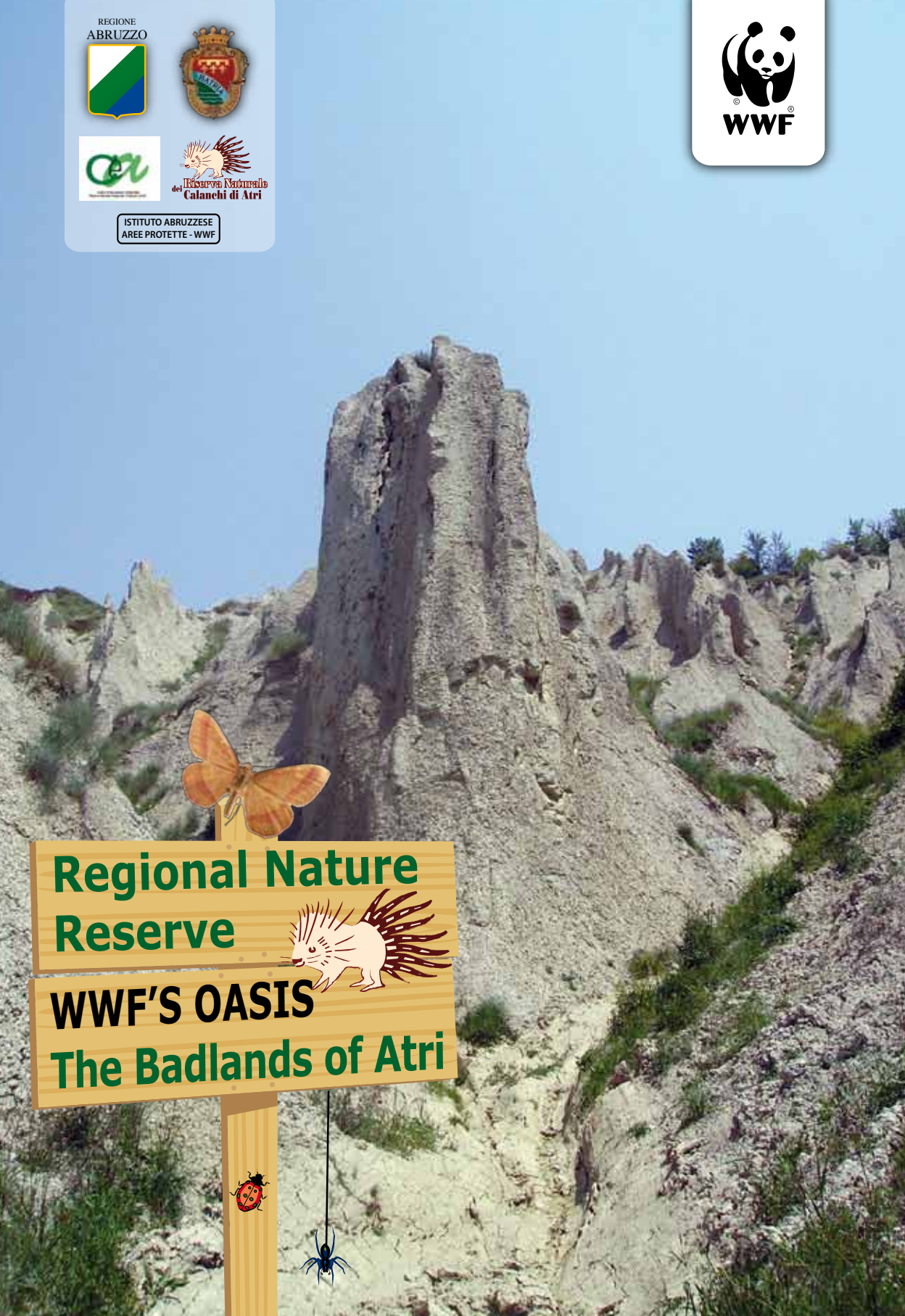
REGIONE
ABRUZZO

Riserva Naturale dei Calanchi di Atri

ISTITUTO ABRUZZESE
AREE PROTETTE - WWF

WWF



The Oasis of the Badlands of Atri

WWF's Oasis

In Italy there are more than 130 WWF Conservation Areas, which consist of rivers, swamps, forests, mountains, submarine meadows, small islands, ravines and volcanoes: 35.000 hectares of beautiful natural areas, which the Association has managed to save from degradation and destruction. This unique treasure trove of biodiversity is visited every year by half a million people.

