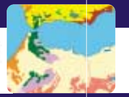
THE mediterranean FORESTS

A NEW CONSERVATION STRATEGY

















1 *Argania spinosa* fruits, Essaouira, Morocco.
Credit: WWF/P. Regato
2 Reed-parasol maker, Tunisia.
Credit: WWF-Canon/M. Gunther
3 Black-shouldered Kite.
Credit: Francisco Márquez
4 Endemic mountain Aquilegia, Corsica.
Credit: WWF/P. Regato
5 Sacred ibis.
Credit: Alessandro Re
6 Joiner, Kure Mountains, Turkey.
Credit: WWF/P. Regato
7 Barbary ape, Morocco.
Credit: A. & J. Visage/Panda Photo

It is like no other region on Earth. Exotic, diverse, roamed by mythical creatures, deeply shaped by thousands of years of human intervention, the cradle of civilisations.
When we talk about the Mediterranean region, you could be forgiven for thinking of azure seas and golden beaches, sun and sand, a holidaymaker's paradise. But it is the forests that perhaps most characterise the region's remarkable biodiversity.
The Mediterranean forests are extraordinarily beautiful, a fascinating kaleidoscope in all shades of green. They are one of the planet's centres of plant diversity, with an incredible 25,000 species.

From Portuguese cork forests to the cedars of Lebanon, from the acacia woodlands of North Africa and the Middle East to the firs of the Italian Apennines, the Mediterranean forest regions contain surprise after surprise. They are one of the few regions where animals such as leopards, bears, ibex and gazelles can wander undisturbed.

WWF Mediterranean Programme Office launched its campaign in 1999 to protect 10 outstanding forest sites among the 300 identified through a comprehensive study all over the region.
The campaign has produced encouraging results in countries such as Spain, Turkey, Croatia and Lebanon.

The next challenge for us is to demonstrate that Mediterranean forests hold an extraordinary patrimony of wealth whose conservation can be highly beneficial for human society and especially for those communities that still inhabit the forests.
To this end, we have developed a new concept, "Green Belts against Desertification", which aims to create an effective network of forest reserves, connected through corridors to promote wildlife flow and habitat connectivity.
This new concept will inspire and steer our future work on forest conservation in the Mediterranean.

THE UNVEILED WEALTH OF THE Mediterranean FORESTS

Forests have always played, and still play, an important role in the daily life of the Mediterranean peoples.
But the forests are fragile and under threat. Clearance and degradation is accelerating throughout the region due to ill-conceived land use policies, development pressure, poverty and population growth.
There is a serious risk that our green heritage will not survive beyond this century. Just 17% of the original forest cover of the Mediterranean region is left, while fires alone destroy a further 1% per year.

This is why WWF has identified the Mediterranean forests among the most valuable and endangered ecoregions in the world, known as Global 200, which constitute biodiversity hotspots to be preserved if the natural heritage of our planet is to be maintained for the generations to come.

We need to act now, together, to save the Mediterranean forests from further extinction. This unique natural heritage deserves our wholehearted support.

Marco Pagliani
Conservation Director
WWF Mediterranean Programme Office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NATURE AND CULTURE, AN INTIMATE RELATIONSHIP

Mediterranean forests played a crucial role in the rise of some of the oldest civilisations, often as a focus of controversy. Strategic control of important forest areas was the cause of dispute between different peoples. But although much Mediterranean deforestation and consequent erosion has happened since classical times, an important process of cultural evolution and know-how formed to make good use of forest environments in the region. Long periods of considerable forest clearance and a general expansion of population and agriculture has sometimes resulted in significant semi-natural and human-shaped landscapes, which are nowadays home to important sets of biodiversity. The forests have long been closely associated with the cultural heritage of the Mediterranean peoples, a source of inspiration for art, science, medicine, health and spiritual guidance, as well as food and income.

But in recent times, the balance between nature and humankind has been lost. Intensive agricultural practices and climate change have led to many of the rare species that characterise the Mediterranean forest region being listed as vulnerable, threatened or endangered on the Red Lists of IUCN – The World Conservation Union.

A Meeting POINT OF NATURE AND CIVILISATIONS


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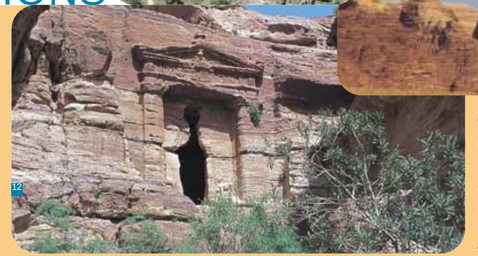
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The Mediterranean climate, characterised by prolonged dry and warm summer seasons, occurs over just 2% of the world's land surface, on the western coasts of all the continents in both hemispheres, along a more or less broad latitudinal range between 28° and 45°, in California, Central Chile, the Western Cape, Southwest Australia and the Mediterranean region itself. By far the largest of these regions is the Mediterranean.

The Mediterranean Sea is the largest in the world, a transitional zone between the European, African and Asian continents. Large peninsulas – Iberian, Italian, Balkan and Anatolian – and countless islands shape most of the broken coastline in the north. The North African and Middle Eastern coast, meanwhile, has a less convoluted outline.
Mountains constitute the backbone of the Mediterranean region and they have determined the outstanding natural and cultural heritage of the region. Whether it is the Alpujarras in Andalucia or the Taurus range in southern Turkey, for millennia communities have lived in harmony with nature, protecting a wide range of flora and fauna unique to their regions. The mountains also form a natural border between the Mediterranean and the adjacent ecological regions, preventing desertification in the south and assuring important hydrological resources in the north.

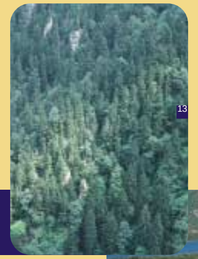
Climate, geography, geology, cultural tradition and history all come together to characterise the Mediterranean region, which is a meeting point of civilisations and nature.
Such a complex human context cannot be understood apart from the natural world. Nature has always had, and will continue to have, a deep influence on the life of the people.

8 Marco Pagliani, Conservation Director, WWF Mediterranean Programme Office. Credit: WWF/P. Regato
9 Etna Volcano, Sicily, Italy. Volcanic substrata are widespread in the region. Credit: WWF/P. Regato
10 Duratón river canyon, Spain. Typical karstic morphology. Credit: WWF/P. Regato
11 Wadi Rum desert, Jordan. Sandstone rocks. Transitional zone to the saharo-sindic biogeographic region (desert). Credit: WWF/M. Pagliani
12 Petra, Jordan. Credit: WWF/M. Pagliani

THE Mediterranean: A SEA OF FORESTS

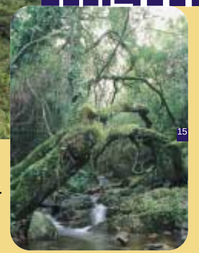
Before humans began exploiting the regional ecosystems of the Mediterranean thousands of years ago, forests covered 82% of the landscape. Today the cover is five times less and in great danger of shrinking further. Despite such alarming depletion, however, Mediterranean forests, woodland and scrub form an outstanding terrestrial ecoregion. It is still extraordinarily rich in forest types and species, most of which are endemic.

They can be divided into six diverse groups, according to their location, ground conditions and the climate they inhabit.



Mediterranean mountain conifer and mixed forest

The cold and humid high elevations of the main Mediterranean mountain ranges constitute outstanding biodiversity hotspots in terms of plant species. The forest landscapes are characterised by many endemic and threatened conifers – fir, cedar, pine and juniper. Old growth conifer forests still remain in isolated areas and on inaccessible steep slopes.



Mediterranean mountain and submontane deciduous forest

Mixed deciduous forests, mainly distributed in the mild and humid mid-elevations, valleys and canyons of the northern part of the Mediterranean region, are characterised by many different oak species, especially abundant in the eastern part of the region, a rich mix of deciduous tree species – such as hornbeam, ash, lime and maple – as well as more Central European beech species.

