

# *nove passos*

IN THE LANDS OF TRÁS-OS-MONTES



## TERRAS DE TRÁS-OS-MONTES

### The Natural Destination

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Located in the extreme northeast of Continental Portugal, *Terras de Trás-os-Montes* (Lands of Trás-os-Montes) are a singular territory, covering an extensive area of about 5,540 km<sup>2</sup> (8,6% of the northern region), with unique natural value.

They are particularly distinct from a biophysical point of view. The combination of those biophysical singularities with the specific demographic and social structures of the region, result in one of Europe's richest natural areas.

Terras de Trás-os-Montes are constituted by the municipalities of Alfândega da Fé, Bragança, Macedo de Cavaleiros, Miranda do Douro, Mirandela, Mogadouro, Vila Flor, Vimioso and Vinhais. Adding to their specific territorial characteristics, they have in common the remarkable natural richness of the region.



The territory of *Terras de Trás-os-Montes* covers a vast area with diverse orographic and climatic conditions, usually distinguishing two main sub-regions: *Terra Fria Transmontana* (Cold Land) and *Terra Quente Trasmontana* (Hot Land).

Cold Land, essentially to the north, presents higher altitude reliefs with colder and wetter climate. *Hot Land*, further south, features lower altitude reliefs with a warmer and drier climate.

Owing to the variations of orographic and climacteric conditions, there is also a difference regarding soil uses in both sub-regions.

To the north, *Cold Land* agriculture is dominated by chestnut production. Much of the territory is covered by extensive forest areas, dominated by native species such as the Pyrenean oak (*Quercus pyrenaica*), in mosaic with pastures and hay meadows.

In the south, *Hot Land* cultures are adapted to the Mediterranean weather, often dominated by olive trees and, in some cases, by almond trees. Large forest stands are less abundant, with large areas dominated by shrublands and pastures. Woodlands, less common than in the north, are essentially dominated by cork oak (*Quercus suber*), sometimes in extensive areas. They are often managed and exploited, mainly for cork production.

These often-opposite characteristics result in an ecologically unique territory, with a rich and diverse geological and biological heritage, that features Trás-os-Montes among the most valuable natural regions in Europe.

For this reason, *Terras de Trás-os-Montes* are the heart of the Transboundary Biosphere Reserve (RBT) Meseta Ibérica, a classification attributed by UNESCO to the north-eastern region of Portugal and cross-border areas of the province of Salamanca (Spain).

This classification highlights the extraordinary natural heritage of the region, promoting its unique conditions, such as the sustainable coexistence of Nature conservation and the use of the territory by human populations. This is precisely the secret that makes *Terras de Trás-os-Montes* *The Natural Destination*.

In the project '*Nove Passos nas Terras de Trás-os-Montes*' (Nine Steps in the Lands of Trás-os-Montes) we give you a glimpse of this Natural Destination, on a journey through nine natural trails, one in each municipality, inside the main protected areas of this remarkable region.

The Lands of Trás-os-Montes can be vastly different, from place to place, but they are intrinsically inseparable, with a territorial and natural continuum. For this reason, we present them as a single entity, with an extraordinary natural heritage. We highlight the protected areas visited by these 'Nine Steps' and present some of the most spectacular natural features that distinguish this region. Finally, we give you a glimpse of the 'Nine Steps' in Nature: nine trails and nine natural themes, each one defining the protected areas in which they are inserted.



Traditional landscape of Trás-os-Montes

## PROTECTED AREAS

The classification of this region as a Transboundary Biosphere Reserve (TBR) *Meseta Ibérica* is a global indicator of the regional natural heritage. To completely understand this richness, it is essential to learn a little bit about the numerous protected areas recognised in the Lands of Trás-os-Montes.

The regional biological and geological diversity is reflected in the extensive amount of land under legal protection, specifically for preservation and conservation of Nature.

In the region there are four areas of national and regional scope and several others classified at European level, under the Natura 2000 Network. Despite the differences, the multiple protected areas are linked by the particular features that constitutes the *Terras de Trás-os-Montes*.

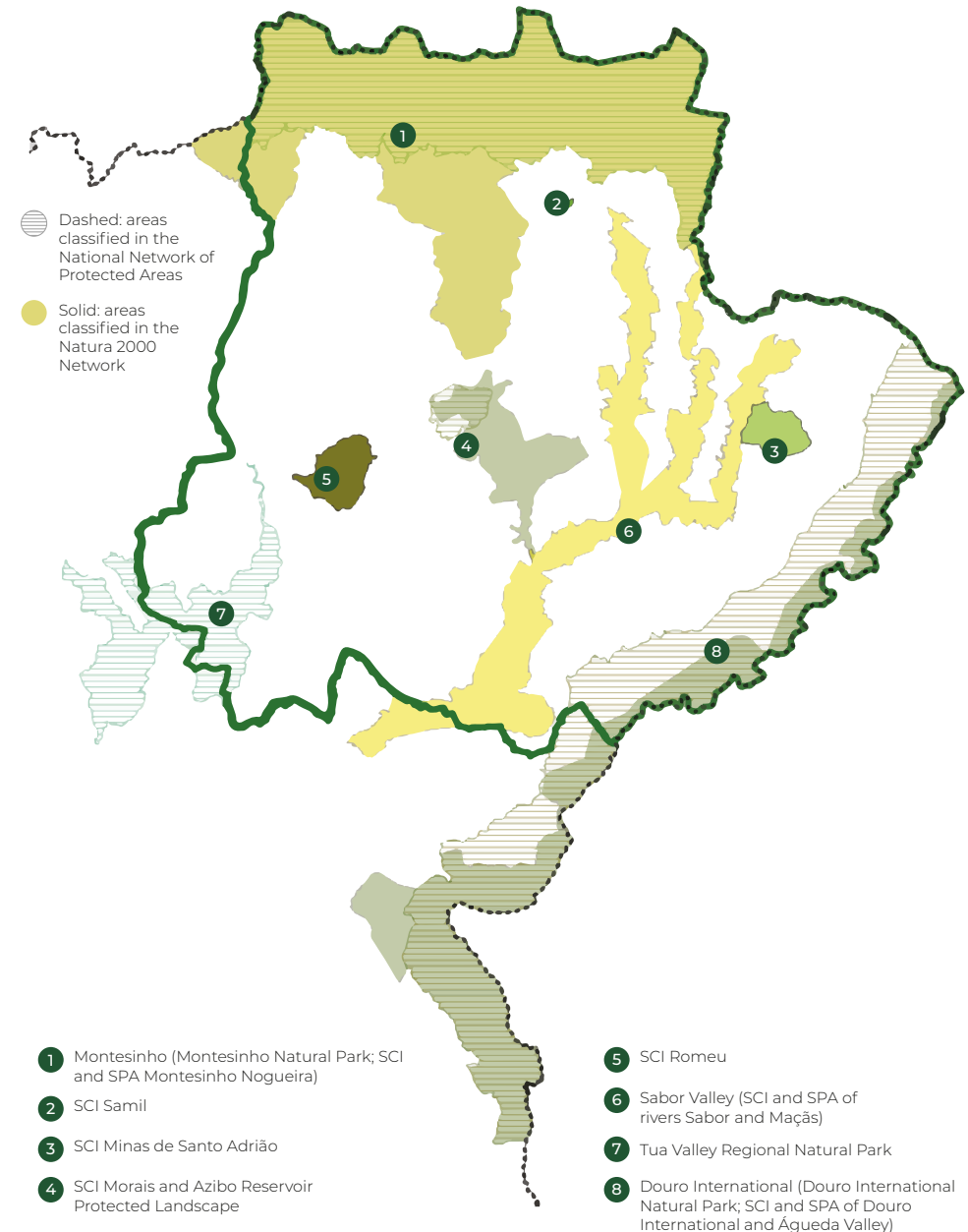
Fourteen areas, with different legal protection statuses are classified for Nature conservation. About 42% of the territory is protected, one of the highest percentages of protected areas of Portugal and of Europe.

Four of these areas are part of the National Network of Protected Areas (two with national and two with regional/local scopes), and 10 are included in the Natura 2000 Network (7 Sites of Community Importance (SCI) and 3 Special Protection Areas (SPA)).

From north to south, from east to west, from main rivers to mountains, the 'Nine Steps' cover twelve of these protected areas, allowing on-site observation of the main natural features and regional diversity.

\*The Sites of Community Importance *Minas de Santo Adrião* (in the municipalities of Miranda do Douro and Vimioso) and *Samil* (in the municipality of Bragança) are the smallest protected areas of *Terras de Trás-os-Montes*. They are the only ones not visited by the 'Nine Steps' project.

## PROTECTED AREAS





## Montesinho

Located in the extreme north of the region (limit northeast of Portugal), the mountains of Montesinho and Coroa form one of the most spectacular and extensive natural areas in Portuguese territory, the Montesinho Natural Park (PNM).

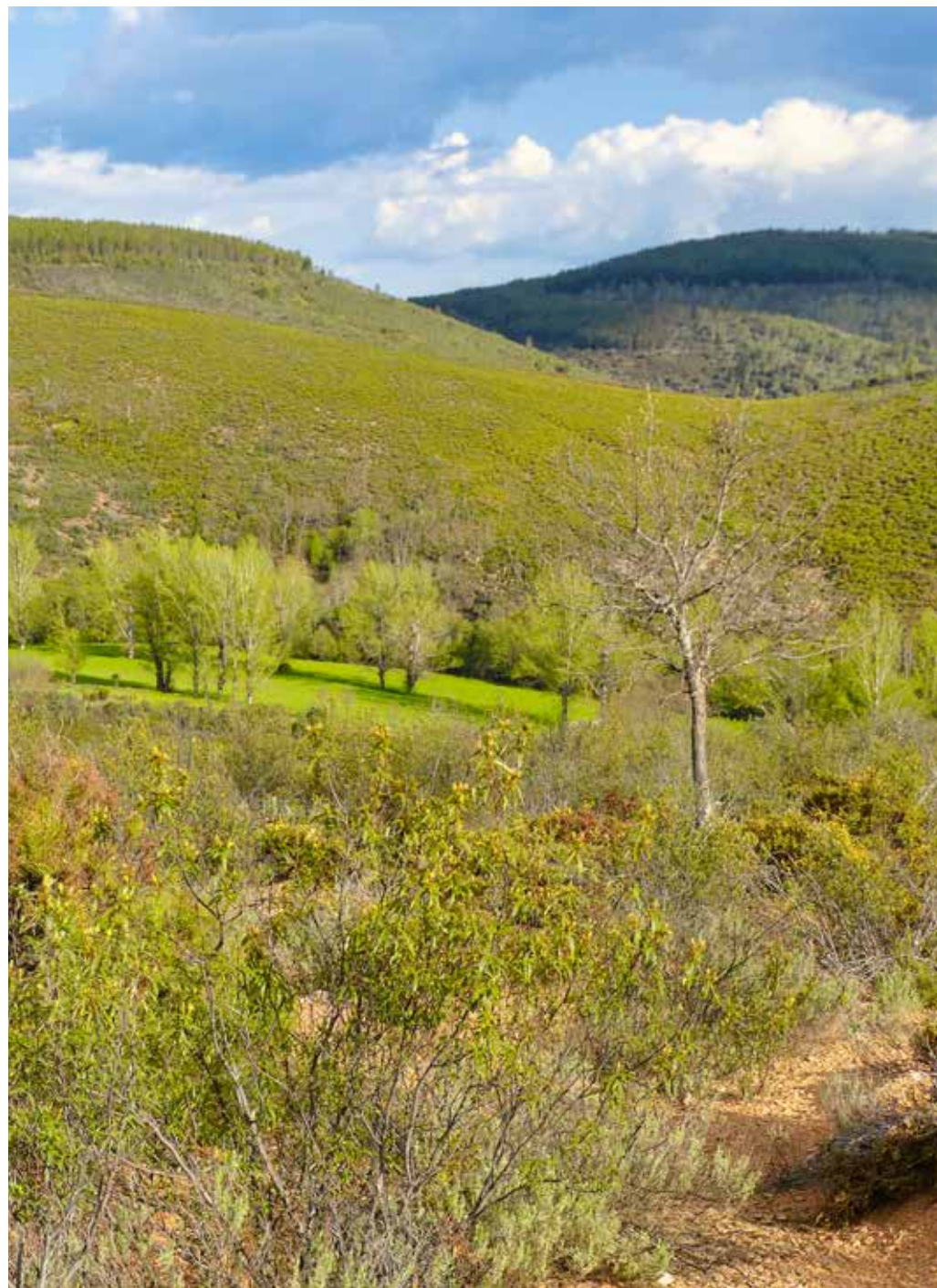
The PNM is one of the oldest protected areas in Portugal (officially designated on August 30, 1979), which reflects its natural relevance.