The protected area

The Regional Nature Reserve "Calanchi di Atri" (Badlands of Atri) was established in 1995 by the region Abruzzo and became a WWF conservation area in 1999. The reserve covers about 400 hectares, spreading from the valley floor of the Piomba stream at 106 meters above the sea level to the Colle della Giustizia at 468 meters above the sea level.

Here you can admire the famous badlands of Atri. The badlands, known also as "Dantesque pits of hell", or called in dialect "li R ipe" ("Escarpments"), are one of the most fascinating aspects of the Adriatic coastal landscape, thanks to their imposing architecture.
Past deforestation has brought clay soils to the surface, which, eroded by the alternation of periods of rain and drought, has produced these particular formations.

Atri

The ancient city of Atri houses innumerable historical testimonies within its boundary wall. The people who have ruled in this territory have left their stamp on the architecture of the city: ancient Roman cisterns, thermal baths, historical fountains, imposing buildings, theatres and churches. Standing out from all of the churches is the majestic Cathedral of Santa Maria Assunta (13th century), with its well-known Renaissance frescos of Andrea Delitio, its typical façade, the cloister and the Roman mosaics beneath the altar.

The origin of the badlands

The development of the badlands

The badlands are typical geomorphologic processes of erosion that occur under the Mediterranean climate. Certain conditions are necessary to form badlands: clayey ground with a certain percentage of sand, steep slope preferably with a southern exposure, a climate characterized by the alternation of storms and dry seasons, and, of course, the absence of vegetation cover.

When the clay ground is wet, it becomes easily mouldable, but once the soil is dry and dusty, it shows fissures and cracks on the surface. There aren't many minerals in the clay ground: it consists mostly of salts, in particular sodium chloride (kitchen salt).

The rainfall from a thunderstorm, which falls on a dry, clay ground, makes the soil heavy, as it absorbs the water like a sponge. The aggregate earth particles dissolve and are carried away, and because of the force of gravity the water comes down, making channels and creating steep ravines.

At the foot of the badlands, the small and light eroded particles and the large blocks, removed from the sides, merge with the many fossils contained in the clay and are carried by streams to the sea.

Steep slopes make the ground unstable: small landslides frequently occur, causing the retreat of the chasms towards the top of the hill.