Mediterranean sclerophyllous and xeric-conifer forest

Evergreen broadleafs – such as oak, strawberry, myrtle and laurel – and xeric conifers – cypress, pine and juniper – and two endemic palms – *Phoenix theofrasti* and *Chamaerops humilis* – give a unique sub-tropical character to the lowlands and dry, warm coastal landscapes all around the region.

Semi-natural, sylvo-pastoral woodlands are still an important source of income for rural economies while maintaining rich biodiversity.

THE BROKEN VEINS OF THE MEDITERRANEAN FORESTS

Riparian forests are essential for preventing and controlling flood damages and for stocking water. They are also important contributors to the health of aquatic ecosystems. In addition, they play a major role in allowing species populations to flow along their natural corridors.

Many relic species which have disappeared elsewhere, took refuge in those habitats, being able to survive until nowadays.

But these forests have been decimated over the years, substituted mainly by intensive agriculture.

Nowadays just a few remain in small, very fragmented areas, where their degraded habitats are threatened by newer, genetically-modified species (i.e. poplars).

WWF has selected several large river basins, such as the trans-boundary Guadiana River basin between Spain and Portugal, as part of a more integrated freshwater and terrestrial conservation programme.

WWF Mediterranean Programme Office has developed a partnership with the Portuguese NGO ADPM (Association for the Defense of Mertola's Heritage), which has led to the establishment of the Guadiana Valley Natural Park.

WWF Spain is promoting alternatives to reduce the impact of irrigation in the Guadiana Basin and to reverse the negative effect of agriculture land afforestation supported by EU subsidies.

Mediterranean Argania woodland and xeric steppe

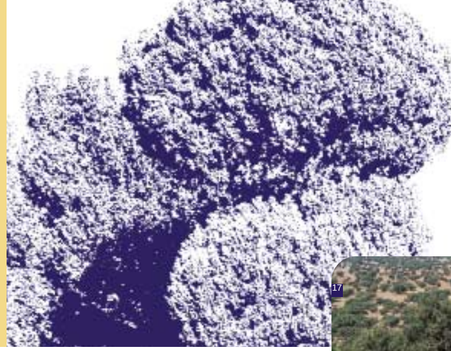
Argania woodland, the only member of the *sapotaceae* tropical family endemic to the arid south-western coastal plains of Morocco and western Algeria, is rich in biodiversity.

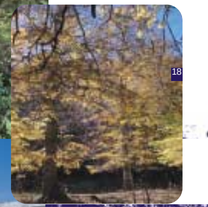
Arganian oil and sylvo-pastoral income-generating activities have high socioeconomic importance. Xeric tree-steppes, dominated by conifers, such as pine and juniper, and broadleafs such as acacia, pistachio and almond, define a transitional belt through North Africa and the Middle East, separating Mediterranean forests from the desert.

Macaronesian forest

The subtropical cloud forests endemic to the Atlantic islands – the Canaries and Madeira – are characterised by the unique and species-rich *laurisilva* evergreen broadleaf mixed forests and sub-humid Canary pine forests. The flora in this transitional forest zone is particularly rich.

13 Oriental spruce forests, Sumela, Turkey. Credit: WWF/P. Regato
14 Holm oak woodlands, Dalmatian coast, Croatia. Credit: WWF/P. Regato
15 Rio Perdu Melis, Monte Arcosu, Italy. Credit: Giovanni Paulis
16 Macaronesian forests, Canary Islands, Spain. Credit: WWF/J.Gamonal
17 Argania woodlands, Morocco. Credit: WWF/P. Regato
18 Beech mixed forests, Abruzzo National Park, Italy. Credit: WWF/P. Regato
19 *Juniperus thurifera* woodlands, Segovia, Spain. Credit: WWF/P. Regato
20 Riparian woodlands, Cuenca, Spain. Credit: WWF/P. Regato





Northern Anatolian and Caucasian conifer and deciduous forest

Endemic fir and oriental spruce old-growth conifer forests characterise one of the most pristine cold and per-humid mountain areas of the Mediterranean region. The humid, mild, medium to low elevations from the Black Sea coastal strip are home to an astonishing mix of broadleaf forest types. These temperate forest types belong to the Euro-Siberian bio-geographic region and spread into the Caucasian Mountains.

THE INTRINSIC VALUE OF MEDITERRANEAN FORESTS

The Mediterranean forests are crucial for the preservation of water resources. A well-preserved forest cover regulates water run-off – which helps prevent floods – and thus helps recharge groundwater reservoirs, resulting in more persistent stream and spring flow during the summer dry season. Mediterranean forests are essential to maintaining water and soil resources, key components for securing human welfare and life in the region. Forests regulate local climates by increasing the air humidity and therefore reducing the intensity of drought. In this way, they are a barrier against desertification. The trees also capture water from the frequent Mediterranean mists, dripping it to the ground, and increasing substantially the annual precipitation. They are also reservoirs of genetic diversity: they contain many species and ecotypes adapted to the various regional environmental conditions.

The maintenance of this genetic pool will be crucial for the species surviving climate change and major human-induced impact.

The forests are a great source of food and income for local communities. People have been harvesting forest, animal and plant products on a large scale in the Mediterranean for thousands of years, developing countless uses and management systems and acquiring sophisticated ecological knowledge of their environment.

But forests are extremely fragile and vulnerable to activities such as overgrazing, intensive agricultural practices and excessive logging, which are leading to irreversible soil destruction in many forest areas.

21 *Lilium candidum*.
Credit: WWF Turkey
22 *Argania spinosa* fruits, Essaouira, Morocco.
Credit: WWF/P. Regato
23 Butcher's Broom, El Feija, Tunisia.
Credit: WWF/P. Regato
24 *Euphorbia resinifera*, Morocco.
Credit: WWF/P. Regato
25 Steppe grasslands, central Anatolia, Turkey.
Credit: WWF/P. Regato

AMAZING plant DIVERSITY

Mediterranean flora constitutes a rich mix of evergreen and deciduous species adapted to the large range of Mediterranean climate subtypes and physical environment.
Evergreen plants are the predominant life form, able to endure both water deficits during the warmest period in summer and frost drought during the wettest period, which can last, mainly in the hinterland areas, from autumn till spring. Deciduous species populate valleys with deep permeable soils, humid mountain slopes and riverbanks.

Despite thousands of years of human use, land clearance and continual modification of the natural vegetation structure and plant composition, the Mediterranean region's flora is still among the richest in the world.

The number of endemic species in the Mediterranean is also very high: 13,000 endemic plants, half of all the flora, which makes it the second richest area in endemic flowering plants in the world, after the tropical Andes.
One of the major plant conservation problems in the Mediterranean lies in the fact that many of the Mediterranean plant endemics are "narrow" endemics that live in small and isolated habitats, and are consequently considered as threatened.
Some 5,000 Mediterranean plant species (17% of the whole flora), from 97 families in 18 countries, are classified as endangered, rare or vulnerable by IUCN, and are on its Red List of Threatened Plant Species.
Eighteen Mediterranean endemic conifer trees – and their related forest habitat types – are classified as threatened and appear on the list too.

SPECIES UNDER THREAT

The over-harvesting and export of aromatic plants and bulbs for cosmetic, medicinal and ornamental purposes has seriously damaged endemic flora and plant communities in the Mediterranean.