The classification as Natural Protected Area promotes the conservation of the unique values of this territory. The natural richness of this area is the consequence of the perfectly harmonious coexistence of relatively humanized areas, with places of high naturalness and complexity. Geomorphology, climatic conditions and geographical location, in association with some very particular soils characteristics, are responsible for an impressive biodiversity, with one of the highest indexes of biological diversity in Portugal.

The PNM area covers the entire Portuguese extreme northeast, in an area with 74,229 ha. About 95% of the area is located in the municipalities of Vinhais and Bragança (about 2% in Macedo de Cavaleiros and about 3% in Chaves).

Due to its natural heritage, the entire PNM area was later included in the Natura 2000 Network. The area is defined as fundamental for the conservation of biodiversity at European level. The Site of Community Importance and the Special Protection Area of Montesinho / Nogueira were thus designated for the conservation of their unique habitats and rare faunistic and floristic species. For some of them, this area represents a particularly important stronghold. These Natura 2000 Network areas are mainly coincident with the Natural Park, but also include a wider area, extending to the south. That extra area is essentially Serra da Nogueira, a mountain area mainly covered with oak forests.

As a whole, these protected areas have a very high natural interest, with an impressive diversity of species of fauna, flora and natural habitats.



Landscape of Montesinho Natural Park

The abundance and diversity of vegetation types, with extensive woodlands of Pyrenean oak, chestnut and holm oak trees, but also riparian forests, broom and gum rockrose shrublands and hay meadows, are noteworthy. Due to the great geological and climatic variability, flora is also very diverse, with special relevance for some unique species of this region, typical of ultrabasic rocky soils.

Montesinho area is one of the most important areas for the conservation of the Iberian wolf (*Canis lupus signatus*), but also for other very rare mammals, such as the wild cat (*Felis silvestris*) and the Pyrenean desman (*Galemys pyrenaicus*). Montesinho is probably the Portuguese area with the highest abundance of red deer (*Cervus elaphus*) and roe deer (*Capreolus capreolus*). These protected areas are also important for other animal groups, including more than 100 nesting birds, dozens of reptiles and amphibians and thousands of invertebrates, with many strictly protected species in Portugal.



Iberian wolf



## Douro International

Located in the eastern part of *Terras de Trás-os-Montes*, Douro International comprises the Douro and Águeda rivers and their canyons, that border Portugal and Spain.

It is an arid territory, marked by dry environments, strongly Mediterranean, rugged landscapes in rocky steep valleys, with large and spectacular cliffs. These cliffs usually end on plateaus of soft reliefs, mostly used in agricultural activities, such as extensive cereal crops and livestock farming.

The Douro International Natural Park (PNDI), with an area of 86,835 ha, includes the border area of the Douro and Águeda rivers, as well as the national side of its rugged valleys and adjacent plateaus. It continues in Spanish territory with its counterpart *Arribes del Duero Natural Park*, forming one of the largest protected areas in Europe, with an area of 192,605 ha.

Much of the area of the Natural Park is also included in the European Natura 2000 Network. The Site of Community Importance and the Special Protection Area of Douro International and Águeda Valley are basically coincident and slightly smaller than the Natural Park (they cover the entire river valley but a smaller area of the surrounding plateau).

Globally, these large protected areas include the territories of five different municipalities. More than 50% of these areas are part of *Terras de Trás-os-Montes*, specifically in the municipalities of Miranda do Douro and Mogadouro.

The protected areas of the Douro valley include remarkable and absolutely unique landscapes. Its particular geomorphology holds impressive scenic and scientific values, creating conditions for a particularly special biodiversity.

Exceptionally rich in terms of biological diversity, the Douro International is particularly important for the conservation of its extraordinary communities of rupicolous species. In fact, this is undoubtedly one of the most important Iberian areas for many highly endangered birds, typical from these rocky environments.



The vegetation is often dominated by woodlands of Pyrenean oak, Portuguese oak, holm oak and cork oak and sometimes European hackberry trees, but also shrublands of broom, bridal broom and gum rockrose. Endemic woodlands of prickly juniper and some well-preserved riparian forests, both endangered and protected by law (listed as priority natural habitat types), are also present. Several rare plants, including some regional, national and Iberian endemic species, can be found in some particular ecological niches.

About 250 species of vertebrate animals, including 35 mammals, 20 reptiles, 11 amphibians, 14 fishes and 170 birds, use these protected areas.

The bird communities have some of the most emblematic Portuguese birds, such as the griffon vulture (*Gyps fulvus*), the Egyptian vulture (*Neophron percnopterus*), the golden eagle (*Aquila chrysaetos*), the Bonelli's eagle (*Hieraetus fasciatus*), the peregrine falcon (*Falco peregrinus*), the black stork (*Ciconia nigra*), the eagle-owl (*Bubo bubo*) and many others.



Douro International river canyon

Griffon vulture

## Sabor valley

The Sabor river is a tributary of the right bank of the Douro river. The Sabor valley, including its main affluent, the Maçãs river, is characterized by highly irregular landscapes, strongly influenced by a Mediterranean climate.

These features, combined with isolation and reduced human pressure, result in very distinguished floristic communities, unique in northern Portugal. For the same reason, this is also an important area for many wild animal species, including several endangered species, especially birds.

The rivers and respective valleys are protected by Natura 2000 Network in two different forms. The Site of Community Importance and the Special Protection Area of the rivers Sabor and Maçãs include a large extent of these rivers and the main tributary of the Maçãs: the Angueira river.

The protected area in the Sabor valley extends over 50,000 ha, including the rivers, the often-rugged valleys and surrounding areas, dominated by shrublands, natural woodlands, pastures and olive groves.

More than 90% of these protected areas are included in the *Terras de Trás-os-Montes*, specifically in the municipalities of Alfândega da Fé, Mogadouro, Vimioso, Bragança, Macedo de Cavaleiros and Miranda do Douro.

Historically, these were sinuous, meandering watercourses, with little human influence, flowing naturally, from its source to the river mouth. Currently, the rivers have been partially modified by the construction of a big dam in the lower part of the Sabor river (Baixo Sabor Hydroelectric Power Plant). This construction resulted in some significant changes from the ecological and landscape point of view. The reservoir gave rise to an impressive complex of lakes (Sabor lakes), with influence on the local wildlife, but with an extraordinary landscape value. In the upstream areas, Angueira and Maçãs rivers still keep their original forms, contrasting with the extensive and beautiful water plan of the Sabor river lower course.



Angueira river



Sabor lakes



This is an area dominated by vegetation adapted to the geological and climatic singularities of these steep valleys. The natural vegetation is mostly dominated by shrubs, with small patches of highly important woodlands, with cork oak, holm oak and prickly juniper trees. The most relevant floristic communities include species dependent of the rugged habitats and river beds, like the highly endangered communities of the evergreen shrub *Buxus sempervirens*.



Peregrine Falcon

These steep valleys and undisturbed slopes, provide good nesting conditions for several bird species. Endangered birds of prey, like the golden eagle (*Aquila chrysaetos*), the Bonelli's eagle (*Hieraetus fasciatus*) and the peregrine falcon (*Falco peregrinus*), are relatively common here. The Sabor river, and specially its main tributaries, are also very important for several aquatic and semi-aquatic species, such as the otter (*Lutra lutra*), the Pyrenean desman (*Galemys pyrenaicus*), the Mediterranean pond turtle (*Mauremys leprosa*) and several endemic and rare species of fish and aquatic invertebrates.

In the big reservoir, still adapting to the new ecological environment, species that typically explore large water bodies have already started to establish their populations.



## Morais and Azibo reservoir

Mainly in Macedo de Cavaleiros municipality, you can find two partially coincident protected areas of great natural importance in the region: the Site of Community Importance Morais and the Azibo Reservoir Protected Landscape. The entire territory of Macedo de Cavaleiros is also designated by UNESCO as *Geopark Terras de Cavaleiros*, recognizing the geological and historical relevance of this area, where SCI Morais and the Azibo Reservoir Protected Landscape are included.

SCI Morais is a protected area with about 12.878 ha, identified and protected by Natura 2000 Network. It is a mountainous area, of medium altitude, which roughly overlaps the *massif of Morais*, a hill with particular interest from the geological and botanical points of view.

The Azibo Reservoir Protected Landscape includes the Azibo lagoon and surrounding areas, in an extension of 3.327 ha. This reservoir was created with the construction of a hydro agricultural dam in the upper part of the river Azibo (tributary of the Sabor river), joining 3 small watercourses: the Azibo river and the Azibeiro and Reguengo streams.



