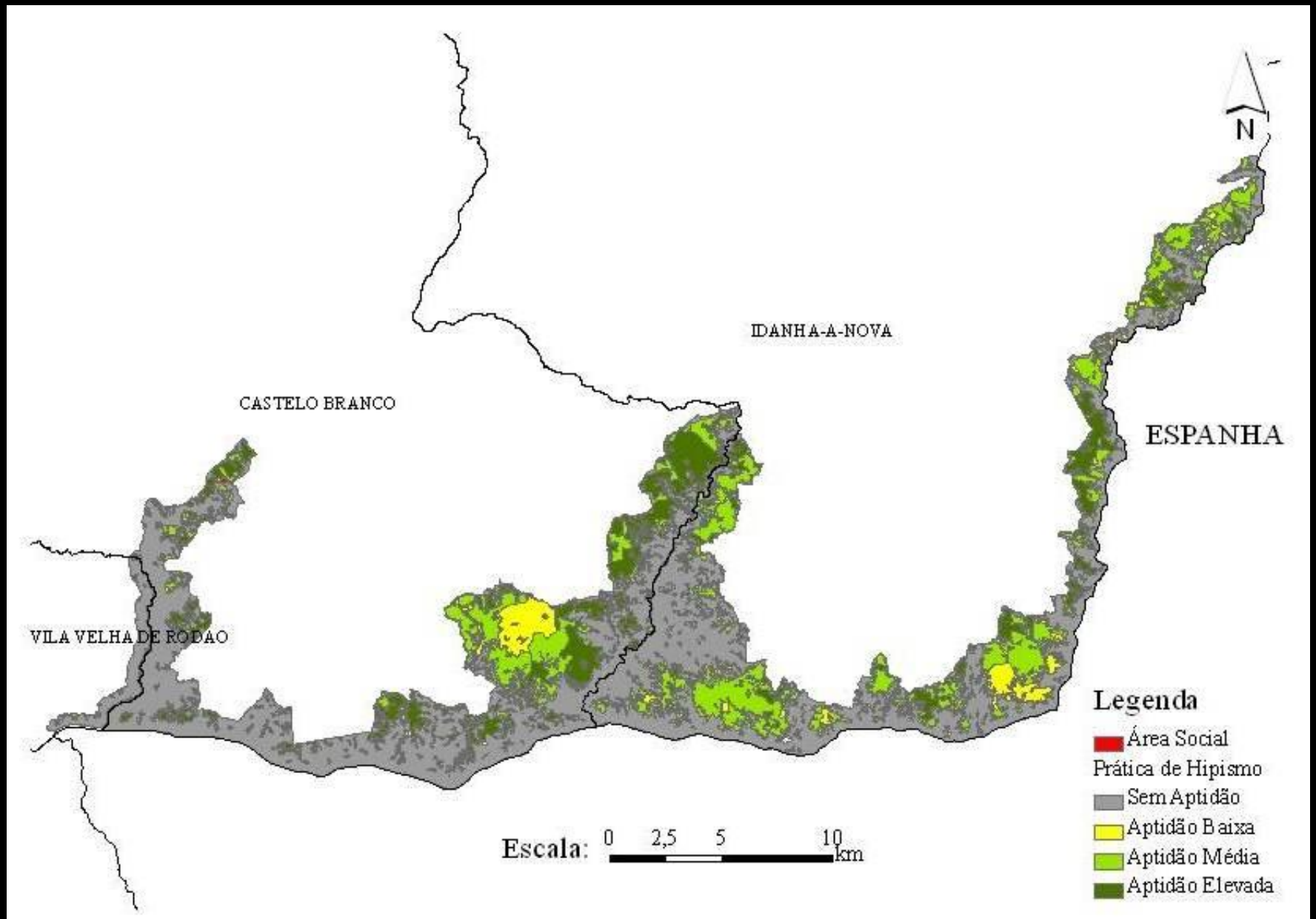
Suitability Map - Orienteering



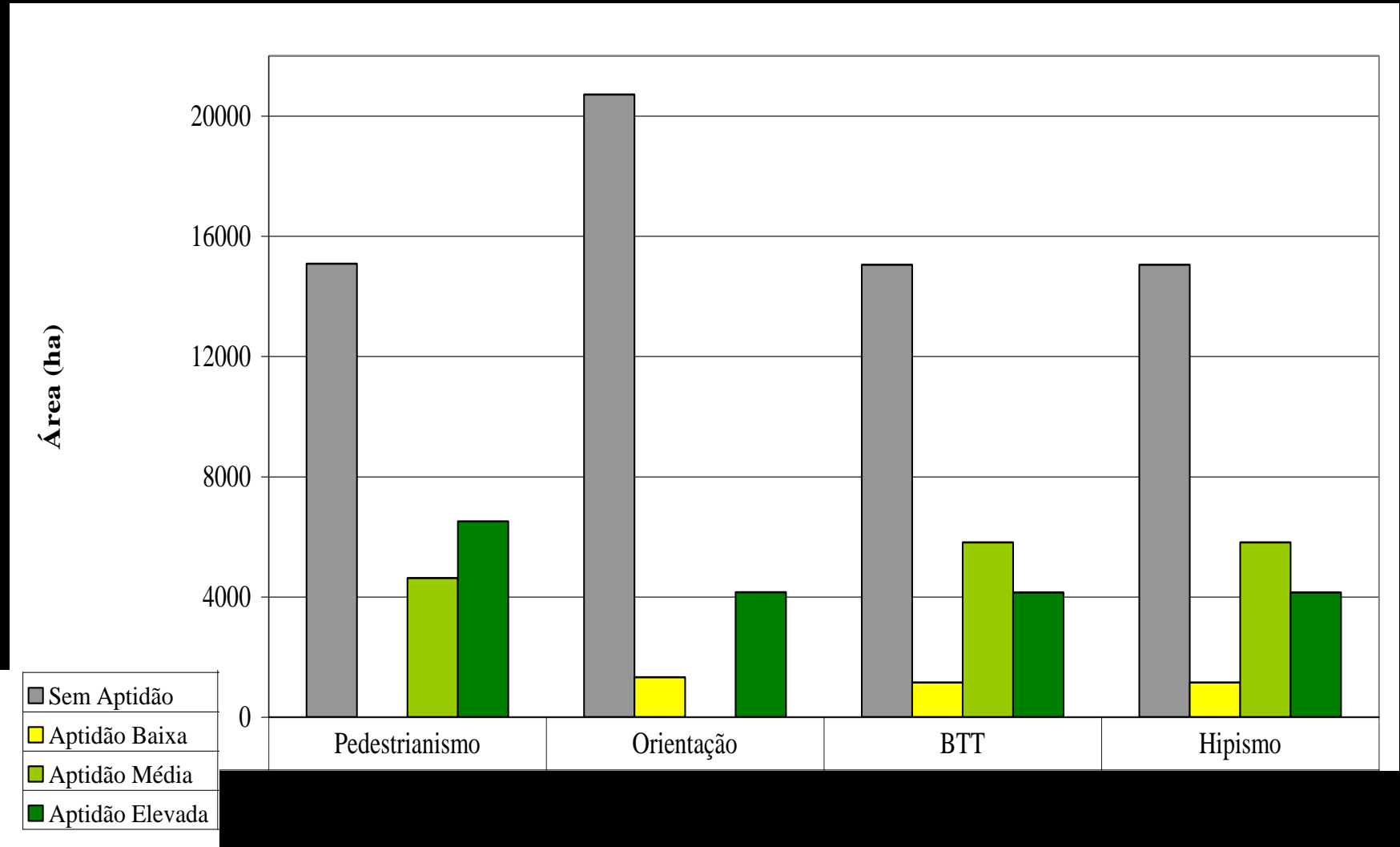
Suitability Map – Mountain biking



Suitability Map – Horse riding



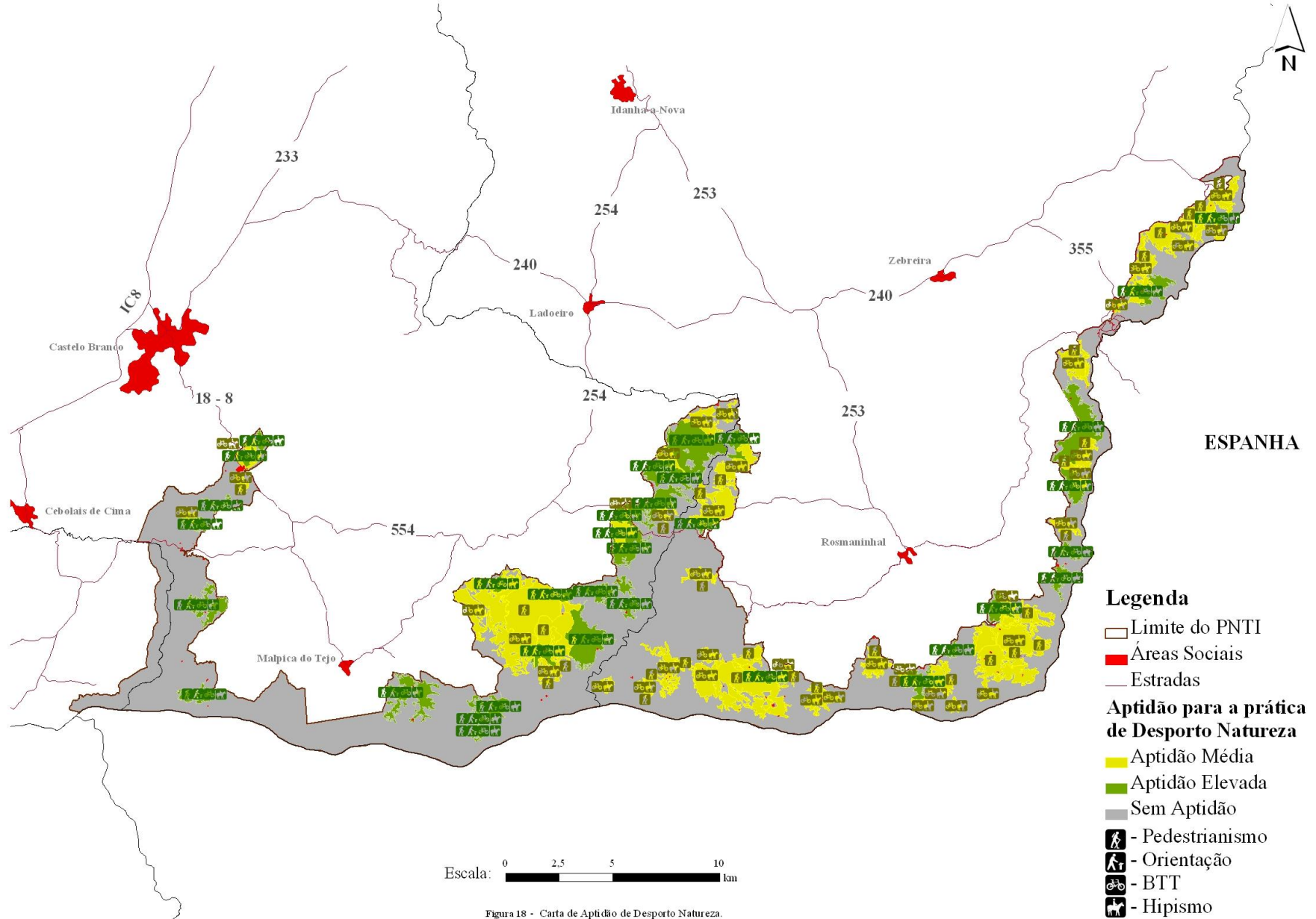
Quantification of areas with different suitability for Outdoor Sports in PNTI



Proposal

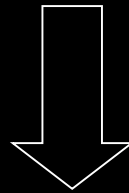
- Proposal map: areas with high, medium and low suitability.
 - **High suitability areas** – low sensitivity.
 - **Medium suitability areas** – some sensitivity.
 - Sports and other recreation activities only in pathways, during the breeding season (15th December to 15th August).
 - Competition not allowed.
 - **Low suitability areas** – High ecological sensitivity or slopes > 20%.
 - Recreation activities not allowed.

Proposal Map

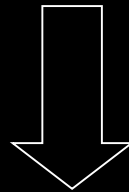


Post evaluation process

monitoring and audit programs



to verify the efficiency of environmental management measures



To mitigate impacts over natural values