A large number of species are under threat. The IUCN's Red List of Threatened Plant Species includes:
- 34 Mediterranean orchids;
- 22 sage, 21 crocus and 5 cyclamen species in Turkey;
- 16 marjoram and 23 fritillary species in Greece and Turkey;
- 28 lily species in the Middle East and Turkey;
- 11 thyme and 19 germander species in the Iberian Peninsula;
- and 13 germander and 6 savory species in North Africa.
According to the 1998 TRAFFIC report, *Europe's medicinal and aromatic plants: their use, trade and conservation*, **uncontrolled collection of wild plants plays a vital role in trade in medicinal and aromatic plants in Europe, mainly in Albania, Turkey and Spain. In fact, almost the whole overall harvest comes from the wild. Prices for wild-collected plants are much lower than for material of cultivated origin, meaning there is a demand for poachers to collect in large quantities. Regulations providing precise rules for sustainable harvesting techniques are almost non-existent at a national and international level. In countries such as Albania and the former Yugoslav republics, which have undergone major political upheaval and are passing from state-controlled commerce to free markets with intense harvesting techniques, wild collection is particularly destructive.**
WWF, IUCN and TRAFFIC believe that the conservation of the Mediterranean forest, woodland and maquis habitat types is a valuable way to secure the long-term preservation of viable populations of such plant species. This implies an urgent need for designating more protected areas and securing adequate management plans in existing protected areas, mainly by promoting economic incentives for local communities, based on sustainable use of non-timber forest products. Cultivation of medicinal, aromatic and ornamental plants is a very efficient means, if not the most promising one, of satisfying the expanding demand of the so-called "green movement" market. Green markets heralded a 20% increase in European imports of these plants from 1992 to 1996, at the same time reducing or eliminating pressure on indigenous wild populations.
WWF is supporting a number of projects in the Mediterranean region, helping local communities and protected area managers improve their capacity to manage and share benefits in a collaborative way.
This is leading to sustainable harvesting and marketing of aromatic and ornamental plants, as well as other non-timber forest products.
N.B. The TRAFFIC Network is the world's largest wildlife trade monitoring programme with offices covering most parts of the world.

It boasts an amazing number of flowering plants: 25,000 in total, 30,000 if sub-species are included. This represents 10% of the world's flowering plants on just over 1.6% of the Earth's surface.
This is 4,000 more plant species than the former Soviet Union countries put together, over a land surface ten times smaller. The Mediterranean region also contains the same number of plant species as the whole of tropical Africa, and the latter is four times larger.

The countries with the highest number of threatened plants are:
Turkey (21.7% of total flora);
Spain (19.5%);
and Greece (11.4%).

The Mediterranean plant species are adapted to a fragile environment, with frequent natural and human disturbances. Although natural factors – such as geographic isolation and rarity of habitat – can cause a species to be regarded as threatened, human impact is usually the reason.
Any strategy for plant conservation must focus at the ecosystem or landscape level, in order to understand the natural dynamics related to the concerned plant communities, predict human impact and ensure proper management plans.

The Mediterranean fauna's uniqueness is due in a large part to the geographical position of the Mediterranean, at the crossroads of three continents, lying in the transition zone between tropical and temperate climates. Although centuries of human encroachment have had a severe impact on the biodiversity of the region, the forest, shrub and savannah of the Mediterranean region are still home to a rich and varied fauna, a diverse mix of paleoarctic, Ethiopian and eastern species.

The presence of some species is little-known and a surprise once revealed. Large carnivores, such as the brown bear, lynx and wolf, coexist in the Mediterranean region with more tropical or eastern species, including leopards, striped hyena and jackals.

Only a few mammals are endemic to Mediterranean forests: among these, the Barbary ape (Morocco, Algeria and Gibraltar), mouflon (Sardinia, Corsica and Cyprus), Iberian lynx (Spain and Portugal), Spanish imperial eagle, Algerian and Corsican nuthatch, and many reptiles such as lizards, chameleons, tortoises and snakes.

The Mediterranean wooded areas are also a strategic area for bird migration. The fauna of Mediterranean forests – although maybe not as easily enjoyable and well-known as elsewhere in the world – is a fascinating and unique heritage, highly threatened and in urgent need of preservation for the sake of the future generations.

THE SECRETS OF MEDITERRANEAN WILDLIFE

Wild cats are among the best kept secrets of Mediterranean wildlife. The Iberian lynx survives in the forests and shrub of south-western Spain and Portugal (see separate box on large animals on these pages). The leopard was once widespread all over the Mediterranean, but recently became extinct through most of its distribution range. Nowadays, a few leopards of the Middle Eastern sub-species (*Panthera pardus jarvisi*) survive in the deserts of the Judean Hills, the Negev (Israel) and Sinai (Egypt), while the last remaining specimens of the Atlas leopard are confined to the most remote mountain forests of central Morocco. Turkey was once home to two subspecies of leopard, of which the Anatolian leopard still survives in western Taurus. Several smaller cats roam the thick Mediterranean bush, among which is the serval, a rare dweller of the most pristine Maghreb forests.

AN Unknown ANIMAL WORLD

26 Serval.
Credit: T. Whittaker/Panda Photo
27 Leopard.
Credit: WWF/Martin Harvey
28 Imperial Eagle.
Credit: WWF/J.L.G. Grande
29 Black Vulture.
Credit: D. Ruiu
30 Oryx.
Credit: F.Petretti/Panda Photo
31 Nubian ibex.
Credit: WWF-Canon/Bruno Pambour
32 Iberian lynx.
Credit: Francisco Marquez
33 Barbary deer.
Credit: Domenico Ruiu

HIGH IN THE SKY

The Spanish imperial eagle is perhaps the most threatened among Mediterranean birds of prey. It has disappeared in Portugal and the Maghreb, and only 104 couples still nest in the most remote forests and mountain ranges of south-western Spain. Among Mediterranean vultures, the black vulture is dependent on old-growth forests, as it builds its huge nest on top of the largest trees. Although Spain is its stronghold, the black vulture is also found in Turkey and Greece. WWF Greece has been very active for the last six years in successfully protecting black vultures in the Dadia forest.

ISOLATED KINGDOMS

Many large herbivores still browse the young shoots of Mediterranean trees, bushes and grasses. The region is home to several endemic species and sub-species, most of which are rare or endangered. Mediterranean mountains host a number of endemic goats and sheep: the mouflon, ancestor of the domestic sheep, lives in forests in Sardinia, Corsica, Cyprus and Turkey. High mountains and rocky outcrops are home to the Nubian ibex (Egypt, Israel, Jordan), the Spanish ibex (several Spanish *sierras*), the Bezoar ibex (Taurus and Anti-Taurus ranges in Turkey), the Abruzzo chamois (central Italy) and the eastern Anatolian chamois, which spends winter times in the wooded areas of the lower elevations.

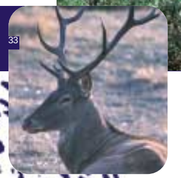
The shrub and Acacia savannah in the southern portion of the Mediterranean have always been the kingdom of gazelles, oryx and antelopes. Reintroduction programmes are underway for several species of oryx and gazelle throughout the Maghreb and the Middle East, and they are again becoming a familiar sight in protected areas such as Bou Hedma (Tunisia), Bas Draa (Morocco), Shaumari (Jordan), and Hai Bar (Israel).

LARGE MAMMALS, THE KEY TO ECOLOGICAL SECURITY

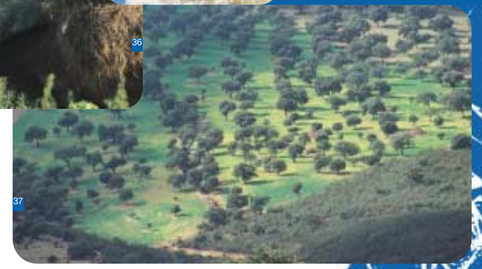
Large mammals are considered as good indicators of the wealth and ecological integrity of Mediterranean forest ecosystems. Working with such species helps identify habitat requirements that can secure the long-term survival of their viable populations.

WWF Italy saved from extinction the Sardinian deer, once widespread in Sardinia and Corsica, by purchasing the Monte Arcosu Nature Reserve and implementing a comprehensive conservation programme. Three thousand Sardinian deer now populate the southern part of the island. The Barbary deer is still found in the oak forests of Kroumerie-Mogod (north-western Tunisia) and north-eastern Algeria.

WWF Mediterranean Programme Office and WWF Italy have started a twinning programme for nature conservation between the two protected areas hosting the largest populations of Sardinian and Barbary deer: Monte Arcosu and El Feija National Park in Tunisia.