Great crested grebe

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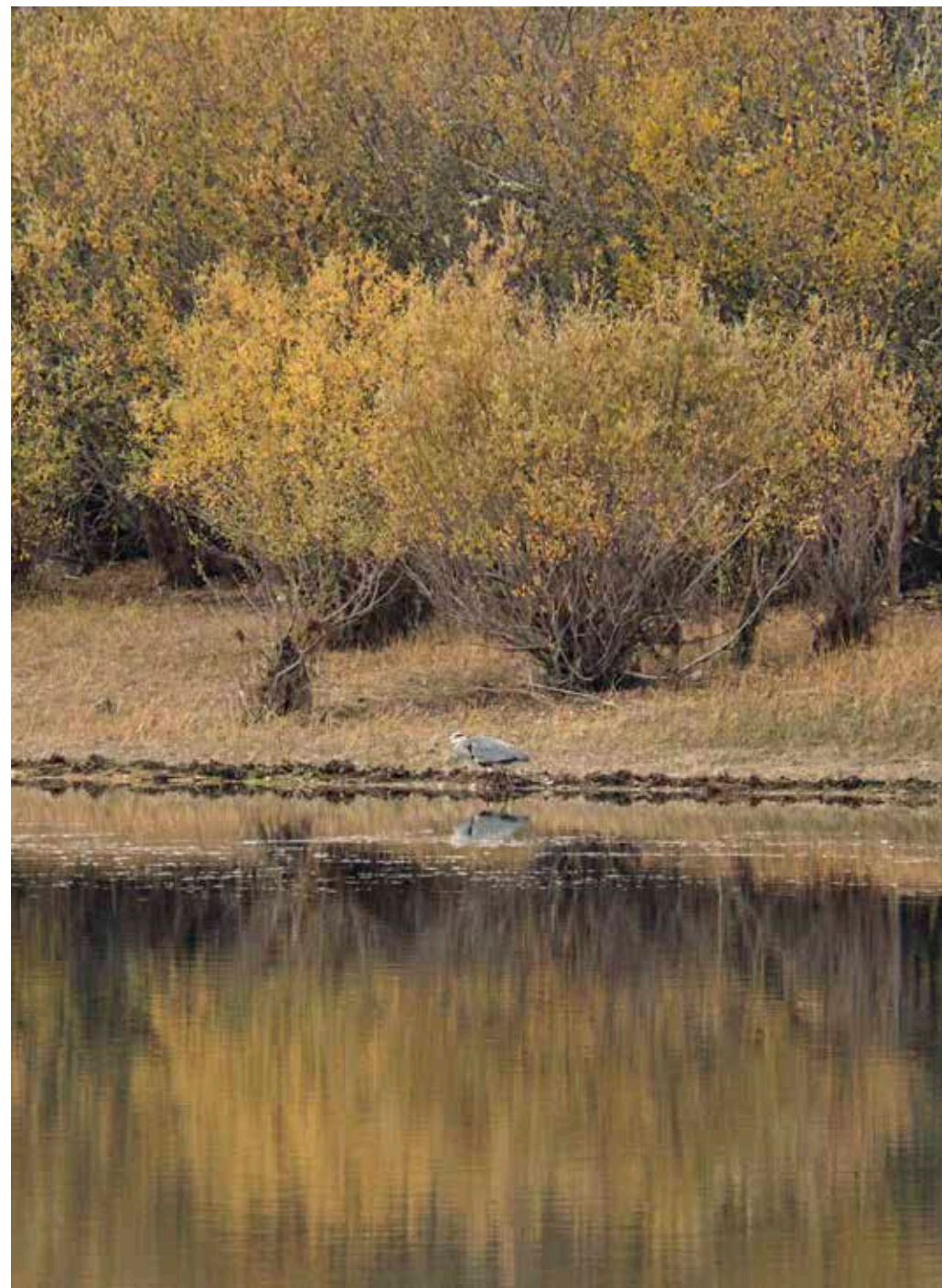
These two protected areas, both designated for biodiversity conservation, are located almost entirely in the Geopark *Terras de Cavaleiros*. The Geopark promotes and protects a unique geological and geomorphological heritage, recognized as a UNESCO World Geopark. The Geopark has 42 geosites, remarkable from the scientific point of view, with records of a history of more than 400 million years.

SCI Morais holds some very particular botanical communities, that results of those specific geological features. Several Iberian and Lusitanic endemics species of plants, often associated with outcrops of ultrabasic rocks, are among the rarest and most endangered botanical species of the region. The dominant vegetation are cork oak and holm oak woodlands, but there are also some important patches of woodlands of prickly juniper in association with *Quercus* species as well as Portuguese oak woodlands.

The Azibo Reservoir Protected Landscape, specifically the lagoon, is highly important for aquatic species. The reservoir is regularly used by dozens of species of birds, including an emblematic breeding population of great crested grebe (*Podiceps cristatus*), the symbol of this protected landscape.

Both the Protected Landscape and SCI Morais are also fundamental for the conservation of many wild animal species associated with small rivers and streams. The highly endangered Pyrenean desman (*Galemys pyrenaicus*) still inhabits these small watercourses. On the other hand, for the white-clawed crayfish (*Austropotamobius pallipes*), an aquatic invertebrate virtually extinct in Portugal, these streams represent the best chance for the recovery of its wild populations.

Azibo reservoir





## Romeu

The picturesque village of Romeu, in the municipality of Mirandela, gives its name to one of the most curious protected areas of this region: The Site of Community Importance Romeu. This SCI, exclusively located in the municipalities of Mirandela and Macedo de Cavaleiros, is partially coincident with the Geopark *Terras de Cavaleiros*.

Significantly smaller, than other protected areas of *Terras de Trás-os-Montes* (about 4,700 ha), the SCI Romeu stands out for its great importance for the conservation of some specific and increasingly rare native woodlands.

It is an area with noticeable Mediterranean influence, typical of the *Hot Land*. In addition to the patches of natural woodlands, the olive trees and other extensive agricultural activities dominate a large part of the landscape.

The presence of an impressive extension of woodland dominated by cork oak (*Quercus suber*), often in mosaic with prickly juniper thickets (*Juniperus oxycedrus* var. *lagunae*), in excellent condition, is clearly the most important natural feature of this protected area. These endangered woodlands are particularly important natural habitats, protected by Portuguese and European laws.

SCI Romeu is also relevant for the conservation of many other natural woodlands, especially the ones associated with the small tributaries of the Tua river.

The coexistence of the natural woodlands and the traditional agricultural activities are also the preferred habitat of numerous wild animals and plants species.

Cork oaks trees in Romeu



## Tua valley

In the mythical valley of the Tua river is located the youngest protected area of the region: the Tua Valley Regional Natural Park, created in September 2013.

With about 25,000 ha, this regional protected area is located in the lower Tua, between the districts of Vila Real and Bragança. About 45% of its area is located in *Terras de Trás-os-Montes*, in the municipalities of Vila Flor and Mirandela.

It is an area with great geological and lithological diversity, which translates into rugged reliefs, with mountains with imposing quartzite ridges, and plateaus divided by the steep valleys of the Douro, Tua and Tinhela rivers.

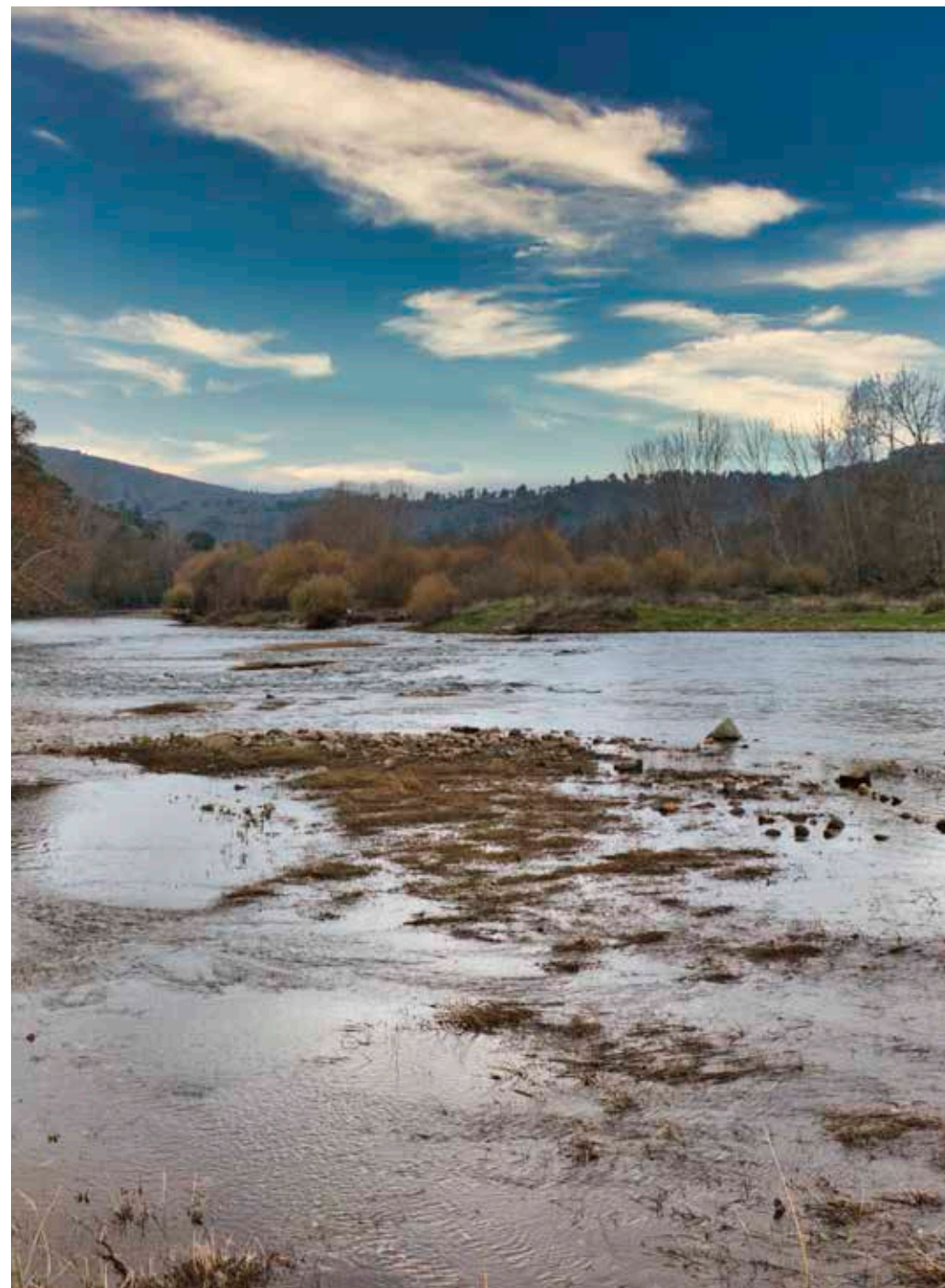
Located mostly in the so-called *Hot Land*, it still has a significant climatic variety, ranging from particularly dry areas in the lower Tua river, to more moderate weather conditions in the northern parts of this protected area.

These characteristics shaped a very diverse landscape, marked by multiple extensive agricultural crops, surrounded with areas of natural vegetation.

The natural vegetation includes some interesting cork oak (*Quercus suber*) and Pyrenean oak (*Quercus pyrenaica*) woodlands, but here, the main focus are the extraordinarily rich riparian habitats associated with the Tua river. These environments are the habitat for hundreds of species of flora, including many rare and regional endemic species.

The fauna communities are also very rich. Almost 200 vertebrate species are described for this protected area. Some of the most important include the critically endangered black wheatear (*Oenanthe leucura*), the impressive and rare eagle-owl (*Bubo bubo*) and many species directly dependent on the rivers and riparian galleries, such as the very rare brook lamprey (*Lampetra planeri*).

