



REPUBLIC OF CROATIA

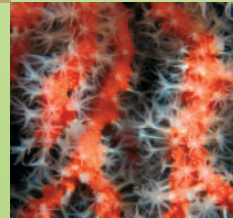
MINISTRY OF ENVIRONMENTAL
AND NATURE PROTECTION



Empowered lives.
Resilient nations.

Nature of Croatia

Capital for the future





Nature Protection Information System Geoportal

Nature Protection Information System Geoportal (NPIS) is a web system that ensures public access to accurate and verified data on biodiversity and nature protection in Croatia. The NPIS Geoportal is available on www.iszp.hr.



More info:
www.dzzp.hr

Red List Categories

EX – extinct
RE – regionally extinct
CR – critically endangered
EN – endangered
VU – vulnerable
NT – near threatened
LC – least concern
DD – data deficient

Contents

Introduction.....	3
SPECIES.....	4
Mammals.....	6
Birds.....	8
Amphibians and reptiles.....	10
Fish.....	12
Invertebrates.....	14
Plants and algae.....	16
Fungi and lichens.....	18
Domesticated breeds and autochthonous varieties.....	20
HABITATS.....	22
A. Inland surface water and wetland habitats.....	24
B. Unvegetated and sparsely vegetated inland surfaces.....	25
C. Grasslands, fens and bogs and tall herb communities.....	26
D. Scrubs.....	27
E. Forests.....	28
F. Sea Coast.....	29
F. Sea.....	30
H. Underground.....	31
THREATS TO BIODIVERSITY.....	32
Transport infrastructure.....	34
Dams and water management.....	34
Invasive alien species.....	35
Terrestrial plants harvesting.....	36
Renewable energy – Wind-Power plants.....	37
GEOLOGICAL DIVERSITY AND GEOLOGICAL HERITAGE.....	38
NATURE CONSERVATION MECHANISMS.....	40
Conservation and management of wild species.....	41
Conservation of habitats.....	42
Protection of minerals and fossils.....	43
Protected Areas.....	44
Ecological network of the Republic of Croatia (Natura 2000).....	47
ECOSYSTEM SERVICES.....	49

Introduction

Nature has been changing under the influence of mankind over the years – forests, steppes, wetlands, meadows and small areas of cultivated land were covering most of Europe until several hundred years ago. With the development of cities and roads, and with the intensification of agricultural production, the diversity of habitats started decreasing over time. Despite that, however, the remaining natural forests, meadows and pastures, wetlands and unregulated rivers, marine, underground and other habitats inhabited by numerous species still represent a rich natural heritage. Many existing important habitats are, in fact, a result of traditional methods of using space that do not endanger but enrich biodiversity. Some wild species have adjusted to nature changed by mankind and today live in semi-natural habitats, such as carp fish ponds, or even in the direct vicinity of man, on agricultural surfaces or in cities.

Rich and diverse nature is the most valuable resource available to us, and conserved nature ensures all the functionalities necessary for life and economic development. As it is in the rest of the world, nature in Croatia is under constant pressure due to human activities, and the elements of nature are increasingly threatened despite significant efforts that are being invested in conservation.

Despite the fact that knowledge on biodiversity and geodiversity is still incomplete and is being continuously updated and accompanied by the development of nature conservation mechanisms, the awareness of Croatian citizens regarding the need for nature conservation and its inevitable role in the development of society is quite high.

In a public survey conducted in 2013, respondents throughout Croatia stated that conserved nature occupies a very high position in their value system. Over 60% of respondents pointed out that Croatia's conserved nature is of the largest value to them, and the perception of nature's role in society turned out to be predominantly positive – for example, almost 70% of respondents expressed belief that protected nature constitutes an opportunity for economic growth. The degree to which respondents are informed on nature-related matters has also proven to be high, with almost 50% of respondents acquainted with the concept of biodiversity. On the other hand, when it comes to the Ecological network of the Republic of Croatia (Natura 2000) – a relatively new nature conservation mechanism in Croatia – only slightly over 5% of respondents stated that they had heard about that network. In comparison with the EU average, however, this particular indicator is not necessarily bad, taking into account the fact that Ecological network of the Republic of Croatia (Natura 2000) is being publicly promoted in Croatia only since 2009. The survey pointed out that the support of the public for nature conservation is at a high level; however, it also made it clear that there is a need for further education on the matter, which is also the purpose of this publication.



Common Tree Frog (*Hyla arborea*) is, although the smallest frog in Croatia, the loudest one and a very skilled climber.
Photo: S. Richter



Ornate Bluet (*Coenagrion ornatum*) is a strictly protected dragonfly species, inhabiting small, isolated and shallow streams or slow-flowing canals.
Photo: M. Franković



SPECIES

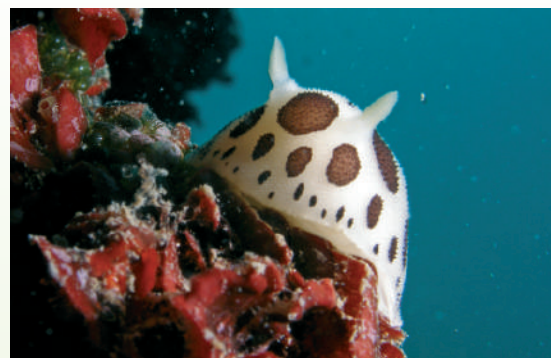
As a result of the country's unique geographical position, Croatia enjoys an extraordinary wealth of wild species that can be found in diverse ecosystems. The specific location of Croatia, situated on the border of three biogeographical regions, is a reason why such a wide spectrum of diverse ecological conditions for the development of fungi, plant and animal life can be encountered on a relatively small area.

That is why Croatia is, in terms of biodiversity, one of the richest countries in Europe. The exact number of wild species is still unknown; however, the total of approximately 40 000 species has been recorded in Croatia so far. The presumed number of species is significantly higher (ranging from 50 000 to over 100 000 species), with scientists discovering and describing new species and subspecies every year.

In the period from 2008 to 2012, the number of known or recorded species in Croatia grew by over 2000 species, or 5%. The reason for this is a better knowledge regarding biodiversity; due to significant research efforts largely connected with EU accession preparations, in particular the preparation of the proposal for the Ecological network of the Republic of Croatia (Natura 2000). The largest step forward in terms of expanding the knowledge on biodiversity was made in the sphere of invertebrates, which was expected given their number and diversity.

One particular characteristic of Croatia's wildlife can be seen in a number of endemic species, constituting almost 2.7% of the total number of known species. The largest number of endemic species can be found among freshwater fish species, followed by freshwater invertebrates and plants. The key centres of endemic flora are the mountains of Velebit, Biokovo and Mosor, while endemic fauna is most prominent in underground habitats (cave invertebrates), on islands (lizards and snails), and in karst rivers of the Adriatic basin (fish).

European Otter (*Lutra lutra*) is on top of the freshwater ecosystem food chain. In Croatia, this species inhabits almost all types of inland surface waters and wetland habitats. Photo: J. Bohdal



Dotted Sea Slug (*Discodoris atromaculata*) is an oval-shaped slug. Its white colour in combination with the black dots is the reason why the species is referred to as Dalmatian sea slug in Croatia. Photo: J. Ferjan



Common Kingfisher (*Alcedo atthis*) is a small, fast and active bird with a striking and easily recognizable appearance. Photo: H. Domazetović

Scarce Large Blue (*Phengaris teleius*) is a butterfly species critically endangered in Croatia and throughout Europe, living solely on lowland hay meadows that include the great burnet plant species. Photo: I. Plavac



Number of known, endemic and endangered species in Croatia

Group	Number of recorded species	Number of endemic species	Number of threatened species (CR, EN i VU)
Fungi and lichens	~ 5500	?	297
Plants	5636	377	223
Freshwater algae	1668	6	?
Marine algae	1525	?	8
Invertebrates	~ 25 000	~ 700	581
Freshwater fish	130	14	61
Marine fish	442	?	24
Amphibians	20	0	2
Reptiles	39	0	6
Birds	399	0	72
Mammals	116	1	8
In total	~ 40,000	~ 1110	1282

Despite the great diversity and the number of species that can be found in Croatia, the survival of individual species is threatened. Species that had endangerment assessment made are put in one of the categories defined by the International Union for Conservation of Nature (IUCN), and the endangered ones have been placed on the Red List. Croatia has 1282 species on the Red List. Also, all of the threatened species are protected by law.

Roundleaf Sundew (*Drosera rotundifolia*) is a strictly protected carnivorous plant, which got its name due to small transparent drops, produced by its leaves, which remind of dew. Photo: I. Zupan



Dubrovnik Knapweed



Dubrovnik Knapweed (*Centaurea ragusina*). Photo: S. Bogdanović

Dubrovnik Knapweed (*Centaurea ragusina*), along with the Velebit Degenia, is one of the best-known endemic plant species in Croatia. It can be found in the area from the Island of Dugi otok in the north to the far southern part of the Dalmatia region. It grows in the endemic plant community *Phagnalo-Centaureetum ragusinae*, in the crevices of rocks on the shore. In addition to the Dubrovnik Knapweed, other endemic knapweeds can also be found on our coast and the islands, such as Biokovo, Dalmatian, Jabuka and Palagruža knapweeds.

Ranging in size up to as many as eight centimetres, the Stag Beetle (*Lucanus cervus*) is one of the largest insects of Europe. Photo: D. Jelić





Mammals

The territory of the Balkans has been recognized as a “biodiversity hotspot” for the terrestrial mammal fauna of Europe, and Croatia is at the very top of this region with its 116 known mammal species in total. Out of this number, 9 species have been extinct, 14 have been introduced into the area, and the rest are autochthonous.

Croatia is one of the few countries in Europe with three large carnivores still present in the country’s territory: Lynx (*Lynx lynx*), Wolf (*Canis lupus*) and Bear (*Ursus arctos*). Based on the most recent data, it is estimated that there are approximately 50 Lynxes living in Croatia, around 170 Wolves, and around 1000 Bears. According to the newest assessment, Lynx is a critically endangered species (CR), while the number of Wolves is decreasing continuously.

With 34 recorded bat species, Croatia is the European leader in terms of the number of species. After over 80 years, the finding of the Giant Noctule Species (*Nyctalus lasiopterus*) has been confirmed in the territory of the Kornati archipelago. One species – Mehely’s Horseshoe Bat (*Rhinolophus mehelyi*) – is considered to be regionally extinct (RE).

There are 10 marine mammal species present in the Adriatic Sea, with the Bottlenose Dolphin (*Tursiops truncatus*) and Striped Dolphin (*Stenella coeruleoalba*) being the most numerous.

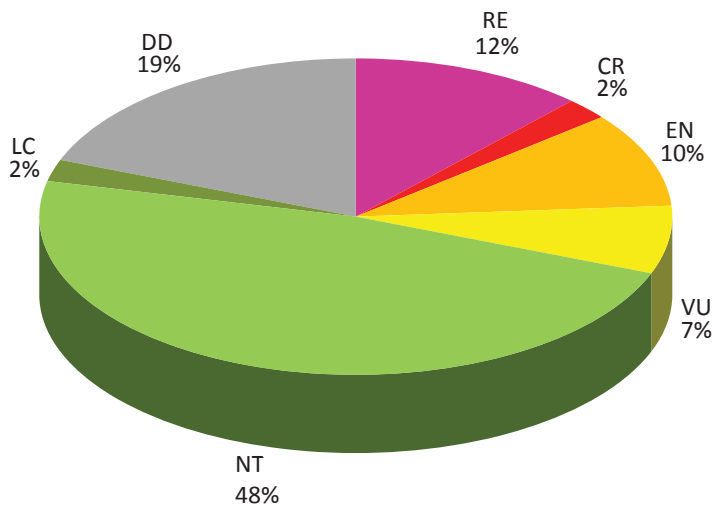
Maternity colony of Greater Mouse-eared Bat, (*Myotis myotis*) and Long-fingered Bat (*Myotis capaccinii*). Photo: D. Hamidović, Croatian Biospeleological Society Archives



Brown Bear (*Ursus arctos*) is the largest terrestrial mammal species in Croatia, inhabiting large and uninterrupted natural forest areas. Photo: M. Krofel

Eurasian Lynx (*Lynx lynx*) is the largest European cat, and the most endangered mammal species in Croatia. Photo: D. Hamidović





Overview of individual threat categories for the assessed mammal species

The area of the Dinarides has a large number of endangered species (5 to 6 per 12 km²). When it comes to the reasons behind the threats posed to mammals in Croatia, they are primarily connected with the loss and fragmentation of habitats, pollution, disturbance that animals are subjected to in their shelters, excessive and illegal hunting, tree logging, forest exploitation, and traffic accidents. In Europe, including Croatia, bats are one of the most endangered group of mammals, in addition to carnivores.



More info:
Large Carnivores in Croatia
www.life-vuk.hr

Balkan Snow Vole



Balkan Snow Vole (*Dinaromys bogdanovi*). Photo: N. Tvrtković

Balkan Snow Vole (*Dinaromys bogdanovi*), an endemic species of the Dinarides, is the Croatian contribution to Annexes II and IV of the EU Habitats Directive. Typical habitat of the Balkan Snow Vole can be found in rock formations on meadows above the forest line; the species can also be found in rocky habitats below the tree line. This species is rare and well hidden, and has been researched on several locations in Croatia in recent years.

Bottlenose Dolphins (*Tursiops truncatus*) are the most numerous marine mammals permanently present in Croatia. Photo: D. Holcer



Birds

According to the Croatian Bird List of 2010, as many as 399 bird species were recorded in Croatia, including accidental and irregular visitor species, and species that appeared in nature due to their escape from captivity (such as, for example, the Yellow-Billed Stork *Mycteria ibis*) or due to deliberate introduction by man, such as the Chukar Partridge (*Alectoris chukar*), the Northern Bobwhite (*Colinus virginianus*), and the Common Pheasant (*Phasianus colchicus*).

Out of this total, 288 bird species are regularly present in Croatia, which constitutes 55% of all European bird species, while 246 species are nesting permanently.

Largely due to conserved nature, certain species that are critically endangered in Europe have substantial populations in Croatia. For example, there are still major wetland complexes in the floodplains of Drava and Sava Rivers, which are extraordinarily valuable for the nesting of species dependant on wetland habitats, such as the Spoonbill, Herons and Terns, the White-tailed Eagle, Black and White Stork, and the Lesser Spotted Eagle.

Forest use, water management and agriculture are the key activities impacting upon the status of conservation of birds. In addition, a large proportion of endangered bird species depend upon the decrease of the negative impact of illegal hunting and poisoning, together with the danger posed by power lines. It is also important to monitor the impact of the existing wind power plants on endangered species of birds of prey; new wind power plants should be planned in areas where their impact on endangered species would be acceptable.