Only 650 Iberian lynx, one of the most endangered felines on Earth, survive in the forests and shrub of south-western Spain and Portugal. The lynx symbolises the crisis most large carnivores face in the Mediterranean. WWF Mediterranean Programme Office has supported a review of the current status of the Iberian lynx, the threats to its survival and the measures needed to ensure its conservation. WWF Spain is actively involved in raising awareness among landowners and hunters, campaigning against damaging infrastructure projects and lobbying governments to establish a network of Natura 2000 sites for the Iberian lynx.



34 Cork oak harvesting, Tunisia.
Credit: D. Ruiu
35 *Pinus leucodermis*, Pollino National Park, Italy.
Credit: WWF/M. Pagliani
36 Peasant, Kure Mountains, Turkey.
Credit: WWF/P. Regato
37 Evergreen oak sylvopastoral woodlands, Alcudia, Spain.
Credit: WWF/M. Pagliani

ITALY DECLARES BIG TREES AS NATIONAL MONUMENTS

WWF Italy has persuaded the Italian government to give large trees the status of national monuments.
Twenty trees have been identified in each region of the country.
This is a rare instance of a government granting historical and cultural value to nature. Anyone caught damaging the protected trees will be heavily fined or even sent to prison and will be liable for repairing the damage.
The biggest tree selected is a chestnut tree in Sicily whose trunk has a circumference of 20 metres, while the oldest is a 2000-year-old wild olive in Sardinia. Others have been chosen for their inspiration to artists or as witnesses to historical events.
They give refuge to a broad variety of organisms: mosses, lichens, mushrooms and fern growing in the bark, birds and mammals nesting in their hollows, and wild cats, lynx, martens and badgers burrowing lairs in their roots.

MILLENNIA OF HUMAN *interaction* WITH FORESTS

There is almost no pristine wilderness left in the Mediterranean region. Exploitation of the natural landscape, however, was long, slow and relatively sustainable, at least until the last few decades.
This is why the Mediterranean still has the lion's share of Europe's biodiversity: about 80% of the plants whose sites and habitats are to be protected under the European Union's Habitats Directive are from Mediterranean countries.

Man has shaped the Mediterranean landscape into a mosaic of innumerable variants of cultural lands, including field crops, vineyards, olive and fruit groves, sylvo-pastoral systems, semi-natural forests, shrubs and meadows.
A positive example of sustainable exploitation is cork production in the forests of the western part of the region from Morocco to Tunisia and from Italy to Portugal.

LOCALS TURN TO HONEY TO PRESERVE FORESTS

WWF is helping local Mediterranean communities find other ways of earning income from the forest than the traditional destructive practices of chopping down trees, overgrazing and poaching.
One of seven regional pilot projects has been set up in the El Feija National Park, Tunisia, and is achieving a new balance between economic activity and the forest. El Feija region hosts the largest area of zen oak, an extremely rare endemic tree species restricted to very few areas in the Mediterranean, targeted by firewood collectors and shepherds. The Park is also one of the last refuges for Barbary deer, previously the target of poachers.
WWF, in close collaboration with DGF (Direction Générale des Forêts), has provided local families with beehives and trained them in honey production, from sustainable harvesting to marketing. Through this pilot activity, WWF has promoted an innovative way of integrating local communities in forest management. Now the people of El Feija have bought extra beehives instead of goats.

This being said, wilderness in the Mediterranean has a different meaning than in other parts of the world: many endangered ecosystems and rare, endemic species in the Mediterranean still coexist in close relationship with humans.
Thousands of years of human intervention has drastically changed the Mediterranean landscape.
The primeval old-growth forests which covered most of the region following the last Ice Age have been reduced to small, semi-natural, fragmented patches, almost entirely restricted to the poorest soils and the least accessible mountain areas.
Mediterranean forests have played a major role in the rise and fall of many civilisations: the legendary naval power of the Phoenicians was built on the exploitation of the beautiful cedar forests of the Middle East, while, much more recently, extensive forest areas in the southern Anatolian mountains were cut down to build the Suez Canal.

The *dehesas* of Spain and *montados* of Portugal – home to endangered species such as the Iberian lynx and black vulture – provide an ideal example of forest management, which positively includes biological diversity.
The harvesting of non-timber forest products such as spices, resins, medicinal plants, essential oils and honey is also often still carried out using local know-how and can provide increasingly significant sources of income for communities living in and around forests.
This is why WWF believes that the traditional management and sustainable use of forests is not only compatible with conservation but a key tool and much-needed ally in the effort to save forest biodiversity around the Mediterranean. Sustainable economic systems for local communities, deepening links between man and nature, and allowing them to coexist in harmony, are possible if recommended best practices are followed.

After centuries of positive interaction between humans and nature, the last few decades have proved disastrous for the Mediterranean forests. Degradation is accelerating and, without action now, the ecological balance of the forests will be destroyed for ever.

Rapid land-use changes that have occurred in the region during the last 30 or 40 years include coastal and high mountain tourism, urban development and the socioeconomic and political instability that is still dramatically affecting certain areas of the region, particularly the Balkans, Middle East and Algeria.
Traditional rural management systems, such as fires, logging and grazing, are also having an increasingly negative impact on the conservation of forest ecosystems and related species. Forest resources are being over-exploited through firewood collection, wildlife hunting and plant harvesting, too.

Urban development in the last half of the 20th century has contributed significantly to the reduction of coastal forest ecosystems, provoking the intensification of disturbance processes that are threatening the remaining natural areas.
As an example, 70% of the Italian coastline is already urbanised.
These major problems exist primarily because the majority of Mediterranean forest types are scarcely represented in the regional networks of nature reserves. In addition, conservation plans tend to be inefficiently implemented if they exist at all.
This is why WWF has made acquiring a better understanding of the current conservation status, and threats to, the Mediterranean forests an urgent priority. Major gaps need to be addressed by governments, non-governmental organisations and research institutions, in order to safeguard the forests from unwanted human impact.

FORESTS ON THE Wane

Forest fires in the Mediterranean region have dramatically increased during the last few decades due to rapid land use changes and socioeconomic conflicts and competing interests. About one per cent of Mediterranean forest burns every year, equal to 400,000 hectares, and some 95% of fires are caused by arson or negligence.
The problem of forest fires is related to land use planning, and especially the rapid introduction of new land uses, such as coastal tourism development and economic interests to convert rural land into urban land, mainly in the European Mediterranean countries. A forest fire means more land for development and this tactic is particularly prevalent in areas where planning laws are weak.

THE BURNING ISSUE

Forest fires are one of the most common catastrophes in EU Mediterranean countries, such as Greece. In the summer of 2000, fires hit two of the most important wildlife areas in the country. The Pindos Mountains, home to countless plant species and a key habitat for brown bears, wild cats and wolves, lost 3,200ha, while the island of Samos lost the whole of its brutia pine, which provided islanders with their only alternative income to tourism. In summer 1998, another disaster involved forests of exceptional ecological significance on Mount Taygetos. In the same year, WWF Greece launched a campaign against forest fires. Called "Forests For Ever", the campaign represents an ambitious effort to change forest legislation, improve fire prevention in selected forests of particular ecological importance and promote forest restoration through model demonstration projects. Two sites have been successfully restored, fire prevention plans have been prepared for a further three forest areas and specific proposals have been submitted to the Greek government recommending changes in law.

38 Logger felling tree, Rodope Mountains, Greece. Credit: WWF-Canon/M. Gunther
39 Sand quarry, Segovia, Spain. Credit: WWF/P. Regato
40 Urban development, Cape d'Agde, France. Credit: WWF/M. Gunther/Bios
41 Forest fires in the "Garrigue", France. Credit: WWF/Michel Gunther/Bios

TOURISM OR NATURE?

The Dalmatian coast in Croatia is a hotspot for marine and forest conservation. WWF has identified there several ecologically relevant areas, for example in the Dalmatian islands of Lastovo, the archipelago near Dubrovnik, the lower Neretva coastal plain and the coastal slopes of Biokovo mountain range. They include some of the best examples of coastal mixed holm oak evergreen forest and Aleppo pine forest in the Mediterranean. Tourism developers are increasingly targeting the traditional villages of these areas.