Tua river



## NATURAL HERITAGE

### Geology and geomorphology

Trás-os-Montes is a particularly rich and diverse region in terms of geology and geomorphological environments. To this fact adds the region long history of mineral exploration, which is expressed in the vast archaeological-mining heritage.

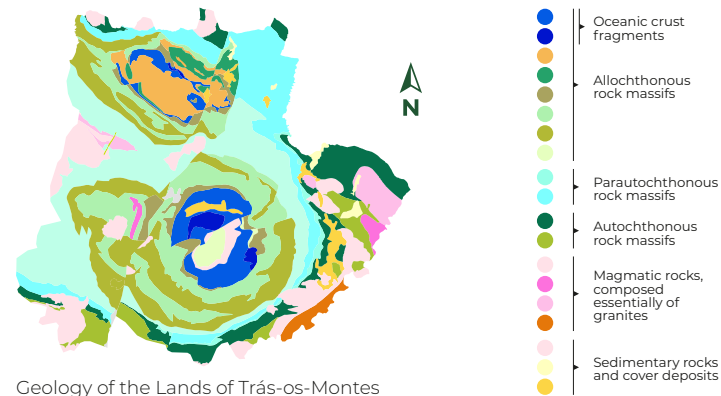
Currently, the interest in this region nature-based tourism, including geotourism, is growing continuously. In fact, numerous geomonuments (classified geosites) can be found in *Terras de Trás-os-Montes*. We emphasize the Geopark *Terras de Cavaleiros*, classified by UNESCO since 2014. In this particularly interesting territory, you can find many important natural history events recorded on rocks.

The geological value of the region is also expressed in the growing interest for research and exploration of minerals, including different ores, ornamental rocks, and industrial minerals.

In view of this scenario, to promote a sustainable and balanced development of the *Terras de Trás-os-Montes*, it is imperative to also promote clear and objective information about its great geological heritage.

On general terms, the geology of Trás-os-Montes is subdivided in five main domains:

1. Autochthonous rock massifs, consisting of ancient schist and other metamorphic rocks;
2. Parautochthonous rocky massifs, consisting of metamorphized sediments – paleozoic metasediments;
3. Allochthonous rock massifs, composed of several massifs from oceanic crust, surrounded by metasediments;
4. Magmatic rocks, essentially made up of granites;
5. Sedimentary rocks and cover deposits.



Geology of the Lands of Trás-os-Montes

All these lithologies preserve a long geological history, characterized by remarkable episodes of metamorphism and crustal deformation. In fact, the eastern Trás-os-Montes region was affected by all phases of crustal deformation (responsible for the NW of the Iberian Peninsula structure).

Here, you can see several geological domains which are clustered in the form of large thrust nappes. These thrust nappes correspond to regional geological faults whose fracture planes are almost horizontal. However, there is also a complex network of other types of geological faults, of different scales, which 'cut' indiscriminately the rocky massifs of the region.

Among the various geological formations, the allochthonous rocky massifs stand out due to the high scientific curiosity they present. They are called allochthonous because they formed in a different place from the area where they currently are, and they are known as the Bragança and Morais massifs.

These important rocky massifs, consisting of amphibolite, gabbro, serpentinite, greenschist and other ultrabasic rocks, are fragments of oceanic crust. They incorporate a rare geological phenomenon in continental areas that is scientifically called *Ophiolitic series*.

Around these allochthonous rocky massifs (Bragança and Morais) expands a vast metamorphic belt, from the Paleozoic age, consisting of schistic and quartzite rocks (e.g. quartzites, quartzolites, pelites and metaconglomerates). Granites and other eruptive rocks, as well as older schists, tend to be distributed in discontinuous edges, located at the ends of the aforementioned metamorphic belt.



Castle of Algosó, built on top of a quartzite crest

Often, granite mantles of the region give rise to gneiss and migmatites because of the metamorphism process they suffered.

In the region, in addition to granitic forms, other magmatic rocks geologically more recent, with aplitic and pegmatitic composition, are also present. These rocks result from the rise of late magmas along large tectonic structures (regional geological faults), and for this reason, sometimes they look like veins.

Low areas, such as riverbanks, slope bases and eluvial plains, concentrate recent sedimentary sequences, deposited during the Quaternary age. Some particular examples of these sediments are: deposits of the culminating areas of the *Planalto Mirandês* (Plateau of Miranda do Douro); deposits accumulated in depressions generated by the tectonic accidents of Bragança-Vilariça-Manteigas and Mirandela; and concentrated alluvium on the banks of the Onor river.

*Terras de Trás-os-Montes* geomorphology is characterized by a succession of plateaus with altitudes that globally hover around 700 m, interspersed by mountainous peaks and imposing steep river valleys, whose 'backbone' is the Douro river. Besides the Douro river, other important watercourses stand out, such as: the Tua, the Sabor, the Onor, the Maçãs, the Fervença and the Azibo rivers, and the streams of Bemposta and Vilariça. Even so, the predominant photographic image is a flattening surface with slightly wavy horizontal lines.

The main crest lines of the region, often narrow and elongated, are residual reliefs that reflect the presence of rocks more resistant to erosion, such as quartzites and granites. Below the culminating surface (flattened) are the quaternary sediments.

Several tectonic depressions, whose predominant orientations vary between N-S and NNE-SSW can be identified. The depressions of Bragança-Vilariça-Manteigas, Mirandela and Verin-Penacova, are the most important in the region.

In the *Terras de Trás-os-Montes* geomorphology, you can also identify some regional elevations, such as: Serra de Montesinho (1.486 m); Serra da Nogueira (1.320 m); Serra de Bornes (1.199 m); Serra das Barreiras Brancas (1.074 m) and Serra de Mogadouro (997 m).



Typical flattened, slightly wavy surface, of the Lands of Trás-os-Montes

## Flora and vegetation

The territory of *Terras de Trás-os-Montes* is a small part of Continental Portugal, in the northern region. But this tiny part has a huge climatic range and geological diversity that make this territory unique, even in the Iberian context. The native woodlands are very diverse, from the mountain oak woodlands to the holm oak and prickly juniper woodlands of the driest places of the Douro valley.

The Pyrenean oak (*Quercus pyrenaica*) woodlands are very common in the Trás-os-Montes mountains. In fact, Nogueira and Montesinho mountains have one of the largest forest extensions of this species in the Iberian Peninsula. The Portuguese oak (*Quercus faginea* subsp. *faginea*) is less frequent, occurring usually in association with cork oak (*Quercus suber*) woodlands of Trás-os-Montes *Hot Land*. However, due to some recent regeneration, there are now some pure patches of Portuguese oak trees in Mogadouro, Macedo de Cavaleiros and Vimioso. These particular woodlands are expanding in areas with limestone or related alkaline rocky soils. Pyrenean and Portuguese oak woodlands are very rich in species with high conservation interest, such as the rare *Pulmonaria longifolia* subsp. *glandulosa*, an endemism recently described for the Iberian Northwest.



Portuguese oak and Pyrenean oak woodlands

Other species that may occur in these environments are *Rhaponticum exaltatum*, an extremely rare species in Portugal and listed in Habitats Directive (Annex V); or *Veronica micrantha*, an Iberian endemism with restricted distribution,

listed in Annex II of the same European Directive. These oak woodlands are also important for other rare plants, namely *Dactylorhiza insularis*, *Hypericum montanum*, *Thymelaea ruizii*, *Sorbus torminalis*, *Carex sylvatica*, *Cephalanthera rubra*, *Avenula pubescens*, *Corydalis cava*, *Peucedanum carvifolia* and *Viola hirta*.



*Sorbus torminalis*

The holm oak and cork oak woodlands of Trás-os-Montes occur in the dryer areas of this territory, like the valleys of the main rivers.

The cork oak (*Quercus suber*) is the most widespread species of the genus *Quercus* in Portugal. It is almost always present in acidic and not very poor soils. The large extent of this species in the territory results from natural favourable conditions, but also from human action. The use of cork and its acorn promoted the expansion of cork oak, a process that was reinforced by the legal protection of the cork oak (and holm oak) in Portugal. In the Mediterranean territories of northern Portugal, the cork oak occurs naturally in the most thermal valleys, avoiding mountains and plateaus. It may occur associated with other species, such as the Portuguese oak, the prickly juniper (*Juniperus oxycedrus*) or the holm oak (*Quercus rotundifolia*).



The holm oak grows in the hottest and driest areas of the territory. It can be found in steep valleys, in low humidity soils, or replacing the cork oak in flatter lands but in lithologies that generate neutral or alkaline soils (such as limestones or ultrabasic rocks). It can also be present in acidic soils or areas without pronounced slopes in the south-eastern part of the territory, usually in the company of prickly juniper, in areas where levels of precipitation are too low for the cork oak. In the driest valleys, when associated with juniper, the holm oak often grows with a shrubbier size than in the central and southern Portugal, and is called 'carrasco' by the local populations for this reason.

The holm oak and cork oak woodlands of Trás-os-Montes do not contain many endangered species. However, they possess a huge floristic diversity, with several species of rare beauty, such as the *Paeonia broteri*, the extraordinary Roman dactylorhiza (*Dactylorhiza sulphurea*) or an early-purple orchid (*Orchis langei*). Still, the edges of some holm oak woodlands on more unique substrates can grow rare plants, such as *Armeria langei* subsp. *daveaui*, *Phleum phleoides* and *Saxifraga dichotoma*.



Typical profile of the main watercourses in Trás-os-Montes

The rich diversity of the riparian forests of Trás-os-Montes reflects the various plants strategies to adapt themselves to different ecological conditions of rivers and streams. The alder (*Alnus glutinosa*) needs to grow near the water. It is often absent in Mediterranean areas, in rivers with wider riverbeds that dry for most of the year. Rivers with alder trees on the river banks develop aquatic communities dominated by hydrophytes, plants completely rooted in the soil, but always submerged by water. The woodlands dominated by ash (*Fraxinus angustifolia*) are less restrict and can grow in moist soils near water, even in rivers with intermittent water regimes. Willow thickets and woodlands dominated by willow and poplar trees appear more often in intermittent watercourses and are often associated with other tree species, such as the nettle (*Celtis australis*).



River with aquatic communities

The areas next to the tree lines typical of these environments are ideal for the growth of several large herbaceous plants. They are also connected with the semi-natural hay meadows, resulting from the cut of the trees of the natural forest ecosystems in more humid areas. These meadows are maintained by regular cutting or grazing and the dominant plants are typically grassy, in particular *Arrhenatherum bulbosum*, the sweet vernal grass (*Anthoxanthum odoratum*) and the common bent (*Agrostis capillaris*).

