



Figure 6. Kopački rit, a flood area at the mouth of the Drava and the Danube river
(photo by M. Schneider - Jacoby)

1.1. Landscapes

The protection of the landscape diversity is one of the starting points for the landscape protection in general, which is again one of the foundations of the overall evaluation of the space. Nevertheless, the collective knowledge of the landscape values is comparatively of a recent date, appearing in a serious form only after man has become aware of an ever-growing endangerment of the environment, or rather of the endangerment of the landscape as a part of it. In statutory provisions landscape is still treated inadequately and almost incidentally, which can also be said for landscape as a topic within professional and scientific frameworks.

Such a state is to a high degree a result of the fact that our thinking about landscape is closely linked with the experiential and aesthetic sphere; in other words, with something falling into the category of being individual and personal. And we know that this individual sphere is affected by a number of circumstances like emotions, symbols or culture.

It is difficult to imagine universal criteria for evaluation of the landscape. We know from the experience that regardless of the judgement most people would still agree on certain objective landscape values such as an attractive relief, water areas, picturesque clearings, etc. The present time has definitely acknowledged the preserved landscape as one of the elements of the quality of life, which, in the circumstances of an explosive development of global tourism, is getting a concrete economic dimension.

The landscape diversity, or rather the need for its protection, is to be considered in the light of those facts. This diversity does not necessarily in all segments imply automatically a higher quality. Nevertheless, if we know that in it, beside nature, the presence of man with all the consequences of his activities (history, building, land cultivation and use, etc.) is reflected, then a specific

landscape acquires features of the cultural heritage of a certain region and space.

Throughout Europe the remaining natural and subnatural areas are few at present, with the predominance of those seminatural and artificial – areas to a higher extent or completely changed by man. The Pan-European Biological and Landscape Diversity Strategy has therefore placed great emphasis on landscapes that reflect the values and interrelationships of the biological and geological diversity, as well as national cultural heritage. Accordingly, the European Landscape Convention was opened for signature in October 2000.

Speaking of Croatia it needs to be stressed that in numerous physical plans chapters about landscape valorization can be found, and the Physical Planning Strategy passed in 1997 incorporated the obligation to formulate the “landscape foundations” for the entire country. It will serve as a regional planning basis for identification of fundamental landscape values and incorporation of the obligation to protect landscape into the legislation.

AN OVERVIEW OF CROATIA'S LANDSCAPE UNITS

The text below gives an overview of Croatia's landscape units based on the classification adopted within the Physical Planning Strategy of the Republic of Croatia.

When speaking of wider spaces, each landscape consists of four basic components: relief, vegetation, waters (including the sea) and human handiwork.

Croatia is divided into **16 basic landscape units** the majority of which may be further distinguished (Map 5.). In

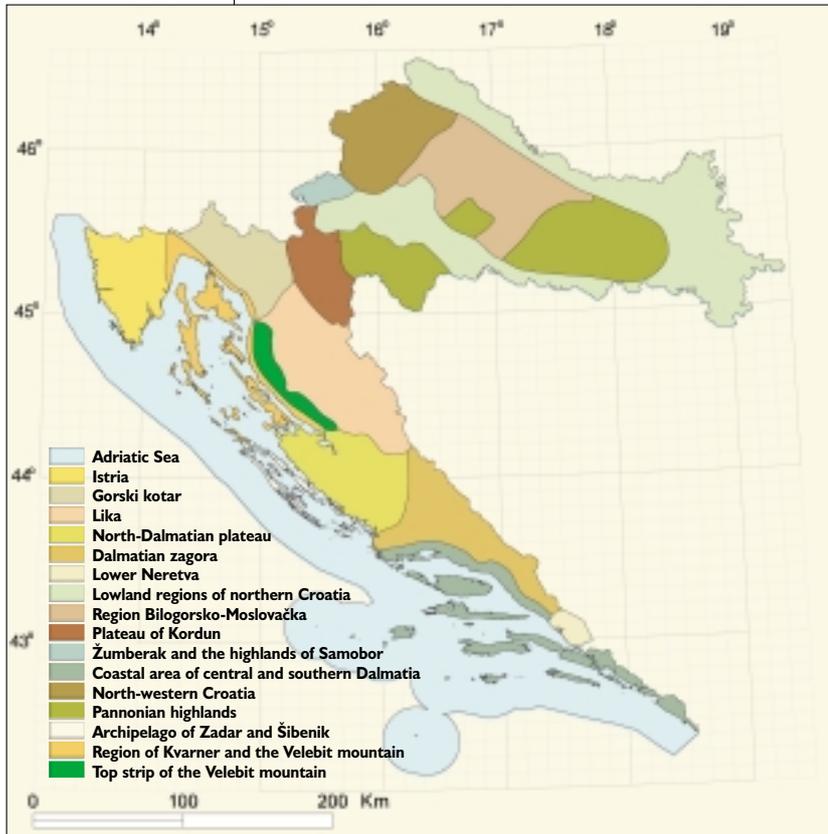
Map 5. Overview of landscape units in the Republic of Croatia