There have also been many forest fires that have resulted in the conversion of forest into urban land. In summer 2000, for example, a large part of the Korçula Island forest, and the forests around Dubrovnik, were burned, altering the integration of nature and culture in such an important historical place, and promoting soil erosion and slope instability, increasing the risk of landslides on to the villages below. In addition, competition between tourism and nature for water is reducing the available resources for forests and natural vegetation and could result in drought in the future. Wastewater from tourist resorts is also invading underground reservoirs, affecting areas well downstream from the point of pollution.

THE GLOBAL 200 IN THE mediterranean

The rapid loss of biodiversity and the accelerated and intense fragmentation of forest ecosystems remains one of the greatest threats for the Mediterranean region.
WWF is developing new tools to tackle this accelerating process.
One of these, which has been used as a basis for conservation work at a Mediterranean level, is the Global 200.
The central concept of the Global 200 is simple: by conserving a comprehensive representation of the world's habitats, we can conserve the broadest range of the world's species and most endangered wildlife, as well as the ecological and evolutionary processes that maintain the web of life.

But biodiversity is not evenly distributed and this led WWF to identify the most outstanding terrestrial, freshwater and marine ecoregions in the world, on which it could focus its conservation efforts. Ecoregions constitute relatively large geographic areas, characterised by their biological distinctiveness – species richness, high endemism, unusual ecological or evolutionary phenomena, and global rarity of major habitat types – and by their conservation status, defined as the ecoregion's ability to maintain viable species populations, to sustain ecological processes, and to respond to natural environmental disturbances.
This methodology has received acclaim from leading scientists around the world and already serves as a priority-setting tool for many government agencies and international organisations.
Five of the Global 200 ecoregions chosen by WWF are in the Mediterranean region. All these areas are classified as "globally outstanding" and "critically endangered" ecoregions, where conservation plans need to be put in place urgently.

Three of them are terrestrial, characterised by a high diversity of forest ecosystems: "Southern European Mountain Mixed Forests" from the Pyrenees to the Alps and the Rodopes; "Caucasus-Northern Anatolian-Hyrcanian Temperate Forests" in northern Turkey and the Caucasus; and "Mediterranean Forests, Woodlands and Scrubs" all over the Mediterranean region. Within these three ecoregions, WWF has established "sub-ecoregions" which correspond to homogeneous ecological units, defined by major forest types and bio-climates (see map overleaf). This scale is more appropriate for planning long-term regional conservation strategies.
WWF Mediterranean Programme Office, in close collaboration with the WWF Conservation Science Programme, the European Topic Centre on Nature Conservation and a number of regional experts, prepared the terrestrial ecoregion map for the Global 200 in the Mediterranean region.

42 Cape of Good Horn, South Africa. One of the five Mediterranean ecoregions in the world. Credit: WWF-Canon/ M. Harvey

THE THREE global200 TERRESTRIAL ECOREGIONS IN THE MEDITERRANEAN

Mediterranean Forests, Woodlands & Scrubs
Caucasus, Northern Anatolian & Hyrcanian Temperate Forests
Southern European Mountain Mixed Forests

THE terrestrial SUB-ECOREGIONS IN THE MEDITERRANEAN

"Southern European Mountain Mixed Forests" ecoregion, and other related lowland forests

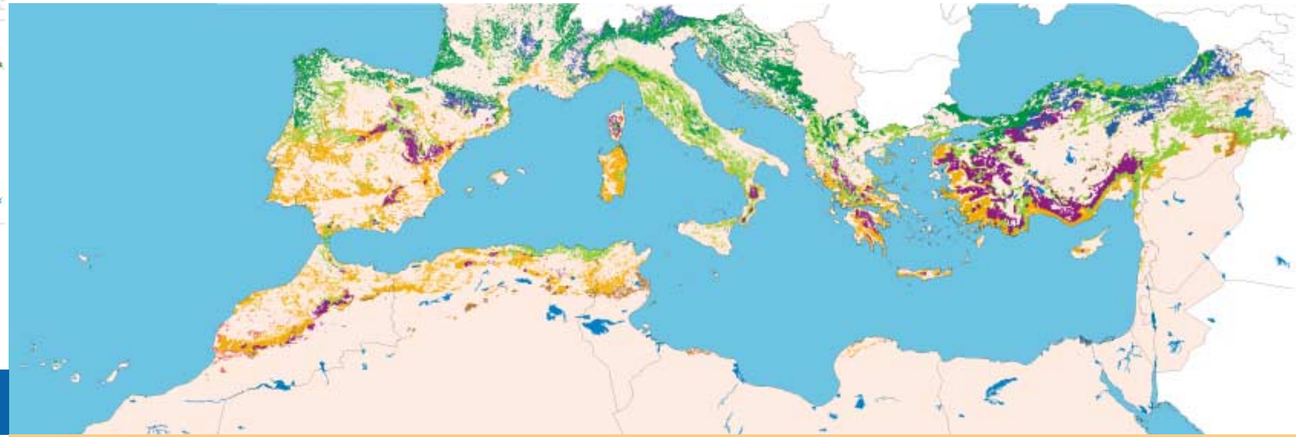
- Apennine deciduous mountain forests
- Balkan deciduous mixed forests
- Dinaric mountain conifer and broadleaf forests
- Pyrenean conifer and mixed broadleaf forests
- Rodope montane mixed forests
- Alpine conifer and mixed broadleaf forests
- Cantabric deciduous mixed forests
- Pannonian mixed forests
- Po Basin deciduous mixed forests

"Caucasus, Northern Anatolian & Hyrcanian Temperate Forests" ecoregion

- Caucasus mixed forests
- Northern Anatolia conifer and deciduous forests
- Euxine-Colchic mixed deciduous forests

"Mediterranean Forests, Woodlands & Scrubs" ecoregion

- High Atlas conifer and sclerophyllous forests and woodlands
- Northern Africa & southern Spain mountain conifer forests
- Corsican mountain conifer and deciduous forests
- Eastern & central Spain mountain conifer forests
- Southern Balkan mountain conifer and mixed forests
- Southern Italy mountain conifer and mixed forests
- Southern Anatolia & Middle East mountain conifer and deciduous forests
- Central Anatolia deciduous forests
- Eastern Anatolia deciduous forests
- Iberian deciduous forests
- Apennine deciduous mixed forests
- Illyrian deciduous forests
- Northern Africa & southern Iberian deciduous and sclerophyllous forests
- Western Anatolia mountain conifer and deciduous forests
- Canary Islands & Madeira Islands *laurisilva* and conifer forests
- Northern Africa sclerophyllous and dry conifer forests
- Aegean & western Turkey dry conifer and broadleaf forests
- Iberian sclerophyllous and dry conifer forests
- Tyrrhenian & Adriatic sclerophyllous forests
- South-eastern Anatolia & Middle East dry conifer and broadleaf forests
- Crete conifer and broadleaf forests
- North-eastern Spain & southern France dry conifer and broadleaf forests
- South-western Iberian & north-western Morocco sclerophyllous forests
- Cyprus conifer and broadleaf forests
- Northern Africa tree-steppes
- South-western Morocco Arganian woodlands
- Middle East tree-steppes
- Eastern Spain tree-steppes
- Central Anatolia steppes
- Eastern Anatolia mountain tree-steppes



CURRENT Mediterranean FOREST COVER

Current forest cover of the major forest types in the Mediterranean region

- Southern European & northern Anatolia mountain conifer forests
- Southern European & northern Anatolia broadleaf deciduous forests
- Mediterranean mountain conifer forests
- Mediterranean broadleaf deciduous forests
- Mediterranean sclerophyllous and dry conifer forests
- Mediterranean tree-steppes
- Macaronesian *laurisilva* and pine forests
- Arganian woodlands

Forest Cover data have been kindly provided by UNEP-WCMC

A BRAND NEW TOOL: THE gap ANALYSIS

Assessing the current conservation status and gaps in forest protection of all forest types in the whole Mediterranean terrestrial ecoregions and sub-ecoregions has become a priority for WWF Mediterranean Programme Office. A new tool to identify these gaps has been applied, this tool is called the Mediterranean Forest Gap Analysis. It started in 1998 and was finalised in 2000.