The typical flora of riparian galleries is one of the most interesting in terms of conservation and is usually associated with a large number of species. There are several rare and endemic plants characteristic of this type of environments, especially in Mediterranean mountainous areas. Among these, *Viburnum lantana*, *V. opulus*, *Allium ursinum*, *Bromus ramosus* and *Viola bubanii* can be mentioned. Interestingly, many species with high conservation interest are shared by this type of woodlands and by the adjacent edges and hay meadows. The list is extensive and includes several plants of singular beauty. Among the most endangered are *Euphrasia hirtella*, *Vicia orobus*, *Euonymus europaeus*, *Knautia nevadensis*, *Rumex longifolius*, *Centaurea jacea* subsp. *angustifolia*, *Vicia onobrychioides*, *Ventenata dubia*, *Selinum broteri*, *Veronica micrantha*, *Aconitum napellus* subsp. *lusitanicum* and *Vicia narborensis*.



Mosaic of hay meadows and riparian woodlands

Shrublands and thickets are distributed throughout the territory and are dominated by legumes of the genera *Pterospartum*, *Cytisus* or *Retama*. The shrublands of the higher altitude areas are dominated by *Pterospartum tridentatum* subsp. *lasianthum* and several species of heather (*Erica* sp. pl.). In the transition zones it is possible to observe the white broom (*Cytisus multiflorus*) and French lavender (*Lavandula pedunculata*). In the drier areas of low altitude these shrublands become sparser, incorporating plants characteristic of more xerophilic environments, such as the bridal broom (*Retama sphaerocarpa*). In the most thermally favoured areas of the Douro valley and its tributaries occur interesting communities of wild-olive (*Olea europea* var. *sylvestris*) with *Rhamnus lycioides* subsp. *oleoides* and *Asparagus albus*.



*Rumex longifolius*



*Anthemis canescens*

In open areas around the less dense shrublands and thickets, annual and vivacious plant communities, typical of Mediterranean environments, are frequent. Some are dominated by *Bulbous Poa* and *Trifolium subterraneum*, forming a particular type of pastures: the bulbous bluegrass dry pastures. They were once very common throughout the Iberian Peninsula but are currently in decline in Trás-os-Montes, due to the reduction of the number of flocks of sheep in the area.

Among the taxa of conservation interest that may occur in these types of more sparse vegetation, there are several protected by European legislation, such as *Holcus annuus* subsp. *duriensis*, *Antirrhinum lopesianum*, *Linaria intricata*, *Anthyllis vulneraria* subsp. *lusitanica* and *Santolina semidentata*. Two endemic species, emblematic of these environments, *Festuca brigantina* subsp. *brigantina* and *Avenula pratensis* subsp. *lusitanica*, are exclusive of the ultrabasic soils of Trás-os-Montes. These soils derive from rocks very rich in heavy metals, toxic to most plants, which enhance the presence of highly specialized species. Other species of conservation interest, typical of these environments, include *Armeria eriophylla*, *Anthyllis vulneraria* subsp.



*Bufonia macropetala* subsp. *willkommiana*



*Sideritis montserratiana*

*sampaioana*, *Anthemis canescens*, *Anthemis alpestris*, *Gagea pratensis*, *Silene legionensis*, *Viola parvula* and *Astragalus incanus* subsp. *nummularioides*.

Rocky and saxicolous environments (i.e. typical of rocks or stony soils) are quite common in areas of rugged topography, such as the valleys of the large rivers of Trás-os-Montes. These extreme environments are the habitat of some rare and/or endemic species, such as *Digitalis purpurea* subsp. *amandiana*, *Scrophularia valdesii* or *Isatis platyloba*. The rocky biotopes of the banks and riverbeds are, from the botanical point of view, the most severely affected by the construction of successive hydroelectric power plants in the upper Douro. For this reason, banks and rocky beds of the sections of Trás-os-Montes rivers with natural flow are very important for the conservation of the characteristic flora of these places. In these biotopes, the Douro valley canyon is absolutely unique, with some plants practically restricted to this place in national territory. This is the case of rarities such as *Andryala ragusina*, *Coronilla minima*, *Bufonia macropetala* subsp. *willkommiana*, *Aphyllanthes monspeliensis*, *Genista scorpius*, *Sideritis montserratiana* and *Globularia vulgaris*.



Nitrophilic vegetation

The nitrophilic herbaceous vegetation appears dispersed in the territory of Trás-os-Montes, associated with disturbed environments and nutrient-rich soils. It can occur near riparian woodlands, taking advantage of nutrient deposits brought by the river, being dominated by tall herbaceous plants.



Pond with agricultural use

In non-riverine areas, communities with Alexanders (*Smyrniolus atrum*) prevails in shaded environments. The large thistles, namely *Silybum marianum*, *Carduus tenuiflorus* or *Onopordum acanthium*, are founded in areas exposed to the sun. Annual plant communities can grow on the edge of the paths. Those communities are frequently dominated by cabbage family plants that bloom in early spring, such as *Brassica barbellierii*, *Coyncia monensis* subsp. *cheiranthus*, or grasses that bloom later, such as the mouse barley (*Hordeum murinum* subsp. *leporinum*), or the different species of the genus *Bromus*. The annual communities most dependent on nitrogen thrive as weeds in farming fields and have a high species diversity (*Lamium amplexicaule*, *Raphanus raphanistrum*, *Chamaemelum fuscum*, etc.).

Although they are essentially composed of common flora, these communities can have some rare plants, such as *Adonis annua*, *Glaucium corniculatum* and *Trigonella polyceratia* subsp. *amandian*. The latter is endemic of the Douro valley, appearing on the flood plain of the rivers and agricultural areas located in the vicinity.

In this region, hygrophilous and aquatic vegetation is associated with environments with high availability of water throughout the year, such as rivers, but also in temporary or permanent ponds, some of which are home to very rare plants in Portugal. The grass *Alopecurus aequalis* was originally described for the municipality of Miranda do Douro, and nowadays the largest Portuguese subpopulations of this species are located in the northeast of Trás-os-Montes.

Even rarer is the aquatic plant *Elatine alsinastrum*, a species distributed throughout Europe and North Africa, whose populations have suffered a sharp decline. It was first seen in Portugal near Vilar Formoso; however, that population does not exist anymore. *Elatine alsinastrum* was recently discovered in the municipality of Miranda do Douro, and this is now the only currently known location in Portugal. Many of these plants develop in ponds of human origin for agricultural use, but with unique plant communities.

## Fauna

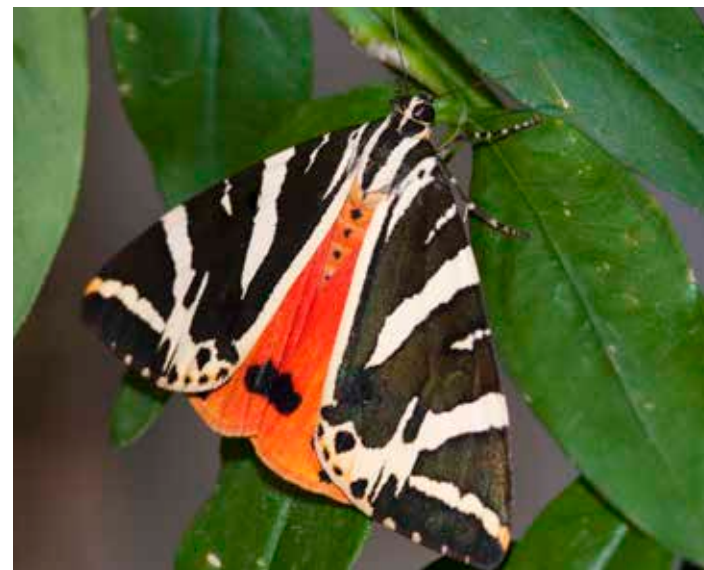
The diverse climatic, geologic and vegetation conditions of *Terras de Trás-os-Montes* have created extraordinarily rich ecological conditions, explored by countless species of fauna. From smallest invertebrates to large mammals, animal species are perfectly adapted to the huge mosaic of habitats, shaped by man, that mark the landscape of the region.

Often unnoticed, invertebrates are present by the thousands, with many species of high conservation value, such as river mussels, dragonflies, butterflies and moths, beetles, bees and many more.

Among the most emblematic, for their beauty, are butterflies and moths (order Lepidoptera). Although it is not a scientifically accurate definition, the term moth is generally used to describe nocturnal and less colourful lepidopterans, while butterflies are considered diurnal and more colourful, but that is not always correct. It is the presence of numerous scales on the wings, forming multiple and curious patterns, that make this group so distinct.

In *Terras de Trás-os-Montes* dozens of species of lepidopterans are described, and Vinhais is one of the areas with the greatest diversity. Species such as the swallowtail (*Papilio machaon*), the peacock (*Aglais io*) and the comma (*Polygonia c-album*) are just some examples particularly beautiful and common in the region. The jersey tiger (*Euplagia quadripunctaria*) and the marsh fritillary (*Euphydryas aurinia*) are rare in Portugal, protected by Portuguese and European legislation. Both are typical of hay meadows and relatively frequent in the Montesinho Natural Park.

Among other invertebrates, one of the most endangered is the European stag beetle (*Lucanus cervus*), the largest beetle in Europe. It is an unmistakable species, especially the male, thanks to its tweezer-shaped jaws that it uses to fight other males. Although uncommon in *Terras de Trás-os-Montes*, it can be observed associated with oak or chestnut trees in the Montesinho Natural Park.



Jersey tiger



European stag beetle

Numerous dragonflies occur generally associated with the riverbanks. *Coenagrion mercuriale*, *Macromia splendens*, *Gomphus graslinii* and *Oxygastra curtisii* are among the rarest in the country and in the region, and protected by national and European legislation. *Oxygastra curtisii*, for example, can be observed in rivers of the *Cold land* (e.g. in the PNM) and of the *Hot Land* (e.g. in SCI Romeu).

Associated with rivers, there is also an invertebrate characteristic of *Terras de Trás-os-Montes*: the freshwater pearl mussel (*Margaritifera margaritifera*). It is a species with a great longevity, living up to 200 years. However, in the Iberian Peninsula it seems not to exceed 70 years. It is currently one of the most endangered bivalve species at national and global levels, but it is still abundant in the Tua river basin.

Included in the large Douro basin, the rivers of the region have very distinct biophysical features. From the upper stream sections, in the mountainous areas further north, to the large flowing main rivers, downstream, in the Mediterranean areas of the *Hot land*, the differences are noticeable, and are reflected in the fish communities.

The cold and well-oxygenated upstream sections are dominated by trout (*Salmo trutta*). Despite being a common species, with a widespread distribution, its presence is usually an indicator of good water quality. In the intermediate sections of the rivers, where the riverbeds have a lower gradient and higher depths, cyprinids dominate. They include several protected and endemic species of the Iberian Peninsula. The northern straight-mouth nase (*Pseudochondrostoma duriense*) and the common barbell (*Luciobarbus bocagei*) are the best known, but smaller species such as the Iberian-roach (*Squalius alburnoides*) and the ruivaco (*Achondrostoma oligolepis*) are also abundant.