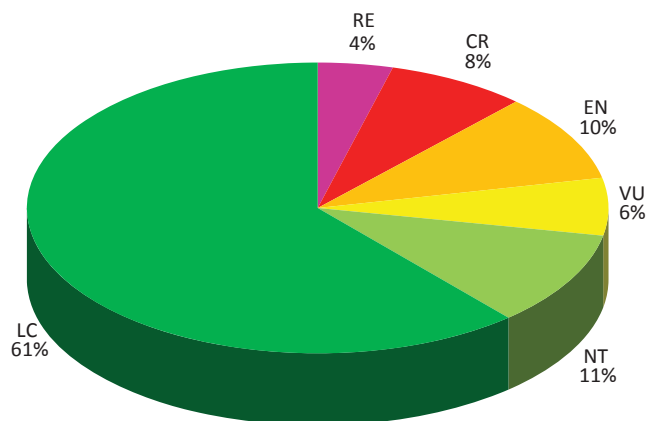
Ortolan Bunting (*Emberiza hortulana*) is nesting on partially overgrown grasslands in Croatia, from the mountains of Čićarija and Učka to the mountains of Velebit, Dinara and Sniježnica above the region of Konavle. Photo: I. Lolić



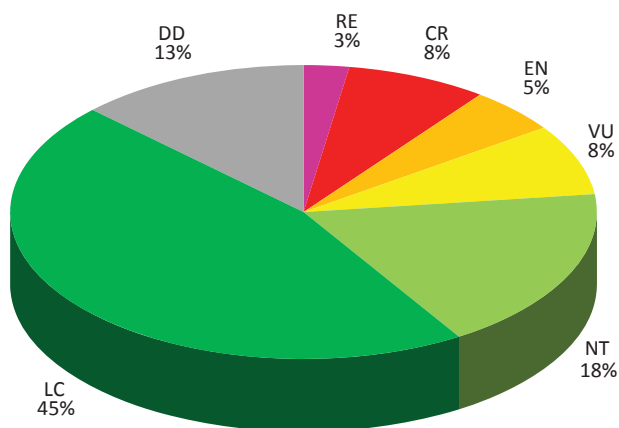
Eurasian Green Woodpecker (*Picus canus*) makes a new tree hollow every year, while the old hollow is inhabited by other animals, which makes it extraordinarily important for the survival of other forest species. Photo: I. Lolić

White-tailed Eagle (*Haliaeetus albicilla*) is the largest eagle species in Europe as well as the largest predator among eagles. In Croatia, it can be found in the floodplains of major rivers, and in floodplain forests near carp fishponds. Photo: H. Domazetović

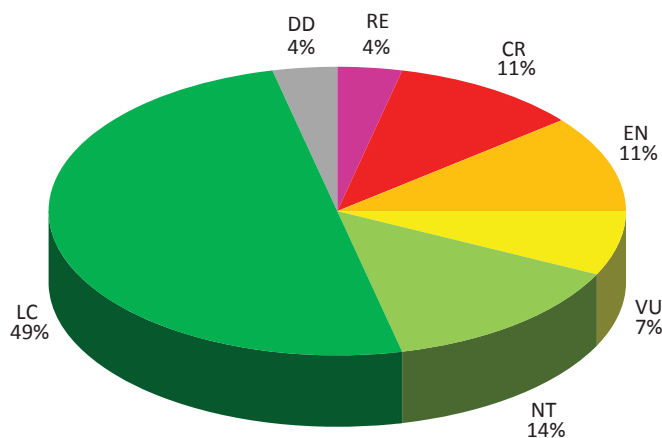




Overview of individual threat categories for the assessed bird species -
a) Nesting birds

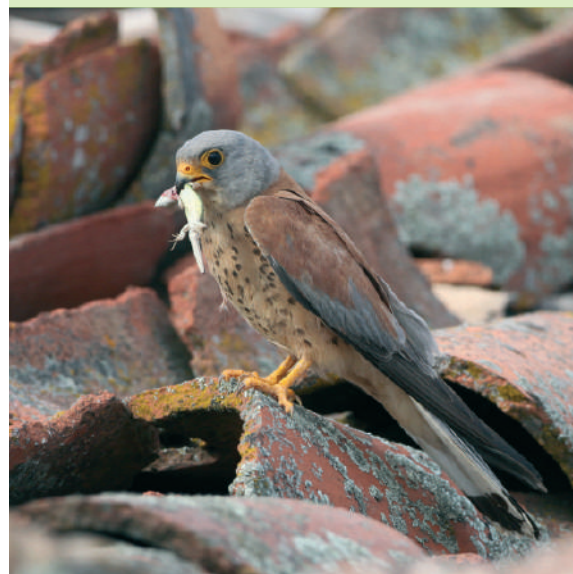


Overview of individual threat categories for the assessed bird species -
b) Passage migrants



Overview of individual threat categories for the assessed bird species -
c) Wintering birds

Lesser Kestrel



Lesser Kestrel (*Falco naumanni*).
Photo: I. Mraz

In the second half of the 20th century, the numbers of the **Lesser Kestrel** (*Falco naumanni*) in Europe started decreasing drastically, with the species becoming extinct in Croatia. The last sighting of these birds in nesting during that period was recorded in the region of Istria in the 1960s. As a nesting species, the Lesser Kestrel was recorded again as recently as 2010 in the area of the Island of Rab, where a colony with around twenty nesting pairs was found. Lesser Kestrels are extraordinarily sociable birds, and their colonies can be found in suitable holes in buildings, ruins and cliffs. They predominantly feed on insects, and sometimes also catch small vertebrates. That is why the preservation of extensive cattle farming and rocky pastures on the Island of Rab, which constitutes their best feeding grounds, is of decisive importance for the conservation of this species in Croatia.

Amphibians and reptiles

Olm



Olm (*Proteus anguinus*).
Photo: B. Jalžić

Olm (*Proteus anguinus*) is the only true underground vertebrate species; medieval legends used to describe them as young dragons hiding in caves. Olm is an endemic species in underground freshwater habitats of the Dinaric karst, inhabiting caves and abysses in karst fields in the area from the Istrian peninsula to Dubrovnik. Olm is an amphibian species with the highest longevity, given the fact that they are capable of reaching over 60 years. Olm skin is pale, with white and rose hue, and its similarity with the human skin is the reason why the Croatian name for the species is “manlike fish”. The Red Book of Amphibians and Reptiles defines its status as endangered species (EN).

In terms of the wealth of species, the amphibian and reptile fauna (herpetofauna) in Croatia constitutes a significant contribution to the biodiversity of Europe. That is particularly true when it comes to endemic species, regardless of whether such species are regionally endemic, such as the Italian Agile Frog, or endemic at the level of Croatia, such as the Dalmatian Wall Lizard.

There are 20 amphibian species recorded in Croatia, which constitutes approximately 26% of the described amphibian species in Europe. Most of these species – 19 to be exact – are connected to the territory of the continental and mountainous part of Croatia. Out of the total of 6 regional endemic species in Croatia, the best known species are Olm (*Proteus anguinus*) and the Italian Agile Frog (*Rana latastei*), which are also the most endangered species.

Given the fact that amphibians live both on land and in freshwater bodies, negative impacts in both of these ecosystems constitutes a threat to their survival, which is why they are globally perceived as being the most endangered group of vertebrates. The destruction of habitats due to pollution and ecosystem changes (e.g. drainage of wetlands) constitute the key threats for amphibians. Invasive species, primarily fish species feeding on amphibian eggs and larvae, also have a negative impact.

Croatia is an important centre of biodiversity and endemism when it comes to reptiles, and it is at the very top in Europe with its 39 known reptile species. The region of Dalmatia is the most diverse part of Croatia in terms of the number of reptiles, which is particularly true for its islands and mountain peaks. Eight reptile species in Croatia are regional endemic species, while four lizard subspecies are endemic species at the level of Croatia. One invasive alien species – the Red-eared Slider Turtle (*Trachemys scripta*) – is also represented among the known species, with a negative impact on the autochthonous turtle European Pond Terrapin.

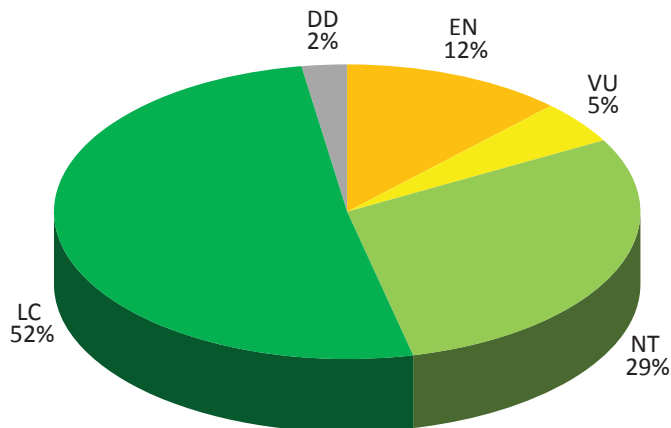
The main threats to the survival of reptiles in Croatia are connected to the loss and decreased quality of habitats, as a result of road and railway construction, development of tourist areas, and the transformation of favourable habitats to agricultural land. Some of the most endangered reptile species in Croatia include the Balkan Terrapin, the Caspian Whip Snake, the Meadow Viper, and the Snake-eyed Skink.

Italian Crested Newt (*Triturus cristatus*) can reach up to 18 cm in length, and it inhabits various temporary and permanent standing waters, particularly in mountain areas. Photo: D. Jelić

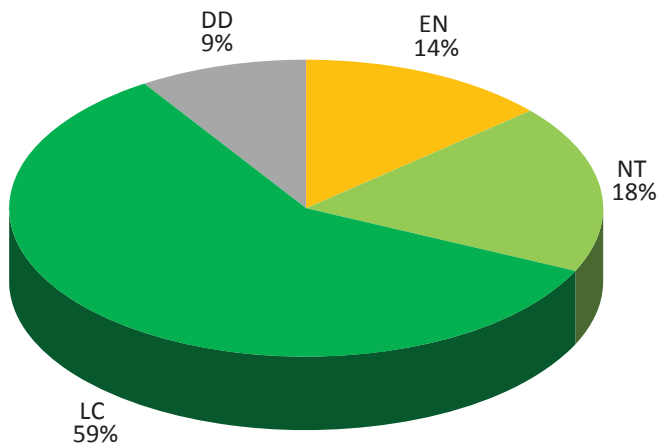


Italian Agile Frog (*Rana latastei*) lives only in the territory of central and northern Istria in Croatia, with its largest populations inhabiting the Motovun Forest and the Valley of the River Mirna. Photo: P. Gambiroža





Overview of individual threat categories for the assessed amphibian species



Overview of individual threat categories for the assessed reptile species

Balkan Terrapin (*Mauremys rivulata*) is one of the two freshwater turtle species in Croatia. It can be found only in the territory of Dubrovnik - Neretva County, with three known separate populations. Photo: A. Štih



Loggerhead Turtle



Loggerhead Sea Turtle (*Caretta caretta*). Photo: B. Furlan

The Adriatic Sea, in particular its northern section, represents one of the key feeding and wintering areas of the **Loggerhead Turtle** (*Caretta caretta*) in the Mediterranean. Occasional visitors also include the Leatherback Sea Turtle (*Dermochelys coriacea*) and the Green Turtle (*Chelonia mydas*). Sea turtles are endangered due to the fact that they frequently get accidentally caught in fishing by gillnets and benthic trawl nets.

Snake-eyed Skink (*Ablepharus kitaibelii*) is the smallest lizard in Croatia, recorded only in a very small area in Papuk Nature Park and on several localities in the city of Ilok and its near surroundings. Photo: D. Jelić



Fish

Endemic Freshwater Fish Species

Due to a large number of isolated freshwater karst habitats and geological dynamics, the Adriatic basin is particularly rich in **endemic freshwater fish species**. These habitats frequently provide specific living conditions, which is why some fish species inhabiting them have also adjusted to life underground, where they depart in periods when living conditions on the surface become unfavourable. 14 endemic species have been recorded in the Adriatic basin of Croatia, what makes the Dalmatian region one of the centres of ichthyofauna diversity in Europe. Croatia enriched the EU Habitats Directive with seven freshwater fish species: Dalmatian Barbel-gudgeon (*Aulopyge huegeli*), Adriatic Salmon (*Salmothymus obtusirostris*), Dalmatian Nase (*Chondrostoma kneri*), Minnow-nase (*Chondrostoma phoxinus*), Radović's Goby (*Knipowitschia croatica*), Adriatic Dace (*Squalius svallizae*) and Makal Dace (*Squalius microlepis*).

Dalmatian Barbelgudgeon (*Aulopyge huegeli*) is one of the Croatian most remarkable endemic species, whose body is almost all without scale as a result of adapting to underground habitats. Photo: R. Vrtačnik



The freshwater fish fauna of Croatia is marked by a high degree of diversity and wealth of species, and also by a significant number of endemic species. There are 546 autochthonous fish species registered in Europe so far, out of which 130 species can be found in inland waters of Croatia, making it the second country in Europe in terms of the number of freshwater fish species. Four new fish species were described in the period from 2008 to 2012. Such a level of diversity stems from the geographical position of Croatia, the territory of which covers two basins (the Danube basin and the Adriatic basin), and also from specific characteristics of freshwater karst habitats.

Freshwater fish species belong to the most endangered vertebrate groups in Croatia. The key threats include dams and water management and use, municipal wastewater, waste liquids in agriculture and forestry, and industrial wastewater. The most endangered fish species are endemic species in the Adriatic basin.

The most recent fish census in the Adriatic Sea resulted in 442 species (3 lampreys, 55 cartilaginous fish species, and 384 bony fish species), which speaks of their high degree of diversity, and constitutes approximately 60% of known fish species in the Mediterranean Sea. It is assumed that there are 4 endemic fish species living in the Adriatic.

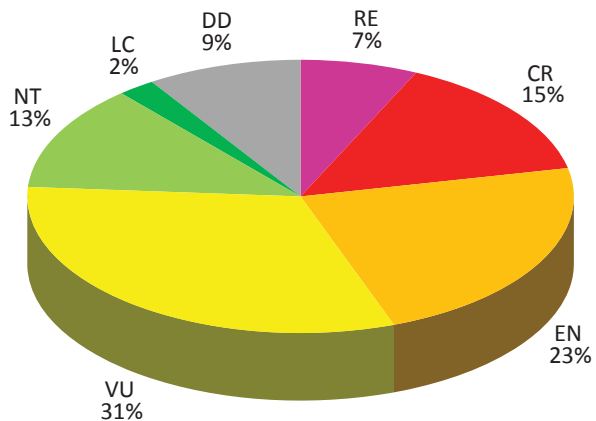
Due to their economic importance, marine fish species belong to the most endangered animal group in the sea. In addition to numerous obvious signs of excessive exploitation, noticed in the Adriatic Sea for decades, the pressure on fish populations is not decreasing. The most endangered group of marine fish species are cartilaginous fish species, including sharks.