CRITERIA FOR SELECTING IMPORTANT FOREST AREAS

A common set of criteria was developed in order to evaluate the significance of WWF-selected Important Forest Areas, according to their conservation status, biodiversity and landscape values, and the threats they face:

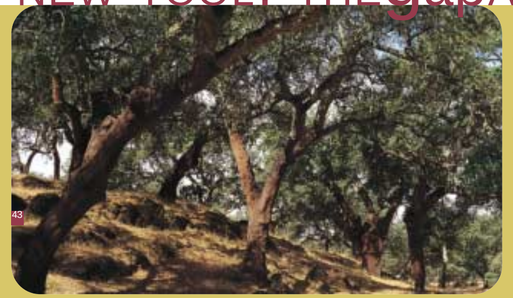
1. Rarity: forest areas including endemic and rare forest types exclusive to the country, endemic forest types at a sub-regional level (i.e. North Africa, Middle East, Balkans), whose distribution is mainly limited to the country.
2. Importance of fauna and flora: forest areas hosting endemic or rare fauna and flora species and habitats.
3. Maturity: forest areas with old-growth forest stands, closed to the highest evolution stage, with a high diversity of age classes, old trees, saplings, dead wood and the presence of animal species related to mature forests.
4. Authenticity: forest areas including natural forests with scarce human activity. They are usually on high mountain steep slopes or consist of semi-natural forest ecosystems under sustainable development, with high landscape, cultural and biodiversity values.
5. Fragility: forest areas with low capacity to face human or natural disturbances, linked with major threats identified in the area.
6. Richness: forest areas holding a considerable number of forest types, with especially rich flora and fauna inventories. Related to complex landform units, such as steep high mountains, canyons, etc.

The methodology

The sub-ecoregions identified by the Global 200 constitute the basic geographic component for the analysis.
The Mediterranean countries share the Mediterranean sub-ecoregions. Each country has very different approaches to habitats/species management and conservation, protected areas legislation, as well as very diverse human and financial resources allocated to nature conservation, etc.
One of the consequences of this complexity is the lack of homogeneous data in terms of quality and quantity.

The methodology used for the Mediterranean Forest Gap Analysis takes into account this biological, political and cultural heterogeneity of the region, working both at a wide and coarse Mediterranean level and at a finer country-to-country scale. The coarse regional analysis identifies large areas of high concentration of species and endemics.
The country-to-country study elaborated by national experts allows the overlapping of those results with the national distribution of the different forest types and their protection status.
This overlapping helps visualise the protection gaps and final selection of the forest Hot Spots called "Important Forest Areas" (see box). WWF Mediterranean Programme Office has managed to identify 300 Important Forest Areas in the Mediterranean.

This analysis provides a rapid assessment of the biodiversity values, conservation status and threats concerning all the different forest types of all the Mediterranean terrestrial sub-ecoregions. The analysis also identifies non-protected ecologically relevant forest areas with the aim of securing the representation of enough surface of all the forest habitat types and species. It seeks to identify gaps (i.e. vegetation types and species that are not represented in the current network of nature reserves) that may be filled through the establishment of new reserves or changes in land management practices.



43 Cork oak (*Quercus suber*) woodlands, Sierra Norte National Park, Sevilla, Spain. Credit: WWF/P. Regato

How much forest remains?

Results indicate that the original forest & woodland cover, including the tree-steppes, in the Mediterranean countries once represented about 82% of the total land cover.
Nowadays only about 17% of the original forest cover remains and most of this cover is represented by different stages of degraded forest ecosystems, which have little to do with the original pristine and rich mosaic of forests.
The Middle East countries – Lebanon, Syria and Jordan – are most affected by deforestation, with less than 5% of the original forest cover remaining.
Greece, Bosnia-Herzegovina and Slovenia still host around half of their original forest cover.

Maghreb countries still maintain around 15% of original forest cover, while in the EU Mediterranean countries current forest cover can be estimated at around 20%.

A huge, living biodiversity

At a Mediterranean-wide level, the Gap Analysis has provided a number of coarse "hotspots" or centres of forest diversity, in terms of high concentration of forest types, endemic plants, and relevant indicator species such as forest birds and large mammals.
The majority of the centres of forest diversity correspond to sub-ecoregions in isolated mountain areas with high environmental diversity.

The following forest sub-ecoregions and their geographic areas are worth highlighting:

- All the Mediterranean mountain conifer and mixed forest sub-ecoregions, which have the highest concentration of endemic plants, the majority of the most threatened relic forest types (all the Mediterranean fir species and related habitat types), and very endangered vertebrates (the North African and the Anatolian leopard, the Iberian ibex, the North African macaque, the Corsican and Algerian endemic nuthatch, etc.).

These geographic areas are:
- Middle Atlas, Rif (Morocco) & Baetic complex (Spain);
- the Tellien Atlas in Algeria;
- Taurus & Amanus complex in Turkey;
- eastern & central mountain ranges in Spain;
- Corsica;
- Dinaric Alps (from Istria to Albania);
- central Greece (Smolikas, Pindos, Olympus, Typhrintos) and the Peloponnese (Taygetos).

MEDITERRANEAN FORESTS IN FIGURES

The original forest and woodland cover, including the tree-steppes, in the Mediterranean countries once represented about 82% of the total land cover.
Just 17% of the original forest cover of the Mediterranean region is left while fires alone destroy a further 1% per year.
Forest protected areas represent on average less than 3% of the forest cover in the southern part of the region, while in some Euro-Mediterranean countries it can be higher than 10%.
Only 5% of Mediterranean coastal vegetation is protected.
The majority of forest protected areas are too small and isolated (this doesn't allow the long term survival of many species populations and habitats).
During the 15 years of civil war which ravaged Lebanon, the famous cedar forests were almost totally destroyed.
The European Mediterranean countries contain an area of land with high erosion risk of 229,000 km² (about the surface of Greece and Portugal together).
The cost of direct impact of erosion on the environment is estimated at 280 million EURO per year.
The cost of forest restoration, improvement of water retention and soil protection is estimated at about 3,000 million EURO.

• Deciduous mountain forest sub-ecoregions:
- the mixed oak forests of the Tellien Atlas & Kroumerie-Mogod complex in Algeria and Tunisia, home of the last populations of the endangered Barbary deer;
- certain mountain areas of the Apennines (Sila-Aspromonte-Pollino complex; Gargano; Abruzzo Mountains; Casentino-Apuan Alps -Ligurian Alps);
- northern Greece (Prespa, Calcidia, Rodopes).
• The sclerophyllous & dry conifer forest sub-ecoregions:
- the south-western Iberian Peninsula & north-western Morocco, especially important for wildlife preservation (e.g. endangered raptors, Iberian lynx);
- Greece & south-western Anatolia, home of very rare and threatened plant species or ecotypes (such as *Phoenix theophrasti* and *Liquidambar orientalis*);
- Sardinia, home of the endangered Sardinian deer and mouflon;
- the French regions of Provence and Languedoc.

Some very important forest areas for biodiversity, with current low impact, appear close to places where human pressure is very high (e.g. tourism coastal development in the Croatian Dalmatic islands, Greek islands and on the south-western coast of Turkey, particularly the Datca Peninsula).
A high risk of disturbances exists in these places, mainly forest fires, as happened last summer on the Greek island of Samos and the Dalmatian island of Korcula.