Ruivaco

In the region there are also two highly endangered species in Portugal, an Iberian endemic loach (*Cobitis calderoni*) and the brook lamprey (*Lampetra planerii*). In Portugal, *Cobitis calderoni* is currently restricted to the Tua river basin. The brook lamprey is a fresh water lamprey, whose adults may reach a maximum length of 15 cm. It is listed as a critically endangered species in Portugal, with a new population recently discovered in this region, in the Tua Valley Regional Natural Park.

The complex life cycle of amphibians, which requires both aquatic and terrestrial environments, makes them very dependent on water. They need wetlands at least during larval development (tadpoles). This dependence makes them particularly susceptible to climate change, which has been reducing the availability of breeding sites.

Among the most common amphibians present throughout the region are the Perez's frog (*Pelophylax perezii*), the common toad (*Bufo bufo*), the natterjack toad (*Epidalea calamita*), the Iberian newt (*Lissotriton boscai*) and the marbled newt (*Triturus marmoratus*). The Perez's frog is the most abundant. It can be seen in all forms of water bodies throughout the year. Newts also have a long aquatic phase, which can occur at both natural and artificial water bodies. The common toad and the natterjack

toad are mostly terrestrial, using water bodies essentially in breeding season, for short periods of time, sometimes in small puddles and ephemeral ponds.



Marbled newt

The Iberian ribbed newt (*Pleurodeles waltl*) and the Iberian midwife toad (*Alytes cisternasii*) are typically associated with the Mediterranean areas of the *Hot Land*. The Iberian ribbed newt is abundant, for example in the Douro International, spending most of its time in water or buried in moist soil. The Iberian midwife toad is an Iberian endemism and much less abundant. Its most notorious feature (which it shares with the common midwife toad) is the fact that, after reproduction, males carry the eggs until the time of hatching (they wrap egg strands on their legs).

In the wetter areas of the *Cold Land*, the Iberian frog (*Rana iberica*), another Iberian endemism, is mainly associated with rivers and mountain streams. It is common in the Montesinho Natural Park. Like all frogs it is a water-dependent species, spending its entire life cycle around water bodies.

Some amphibian species have a more fragmented distribution in *Terras de Trás-os-Montes*. The Iberian tree frog (*Hyla molleri*) and the common midwife toad (*Alytes obstetricans*) are relatively common, occurring in isolated spots, throughout the region. The Iberian painted frog (*Discoglossus galganoi*)

is possibly the most endangered amphibian of *Terras de Trás-os-Montes*. Although present in virtually all protected areas of the region, it is generally not abundant, and listed as Near Threatened in Portugal. It is also an Iberian endemism, protected at European level.



Iberian painted frog

Reptiles are well represented in *Terras de Trás-os-Montes*. Specimens of all reptile groups present in Portugal can be found in the region, including several snakes and lizards, a gecko (*Tarentola mauritanica*) and turtles.

Two species of autochthonous freshwater turtles are present in Portugal and in the region: the Mediterranean pond turtle (*Mauremys leprosa*) and the European pond turtle (*Emys orbicularis*). Both are protected at European level, although in Portugal the Mediterranean pond turtle is not threatened. The European pond turtle is clearly rarer and is listed as Endangered. It occurs mainly in the South of Portugal; in the North it is known on very few isolated spots, most of them in the *Terras de Trás-os-Montes*, particularly in the Douro International Natural Park. The more common Mediterranean pond turtle is mostly present in Mediterranean areas, including the main rivers and

ponds of the region. Both can grow to about 20 cm of carapace length, and are usually found in stagnant water sites with abundant vegetation.

The lizards described for the region include several species, from the small (up to 5 cm) Spanish psammodromus (*Psammodromus hispanicus*), to the larger mackerel (*Timon lepidus*) (up to 80 cm), including several snake-like lizards such as the slow-worm (*Anguis fragilis*). Three species are endemic to the Iberian Peninsula: the Bocage's wall lizard (*Podarcis bocagei*), the Iberian emerald lizard (*Lacerta schreiberi*) and the Bedriaga's skink (*Chalcides bedriagai*).

Bocage's wall lizard is a very restrict Iberian endemism that only occurs in the northwest of Portugal and Spain, associated with the Atlantic climate. In Portugal it is very abundant in Minho and Douro Litoral and practically does not occur outside these regions, except for an isolated population in Montesinho and Nogueira mountains.

The Iberian emerald lizard, easily identified by the remarkable bluish colour of the head and throat on males during the reproduction season, is also a typical Atlantic species. It has a wider distribution compared to the Bocage's wall lizard, but in general is much rarer and is protected at European level. It is found in association with banks of rivers and streams, mainly in the northern part of *Terras de Trás-os-Montes*.

The Bedriaga's skink is a snake-like lizard with vestigial legs, inhabiting mainly warmer areas. It is not endangered in Portugal, but it is also protected at European level. In *Terras de Trás-os-Montes* is not common but can be found in several places, particularly in the *Hot Land*.

Mostly harmless to humans, snakes are also common in the region, often connected to particular ecological niches.

Water snakes (*Natrix natrix* and *Natrix maura*) usually occur near rivers, reservoirs, and ponds throughout the region, although adults can move significantly away from water. The ladder snake (*Rhinechis scalaris*) and the Montpellier snake (*Malpolon monspessulanus*) are more frequent in rural and agricultural areas, that have high abundance of prey, such as rodents.



European pond turtle



Iberian emerald lizard



Among the snakes, the only potentially dangerous for Man is the Lataste's viper (*Vipera latastei*). This viper produces a poison, especially harmful for children and the elderly. Even so, this is a very elusive species; when threatened it prefers to flee. Because of that, cases of viper bites and poisoning in Portugal are very uncommon. It is a small sized snake (up to 70 cm), easily distinguished by the triangular shape of the head. It is also relatively rare throughout the country. In the Trás-os-Montes region it is present mainly in inhospitable rocky areas.



Lataste's viper



Black stork

With more than 250 regularly occurring species, this is a region with great importance for bird conservation.

Birds can have different life strategies that may include large migrations. Many bird species spend the Winter in warmer regions, returning to their usual breeding sites in Trás-os-Montes in Spring. They are called 'breeding' or 'Summer migrants', and include several species of swallows, cuckoos, warblers, nightingales, among many others. Species such as the great cormorant, some ducks, thrushes, and many others, breed in northern Europe, being present in Trás-os-Montes only in Winter periods or in migratory passages; they are called 'Winter visitors' and 'passage migrants', respectively. A large number of species, from passerines (tits, jays, woodpeckers, sparrows, etc.) to birds of prey (golden eagle, Bonelli's eagle, peregrine falcon, etc.), are in the region all year round; they are the 'residents'. For this reason, distinct bird communities can be seen in this region at different periods of the year.

For conservation purposes, the most important birds of *Terras de Trás-os-Montes* are undoubtedly the rupicolous birds, birds that inhabit and/or nest in cliffs and steep rocky escarpments. This group includes the black stork (*Ciconia nigra*), the red-



Bonelli's eagle

billed chough (*Pyrhocorax pyrrhocorax*), the black wheatear (*Oenanthe leucura*), the eagle-owl (*Bubo bubo*) and several birds of prey, such as the golden eagle (*Aquila chrysaetos*), the Bonelli's eagle (*Aquila fasciata*), the peregrine falcon (*Falco peregrinus*), the Egyptian vulture (*Neophron percnopterus*), the black vulture (*Aegypius monachus*) and the griffon vulture (*Cyps fulvus*), all highly endangered in Portugal.

The spectacular rugged valley of the Douro river, but also the valleys of the Sabor and the Maças rivers, are vital for the survival of these species, not only in the Portuguese context but also in the Iberian and even global context. This region has some of the largest and most important European populations of many of these species, such as the Egyptian vulture population. At national level, all these species are listed as threatened or near threatened, and some, such as the black vulture and the Bonelli's eagle, are priority conservation species at European level.

The Douro International region is also important for the conservation of many endangered birds associated with the plateau at the top of the river valley, such as the red kite (*Milvus milvus*), the Montagu's harrier (*Circus pygargus*), the little bustard (*Tetrax tetrax*), the stone-curlew (*Burhinus oedichnemus*) and the calandra lark (*Melanocorypha calandra*). These are typical species of open environments, the steppes, usually more associated with landscapes of Alentejo, that have found an unexpected refuge in Trás-os-Montes.

Besides Douro and Sabor valleys, other places in the region are also worth mentioning for birds conservation.

For Montesinho Natural Park are described more than 160 species of birds (more than 100 nesting birds), including some already mentioned, such as the golden eagle (*Aquila chrysaetos*) and the black stork (*Ciconia nigra*), but also species such as the hen harrier (*Circus cyaneus*), the red-backed shrike (*Lanius collurio*), the rock thrush (*Monticola saxatilis*) and the water pipit (*Anthus spinoletta*), usually associated with mountainous altitude zones, especially in the breeding season.

The Azibo Reservoir Protected Landscape is also a place of great importance for a particular community of birds. It is one of the most important refuges for waterfowl and semi-aquatic birds



Red kite



Red-backed shrike



Little ringed plover



Bee-eater

in the interior of the country. In this reservoir, the breeding population of great crested grebe (*Podiceps cristatus*), symbol of the protected area, is particularly important, but there are dozens of other species regularly seen in this very particular habitat. Ducks, such as the widgeon (*Anas penelope*), the gadwall (*Anas strepera*) and the common pochard (*Aythya ferina*); wading birds, such as the common sandpiper (*Actitis hypoleucos*), the little ringed plover (*Charadrius dubius*) and the common snipe (*Gallinago gallinago*); and many others, such as the kingfisher (*Alcedo atthis*), the great egret (*Ardea alba*) and the common coot (*Fulica atra*), are just a few examples of this diversity.

In the SCI Romeu dominate forest and farmland birds. Predators, such as the short-toed eagle (*Circaetus gallicus*), the booted eagle (*Hieraetus pennatus*) or the smaller common kestrel (*Falco tinnunculus*), are regular visitors. The partridge (*Alectoris rufa*), the thrushes (*Turdus iliacus* and *Turdus philomellus*), the bee-eater (*Merops apiaster*), the finches (*Carduelis carduelis*, *Chloris chloris* and *Fringilla coelebs*) and other particularly curious birds, such as the shrikes (*Lanius senator* and *Lanius meridionalis*), are very common.

The Tua valley riparian galleries are also inhabited by a huge diversity of birds, including several tits species (*Aegithalos caudatus*, *Cyanistes caeruleus*, *Parus major*), the cetti's warbler (*Cettia cetti*), the turtle dove (*Streptopelia turtur*), the golden oriole (*Oriolus oriolus*), the serin (*Serinus serinus*), the cirl bunting (*Emberiza cirlus*) and the black kite (*Milvus migrans*). The river itself is regularly used by many other birds, such as the great cormorant (*Phalacrocorax carbo*), the grey heron (*Ardea cinerea*) and the curious and elusive white-throated dipper (*Cinclus cinclus*).

Wild mammals populate the entire Trás-os-Montes region. One of the most important and emblematic species of Portugal is the wolf (*Canis lupus*). Currently endangered in Portugal, it is one of the most threatened species in all Europe, considered a priority species of community interest.