Jadova Minnow (*Delminichthys jadovensis*) is an endemic and critically endangered species that spends most of the year underground. Photo: P. Mustafić

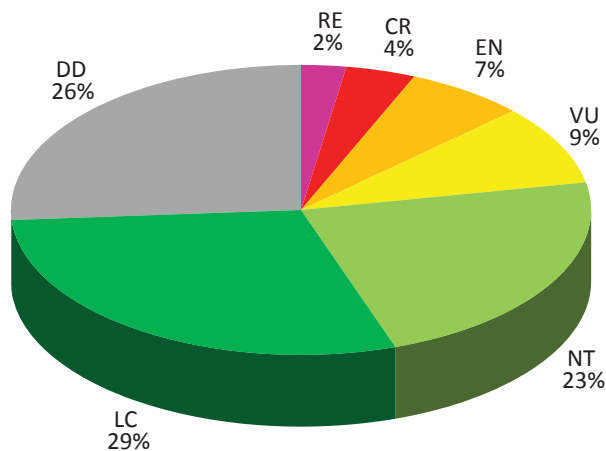


Adriatic Salmon (*Salmothymus obtusirostris*) is the largest salmon species of the Adriatic basin, and can grow up to 70 cm. Photo: A. Duplić





Overview of individual threat categories for the assessed freshwater fish species

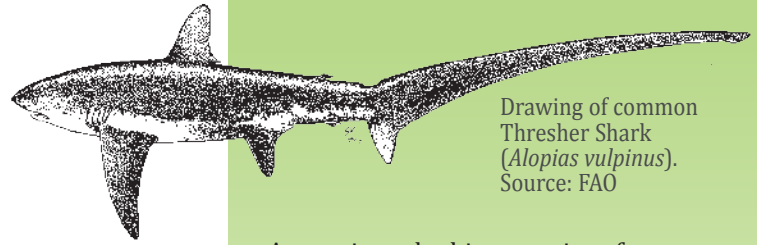


Overview of individual threat categories for the assessed marine fish species

Salema (*Sarpa salpa*) is present throughout the Adriatic, representing one of its largest »vegetarian« species, given the fact that it feeds on all seagrasses. Photo: P. Rodić



Sharks



Drawing of common Thresher Shark (*Alopias vulpinus*). Source: FAO

Approximately thirty species of **sharks**, or 40% of the total number of recorded shark species in the Mediterranean, have been noticed in the Croatian part of the Adriatic Sea; out of these species, some live in the Adriatic permanently, and some species are only occasional visitors. Among other things, six species of large sharks have been recorded: the Basking Shark (*Cetorhinus maximus*), Great White Shark (*Carcharodon carcharias*), Common Thresher Shark (*Alopias vulpinus*), Bluntnose Sixgill Shark (*Hexanchus griseus*), Shortfin Mako (*Isurus oxyrinchus*), and the Small-tooth Sand Tiger Shark (*Odontaspis ferox*).

Common Two-banded Seabream (*Diplodus vulgaris*) got its Croatian name "Monk" due to its black spot in the form of a collar; it lives throughout the coastal belt up to the depth of 200 m. Photo: N. Stagličić



Invertebrates



Noble Pen Shell (*Pinna nobilis*) is the largest Bivalvia in Adriatic Sea and can grow up to 1 m, which lives in sandy bottoms from 2 to 30 m. Photo: B. Furlan

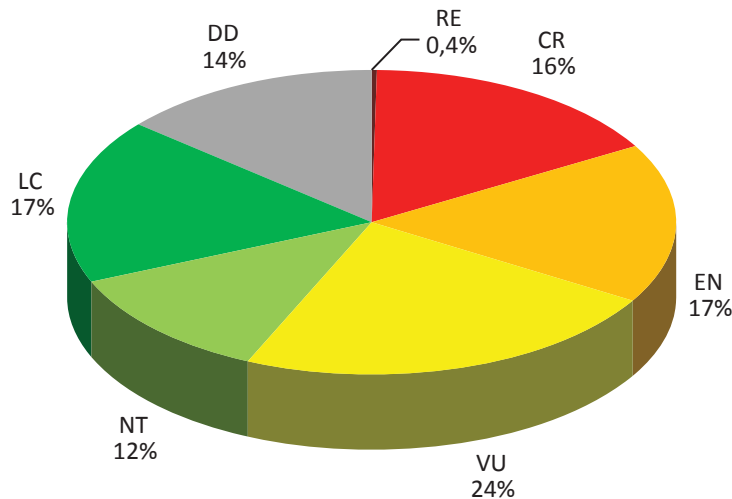
On account of their diversity and numbers, invertebrates constitute an irreplaceable link in the chain of ecosystem functioning; despite that, however, they are also the least known group. Over 25 000 invertebrate species have been recorded in Croatia so far, out of which terrestrial invertebrates constitute the biggest group (at around 65.2%), followed by marine invertebrates (at approximately 27.2%), with the lowest share of freshwater invertebrates (at approximately 8%). In the invertebrate world, but also the animal world as a whole, insects are the dominant group in terms of numbers. For example, there are approximately 14 000 insect species known in Croatia at the present time.

There are around 700 known endemic invertebrate species, most of them belonging to the group of freshwater snails (Gastropoda) and crustaceans (Amphipoda) in karst watercourses and wells.

The expansion of urban areas and accompanying municipal and traffic infrastructure have the most negative impact on terrestrial invertebrates. On the other hand, freshwater invertebrates are predominantly threatened due to inadequate water management and the pollution of watercourses, while the key threats to invertebrates dependent upon marine ecosystems include waste disposal in nature and the expansion of tourist and recreation areas.

Apollo (*Parnassius apollo*) is one of our most beautiful butterflies. This predominantly mountain species is considered to be a rare and threatened butterfly species. Photo: L. Katušić



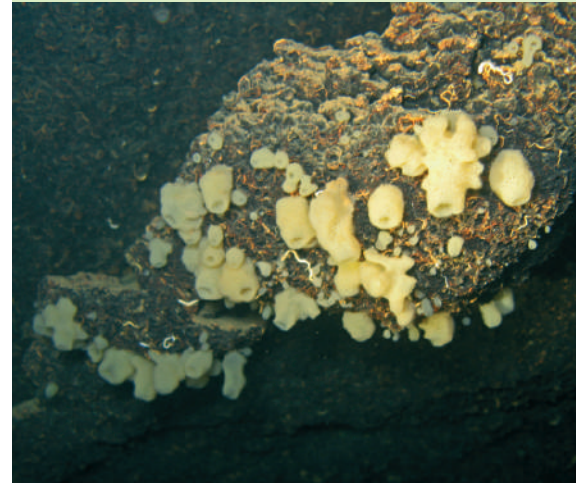


Overview of individual threat categories for the assessed invertebrate species

Rosalia Longicorn (*Rosalia alpina*) is a very attractive insect belonging to the order of Coleoptera that can be encountered in beech forests. Photo: D. Jelić



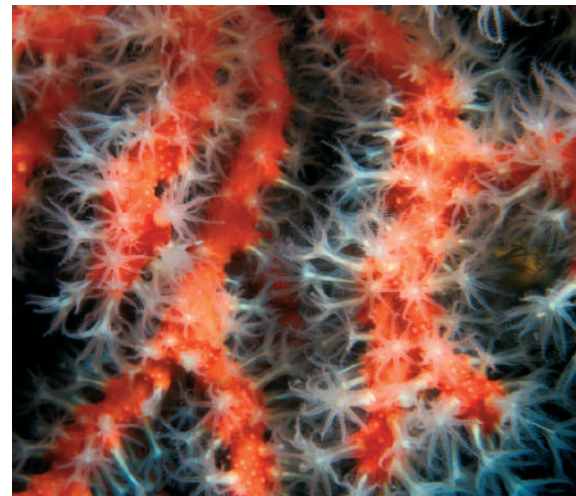
Ogulin Cave Sponge



Ogulin Cave Sponge (*Eunapius subterraneus*). Photo: H. Bilandžija

Ogulin Cave Sponge (*Eunapius subterraneus*) is merely one in a range of interesting endemic species, and species in general in Croatia. What is unique about it is the fact that it is the only underground freshwater sponge in the world. It lives in karst groundwater of the Ogulin-Plaški plateau and the north-western part of the region of Lika, in the basin area of Dobra and Mrežnica Rivers. The body of this sponge species is loose and soft; it does not contain pigment, so it is white in colour.

Red Coral (*Coralium rubrum*) is Cnidaria, which growth rate is from 4 to 8 mm per year. Photo: B. Furlan





Plants and algae

Orchids

Croatia has approximately 150 species of wild **orchids**, out of which as many as 19 species are endemic. Orchids also include species from the genus *Ophrys*, with flowers whose appearance and scent mimics female insects of various insect species, in order to attract male insects. The latter are attracted to orchid flowers in the attempt of mating, thus pollinating them. Orchids in Croatia are primarily threatened by the loss of habitats, but also by illegal harvesting and transplantation of plants into gardens. All orchid species in Croatia are thus strictly protected by the Nature Protection Act.

Orchid species *Ophrys medea*.
Photo: V. Posavec Vukelić



In total, 8829 species and subspecies of plants (vascular flora and mosses) and algae have been recorded in Croatia so far. In this context, according to available data, the vascular flora of Croatia, including ferns and seed plants, has 4990 species and subspecies in total. Croatia is considered to be the richest country of Europe in terms of the diversity of vascular flora in comparison with the size of the country. In the territory of Croatia, there are 377 endemic species; territories with the highest concentration of narrowly distributed endemic species are mountains of Velebit, Biokovo and Mosor, followed by the Kvarner area, the islands of central and southern Dalmatia, and the southern region of Konavle.

The main threats to the Croatian flora are habitat loss and degradation caused by human impact, particularly due to agriculture, excessive exploitation, industrial development, tourism, construction of infrastructure and settlements, drainage of habitats, and melioration.

Out of the total of 646 moss species recorded in Croatia, 488 species belong to the group of true moss (Bryidae), 156 to the group of Marchantiidae, and two to the group of Anthocerotidae.

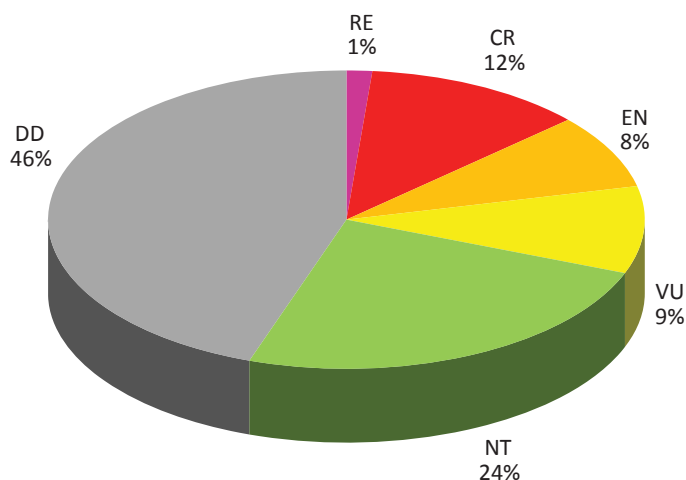
There are 1668 species of freshwater algae and 1525 species of marine algae recorded in Croatia so far; however, in general terms, the scope of research on these species has been relatively poor. Important localities and habitats of freshwater algae in Croatia consist of karst areas in which algae are constituent parts of the process of calcification of tufa sediments. The diversity of marine algae in the Adriatic is increasing from the northwest to the southeast, and from the shore towards the open sea. Algae inhabiting the sea bottom, together with various sea-grass species, constitute the phytobenthos; on the other hand, algae dispersed in the water column of the marine ecosystem form the phytoplankton.

Marsh Garlic

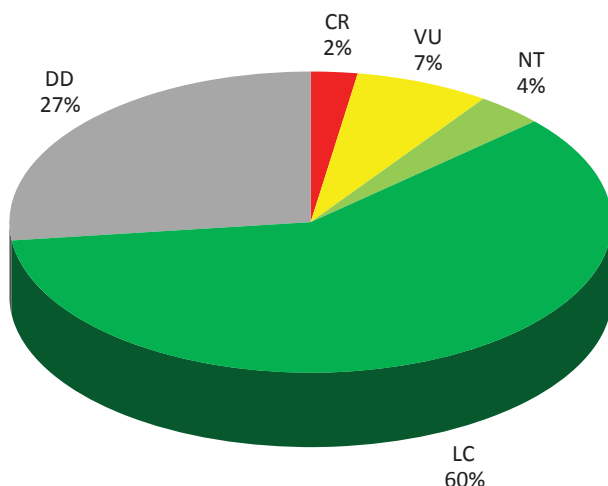
Marsh Garlic (*Allium telmatum*).
Photo: I. Boršić

Five new plant species have been described in the territory of Croatia since 2008, including the so-called Marsh Garlic (*Allium telmatum*). This endemic species can be found only in the northern part of the Dalmatia region, and as is clear from the very name of the plant, it grows in salty wetland habitats on the shore. Another specific characteristic of this garlic species is connected with the time of its flowering – it takes place in the autumn, from September to November.





Overview of individual threat categories for the assessed vascular flora species



Overview of individual threat categories for the assessed marine algae and sea-grass species

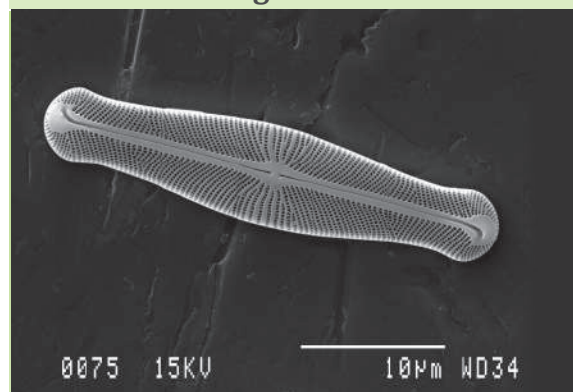
Peacock's Tail (*Padina pavonica*) is a fan-shaped brown algae species, which colour derives from calcium carbonate deposits. Photo: B. Furlan



Mosses in the locality Svinjarevac within Papuk Nature Park create soft forest »carpets«, diverse in colour and shapes. Photo: I. Žeger Pleše



Freshwater Algae



Diatomea (*Envekadea hedinii*). Photo: M. Gligora Udovič

Several species of **freshwater algae** were first recorded and described in Croatia, primarily in the area of Plitvička jezera National Park. Taxonomically, they belong to the group of Diatomeae, and, insofar as the available findings are concerned, their distribution in Croatia is limited. The species *Envekadea hedinii* is also peculiar – in Croatia, it has been found only in Vransko jezero near the town of Biograd, and it is classified within a newly described genus.