A PAN-MEDITERRANEAN ECOLOGICAL NETWORK

The Habitats and Species Directive aims to establish a coherent European Ecological Network, known as Natura 2000, to protect areas where the most valuable species and habitats are found and promote sustainable management of wider landscapes inside or outside the network.
WWF strongly supports the Habitats Directive and is working to ensure an adequate representation of the most threatened species and habitats within the network by actively identifying and proposing areas that cover the gaps in EU member state proposals.
WWF Greece has been very successful in securing the inclusion of almost all the Greek forest important areas identified through the Gap Analysis in the national Natura 2000 list.
WWF Spain and WWF Italy are actively involved in the implementation of a number of Natura 2000 sites, among them the Spanish Forest Hot Spot of Gúdar, recently declared a Natural Park.
WWF Mediterranean Programme Office and European Policy Office are promoting a Mediterranean Ecological Network, MED Natura 2010, which can secure adequate representation for many endangered habitats and species shared by the European, North African and Middle East countries of the region. This will provide the means to establish a coherent and well represented conservation network, which can reverse the accelerated rate of fragmentation of, and biodiversity loss in, regional ecosystems, and help nature to face new regional development trends, such as the Euro-Mediterranean Free Trade Zone.

44 Holly Oak woodland with sheep, Crete, Greece. Overgrazing represents a major threat to biodiversity. Credit: WWF/P. Regato
45 Brown bear, one of the Mediterranean endangered species. Credit: F. Pavelli/Panda Photo

Semi-natural paradises

Some forest areas are surprisingly still in a good natural state, are of considerable size and face a current low level of threat, even if certain development trends, such as road construction and logging interests, are questioning their future preservation.
They host, in addition to high concentrations of endemic flora, endangered flagship species such as the bear, lynx, and leopard.
This is the case, for example, with the highly diverse Taurus Mountain conifer forests in Turkey, blessed with maybe the last populations of the Anatolian leopard; the Kure Karstic Mountains and the colchic forests of north-eastern Turkey, as well as the Velebit Mountain Range in Croatia, which still host large numbers of bear and lynx.
Other areas with high authenticity value, which mostly constitute semi-natural, human-shaped, silvo-pastoral landscapes related to the evergreen sclerophyllous forest ecoregion, are still found in south-western Spain, Sardinia – Sulcis and Gennargentu – and north-western Tunisia (Kroumerie-Mogod).

Endangered relics

Certain forest habitat types and forest-dominant tree species have been very much affected by human impact over time and nowadays only a few hectares – from several hundred to a few thousand depending on the ecoregion – remain. These are considered relic forests with a high risk of extinction. The Mediterranean region is quite rich in this type of forest and the species within them. The Gap Analysis has identified some of the most valuable and endangered ones:
- Monchique, hosting some tertiary relics (e.g. *Rhododendron ponticum*) and the main habitat for the last Iberian lynx in Portugal;
- Talasemtane (Rif, Morocco), with an incredibly high plant diversity and the few existing stands of two very endangered conifer forests – *Abies maroccana* and *Pinus magrehbiana*;
- the Babor cedar forests in Algeria, hosting the only relic and small stands of *Abies numidica* and *Pinus maghrebiana*;
- the Paphos *Cedrus brevifolia* relic forests in Cyprus;
- the Algerian Arganian relic woodlands;
- juniper woodlands and cypress relic stands in the High Atlas and Middle Atlas in Morocco, which have huge problems due to lack of regeneration;
- several important forest areas related to riparian ecosystems, such as the *Liquidambar orientalis* flood plain forests in south-western Taurus (Turkey), the Policoro forests in Calabria (Italy) and the Lower Neretva flood plain forests in Croatia.

Lost areas

Other forest areas can be considered “lost” in terms of poor biodiversity. Whole forest habitats have disappeared (accompanied by high fragmentation, in many areas with just isolated trees or small copses between agriculture land), due to the presence of heavy human activities such as agriculture and urban/tourism development.
These areas overlap the majority of Mediterranean fertile lowlands and valleys, and mostly affect the evergreen sclerophyllous and mixed deciduous oak forest ecoregions. The majority of holm oak and holly oak forest cover in the western Mediterranean region has been reduced to agricultural land, or just appears as more or less degraded coppice woodlands in certain mountain areas.
Certain oak forest types in the eastern part of the region, such as *Quercus infectoria* in Cyprus and *Quercus aicheri* in southern Turkey, appear as isolated individuals or small groups of trees with no habitat or undergrowth species. Few, if any, important biological areas are completely free from some degree of degradation or threat.

The major threats

The major threats to biodiversity relate to mismanagement of forest land, due to:
- over-exploitation of forest resources (firewood, logging, overgrazing and hunting) and conversion into agricultural land, mainly in North Africa and the Middle East;
- rural abandonment and land use changes (urbanisation, related to tourism in coastal areas, road construction and quarries), which have dramatically increased forest fires and pollution, mainly in Euro-Mediterranean countries. Road construction is provoking an intense fragmentation of once very well preserved large mountain conifer forest areas, such as in the Iberian range in eastern Spain and central Greece. Another tourist activity related to high mountains is the growing fashion to build ski-resorts, which is destroying or threatening significant forest stands all around the region, even in the Northern African Atlas Mountains. Quarries are significantly affecting the last forest remnants of a country already extremely deforested, Lebanon, where house building is transforming very rapidly the natural landscape and destroying forests;
- illegal logging (Albania, Croatia, Bosnia-Herzegovina, Yugoslavia, FYROM) and forest fires (Algeria), related to the last decade’s political instability in these countries. This is causing the destruction of some of the most pristine forest areas in the region, even affecting important protected areas;
- climate change. Scenarios for the Mediterranean region show that it is a real threat, and impact evidence is found in the evergreen oak forests of the south-western Iberian peninsula or the famous Mamora coastal plain cork oak forest in Morocco, where, during several years of intense and permanent drought, large patches of forests suddenly dried up.

WWF IN action

The Gap Analysis results allowed WWF Mediterranean Programme Office to form a better strategy for conserving the region's priority forest areas, focusing efforts on selected key areas, major threats and identifying appropriate approaches.
WWF Mediterranean Programme Office has launched a Mediterranean Forest Hot Spots Campaign, urging governments to take immediate action to protect their respective and unique national forests.
The campaign is focusing on the so-called Top 10 Forest Hot Spots (see map p. 23), selected among the most important forests in terms of biological diversity, whose protection and conservation is vital in order to preserve the natural heritage of the Mediterranean.

WWF is asking Mediterranean governments to make a contribution to the Gifts To The Earth Campaign.
Gifts To The Earth are new actions or clear commitments by governments, organisations, corporations or individuals to help preserve the planet's natural wealth.
They are the cornerstone of the WWF Living Planet Campaign, helping to meet the goal of mobilising conservation action on a global scale.

The Mediterranean Forests Hot Spots Campaign has already achieved encouraging results:
- the Turkish government has committed itself to protect its forest Hot Spot, by declaring the Western Kure National Park. It is also passing laws to protect eight other forest Hot Spots within the next five years, doubling the current forest protected area surface in the country;
- the Aragón regional government in Spain has declared a Natural Park in Gúdar. Gúdar will be a model project for implementing the Natura 2000 Network in Aragón, led by WWF in partnership with the regional government and key local partners;
- the Patriarch of the Maronite Church, in Lebanon, has pledged to establish the "Maronite Protected Environment of Harissa" in perpetuity.
This "Sacred Gift To The Earth" is designed to ensure the protection of all biodiversity hosted by the Harissa forests;
- the Greek government has placed 29 Important Forest Areas proposed by WWF on to its Natura 2000 list, including the forest Hot Spot;
- the Croatian government has committed itself to declare "Sjeverni Velebit" as a National Park and proposed to protect another Hot Spot area in Croatia within the next five years;
- the Tunisian government and the Sardinian regional government have shown strong interest in Gifts To The Earth and are currently considering WWF proposals regarding their forest Hot Spots;
- WWF France, in association with other NGOs, has bought 100 hectares of forest land in the Maures Massif and a management plan is currently being elaborated;
- Encouraging contacts and preliminary work are underway in Morocco.