In Portugal and Spain remains a relic population, genetically different from the eastern European wolf population, the Iberian wolf (*Canis lupus signatus*). Described as a new subspecies in 1907 by the Spanish Ángel Cabrera, the separation of the Iberian wolf population resulted from a prolonged isolation from other European wolf populations.

The Iberian wolf is slightly smaller (male weighs up to about 35 kg) and has some distinctive marks on the fur: white stripes on snouts and around mouth, and a characteristic black mark on front legs.

It is one of the most endangered species in Portugal, with a population of about 300 adults, in about 60 packs, mostly north of the Douro river. Trás-os-Montes, especially the northern areas, includes more than a third of the Portuguese wolf packs.

One of the factors that contributes mostly to this is the abundance of other large mammals, that they prey on, such as the roe deer (*Capreolus capreolus*), the red deer (*Cervus elaphus*) and the wild boar (*Sus scrofa*). For decades, the roe deer and red deer populations have suffered significant reductions, but recently they have slowly been recovering and recolonizing the region. The roe deer has become abundant and is present throughout the region. The red deer is not yet so widespread, but is already abundant, especially in the Montesinho Natural Park. Both are currently a landmark of Trás-os-Montes.

Several species of smaller carnivores, such as the red fox (*Vulpes vulpes*), the weasel (*Mustela nivalis*), the beech marten (*Martes foina*), the European polecat (*Mustela putorius*) and the common genet (*Genetta genetta*), are present throughout the region. They feed on small rodents, very abundant in rural areas. The otter (*Lutra lutra*) is present in virtually all rivers, selecting places less disturbed by human activities. The wild cat (*Felis silvestris*) is much rarer. It is listed as Vulnerable in Portugal and

Roe deer



its abundance in the region is still poorly known, with references of its presence in Montesinho, Douro International, Sabor valley and the forests surrounding the Azibo. In addition to rodents, the wild cat favourite prey includes the wild rabbit (*Oryctolagus cuniculus*) and the Iberian hare (*Lepus granatensis*), both abundant in Trás-os-Montes.

This region is also fundamental for the conservation of many small mammals, usually unknown but particularly threatened. Cabrera's vole (*Microtus cabreræ*) is a small rodent endemic of the Iberian Peninsula, typical of Mediterranean environments. In the region there are populations of the species in SCI Romeu and in the Tua and the Sabor river valleys. The snow vole (*Chionomys nivalis*) is even rarer in Portugal. It was very recently discovered in the highest areas of the Montesinho Natural Park, and it is not recorded in any other place in Portugal. The Pyrenean desman (*Galemys pyrenaicus*) is a small insectivorous, semi-aquatic mammal. It only exists in the north of the Iberian Peninsula and French Pyrenees, and the rivers of Trás-os-Montes are vital to prevent its global extinction.

It is also important to highlight the conservation importance of the numerous bat species that inhabit this region. Even with some relatively abundant species, all Portuguese bats are listed as protected species at European level. Most of them roosts in the many caves and abandoned mines of Trás-os-Montes (cave-dwelling); in cavities, cracks and small holes in large trees (tree-dwelling); or in fissures in rocks or man-made structures (crevice-dwelling). At night, bats emerge from their shelters to feed on insects, having an important role in maintaining an ecological balance, contributing to the control of agricultural and forest pests.



Red fox



Wild cat



Otter



## NINE STEPS IN THE LANDS OF TRÁS-OS-MONTES

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After presenting the fabulous natural heritage of the *Terras de Trás-os-Montes*, we invite you for a trip through this incredible Natural Destination.

Created by the *Comunidade Intermunicipal das Terras de Trás-os-Montes*, the *Nove Passos* (Nine Steps) project aims to guide you around the natural heritage of the region, through the dissemination of nine trails, promoting knowledge and conservation of its natural values.

At each step, a carefully designed trail will take you on a visit to a specific natural theme, which distinguishes the natural areas where it is inserted.

For each trail you can find information about the best places, the best time of the year and the most suitable conditions to see landscapes, natural monuments, protected forests and wild species of fauna and flora that best illustrate the ecological value of the area.

A complete adventure is proposed, in a journey carried out in nine steps, one for each municipality of the *Terras de Trás-os-Montes*.

All trails are entirely included in protected areas specifically designated for the conservation of the natural heritage and landscape of this region.

Detailed description of the trails, including location, technical data, protected areas, description of the theme and other natural values, can be found in the various products of dissemination of the *Nine Steps in the Lands of Trás-os-Montes* project.



## Sabor Trail

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Theme: Sabor Lakes

Municipality: Alfandega da Fé

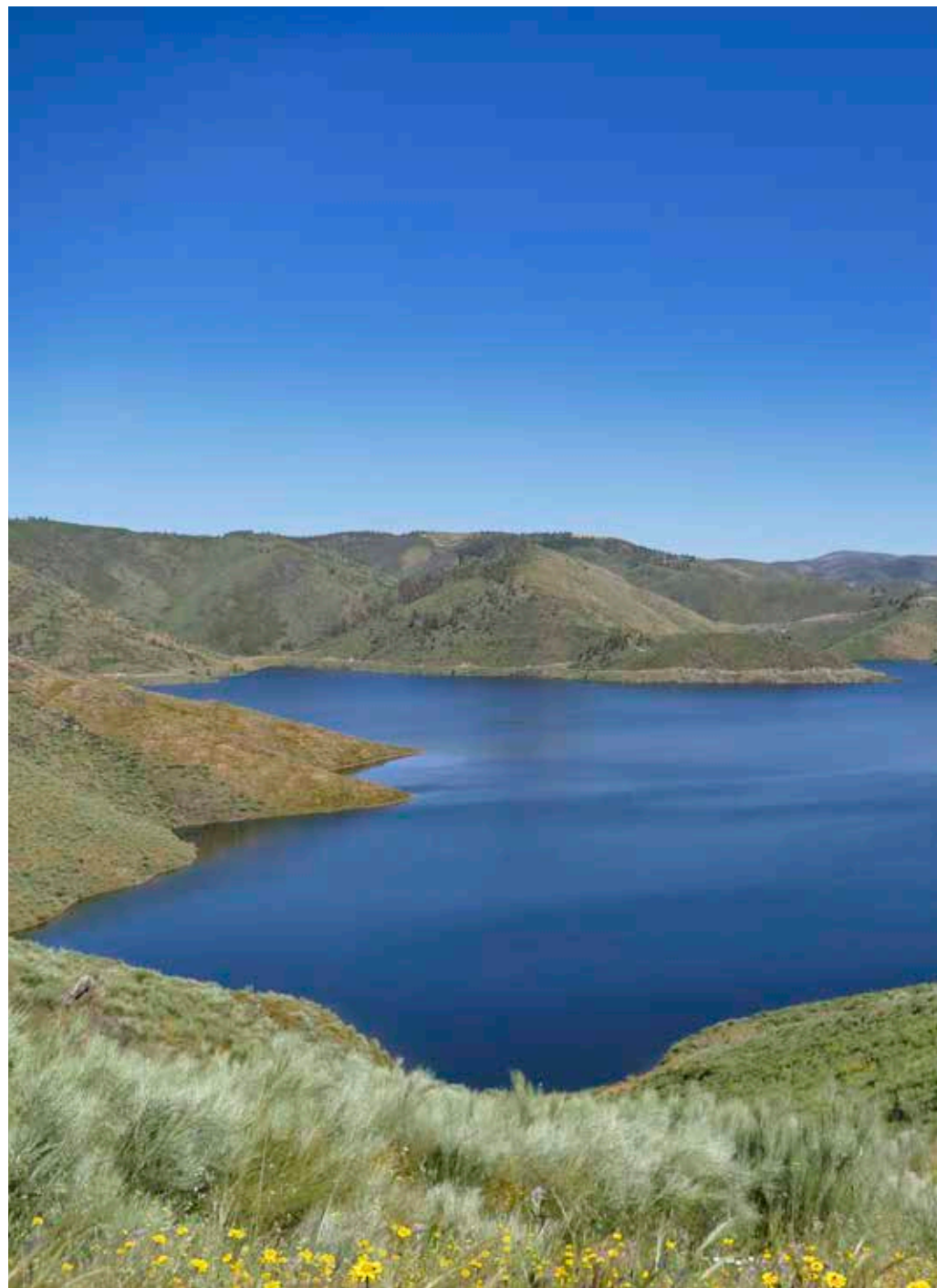
Located in the protected areas of the Sabor valley, the Sabor Trail goes through the surrounding areas of the Sabor lakes, with some privileged panoramic views.

The Sabor lakes landscape is the main theme of a trail with many natural and cultural points of interest. Along the path, some of the fauna and flora that characterize the Sabor valley, still adapting to the presence of these large lakes, can be observed.

The path also goes through one of the most iconic sanctuaries in the region, the Sanctuary of Santo Antão da Barca.



Church of Santo Antão da Barca



Sabor Lakes



Red deer

## Carvalho Trail

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Theme: Red deer

Municipality: Bragança

In Montesinho Natural Park, around the community village of Rio de Onor, the Carvalho Trail promotes a visit to one of the most emblematic inhabitants of this protected area: the red deer (*Cervus elaphus*).

Along the way you can see many of the environments that characterize this protected area, such as rivers, woodlands, shrublands and the typical hay meadows, which are home to a diverse community of wild animals and plants.

Along the way, the presence of a remarkable tree stands out, a hundred-year old Pyrenean oak (*Quercus pyrenaica*), which gives the name to the route (eng.: oak; port.: carvalho).



Hundred-year old Pyrenean oak

## Quercus Trail

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Theme: Birds at the Azibo reservoir

Municipality: Macedo de Cavaleiros

From the banks of the Azibo reservoir, in the middle of the Azibo Reservoir Protected Landscape, the Quercus Trail has an ideal route for a complete visit to the most emblematic values of this protected area.

The theme of the visit is the aquatic birds of the reservoir, with special emphasis on the great crested grebe (*Podiceps cristatus*). The bird observatories present along the trail are ideal places to observe these and many other birds that regularly visit the area.

In the areas that surround the reservoir, and in particular in the large cork oak woodland crossed by this trail, there are also many other species of fauna and flora, very different from the aquatics communities.



Bird Observatory



Great crested grebes



Egyptian Vulture

## São João das Arribas Trail

Theme: Vultures

Municipality: Miranda do Douro

Located in one of the most important areas of the Douro International Natural Park, the São João das Arribas Trail takes you to visit the rupicolous habitat, where some of the most emblematic and rarest wild animal species live.

The trail was selected especially for the observation of vultures such as the griffon vulture (*Gyps fulvus*) but mainly the Egyptian Vulture (*Neophron percnopterus*), symbol of this protected area and relatively easy to see here.

The trail goes through the typical mosaic landscape of the plateau of Miranda do Douro, ending next to the Chapel of São João das Arribas, in a viewpoint with a breath-taking landscape over the Douro river canyon. From here you can see vultures and many other very rare birds.