Maidenhair Fern (*Adiantum capillus-veneris*) grows in humid habitats on rocks. Photo: V. Posavec Vukelić





Fungi and lichens



Pine Cone Bonnet (*Mycena seynii*) is an inedible fungi that grows on fallen pine cones. Photo: M. Franković

Lung Lichen (*Lobaria pulmonaria*) is lichen very sensitive to the air pollution and can often be found on tree barks. Photo: A. Partl

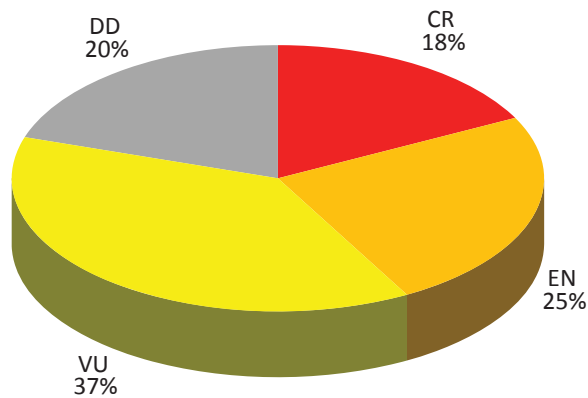


Despite the fact that there are approximately 20 000 species of fungi in the territory of Croatia, only around 5500 species have actually been recorded so far. Approximately 1000 of these species are lichens – a separate group of fungi living in symbiotic communities with algae and/or cyanobacteria. Fungi include 13 potentially endemic species.

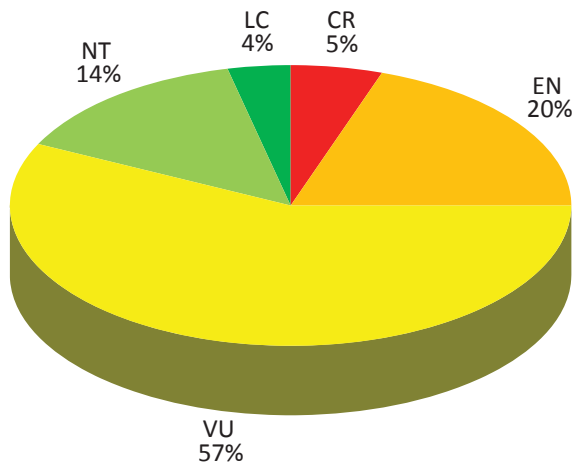
Based on the threat analysis for fungi species in Croatia, 349 fungi and 56 lichen species are endangered. Key reasons underlying these threats include the use of biological resources (i.e. harvesting) and changes in ecosystems – disappearance, degradation or fragmentation of habitats, coupled with pollution.

Magpie Fungus (*Coprinopsis picacea*) is rather beautiful and interesting fungus species growing in wet coniferous and deciduous forests, in particular under beech trees. Photo: M. Franković





Overview of individual threat categories for fungus species



Overview of individual threat categories for lichen species

Powdered Sunshine Lichen (*Vulpicida pinastrī*) is the only poisonous lichen species in Croatia. Photo: A. Partl



Iceland Lichen



Iceland Lichen (*Cetraria islandica*).
Photo: A. Partl

Iceland Lichen (*Cetraria islandica*) is a species consisting of the community of asomycete and green algae. It is an indicator of clean nature, given the fact that it is sensitive and cannot survive pollution. While it is widely distributed in the northern part of Europe, and harvested for commercial purposes due to its medicinal properties, in Croatia it is a very rare species, and grows only on peaks of several mountains (Velebit, Plješivica and Dinara) and is strictly protected by law.

Red Beard Lichen (*Usnea rubicunda*) is very rare lichen in Croatia, which has distinct greyish-red to brownish-red color. Photo: A. Partl



Domesticated breeds and autochthonous varieties

Biodiversity consists not only of wild plants and animals, but also of species that man has changed over time, adjusting various breeds and varieties to his needs by the cultivation and selection of specific properties. Domesticated breeds and autochthonous varieties are thus adjusted to the local climate, tend to be more resistant to diseases, and are frequently very well adapted into nature. In addition, such breeds and varieties represent a valuable source of genes and a significant part of the national cultural heritage, because of the efforts and knowledge of numerous generations invested in their cultivation, in combination with living conditions and the characteristic of the local region. There are 27 officially recognized indigenous breeds entered into the list of indigenous and protected breeds and species of domestic animals. In addition, the Croatian Kennel Club (HKS) registered seven indigenous dog species until 2012: the Tornjak Sheepdog, the Dalmatian Dog, Istrian Short-haired Hound, Istrian Coarse-haired Hound, the Posavac Hound, the Croatian Sheepdog and the Small Međimurje Dog - Međi. Threats to domesticated breeds typically stem from the depopulation of the rural areas and modernization of agriculture, coupled with more modest production characteristics of such breeds compared to modern cross breeds.



Krivopeteljka is an old apple variety ripening at the beginning of October. Photo: I. Ilijaš

Turopolje pig is one of our oldest breeds; there are very few animals remaining nowadays and they are critically endangered. Photo: B. Krstinić





Tornjak sheepdog guards a flock of Lika Pramenka sheep. Photo: B. Krstinić

List of autochthonous domesticated breeds

SPECIES	BREED
HORSES	Lipizzaner
	Croatian Cold-blood Horse
	Posavina Horse
	Međimurje Horse
DONKEYS	Istrian Doneky
	Littoral-Dinaric Doneky
	Northern-Adriatic Doneky
CATTLE	Buša
	Istrian cattle
	Slavonian-Syrmian Podolian cattle
PIGS	Black Slavonian Pig
	Turopolje Pig
POULTRY	Hrvatica Hen
	Zagorje Turkey

SPECIES	BREED
SHEEP	Pag Island Sheep
	Krk Island Sheep
	Pramenka of Lika
	Dubrovnik Ruda Sheep
	Rab Island Sheep
	Dalmatian Pramenka
	Istrian Milk Sheep
	Cres Island Sheep
	Cigaja Sheep
GOATS	Croatian White Goat
	Croatian Coloured Goat
	Istrian Goat
BEES	Carniolan Bee

HABITATS

Habitat represents an area in which individual organisms live in stable interaction with their environment. All habitats of the same kind constitute one habitat type, and habitat types are described by habitat classification systems.

The classification of habitat types has been developing in Europe for some twenty years already. In Croatia, which is one of the richest countries in Europe in terms of biodiversity, the National Habitat Classification (NKS) was developed in 2004. Upon the establishment of the National Habitat Classification, the Map of Habitat Types of the Republic of Croatia was prepared as well, representing the spatial distribution of all habitat types in Croatia.

The National Habitat Classification defines 11 main classes of habitat types, with each class further subdivided into additional four levels, based on the level of detail that they provide:

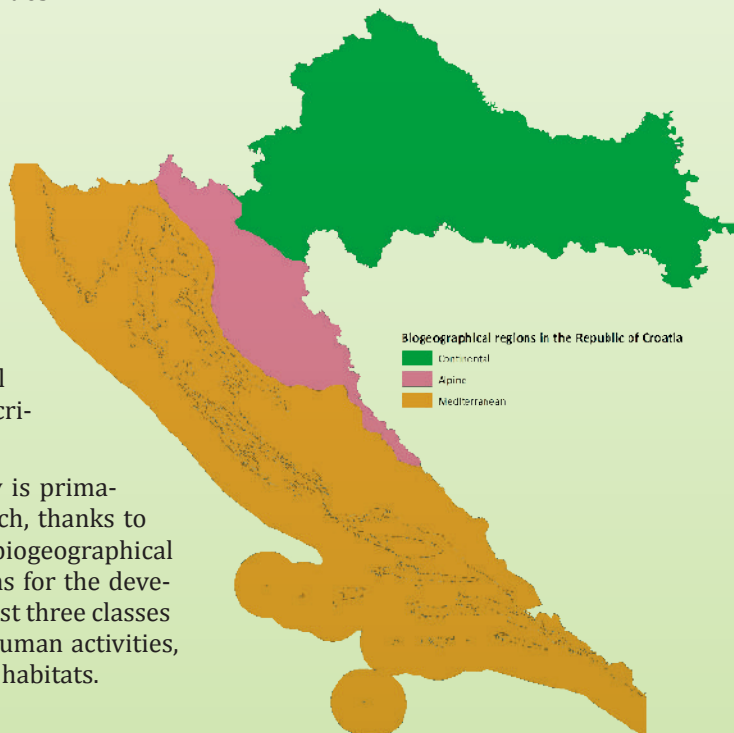
- A. Inland surface water and wetland habitats
- B. Unvegetated and sparsely vegetated inland surfaces
- C. Grasslands, fens and bogs and tall herb communities
- D. Scrubs
- E. Forests
- F. Sea Coast
- G. Sea
- H. Underground
- I. Cultivated non-forested land and habitats with weeds and ruderal vegetation
- J. Constructed and industrial habitats
- K. Complexes

The first eight classes describe the majority of natural and semi-natural habitat types, and are therefore described in greater detail.

Such major diversity of habitat types in the country is primarily due to the geographical position of Croatia, which, thanks to the country's shape, extends across three different biogeographical regions. Each region offers its own specific conditions for the development of unique habitat types or ecosystems. The last three classes are anthropogenic habitats occurring as a result of human activities, which constitute the landscape together with natural habitats.

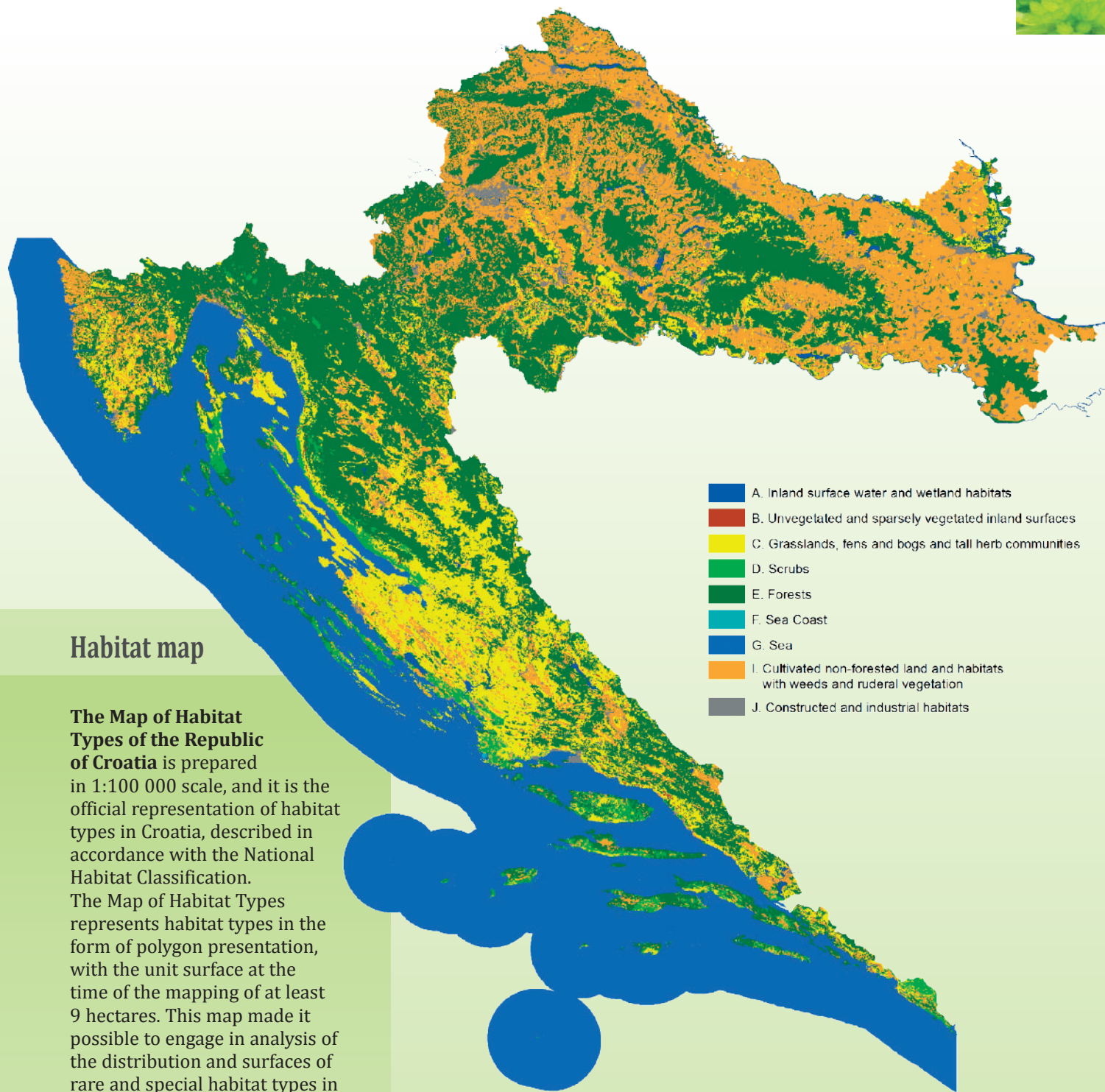


Mountain landscapes are characterized by mosaics of grasslands and forest habitats.
Photo: P. Gambiroža



Biogeographical regions in the Republic of Croatia

- Continental
- Alpine
- Mediterranean



Habitat map

The Map of Habitat Types of the Republic of Croatia is prepared in 1:100 000 scale, and it is the official representation of habitat types in Croatia, described in accordance with the National Habitat Classification. The Map of Habitat Types represents habitat types in the form of polygon presentation, with the unit surface at the time of the mapping of at least 9 hectares. This map made it possible to engage in analysis of the distribution and surfaces of rare and special habitat types in Croatia, and it is used on a daily basis for the purposes of planning and management in the sphere of nature conservation. Croatia has 74 habitat types listed in the Habitats Directive of the European Union.

- A. Inland surface water and wetland habitats
- B. Unvegetated and sparsely vegetated inland surfaces
- C. Grasslands, fens and bogs and tall herb communities
- D. Scrubs
- E. Forests
- F. Sea Coast
- G. Sea
- I. Cultivated non-forested land and habitats with weeds and ruderal vegetation
- J. Constructed and industrial habitats



More info:
www.iszp.hr



A. Inland surface water and wetland habitats

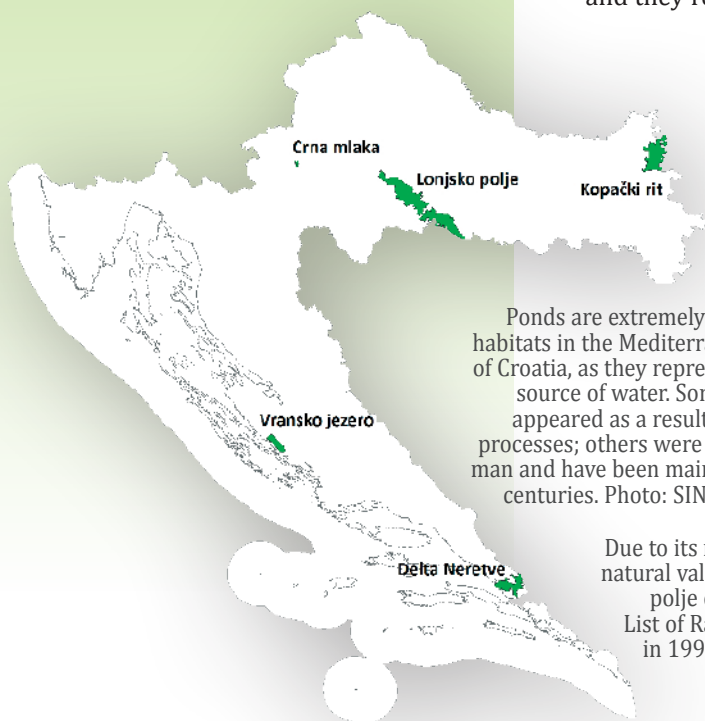
Ramsar Areas in Croatia

The Convention on Wetlands of International Importance especially as Waterfowl Habitat, also known as the **Ramsar Convention**, was reached with the purpose of conserving those areas on Earth that are of decisive importance for the survival of a number of plant and animal species in wetlands and their communities. Croatia has five internationally important wetland areas: Kopački rit, Lonjsko and Mokro polje, lower section of the Neretva River; fish ponds Crna Mlaka, and Vransko jezero near the town of Biograd.