TURKISH GOVERNMENT DECLARES NATIONAL PARK IN KURE MOUNTAINS

The Turkish government has established a National Park in the Western Kure Mountains, the top Turkish Forest Hotspot named by the WWF Mediterranean Forests Hot Spots Campaign. The new National Park covers an area of 34,000 hectares and represents the largest and most intact forest ecosystem in the Central Black Sea Humid Karst Region of northern Turkey. The central part is delimited by a range of impressive deep canyons which include pristine or semi-pristine natural forests of oriental beech and fir. Lower areas near the coast also host relic Mediterranean elements and maquis. Brown bear, roe deer, red deer, wolf, fox and wild boar used to be widespread in the forest, but have been intensively hunted. Birds include goshawks, sparrowhawks, buzzards, kestrels, peregrine falcons and Egyptian vultures.
This Gift has opened a new dialogue between WWF Turkey and the Ministry of Forestry on forest conservation. The Turkish government indeed is positively disposed to protecting the other 8 Hot Spots identified in the country until 2005, which will increase the size of the existing forest protected areas by 50%. The estimated total size of the Turkish Hot Spots is about 250,000 hectares.

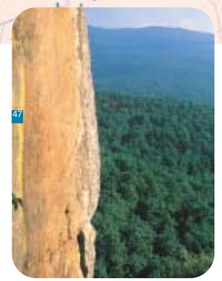
The WWF Mediterranean Forest Hot Spots Campaign will only be considered successful when all 10 Forest Hot Spots have been granted legal protection. While efforts to secure the legal protection of more Forest Hotspots continues, the WWF team has been engaged in the identification of a model for action at the field level.
The idea is to make forest conservation relevant to local communities, promoting a positive dialogue between authorities and grassroots organisations and implementing effective measures to halt and reverse the loss of biological diversity in each area. The result of this process is the "Green Belts against Desertification" concept.

46 Kure Mountains, Turkish Hot Spot identified by WWF. Credit: WWF/P. Regato

Mediterranean Forest Hotspots areas and related sub-ecoregions

HOT SPOTS

1. **Velebit Mountains (Croatia)**
   Dynaric mountain conifer and broadleaf forests
2. **Western Kure Mountains (Turkey)**
   Northern Anatolia conifer and deciduous forests
3. **Kroumerie-Mogod forests (Tunisia)**
   North African & southern Iberian deciduous and sclerophyllous forests
4. **Sulcis forests (Sardinia, Italy)**
   Tyrrhenian & Adriatic sclerophyllous forests
5. **Maures Massif (France)**
   North-eastern Spain & southern France dry conifer and broadleaf forests
6. **Monchique-Caldeirao-Guadiana (Algarve-Baixo Alentejo, Portugal)**
   South-western Iberia & north-western Morocco sclerophyllous forests
7. **Bou Iblane-Middle Atlas (Morocco)**
   Northern Africa & southern Spain mountain conifer forests
8. **Gúdar Mountains (Spain)**
   Eastern & central Spain mountain conifer forests
9. **Taygetos Mountains (Greece)**
   Southern Balkan mountain conifer and mixed forests
10. **Harissa forests (Lebanon)**
    Southern Anatolia & Middle Eastern mountain conifer and deciduous forests



47 El Feija, Kroumerie, Tunisian Hot Spot identified by WWF. Credit: D. Ruiu

SUSTAINABLE FORESTS EXPLOITATION

**FSC (Forest Stewardship Council) is an accreditation organisation for forests and forestry products meeting a wide range of environmental, social and economic criteria. Certification bodies designated by the organisation are in charge of verifying forestry and wood products industry compliance with environmental standards.
Eighteen million hectares of forest in 30 countries had been certified as complying with FSC standards by the end of 2000.
Products obtained with first matter coming from wood or paper certified as FSC are authorised to take the label FSC, which to the final consumer will mean that the purchased product does not cost destruction of a forest environment. Even if other forest certification systems are approaching the market, FSC remains the most rigorous one and the only one that can guarantee the consumer the ecological, economical and social sustainability of purchased products.
WWF Mediterranean organisations are working to develop an FSC system in the region. In Spain, France and Italy, forest and wood products companies and purchasers have already been persuaded to join the FSC scheme. They include Spanish wooden doors manufacturer Vicente Puig Oliver, French supermarket giant Carrefour and a forest collective in Val di Fiemme, northern Italy.
WWF Mediterranean Programme Office has had encouraging results in testing the applicability of FSC principles for non-timber forest products such as cork and chestnuts.**

A NEW APPROACH FOR forest PROTECTION

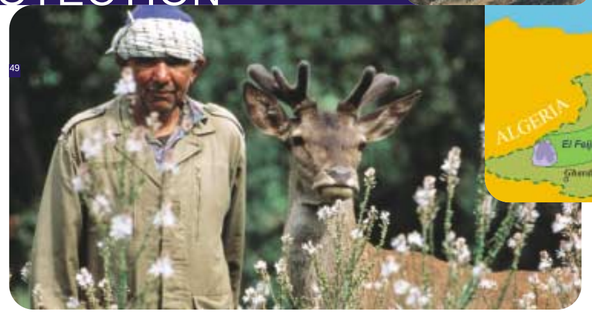
Desertification is a major environmental and socio-economic issue in the whole Mediterranean region. Almost 300,000km² of land in the European coastal zone of the Mediterranean has been classified as "undergoing desertification", affecting the livelihoods of 16,5 million people.
The scenario is much worse in the southern and eastern part of the region.
The chronic water deficit is becoming more and more critical due to increasing water demand related to agriculture, tourism, urban development, intense soil degradation and deforestation processes.
While more and more forests are designated as protected areas by governments and trans-national institutions, the lack of effective conservation measures and consensus-creating management plans is hampering the success of a well-intentioned, but often ill-implemented conservation effort. WWF Mediterranean Programme Office has developed a new concept, "Green Belts against Desertification", which will inspire and steer its future work on forest conservation at the ecoregional level, providing a powerful link between environmental problems and social and economic factors directly or indirectly related to them.
The concept aims to set up an effective network of forest reserves, connected through corridors to promote wildlife flow and habitat connectivity, and surrounded by large buffer zones where land-use planning takes into account the need to preserve habitats and threatened wildlife.
Each "Green Belt" will include core protected areas where forest protection is enforced, as well as larger portions of surrounding territory where conservation and development needs are integrated, so that local people get a clear economic advantage from their natural heritage (see map).
WWF Mediterranean Programme Office aims to put into practice this concept in all 10 key forest areas identified through the Mediterranean Forest Hot Spots Campaign in order to establish a Mediterranean forest web.

As a first step, WWF will work in the following five areas:
- Middle Atlas, Morocco
- Kroumerie, Tunisia
- Algarve-Baixo Alentejo, Portugal
- Velebit Mountains, Croatia
- Western Kure Mountains, Turkey

THE "GREEN BELTS AGAINST DESERTIFICATION" GUIDING PRINCIPLES

The "Green Belts against Desertification" concept aims to:
• secure environmental benefits by:
- conserving biodiversity and its values: water resources, soil, unique and fragile ecosystems and landscapes
- maintaining ecological functions and forest integrity;
- protecting threatened and endangered species and their habitats;
• secure social benefits by:
- respecting rights of local communities living in the forest to use natural resources such as non-timber forest products (fruits, cork, medicinal plants, etc.);
- ensuring a shared management of natural resources by enabling local stakeholders to become partners in conservation and true custodians of the sustainable use of forests;
• invest in human capacities by promoting training and exchange of knowledge on useful field conservation tools.

48 Relic damaged cedar tree, Middle Atlas, Morocco. Result of intense desertification process. Credit: WWF/Sira Jiménez-Caballero
49 Barbary deer with El Feija National Park guardian. Credit: WWF-Canon/M.Gunther



The "Kroumerie-Mogod" Green Belt in north-western Tunisia

- Existing protected areas.
- Proposed protected areas enlargement – integrating the existing protected areas – where nature conservation predominates.
- "Corridor zone" to allow the flow of wildlife and to secure forest habitats connectivity among the protected areas network.
- "Large buffer zone": area where community-based sustainable management of nature resources predominates, to integrate conservation and development needs.

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