Earth pyramids

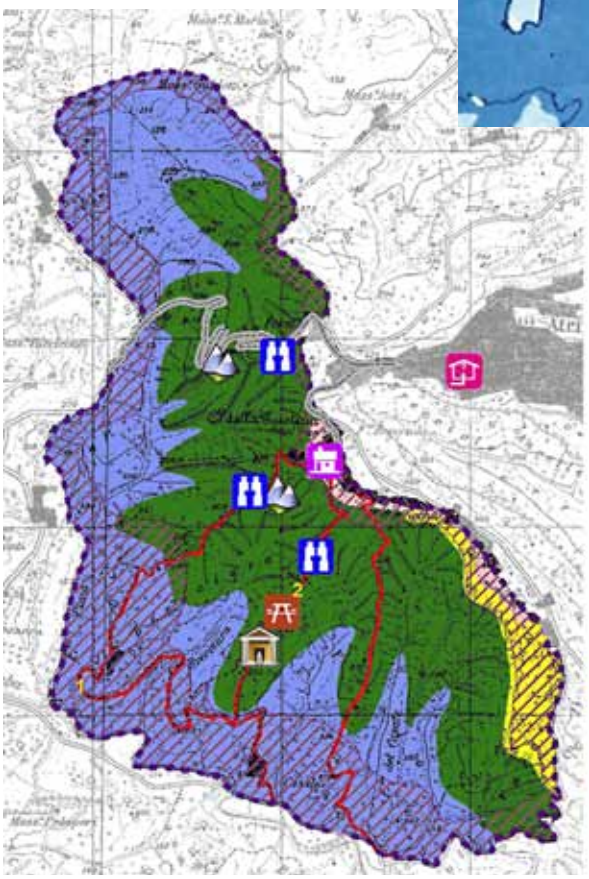
The fossils of the badlands

shark tooth

Hypothetical position of Atri in the Plio-Pleistocene Italy

The geological history

About two million years ago the Apennine Mountains were already formed in their main features. There were no hills and the Adriatic Sea reached the foot of the Gran Sasso. Gravel and sand settled near the coast, while the clay stood offshore.
The formation of the Apennine Mountains continued: the areas in front of the Gran Sasso were raised and emerged from the sea, the coastline shifted eastwards, covering the gray Plio-Pleistocene clays with layers of sand and gravel.
Less than one million years ago the coastline reached Atri.
The calcareous pebbles, transported by the rivers, were placed along the beach, linked with the grains of sand by the water and its minerals. This process formed the large conglomerate blocks, which you can still observe in the cliffs of the Colle di Giustizia or in the caves of Atri.
The orogenetic raising of Atri up to the current altitude caused erosion and landslides. The clay soils were removed more quickly and were dragged towards the sea via the deep valleys, whilst the stronger conglomerates, protected the underlying clay deposits, forming the hills on which Atri lies, which are typical of the regions Abruzzi and Marche.



The Plio-Pleistocene malacofauna

When the position of the badlands coincided with the ancient coastline, sediments of blue clay and sand settled in the water. These sediments encompassed a huge amount of sea invertebrates, the same animals which still live in the Adriatic Sea today.
Several species of invertebrate fossils were found in the sediments of the badlands. The most common fossils belong to the species such as *Murex, Pecten, Chlamys, Aporrhais, Ostrea, Dentalium,* which all inhabit the shallow water, like the waters that once washed over the territory of Atri.

Plio-Pleistocene fossils


Centaurea napifolia


Cynara cardunculus

The flora of the badlands

The plants of the badlands

The flora of the badlands is highly specialized for living in extreme conditions. The high sodium content in the ground, the steep slope of the walls, the exposure of the sides to the sun, the barren land and the constant landslides are the factors which determine and select the badland's flora.

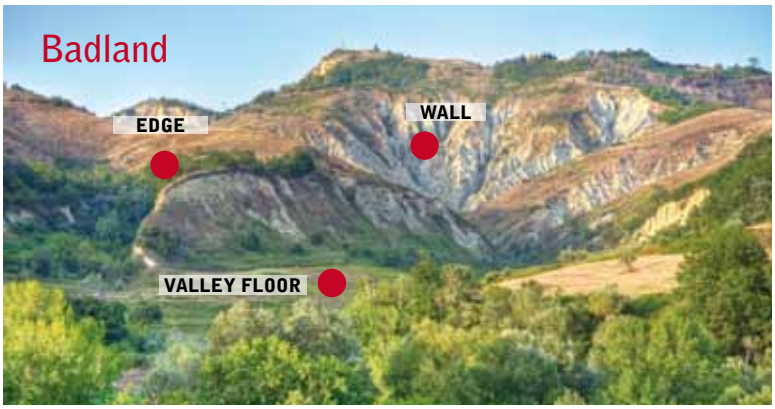
The badlands can be divided into three areas: the edge, the wall and the valley floor, each zone having a particular flora.

The edge

On the top of badlands you can find plants belonging to the typical hill vegetation of Abruzzo, represented by small thermophile forests of downy oaks and underbrushes with *dog roses* and *Rosa sempervirens.* In this area some plant species, such as the Alfalfa and the Sulla *(Hedysarum coronarium)*, have escaped from the neighbouring cultivations. Here and there you can see the famous liquorice plants *(Glycyrrhiza glabra)*, the protected Cardoon *(Cynara cardunculus)* and the very rare *Centaurea napifolia*.

In the uncultivated lands grow beautiful orchids and wild sword-grasses *(Gladiolus communis),* while along the badland's edge there are shrubs, like the broom, the blackthorn, the smoothleaf elm and the hawthorn.


Hedysarum coronarium




Glycyrrhiza glabra

The badland's walls

The xerophilous species are abundant along the steep walls, as they are used to warm and very dry climates: you can also see many true grasses, like the Sea Couch Grass and the *Reichardia picroides.* Anchored to the ground, there are also caper bushes *(Capparis spinosa)* and tamarisks.

The valley floor

On the valley floor there are many hydrophilous plants such as the Pliny's Reed, the Wild Carrot, and the Hairy Canary-clover. Within the reserve there are also various species of trees and shrubs, including the Common Dogwood, the Downy Oak *(Quercus pubescens)*, the White Poplar, the Black Poplar and the White Willow.


Capparis spinosa

The fauna of the badlands


Buzzard

The birth of a protected natural area gives the opportunity to help the wildlife to take back that territory, that mankind, especially hunters, have taken away.