This habitat class includes surface waters, standing water or watercourses, with natural or semi-natural communities, with or without vegetation, regardless of whether their origin is natural or artificial. Habitats within this class are valuable primarily due to a number of endangered species living in them, and as habitats important for the feeding of migratory bird species.

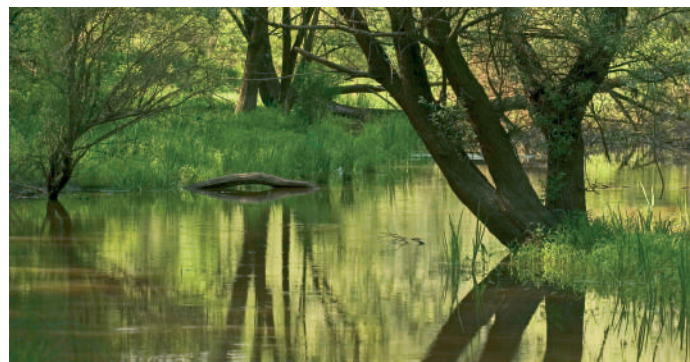
There are 3883 localities in the country that can be perceived as comprehensive wetland areas and 11 major wetland complexes with the total surface of over 800 000 hectares, as well as a range of smaller wetland units. Major wetland complexes are extraordinarily important for the conservation of biodiversity, and are mostly located in floodplains of big rivers. Numerous carp fish ponds along the watercourses of northern Croatia form complexes of semi-natural wetland habitats, which represent important areas for the nesting and migration of waterfowl.

Tufa cascades and watercourses are created by various algae and moss species creating travertine from water rich in lime. In the karst area of the Dinarides, such cascades can be found on smaller and bigger rivers, and the best-known phenomena of this kind can be found in two National Parks: Krka and Plitvička jezera. At the request of Croatia, these habitat types have been added to the Annex I of the Habitats Directive, and they represent separate areas in the ecological network.



Ponds are extremely important habitats in the Mediterranean part of Croatia, as they represent a rare source of water. Some of them appeared as a result of natural processes; others were created by man and have been maintained for centuries. Photo: SINP Archives

Due to its remarkable natural value, Lonjsko polje entered the List of Ramsar Sites in 1993. Photo: B. Krstinić



B. Unvegetated and sparsely vegetated inland surfaces

The most interesting habitats in this class are screes, cliffs and exposed limestone rocks. A number of endemic and relic plants and plant communities are represented, and they are predominantly distributed on mountain areas or limestone rocks on the coast and the islands. Screes develop in areas where separated parts of rocks and gravel accumulate at the bottom of slopes, and they are inhabited by specially adjusted, frequently endemic plants such as *Arabis scopoliana*, *Seseli malyi* and the widely known Velebit Degenia (*Degenia velebitica*).

Cliffs and exposed limestone rocks can be found in the Mediterranean and continental area of Croatia. They are inhabited by rock-crevice vegetation, which is frequently endemic and highly adjusted to the area.

Bare and rocky peaks of Bijele and Samarske stijene are marked by alpine species, the best-known species being Edelweiss. Photo: T. Kirin



Habitats of particular importance for endemic species are rocks and screes. One such species is *Campanula fenestrellata* subsp. *fenestrellata*. Photo: V. Posavec Vukelić



Velebit Degenia (*Degenia velebitica*) is the best-known endemic plant species of Croatia, and it can be found only on the mountain of Velebit. Photo: I. Boršić

Cliffs – vertical rocks with steep surfaces provide habitats to rare and threatened plant and animal species. Photo: A. Partl





C. Grasslands, fens and bogs and tall herb communities

Bogs and fens



Trstenik bog. Photo: A. Štrbenac

Bogs and fens are wetlands with small sedge and moss communities. They are relics of the glacial period that can be found on small surfaces, typically less than one hectare, and they are extremely dependent on microclimatic conditions. A number of highly specialized plants, very rare and threatened in Croatia, are connected with this type of habitat, such as the Bog Mosses (*Sphagnum* spp.), Sundew (*Drosera rotundifolia*), Common Butterwort (*Pinguicula vulgaris*) and White Beaksedge (*Rhynchospora alba*).

The most widespread types of grassland in Croatia are mesophilic meadows and pastures, sub-Mediterranean dry grassland, and eutrophic humid grasslands. Humid grasslands are most represented in the continental part of the country, where they constitute parts of major wetland complexes along the lowland rivers, especially along the Sava River. One species dependent upon humid grasslands is the strictly protected Fritillary (*Fritillaria meleagris*). Karst fields are home to humid meadows with a specific type of vegetation – community *Deschampsietum mediae illyricum*, with *Chouardia litardierei* as the most important species. In the coastal area of Croatia, humid grasslands are particularly prominent in the Neretva Delta area, as well as along the Cetina River, while dry Mediterranean grasslands cover major parts of the coastal area and its hinterland.



Chouardia litardierei is an endemic Illyrian-Balkan species. Photo: V. Posavec Vukelić



Dry Mediterranean grasslands show their beauty and biodiversity in early spring. Photo: D. Župan

Mountain grasslands are important habitats for a number of rare and endangered plant and animal species. Photo: V. Posavec Vukelić





D. Scrubs

The scrub habitat class differs from forests not only in terms of appearance, but also in terms of the structure of vegetation, which mostly includes bushes and only partially trees developed in the form of bushes. Macchia of *Juniperus* spp. is developing as a succession stage on abandoned grassland, and is not threatened due to the fact that macchia surfaces are increasing. Illyrian garrigues represent the characteristic evergreen vegetation of small bushes, frequently disappearing due to the development of forest vegetation. Mountainous and sub-mountainous belt is recognizable by the formations of low, undersized or bent small bushes, the so-called pine thicket.

Certain types of willow scrub along the rivers are threatened in the continental region, such as *Salici-Myricarietum*, while Oleander galleries (*Nerium oleander*) are mostly threatened in the Mediterranean region.



Dwarf mountain pine thicket is developed in the form of a very thick, almost impenetrable scrub that can reach up to 2.5 m in height. It can be found on mountains above the elevation of 1350 m on average, and represents the final zone of forest vegetation. Photo: T. Kirin

Oleander galleries (*Nerium oleander*) cover areas of permanent and temporary watercourses in the Mediterranean part of Croatia. Photo: I. Boršić





E. Forests

There are around one hundred diverse forest communities in Croatia. The total surface of forests and woodland is approximately 2.5 million hectares, which constitutes almost one half of the territory of Croatia. In terms of the composition of tree species, forests in Croatia are natural and quite similar to the virgin forests that they originate from. In comparison with the forests in Europe, the level of conservation of forests in the country is extraordinarily high. As many as 95% of forest stands are marked by a natural and autochthonous composition of species, which is rare and highly valuable at the global level. The largest forest complexes can be found in the area of the western Dinaric Alps (the region of Gorski kotar and Velebit Mountain), where Beech and Fir forests predominate, and in the alluvial areas of the Sava River region (Spačva and Lonjsko polje), where we come across the forests of Pedunculate Oak, Hornbeam and Ash. In the Mediterranean region, most of the forest vegetation is in the macchia (eumediterranean) stage or scrub (submediterranean) stage, even though there are areas with well conserved forests of Holm Oak and Black Pine.

Ramino korito locality is a major Beech-Fir virgin forest on the southern part of the Velebit Mountain, protected as a Special Reserve. Photo: D. Župan



Kopački rit Nature Park is dominated by alluvial forests of White Willow, adapted to wetland conditions. Photo: A. Maričević



Pedunculate Oak and Hornbeam forests are the best-known forests in Croatia. These forests can be found all along the Sava River watercourse and in the valley of the Mirna River. Photo: G. Krivanek

F. Sea Coast

Coastal habitats are under sea influence, but above the high tide line. They are grouped into habitats of mud, sand, gravel and rocky shores. Areas of sand and shingle beaches are quite rare on the Croatian coast (represented on only 5.4% of the coastline), and they are threatened by human activities – tourist developments, construction and uncontrolled waste disposal. Muds can be found on protected and slanted shores, typically in estuaries and confluences of our rivers, and in the most protected parts of deep coves.

Mud shore habitats are threatened and rare, and their importance for bird species is significant. One such example is the Neretva Delta. Photo: D. Petricoli



Sandy shores can be found on the islands of Susak, Rab, Pag, Dugi otok, Vis, Korčula and Mljet, and in the Bay of Nin. Photo: D. Petricoli



Rocky shores are dominant coastal habitats in Croatia. Photo: T. Kirin

Rich formations of Glasswort (*Arthrocnemum fruticosum*) such as the one on the Island of Cres are rather rare on the Croatian coast. Photo: SINP Archives





G. Sea

Adriatic Sea

The **Adriatic Sea** is a small, enclosed and shallow branch of the Mediterranean Sea, marked by major habitat diversity, in particular in its eastern part. The largest part of the Adriatic (73.9%) is shallow sea with depths of up to 200 meters (the littoral area), while larger depths can be found in the depressions near the Island of Jabuka and in the southern Adriatic; in its northern part, the Adriatic Sea is the shallowest, with depths not exceeding 50 meters. The Adriatic stands out in the Mediterranean as the sea with the highest number of endemic plant and animal species, and we can also come across a number of habitats specific for Croatia in the karst submerged by the sea.

Posidonia beds (*Posidonia oceanica*) are abundant in the central and southern part of the Adriatic, and very rare in its northern part.
Photo: B. Furlan



Sea – or marine habitats are found below the high tide limit, and they include free water (pelagic) communities and sea bottom (benthos) communities. One of the characteristic marine habitats in Croatia are karst marine lakes, which include communities significantly different from those in the surrounding coastal sea. This rare phenomenon consists of sea water bodies enclosed in limestone, which are in contact with the surrounding coastal sea via fissures in karst rocks or very narrow and shallow channels. Typical examples of such habitats include the localities of Zmajevsko oko (Rogoznica) and Mir Lake (in the area of Telašćica on the Island of Dugi otok). In a broader sense, the marine lakes of the Island of Mljet can also be included into this category.

The central and southern part of the Adriatic is home to Posidonia beds (*Posidonia oceanica*), an endemic species of the Mediterranean. This flowering plant creates widespread beds on muddy and sandy sea bottom, which constitute oxygen “factories” and areas of high biodiversity, due to the fact that they serve as habitats, nurseries, growth and feeding sites to numerous marine species.



Kornati National Park is known for its extraordinary diversity of marine habitats; Bottlenose Dolphin and Loggerhead Sea Turtle can often be found in its southern part.
Photo: SINP Archives

Karst marine lake Zmajevsko oko near Rogoznica is 12 m deep, and inhabited by species characteristic for the Adriatic. Photo: D. Petricoli





H. Underground

These habitats constitute one of the most important particularities of nature in Croatia, and they represent globally renowned natural wealth. The part of Croatia marked by karst geology, covering 46% of the country's land area, includes an abundance of underground spaces that provide home to extraordinarily diverse and rich underground fauna, due to the diversity of shapes and ecological conditions in these spaces. Underground habitats have been recognized as threatened habitats at the European level as well, and they are immensely rich in endemic species. There are over 9000 caves and pits known in Croatia.

Underground habitats are special not only in terms of their beauty, but also in terms of their ecological conditions. Photo: D. Hamidović, Croatian Biospeleological Society Archives



Some of the diverse cave forms arising in karst caves include stalactites, stalagmites and cave columns. Photo: D. Hamidović, Croatian Biospeleological Society Archives



»Narrow-necked« Blind Cave Beetle (*Leptodirus hochenwartii*) is Coleoptera adapted to the life underground. Its distinguishing features are completely reduced eyes and elongated legs, and its body size exceeds just 12 mm. Photo: T. Čuković



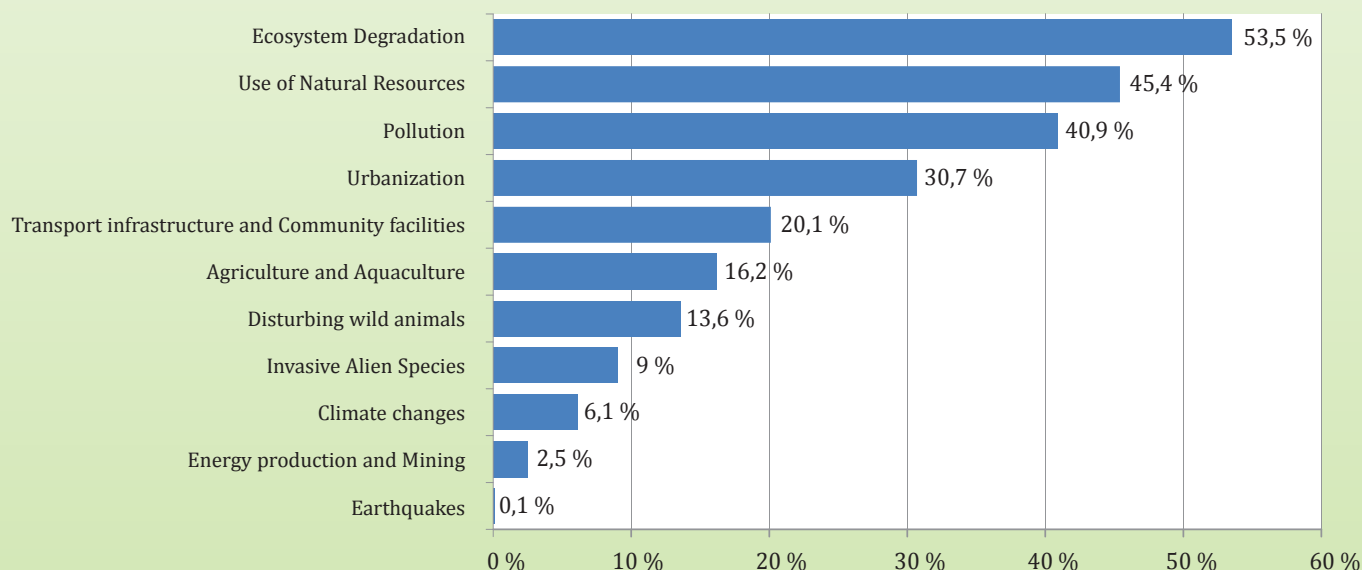
THREATS TO BIODIVERSITY



Grasslands are genuine treasure troves of biodiversity, with a number of plant and animal species; however, with the decrease of grazing on mountain pastures, grasslands are gradually being lost due to the expansion of forests. Photo: T. Kirin

Whenever we describe biodiversity of Croatia, we tend to proudly point out various prominent values of our country, while at the same time disregarding the impact we exert on nature. The key threat to biodiversity is the loss and destruction (degradation) of habitats due to human activity, and other negative impacts include changes in natural ecosystems, uncontrolled use of biological resources, and pollution.