Douro Valley from the viewpoint of São João das Arribas

## Vale de Lobo Trail

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Theme: Cork oak and prickly juniper woodlands  
Municipality: Mirandela

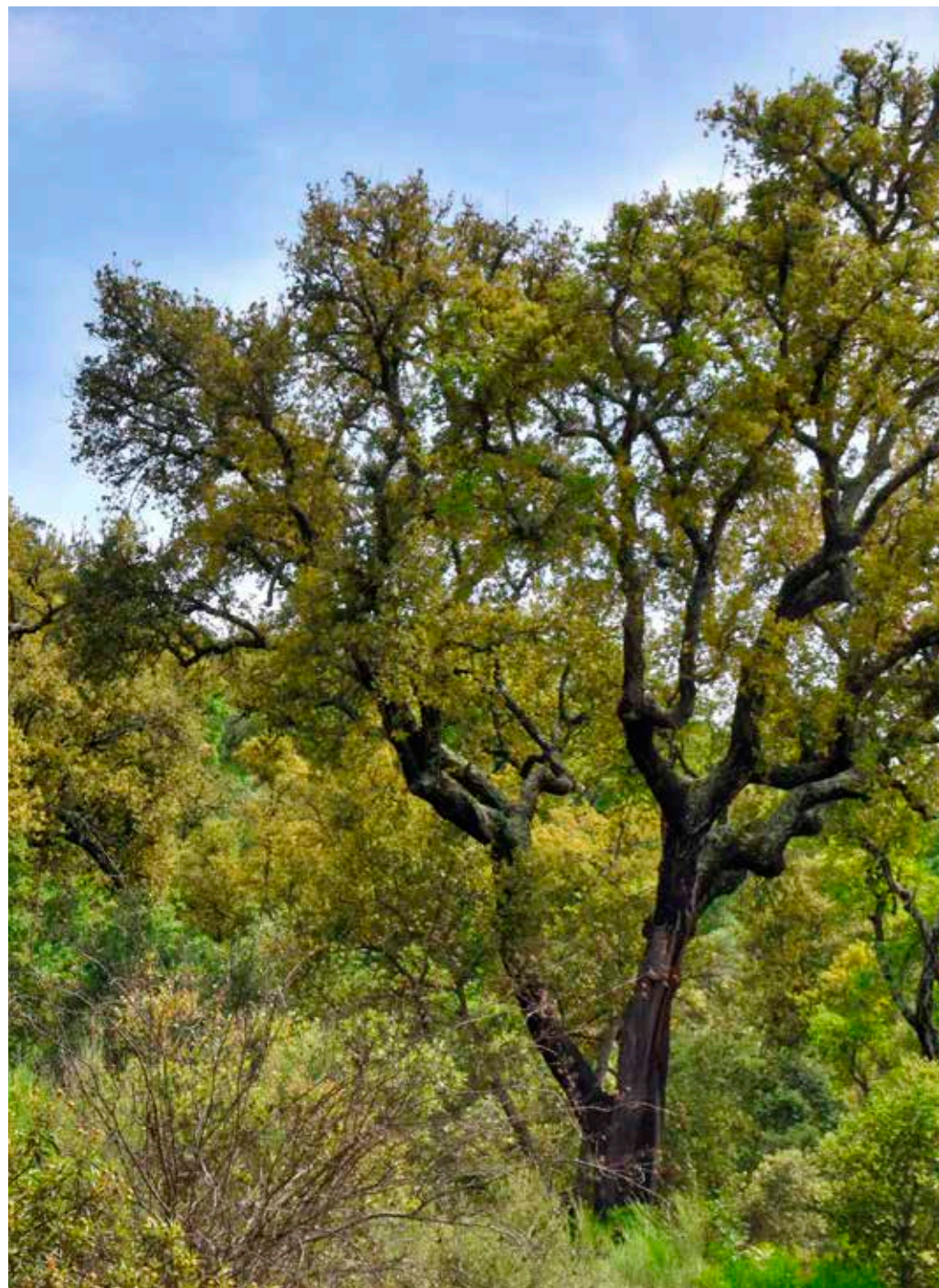
Starting from the village of Vale de Lobo, this trail goes along the boundaries of the SCI Romeu, a protected area marked by its natural sclerophyllous woodlands, typical of the *Hot Land*.

These woodlands, particularly the cork oak and prickly juniper woodlands, are precisely the theme of this route.

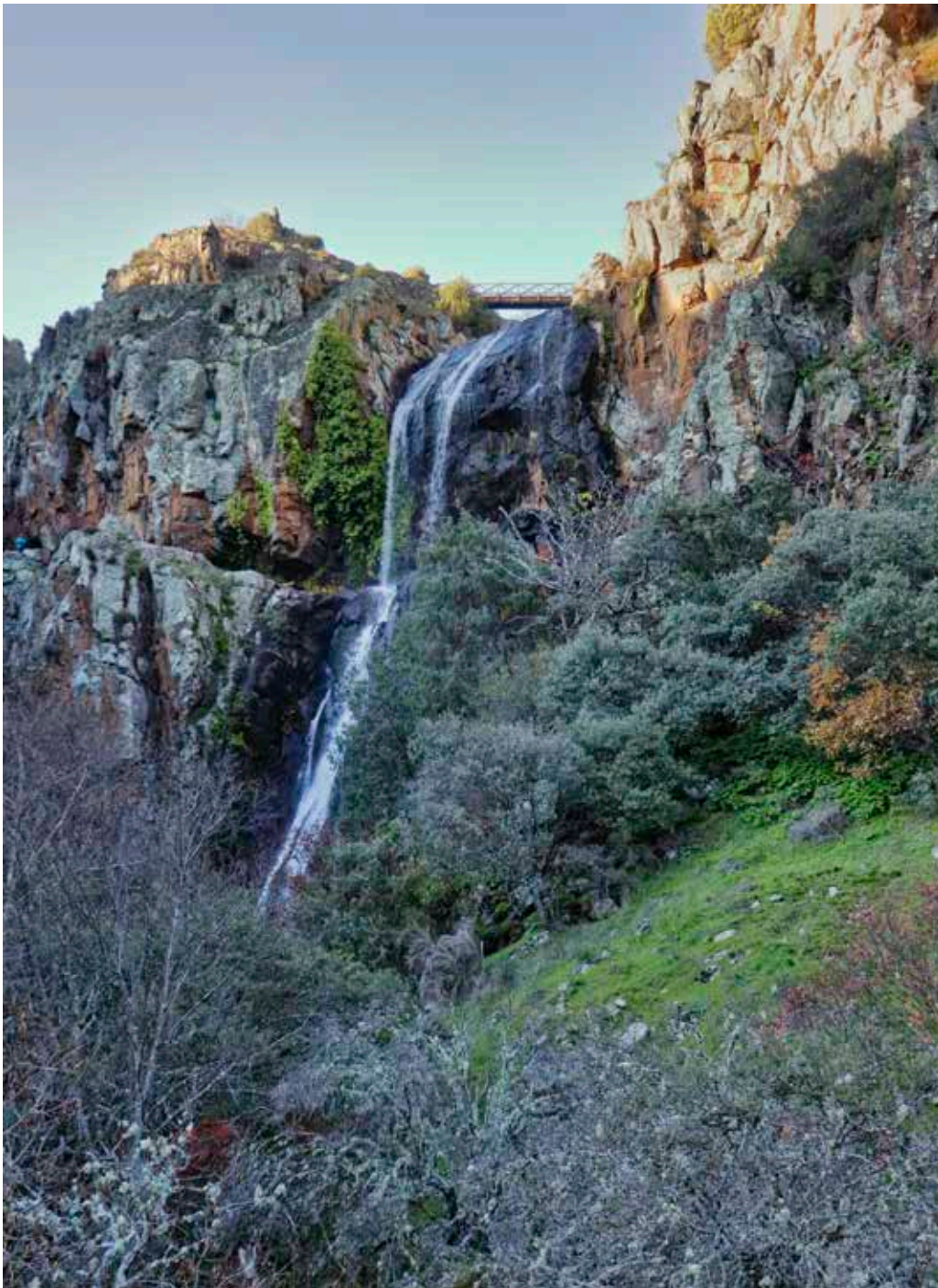
The landscape along the trail is marked by a harmonious combination between farmlands, still mostly traditional, and patches of natural vegetation, often dominated by these increasingly rare and legally protected woodlands.



Vale de Lobo Trail



Cork oak woodland of Romeu



## Cascata da Faia da Água Alta Trail

Theme: Cascata da Faia da Água Alta  
Municipality: Mogadouro

This trail, in the municipality of Mogadouro, promotes the visit to one of the most important geomonuments of the Douro International Natural Park: the waterfall named Cascata da Faia da Água Alta.

This is the largest waterfall in Continental Portugal, with a topographic gap of approximately 40 meters, integrated in an impressive scenery.

The trail ends on a spectacular circular path around the waterfall, with wooden walkways and bridges, which allow a complete view of this natural monument.



Cascata da Faia da Água Alta Trail

Cascata da Faia da Água Alta

## Vilarinho das Azenhas to Ribeirinha Trail

Theme: River Tua riparian gallery  
Municipality: Vila Flor

Next to the mythical Tua railway, this trail is located in the Tua Valley Regional Natural Park.

The main points of interest on the trail are the river and its banks, particularly its leafy riparian woodlands. Dominated by ash and alder trees, these woodlands are fundamental to the entire ecosystem, allowing the stabilization and natural cleaning of the riverbed, and ensuring shelter and food for countless plants and animals.

Always near the river, flanked by agricultural fields and small patches of natural vegetation, this trail portrays the landscapes and biodiversity communities typical of this protected area.



Tua old railway



The Tua river and its riparian galleries



Kingfisher

## Castelo de Algoso Trail

Theme: Fauna of the Angueira river  
Municipality: Vimioso

The Angueira river is one of the best-preserved water courses in the entire region. This river, with meandering form, has one of the richest communities of riparian fauna of Trás-os-Montes.

The trail takes you to different parts of the river, for the observation of multiple animal species, such as the otter (*Lutra lutra*), the Mediterranean pond turtle (*Mauremys leprosa*), the white-throated dipper (*Cinclus cinclus*), the kingfisher (*Alcedo atthis*) and many others.

The trail is also marked by two historical, cultural and landscape monuments that are worth a visit: a medieval bridge and Algoso castle.



Medieval bridge over the Angueira river



### Biospots (Alto da Ciradilha) Trail

Theme: Butterflies and other invertebrates  
Municipality: Vinhais

In the Montesinho Natural Park, Vinhais is one of the areas with the best conditions for observation of butterflies and many other invertebrates, such as dragonflies, beetles, etc.

The surroundings of the trail are marked by the mosaic of meadows and open forests with clearings full of flowering plants, ideal for feeding larvae and adults. On the trail you can see dozens of species of butterflies with an incredible range of colours and shapes.

In this trail, we also recommend a visit to the Biological Park of Vinhais, located at the starting point of the trail, which promotes the landscape and the natural (flora, fauna and geography) and cultural (history, archaeology and ethnography) heritages of the region.



*Polygonia c-album*



*Melitaea trivia*

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