The nature reserve plays host to a rich and diverse wildlife: small birds such as the Whitethroat, the rare African Stonechat, diurnal and nocturnal predators, reptiles such as the Four-lines snake and many mammals, to name but a few species.
The fearful and shy wild animals can only be seen by avoiding noise and sudden movements. Signs of their presence are easier to observe: calls, chirpings, droppings songs, tracks, droppings and leftovers.


Fox


Barn owl


Tiger spider

Peregrine

Buzzard
This diurnal bird of prey alternates its flight between regular wing beats with long glides and vaultings without moving its wings. It lurks on branches or poles and hunts not only small mammals but also birds, reptiles, amphibians and insects.

Barn owl
Nocturnal bird of prey, with a soft and undulating flight. It has long wings, a white body and feeds mainly on small mammals. During the day it perches in well-hidden shelters, in tree's chambers or in old farmhouses.

Fox
Solitary and prevalently nocturnal, the fox shelters in underground tunnels. It is omnivorous and spends the most of its time hunting and scouring the territory.

Badger
This animal tends to be nocturnal and leaves unmistakable tracks with its five strong claws. It builds systems of tunnels with many entrances and even though it is an omnivore, it loves earthworms.


Porcupine

Porcupine
Chosen as symbol of the reserve, this pleasant rodent, also the biggest in Europe, has been sighted here for over twenty-five years, despite its nocturnal habits and his very elusive nature.

Peregrine
In the reserve it is easy to see this beautiful bird of prey hunting unlucky ring-doves. Its diet consists of birds and small rodents. Except for rare local examples, the species shows a decrease in numbers throughout the Western Palearctic, due to persecutions and poisonings. Nowadays the species is recovering and the estimated population of peregrine falcons is of about 500 pairs.


Badger


Iphiclides podalirius


Macroglossum stellatarum


Lasiocampa quercus

The butterflies of the badlands

Colored wings in the badlands of Atri

The butterflies belong to the Lepidoptera (comprised of about 170.000 species) and brighten up most of the temperate zones of our planet with their wonderful colours. As pollinators of flowers they are very useful and are also an important link in the food chain.

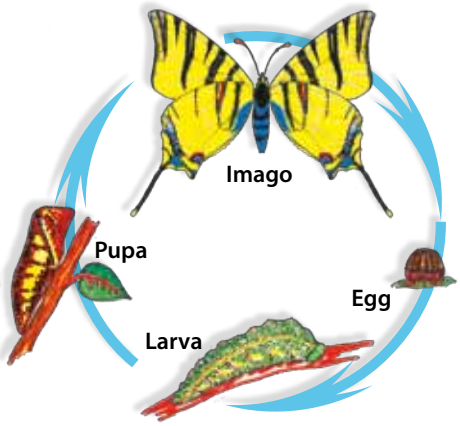
Visiting the nature reserve throughout the year you can easily see the different stages of the butterflies' development. These are, in fact, holometabolous insects and go through four stages: egg, larva, pupa and imago. At the end of this metamorphosis process, the adult butterflies (called also imagos) can survive for one week or one year. It depends on the species and the environmental conditions.

When the temperatures become warmer, several species of butterflies fly from the dry Mediterranean regions to the north, covering long distances: the Painted Lady, for instance, one of the best known migrant species, leaves the African coast and flies to Iceland.

The disappearance of natural areas which are suitable for these insects, together with the abuse of pesticides, puts the lives of butterflies more and more at risk.


Rhodostrophia calabra

Odice suava




Argynnis paphia

Argynnis paphia
Extending from the sea to high altitude, you can see this butterfly from June until July in forests and glades. In this nature reserve it is common to see these on blackberry blossoms.

Macroglossum stellatarum
This is known as the Hummingbird Hawk-moth or colibrì butterfly for its rapid flight. This butterfly flies very quickly from one flower to another without rest, clapping their wings at a frequency of about 200 times per second.

Lasiocampa quercus
Elegant moth with a wingspan up to 7.5 cm. It lives in garrigues and forests and feeds on oak trees.

Rhodostrophia calabra
Beautiful, rare and very localized species, that lives in southern Europe, Morocco, Caucasus and South Caucasus. In the reserve it flies from April to June.

Odice suava
Rare Asian-Mediterranean butterfly with only one generation. It can be seen at night near to light sources.

Iphiclides podalirium
In the reserve, these butterflies can often be seen on the purple flowers of the wild artichokes. The chrysalis hatches early, at the beginning of March. This species has usually two generations and the butterflies fly from March to November.

For further information:
The town council of Atri has entrusted the WWF with the management of the badlands of Atri.
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