The development of human civilization leads to the transformation of natural habitats into construction areas or agricultural land; road networks are built, resulting in habitat fragmentation; water management interventions are undertaken, ultimately changing the water regimes; large quantities of waste and wastewater are disposed in nature, thus causing pollution. In addition, as a result of the fact that the traditional extensive agriculture is being increasingly abandoned, what used to be endless pastures and meadows slowly decay into scrubs, with the resulting loss of abundant biodiversity that once marked such areas. On top of that, the introduction of alien species also has a negative impact on biodiversity, with some such species becoming invasive; further negative impacts include excessive exploitation of nature in hunting



Overview of the vulnerability with the percentage of threatened species



Red Books of the Republic of Croatia provide consolidated key data on threatened species.

and forestry, commercial harvesting of plants and fungi, fishing, as well as intensive agriculture and tourism.

The impact of climate change, which is understood as being one of the key causes of threats to biodiversity in the world in recent times, must not be disregarded. According to the current data, climate change impacts upon such important biological parameters as nesting time, migration, reproduction success, as well as changes in the distribution of species.

In order to assess the actual impact of threats on individual wild species, the level of threat is evaluated based on the criteria of the International Union for Conservation of Nature (IUCN). Following the evaluation, assessed species are then listed in red lists and red books of threatened species. Red lists have been prepared for 17 groups of species in Croatia, together with the Red List of Cave Fauna. Of the total number of assessed species, 46% are classified in categories that entail high extinction risk (categories CR, EN and VU), with freshwater fish species facing the largest threat.



Waste is often disposed of in nature, especially in speleological objects, what makes karstic habitats and species very affected from this kind of pollution.
Photo: I. Zupan



Quarries completely change landscapes and have a significant impact on the environment. Photo: SINP Archives



One of the best-known invasive freshwater invertebrates recorded in the waters of Croatia so far is the Zebra Mussel (*Dreissena polymorpha*).
Photo: A. Duplić



Transport infrastructure

Habitat fragmentation is an inevitable consequence of the construction of new transport routes (roads and railways), in particular when it comes to highways. The surface of favourable habitats is thus decreasing, and ecosystem stability is endangered, with the substantial worsening of biodiversity as the end result. In addition to destroying spacious habitats, roads and railways also represent obstacles and disrupt the movement of animals, which is why many animals end up killed as they try to overcome them. One of the ways in which negative impacts of highways can be mitigated is the construction of so-called “green bridges”.

Increasing transportation also results in increasing noise, pollution and disturbance of animals, as the surrounding habitats gradually become less and less favourable for them. All these factors result in decreasing numbers of various populations, ultimately even contributing to the extinction of certain sensitive and threatened species. The decreasing surface of favourable habitats represents the biggest threat to butterflies; road collisions are a major threat to herpetofauna; and decreasing living space represents the key threat to large carnivores.

Since the 1990s there have been 11 green bridges built in Croatia. Photo: Đ. Huber



Dams and water management

Changes in freshwater ecosystems caused by their exploitation or dam construction projects have a substantial negative impact on plant and animal species living in them. Freshwater systems in Croatia are inhabited by a number of endangered and endemic species, in particular in karst areas. The construction of large dams results in changes of the natural flow regime, which frequently leads to irreversible changes in the ecosystem and loss of individual species – according to assessments, such changes are the cause of threatened status of as many as 33.8% of evaluated species in Croatia. This threat has a particularly negative impact on freshwater fish species and crustacean species.

Hydropower plant “Čakovec” on the Drava River. Photo: T. Čuković



River basins regulations sometimes include intensive building that can cause irreversible damage to landscape, habitats and species. Photo: SINP Archives





Invasive alien species

Alien (non-autochthonous) species are those species that were not naturally present in a given ecosystem of a given area, but were instead introduced into that ecosystem, either by deliberate or accidental introduction. If the introduction or expansion of an alien species results in a negative impact on biodiversity or human health, or if it results in economic damage in the territory where it is introduced, such species is considered invasive. The influence of invasive species is so large, that they, together with the direct habitat destruction, represent the largest cause of biodiversity loss.

Invasive alien species can be found in all ecosystems in Croatia, from freshwaters habitats – the Zebra Mussel (*Dreissena polymorpha*), so-called “Killer Shrimp” (*Dikerogammarus villosus*) and Signal Crayfish (*Pacifastacus leniusculus*); terrestrial habitats – beetles (*Harmonia axyridis*), spiders (*Mermessus trilobatus*), snails (*Arion rufus*), plants (*Ambrosia artemisiifolia*, *Amorpha fruticosa*) and Small Asian Mongoose (*Herpestes javanicus auropunctatus*) to marine habitats – with 25 foreign fish species and algae genus *Caulerpa*, Spotted Sea Hare (*Aplysia dactylomela*) and many others .



Signal Crayfish (*Pacifastacus leniusculus*) represents one of the key threats to the survival of autochthonous crayfish species; on top of direct struggle for food and habitat, Signal Crayfish is also the transmitter of the infectious agent of crayfish plague disease. Photo: L. Katušić



More info:
www.invazivnevrste.hr

Multicolored Asian Lady Beetle (*Harmonia axyridis*) is an alien coccinellid species which threatened autochthonous coccinellid species; its main distinguishing mark is a black “M” or “W” shape on its prothorax. Photo: SINP Archives



Alien mammal species

Alien mammal species were introduced in Croatia predominantly for hunting purposes. There are four alien mammal species in Croatia listed in the Hunting Act – Chittal (*Axis axis*), Fallow Deer (*Dama dama*), Mouflon (*Ovis musimon*) and Small Asian Mongoose (*Herpestes javanicus auropunctatus*), while the Wild Boar (*Sus scrofa*) naturally resides in the land part of the country, but is nevertheless alien to islands. Most of these species are managed in closed breeding sites, but some were introduced in nature, either deliberately or accidentally, and having established their populations they now represent a threat to biodiversity. There are significant populations of Fallow Deer and Wild Boar on some Adriatic islands, such as Cres and Krk, posing a threat to sensitive island ecosystems, but also causing a certain degree of economic harm. Small Asian Mongoose was introduced on the Island of Mljet in 1910, with the aim of decreasing the number of snake populations. Even though the snake issue was resolved, Small Asian Mongoose eventually spread throughout the island and beyond, bringing with it a substantial negative impact on the sensitive island ecosystem.

Small Indian Mongoose (*Herpestes javanicus auropunctatus*).
Photo: Mljet National Park Archives





Terrestrial plants harvesting

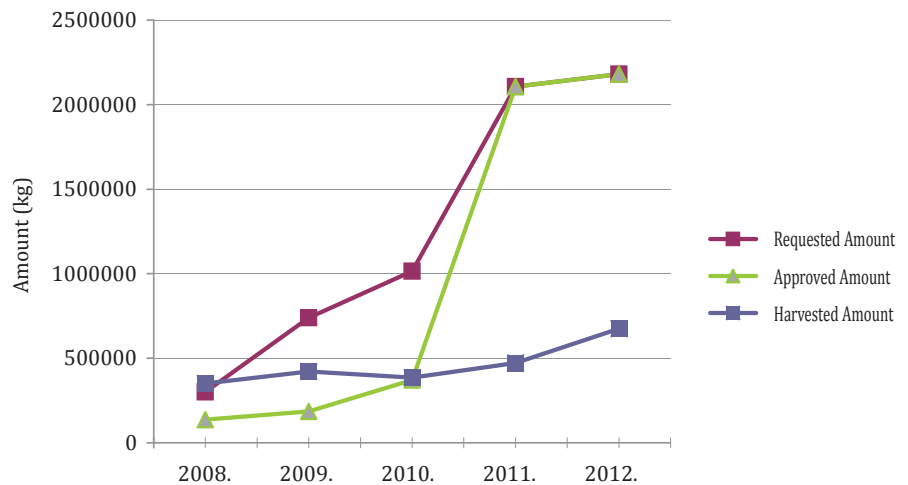
Curry Plant



Curry Plant or Immortelle (*Helichrysum italicum*). Photo: D. Hamidović

One example of a plant species being harvested and commercially used is the Curry Plant (*Helichrysum italicum*). It is a subshrub growing in dry, open habitats along our coast and on the islands. It flowers towards the beginning of summer, but sometimes also in October. The plant, particularly its shoots and inflorescences, are harvested due to medicinal properties, especially for essential oil. The demand for curry plant in Croatia has been growing markedly in recent years, which is a consequence of international market demand for essential oil used in perfume and cosmetic industry, especially for skin care products. Unsustainable and uncontrolled harvesting of curry plant poses an additional danger to the populations of that species.

The impact of intensive plant harvesting represents pressure on populations of plant species, but can also cause degradation of habitats in which these plants grow. Species that are harvested the most are Curry Plant (*Helichrysum italicum*), Bay Laurel (*Laurus nobilis*), Brier Hip (*Rosa canina*), Common St. Johnswort (*Hypericum perforatum*), Spineless Butcher's Broom (*Ruscus hypoglossum*), Calamus root (*Acorus calamus*), Heather (*Calluna vulgaris*), Male fern (*Dryopteris filix-mas*), and also spring flowers such as Common Snowdrop (*Galanthus nivalis*), Crocus (*Crocus* spp.) and Common Violet (*Viola odorata*). It is presumed that this harvesting trend will continue in the future, which is why it is necessary to ensure sustainability, especially through education.



Harvesting of Curry Plant in Croatia

Bay Laurel (*Laurus nobilis*) is often harvested along the Adriatic coastline. Photo: V. Posavec Vukelić



Renewable energy – Wind power plants

There are many renewable energy sources – the power of water, solar energy and biomass, but one of the fastest growing renewable energy sources is wind power. Building wind power plants creates a significant pressure on nature by changing the landscape and causing habitats fragmentation.

In Croatia, wind power plants are mostly built in the coastal hinterland, lacking the necessary infrastructure, and the necessary construction of roads and transmission lines in these almost intact areas have a negative impact on endangered species and habitats. In Croatia, as well as globally, birds and bats are the species most endangered by wind power plants, and wind farms can create serious obstacles for them. Their negative impact is increased by the fact that they are located in areas with wind currents that are also migratory paths of birds.



Wind
Power Plant
Vrataruša
near Senj.
Photo: Croq

Wind Power Plant Velika
Popina near Gračac.
Photo: SINP Archives



Wind power plants effect on the Golden Eagle (*Aquila chrysaetos*)



Golden Eagle (*Aquila chrysaetos*).
Photo: I. Lolić

In Croatia, wind farms are being built in the endangered bird distribution areas. One of these birds is the Golden Eagle (*Aquila chrysaetos*), a nesting bird that can be found in coastal and highland Croatia, where only 25-30 pairs exist. Due to numerous pressures the Golden Eagle is a critically endangered species (CR). Wind farm building is increasing these pressures – the risk of injuries due to collisions with turbine blades and electrical power lines are increased, as well as electrocution.



GEOLOGICAL DIVERSITY AND GEOLOGICAL HERITAGE

Due to its geographical, geological and geomorphological position on the intersection of the Pannonian basin, the Alps and the Dinarides, Croatia is marked by highly valuable geodiversity. Here we can find a rich variety of types of rocks (metamorphic, magmatic and sediment rocks), originating from diverse environmental conditions and geological periods, stemming back 600 million years into history of geological development of the Earth.

Geoheritage of Croatia is marked by a number of geological localities that are highly valuable not only at the local or regional level, but also globally. Some of them are protected as officially declared natural values. Hušnjakovo near Krapina represents one of the best known Palaeolithic habitats of Neanderthals in Croatia and Europe, while the area of Kamenj vrh (Gaveznica) in Lepoglava represents the only preserved fossil volcano, and is the first agate site discovered in Croatia. Rupnica site on Papuk is a unique locality in Croatia, with marked columnar jointing of volcanic rocks. The site of Đurđevački pijesci, also known as “the Croatian Sahara”, is one of the last remains of what used to be a wide, 12 kilometre long belt of sands called Podravski pijesci, created by the interaction of fluvial and aeolian processes during the Quaternary period.

Hušnjakovo brdo, a world-renowned Neanderthal finding site near Krapina. Photo: I. Žeger Pleše



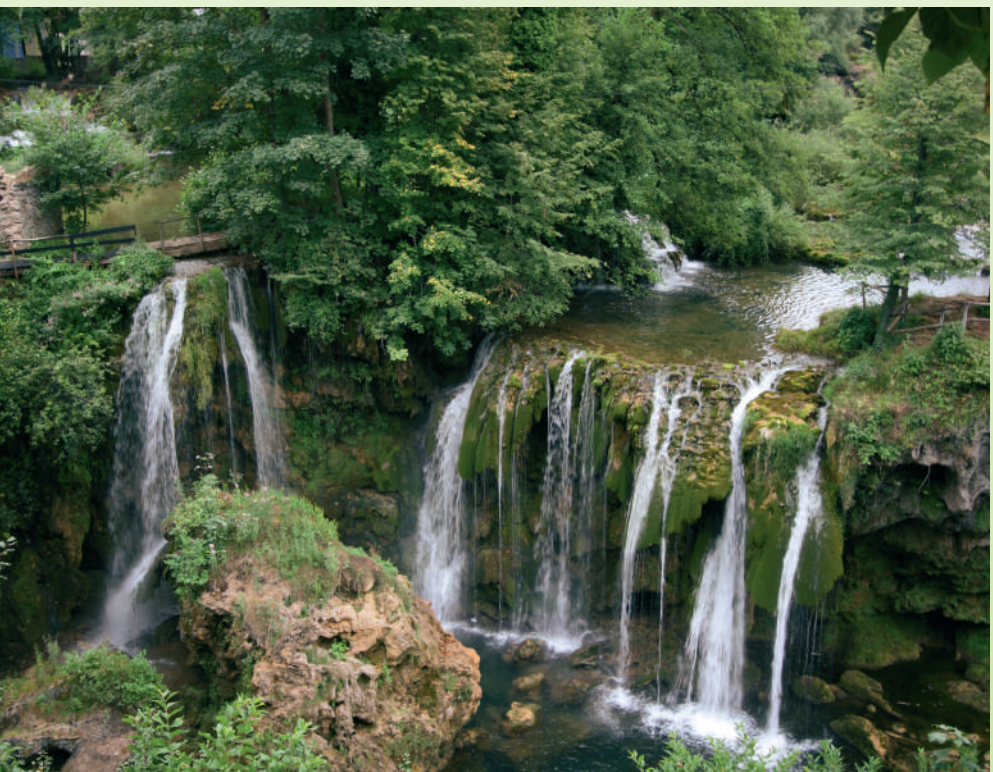
Đurđevački pijesci Special Reserve. Photo: SINP Archives





Rupnica Nature Monument. Photo: I. Žeger Pleše

The age of active tufa cascades is estimated at 6000 to 7000 years, which corresponds to the time when they began forming after the most recent ice age. Photo: A. Partl



Karst

Karst represents a unique type of relief with special hydrogeological and geomorphological properties, and it is characterized by specific surface forms (karst cracks, sink-holes, hollows and fields, etc.) and underground forms (caves and pits), lack of surface water and richness of underground life. Plitvička jezera National Park are a well-known phenomenon that has arisen in the Dinaric karst area, with unique geological, geomorphological and hydrological characteristics. The value of this locality has been recognized at the global level, with the site introduced into the UNESCO World Heritage List. The territory of the Croatian karst also includes three pits with depths exceeding 1000 meters (the deepest being the Lukina jama – Trojama pit system, 1431 meters deep, currently the 14th deepest pit in the world). In addition, there are three cave or pit systems in Croatia that are over 10 000 meters long, and the longest pit system is Kita Gačešina - Draženova puhaljka at 27 802 meters, which is also the longest system in the area of the Dinarides.

Karst landscape. Photo: I. Župan





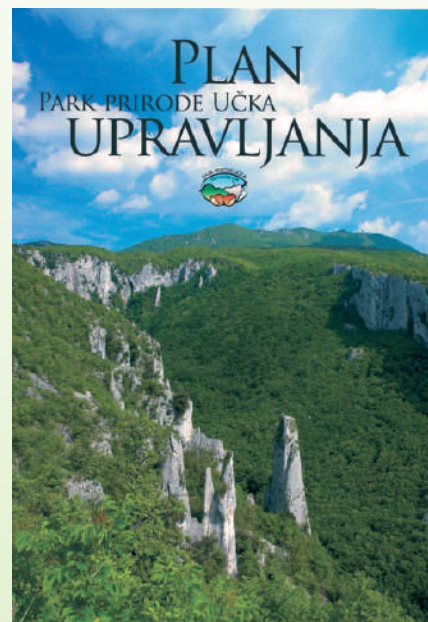
NATURE CONSERVATION MECHANISMS

Landscapes

Landscapes are a result of man's interaction with nature that include various interconnected ecosystems, from natural terrestrial and aquatic systems, such as forests, grasslands and rivers, to landscapes dominated by human influence, including agricultural and urban areas. Landscape diversity is especially important for the preservation of natural resources and cultural heritage, and is based on the European Landscape Convention. In Croatia, like in other parts of Europe, landscapes are threatened by inconsistent and poorly planned urbanization as well as construction in inappropriate locations.

The key aims of nature conservation include the conservation of wild species, habitats and landscapes, as well as soil, rocks, minerals and fossils in all their diversity and favourable status. These aims can be achieved through various mechanisms, primarily legislative, such as the protection of wild species and areas, but also by applied management. In current times, the human impact on all constituent parts of nature is inevitable, which is why it is necessary to establish diverse mechanisms aimed at sustainable use of natural resources, ensuring that there is no significant damage to constituent parts of nature, and that the disturbance to natural balance is minimal.

Moslavačka gora.
Photo: SINP Archives



Management Plan of Učka Nature Park

White Stork (*Ciconia ciconia*) builds one of the biggest and heaviest nests; in Croatia, over 70 per cent of stork nests can be found on roofs and chimneys of houses. Photo: B. Krstinić





Conservation and management of wild species

One of the key mechanisms of the conservation of species is their strict legal protection. The status of strictly protected species is declared for threatened autochthonous wild species, but also for narrowly distributed endemic or wild species where such mode of protection is prescribed by the EU *acquis* or relevant international treaties. Almost 2500 species in Croatia are strictly protected by law.

Strictly protected plants, fungi, lichens and algae must not be picked, cut in whole or in part, removed from soil, harvested or destroyed in nature, while strictly protected animals must not be deliberately captured, killed or destroyed at any stage of their development. In order to protect these species, it is necessary to protect their habitats; in addition, trade in strictly protected species is regulated as well, for the purpose of their conservation.

Species management is implemented by undertaking planned activities aimed at the conservation of species, as prescribed by the relevant action plans. Plans for wolf, lynx and bear have already been prepared and adopted, while plans for several more species are being drafted. In addition to these mechanisms, there are also regulations in place for the alert and monitoring systems regarding captured, killed, injured and sick strictly protected animals, and for the compensation of damage caused by strictly protected wild species.



Meadow Viper (*Vipera ursinii macrops*) is the smallest European venomous snake; in Croatia, it inhabits isolated mountain grasslands of the Dinarides. Photo: D. Jelić



Management plans for Brown Bear, Lynx and Wolf in Croatia.



Grassland conservation



The mowers in Žumberak-Samoborsko gorje Nature Park.
Photo: Žumberak-Samoborsko gorje Nature Park Archives

Many plant and animal species present on grasslands adapted to life with man and are now dependent on his maintenance of their habitats. In order to ensure their survival, traditional human activities important for these endangered habitats are promoted. One of these important activities is the traditional way of mowing – with hand scythes – that is favourable for several plant and animal species. These activities have been conducted in Turopoljski lug Significant Landscape for five years, and Žumberak – Samoborsko gorje Nature Park has been the host for an event called “Yesterdays mowing for tomorrow” for two years now. These events not only educate the local community and visitors about grassland conservation but on the traditional way of life.

Conservation of habitats

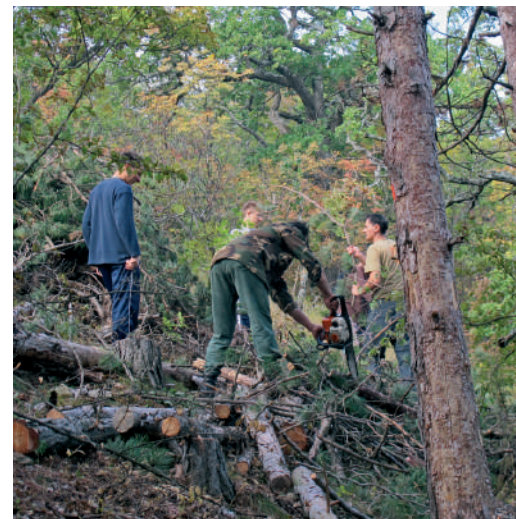
An important element enabling the conservation of habitats is their legal protection. In such a manner, protection is ensured for all habitat types covered by the Habitats Directive, Resolution 4 of the Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention), and for habitats threatened at the national level. In addition, general protection measures are also prescribed for main habitat classes according to the National Habitat Classification – an example of such a measure would be the obligation of implementing afforestation by autochthonous tree species that reflect the natural composition of a given habitat. On the other hand, there are also specific measures, such as the revitalization of meadows coupled with active removal of overgrowing woody species, or the removal of invasive species, and such measures are built into physical plans, sectorial management plans and individual projects. In addition, the implementation of specific measures aimed at the conservation of individual species also provides a direct contribution to the conservation of their habitats. An example of such a measure would be mowing at certain times of the year in order to conserve butterfly populations.

Protected areas, as well as areas within the Ecological network of the Republic of Croatia (Natura 2000), which include rare, threatened and endemic habitats, represent yet another mechanism of habitat protection. Declared protected areas provide the widest coverage for inland surface water habitats and wetland habitats and the most represented habitat type within the protected areas are forests.

Tufa cascades are Croatia's contribution to the Natura 2000 Network. Photo: D. Župan



Removal of self-grown black pine trees (*Pinus nigra*) in Snake-eyed Skink (*Ablepharus kitaibelii*) habitat in Papuk. Photo: Papuk Nature Park Archives





Protection of minerals and fossils

In addition to diverse forms of rocks, the territory of Croatia also includes a number of paleontological and mineralogical findings, even though the mineralogical ones are somewhat less represented. Their protection is regulated by law, and the mechanism used to ensure protection is similar to the mechanism intended for the protection of plant and animal species. The aim is to conserve the attractive paleontological and mineralogical heritage under the threat of destruction.

In the territory of Istria, Biokovo, the islands of Hvar and Dugi otok, 20 sites with dinosaur footprints and one site with fossilized bones have been discovered so far; the sites are nominated for protection in the category of protected fossils.



Footprint of a dinosaur at Cape Pogledalo, Veli Brijun Island. Photo: I. Žeger Pleše



Stone spheres

In 2011, series of **stone spheres** were discovered in the course of works on the highway near the town of Vrgorac. These silicate-carbonate spherical nodular concretions have been declared protected natural value, and they represent the only protected mineral in the territory of Croatia.

Stone spheres of Vrgorac.
Photo: I. Žeger Pleše



Protected Areas

The proclamation of a Protected Area within any of the national or international categories of protection represents one of the oldest and most efficient methods of conservation, which is true not only for individual parts of nature, but also for comprehensive ecosystems and biodiversity in general.

In Croatia, there are 418 Protected Areas within nine national protection categories, which represents slightly over 8% of the total country's territory. Protection of an area in any of the national categories can be used in order to ensure targeted protection for habitats of a specific species (for example, in the Special Reserve category); alternatively, such habitats can be protected in the context of a mosaic of several habitats – which means that a given area can be protected due to the totality of its natural values (e.g. Regional Parks).

The oldest continuously Protected Area in Croatia is Arboretum Opeka in Varaždin County, protected in 1947 in the category of Park Architecture Monument. During 2014 our oldest National Parks – Plitvička jezera and Paklenica – celebrated their 65th anniversary.



Brijuni National Park is an oasis for north Adriatic Sea organisms. Photo: Brijuni National Park Archives



Krka National Park includes the most beautiful section of the Krka River, together with the lower section of the Čikola River. With its seven tufa cascades and the total elevation drop of 224 m, Krka is a phenomenon of nature and karst habitats. Photo: B. Opačić



Biokovo Nature Park introduces its visitors to a unique plant world with more than 40 endemic species. Photo: D. Župan

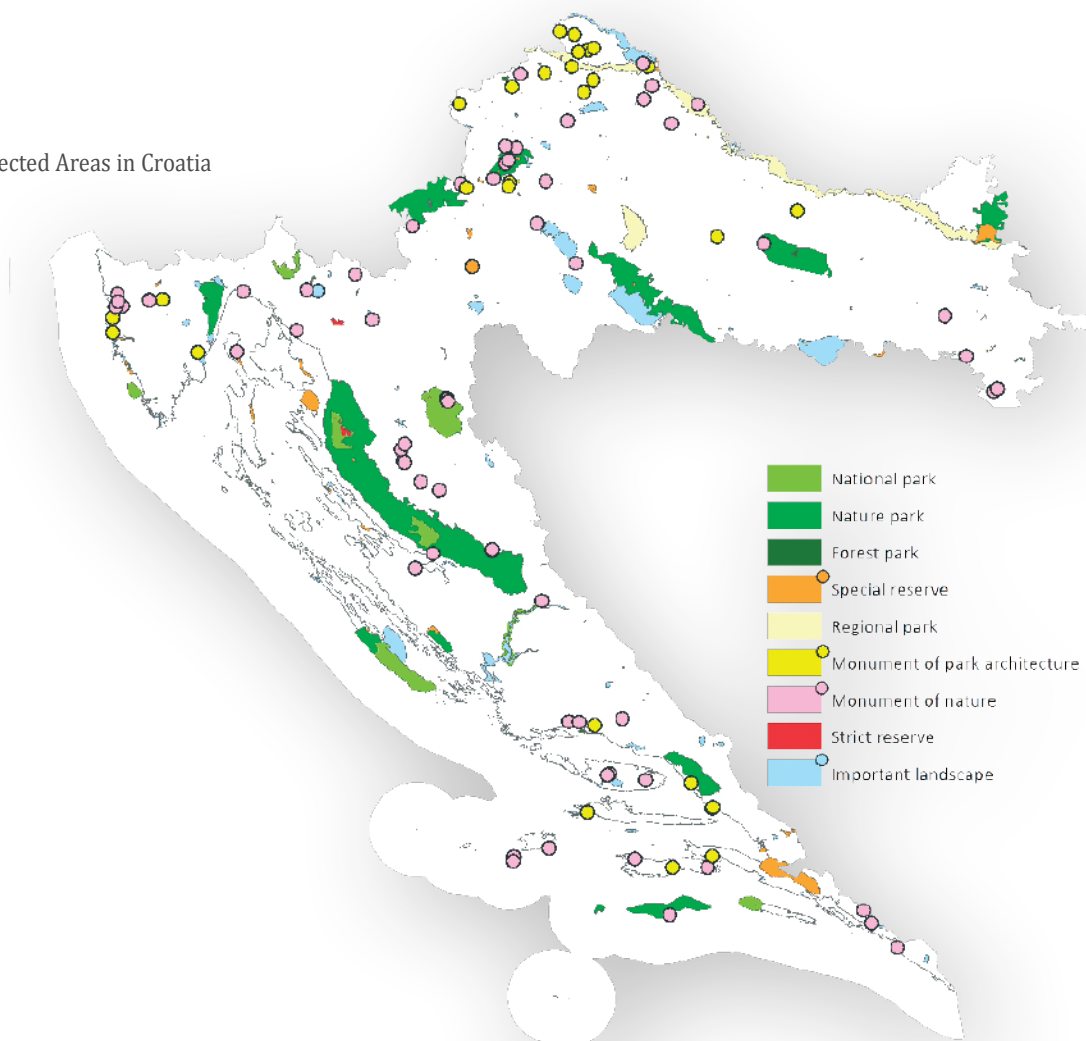


Long-term interaction of man and nature has made Žumberak-Samoborsko gorje Nature Park an interesting area rich with biodiversity. Photo: D. Župan



	Number of Protected Areas	Area (km ²)			Share in Croatian territory (%)		
		Land	Sea	Total	Land	Sea	Total
Strict Reserve	2	24,25	0,00	24,25	0,04	0,00	0,03
National Park	8	763,11	216,52	979,63	1,33	0,68	1,10
Special Reserve	77	286,74	115,06	401,79	0,50	0,36	0,45
Nature Park	11	4130,14	189,71	4319,85	6,77	0,60	4,56
Regional Park	2	1027,21	0,00	1027,21	1,80	0,00	1,16
Nature Monument	85	2,26	0,00	2,26	0,00	0,00	0,00
Significant Landscape	85	1186,67	97,72	1284,40	1,75	0,30	1,23
Forest park	28	30,60	0,00	30,60	0,05	0,00	0,04
Monument of Park Architecture	121	8,38	0,00	8,38	0,01	0,00	0,01
Total	419	7459,37	619,01	8078,38	12,27	1,94	8,57

Protected Areas in Croatia



Internationally Protected Areas



Plitvička jezera National Park.
Photo: SINP Archives

Due to their natural values, **eight areas in Croatia** are recognized as Protected Areas at the European and global level, and are granted international protection. Plitvička jezera National Park is designated as a UNESCO World Heritage Site, while the area of Mura-Drava-Danube and Velebit are recognized as UNESCO Biosphere Reserves. Nature parks Kopački rit, Lonjsko polje and Vransko jezero, together with the Neretva Delta and the Crna Mlaka Special Ornithological Reserve, are listed as wetlands of international importance under the Ramsar Convention. Nature Park Papuk, a European geopark, was included in the UNESCO Geopark Network in 2007.

Three out of eight National Parks in Croatia (Kornati, Brijuni and Mljet) are island parks, and they are characterized by abundant marine life. National parks Sjeverni Velebit, Risnjak and Paklenica are mountain areas marked by specific relief characteristics such as numerous limestone rocks and screes, high-mountain meadows and vast forest complexes. The diversity of habitats, combined with their geographical isolation, has led to the development of specific vegetation with a number of endemic species. National Parks Plitvička jezera and Krka are characterized by unique karst morphology and hydrology, travertine barriers and cascades.

Six out of eleven Croatian Nature Parks are located in mountain areas (Medvednica, Žumberak - Samoborsko gorje, Učka, Biokovo, Velebit and Papuk). Nature Parks Kopački rit and Lonjsko polje are large flooded areas of the Pannonian lowland, and each includes a special ornithological reserve. Vransko jezero Nature Park, located in the coastal area of Croatia, is the largest natural lake in Croatia, extraordinarily important for nesting and wintering of birds. Telašćica Nature Park, as well as our youngest nature park – Lastovsko otočje – are island parks marked by substantial land and marine biodiversity.



More info:
www.iszp.hr



In 2013, a Baseline study for the permanent protection of Dinaric Mountain as a Nature Park was prepared. Photo: D. Župan



Ecological network of the Republic of Croatia (Natura 2000)

Towards the end of the 20th century, biodiversity losses overshadowed the productivity of nature and thus endangered the long-term survival of mankind, which is why the European Union decided to combat biodiversity degradation and to determine which species and habitats are facing the biggest threat of disappearance from the continent, and possibly even complete extinction. The conservation of biodiversity in the European Union is based on the Birds Directive and the Habitats Directive, and one of the mechanisms of protection is the Natura 2000 ecological network. It comprises sites important for the conservation of threatened species and habitat types in the EU. Its aim is to contribute to the conservation of favourable status of over one thousand threatened and rare species, and approximately 230 natural and semi-natural habitat types. So far, around 28 000 areas covering almost 20% of the EU territory have been included in the Natura 2000 ecological network, which makes this network the biggest system of conserved areas in the world.

In Croatia, the ecological network mechanism has been in use since 2007, initially as part of the preparatory process for the establishment of the ecological network of the European Union – Natura 2000. Today, the Ecolo-

gical network of the Republic of Croatia (Natura 2000) covers 36.67% of the country's land territory and 16.39% of its sea territory, and it consists of the Sites of Community Interest (pSCI) and Special Protected Areas (SPA), selected according to the scientific criteria.

The largest share of the ecological network pertains to forests (35%), followed by water surfaces including the sea, at 22%; while agricultural land constitutes 20% of the network. In order to conserve important species and habitats, certain activities will be necessary in the course of the next six years: relevant measures should be defined, and the management system in the areas of the ecological network should be established, having in mind the interest and well-being of people living in them. Protection mechanisms for ecological network areas also include the implementation of nature impact assessments for every plan or intervention that might have an impact, either independently or in combination with other plans or interventions, on conservation goals for a given area.

Around 25% of the territory of the ecological network was already granted protection via the nine national categories of Protected Areas, and 87.17% of Protected Areas in Croatia became part of the ecological network.

The 300 m deep Karst canyon is in contrast with the green colour of the Krupa River. Photo: D. Župan

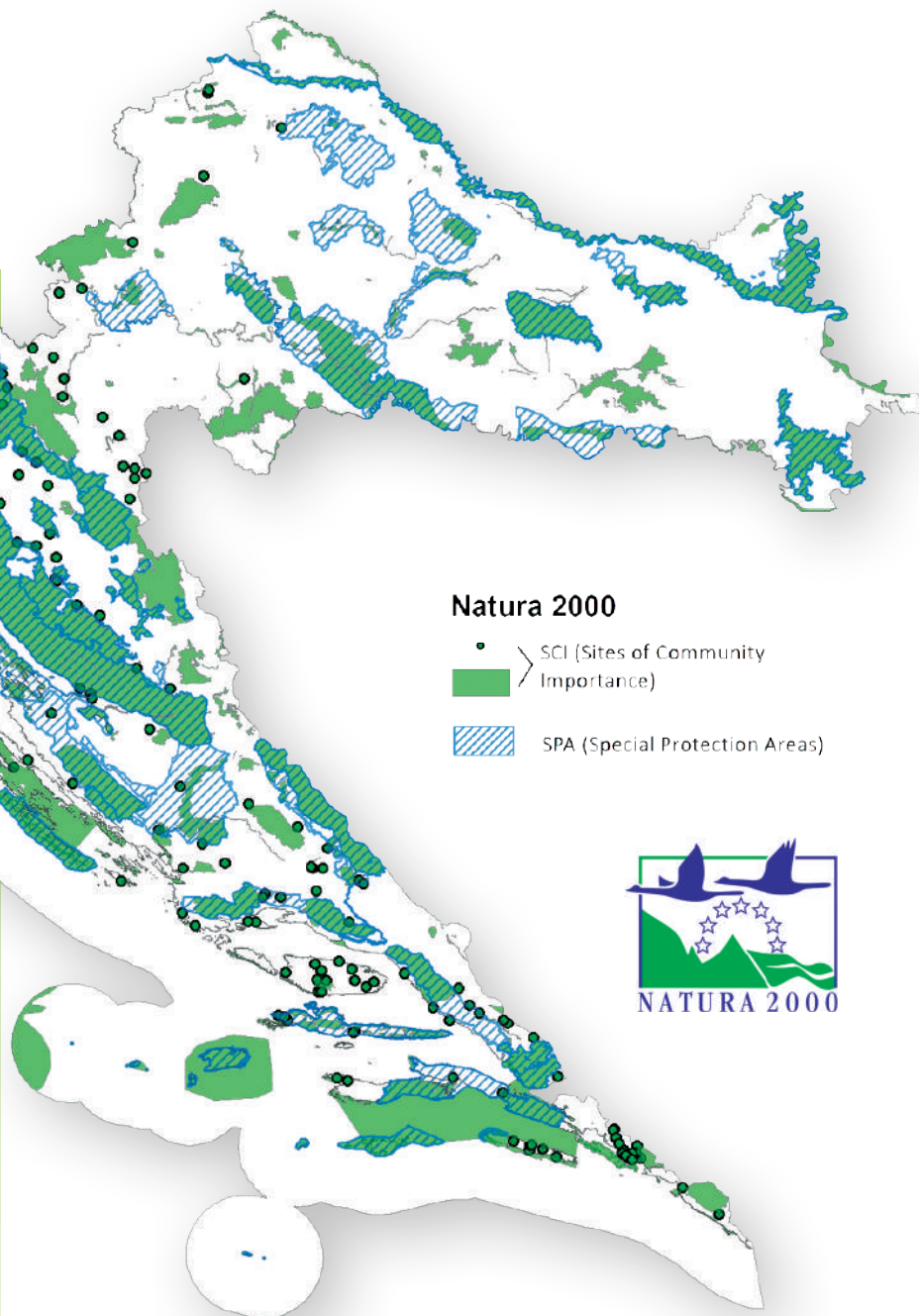


Ecological network of the Republic of Croatia (Natura 2000)

Due to the abundance of biodiversity, Croatia is at the very top of the European Union in terms of the share of land territory covered by the ecological network. The reason behind this high share and the substantial number of species and habitat types within the ecological network lies precisely in the diversity and high level of conservation of habitats, in particular large forest and flood complexes, and underground habitats and karst areas. As a result of the unique natural characteristics of the country, Croatia enriched the Natura 2000 ecological network with 12 species and two habitat types, including the Velebit Degenia and tufa cascades of Karst Rivers.

The State Institute for Nature Protection designed an interactive map which is regularly being updated, and contains all the relevant data for areas of the Ecological network of the Republic of Croatia (Natura 2000). The map is available at:

<http://natura2000.dzpp.hr/natura/>



Natura 2000

- SCI (Sites of Community Importance)
- SPA (Special Protection Areas)



More info:
www.natura2000.hr



ECOSYSTEM SERVICES

All the benefits that individual ecosystems provide to mankind are referred to as ecosystem services. Natural wealth produced by ecosystems is of decisive importance for the functioning and conservation of life on planet Earth, and it contributes to the well-being of society both directly and indirectly. Nature provides man with food, water, tangible raw materials (wood, fibre, etc.), fuel and genetic resources. In addition, some other services given to us by nature include climate regulation, flood protection, erosion control, human disease regulation, water self-purification, and pollination. Due to the evident loss and destruction of natural ecosystems – with over 60% of ecosystems in the world degraded due to human impact – a need has arisen to evaluate them properly, in order to strengthen the arguments for the conservation of disappearing ecosystems upon which we depend. In current times, we are already witnessing the consequences of this trend, such as the pollution of rivers that can no longer be used for potable water supply; pollution of cities and soil, resulting in increasing frequency of individual diseases; global warming; increasing frequency of floods; soil erosion; iceberg melting; rising water levels; etc.

In Croatia, ecosystem services represent a relatively new concept; however, the results of studies conducted so far have shown that Croatian ecosystems are extremely valuable, not only in the classical economic sense, but also in terms of individual cultural ecosystem services that the conventional market typically does not perceive as having substantial economic value.

Lonjsko polje, significant because of its autochthonous breeds, still has the traditional way of grazing. Photo: B. Krstinić



Pollinators



A bee on a flower. Photo: B. Krstinić

Bees, bumblebees, butterflies and other insects transferring pollen from one plant to another are referred to as **pollinators**. The role of pollinators in nature is irreplaceable. Without pollinators, there would be no reproduction of plants that depend on them, including plants that people use for food. The Food and Agriculture Organizations of the United Nations estimates that as many as 85% of agricultural plants depend on pollinators, with the financial gain from pollinators in the agricultural sector standing at 153 billion EUR. Large quantities of insecticides emitted into nature are directly threatening the pollinator species, which is why their numbers throughout the world are decreasing continuously. Unless we manage to lower the quantity of insecticides released to nature, we will lose the pollinator species, thus endangering food production.

Benefits by forest ecosystems

The value of benefits provided by forest ecosystems has been recognized in the forestry sector as early as the 1990s, when the concept of “**non-market forest functions**” was developed. At the global level, the decline of forests is an increasingly visible phenomenon, all the more relevant due to the clear importance of forests in climate regulation, given the fact that forests capture carbon dioxide as one of the key causes of global warming. Success in lowering the current frequency of the destruction of forests by half would result in substantial strengthening of the capacity of forests to decrease carbon dioxide emissions, thus also decreasing the estimated costs stemming from climate change by 3 billion EUR.

Prašnik Special Reserve.
Photo: SINP Archives



Kopački rit Nature Park - the largest complex of conserved natural flood forests in Europe with its priceless biodiversity and landscape values.
Photo: H. Domazetović

In addition to its important role in providing ecosystem services, nature is also a value in and of itself, independently of the importance it has for mankind. It is only conserved nature – in other words, nature in its balanced state – that can provide adequate living conditions to humanity. Nature possesses the mechanisms that make it capable for self-balancing due to unfavourable impacts; however, these mechanisms can function only if we do not strain nature more than nature’s capacities can bear. In other words, we must let nature “breathe”, so that it can continue to enable life on Earth.

Nature conservation is not an option – it is a necessity!

Nature of Croatia

Capital for the future

Published by:
State Institute for Nature Protection

For the publisher:
Matija Franković, Ph.D.

Editors:
Aljoša Duplić, Patricija Gambiroža, Petra
Kutleša, Biljana Opačić, Andreja Ribarić

Collaborators:
Igor Boršić, Zrnka Draganović, Vlatka
Dumbović Mazal, Karla Fabrio Čubrić,
Daniela Hamidović, Vladimir Hršak,
Ivana Ilijaš, Katja Jelić, Jasna Jeremić,
Luka Katušić, Goran Krivanek, Petra
Lunko, Ivana Mahečić, Ana Maričević,
Davorin Marković, Anamarija Partl, Ivana
Plavac, Ivana Petrov Rančić, Vida Posavec
Vukelić, Jasminka Radović, Petra Rodić,
Daniela Schneider, Gabrijela Šestani, Ana
Štrbenac, Petra Štrbenac, Ramona Topić,
Neven Trenc, Boria Vitas, Vesna Vukadin,
Gordana Zwicker Kompar, Irina Zupan,
Irina Žeger Pleše, Dijana Župan

Translated by:
Dario Borković

Graphic design:
Urednik d.o.o., Zagreb,
Alan Čaplar

Printed by:
Kerschoffset d.o.o., Zagreb

Zagreb, 2015.

All charts and tables are taken from
“Nature status analysis in the Republic
of Croatia for the period 2008th-2012th.”
SINP, 2014

This brochure has been prepared with
the assistance of the Global Environment
Facility (GEF).

Neither this publication nor any part
of it may be reproduced in any form
or distributed without prior written
permission of the publisher.

The views expressed in this publication
are those of the authors and do not
necessarily represent those of the
United Nations, including UNDP, or their
Member States.

ISBN 978-953-7169-96-1

CIP record is available from the National
and University Library in Zagreb under
the number 000900061.

Nature of Croatia

Capital for the future

Natural areas of the past, vast and hardly imaginable nowadays, used to provide living space to numerous animals and plants. Over the last thousand years of economic development, however, these areas have been forced to retreat in front of increasingly numerous mankind. If we had the capacity to travel through time, and to witness the same areas of the world that we are living in today in what used to be their natural state only 500 or 1000 years ago, we would surely be astounded by the wonderful green expanses of boundless forests that covered the bulk of our continent, along with steppes, wetlands, meadows, and only modest areas of cultivated land. Coming closer to the surface of the land, we would hardly be able to notice those few cities that existed in times past. Instead of the omnipresent road networks that dominate our landscapes in the present day, we would instead witness clean and unregulated major rivers cutting through floodplains, as they pass through wide expanses meandering on their path from source to confluence. On some humid meadow along a river, we would probably notice the aurochs cattle that used to inhabit Europe in large numbers in the past, but became extinct in the meantime. The last animal of the aurochs species, which also gave its Croatian name Tur to our Tuzlanski region, was recorded in Poland in the 17th century.

Natural forests, meadows and pastures, wetlands and unregulated rivers, marine, underground and other habitats inhabited by numerous species still represent the rich natural heritage of Croatia. This publication has been aimed at presenting at least a portion of that wealth.