(according to the Physical Planning Strategy of the Republic Croatia 1997:230)

this general review many smaller regions with transitional features had to be neglected. On the other hand, several smaller regions were included due to their marked peculiarities and identity (Žumberak, the Neretva River, the top strip of the Velebit mountain).

Each unit was described by the following basic features:

- A. Basic physiognomy
- B. Focus, values, identity
- C. Endangerment and degradation.



Lowland regions of northern Croatia

Lowland regions of northern Croatia spread along the Sava and the Drava river and partly some of their tributaries. These are actually wide, alluvial plains filled with Pleistocene clay and loess, including recent deposits of the watercourses mentioned that have here all the characteristics of lowland rivers: a gentle slope and consequently a number of meanderings (particularly the Sava, the Kupa and the Lonja

Figure 7. Lowland Croatia, a pasture in the Lonjsko polje Nature Park

(photo by M. Schneider-Jacoby)



river), as well as a considerably greater accumulation than erosion. The width of these plains along the Sava and the Drava varies between several kilometres and several tens of kilometres, whereas the plains of their tributaries are comparatively narrower and make their way into adjacent higher regions in form of bays. These plains, with minor exceptions, usually turn gradually into the adjacent relief of rolling hills.

The vegetation of these plains has to a high extent changed by human activities. The famous Slavonian common oak forests were to a high degree cleared and turned into agricultural land, with luxuriant fluvial ambiances with hydrophyllous vegetation increasingly retreating before various hydrotechnical undertakings. Forests and meadows prevail in lower and swampy regions; the arable land in those drained, usually distant from river courses, but closer to settlements that, avoiding the flood areas and searching for the possibility of a combined economy management, mostly found their location at a meeting point of the plain and hills.

The primeval natural looks have also been preserved in some other damp areas. They are the forest of Draganić by the Kupa river, the Lonjsko polje (Fig. 7), Mokro polje, the forests of Spačva by the Sava and the well-known Kopački rit – the wide labyrinth of forests and watercourses in the area where the Drava enters the Danube.

Basic features:

- A. Agrarian landscape with huge tracts of oak-forests and flood areas
- B. Forest edges; fluvial-marshy ambience (Kopački rit, Lonjsko polje, Mokro polje, the forests of Spačva, etc.)
- C. Lack of forests in some places of eastern Slavonia; disappearance of hedges due to land-improvement measures; geometrical regulation of watercourses and disappearance of rich fluvial sites.

Pannonian highlands

This landscape unit refers to Slavonian mountains of Psunj, Papuk (Fig. 8), Krndija and Dilj, including the Moslovačka, the Zrinjska and the Petrova mountain. It is true that the Zrinjska and the Petrova mountain are located on the very border of the Pannonian space, but their essential landscape features justify their classification among “real” Pannonian mountains.

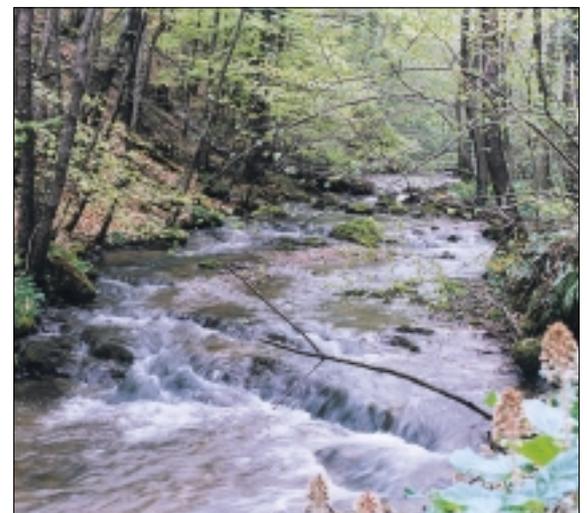


Figure 8. One of the numerous brooks of the Papuk mountain
(photo by D. Grlica)

Basic features:

- A. Isolated, wooded highland massifs, without dominating peaks; gradual relief transitions with a ring of hills
- B. Diversity of forest species; preserved brook valleys; agrarian landscape of the Požega basin inside Slavonian mountains
- C. Inadequate sites for building at the meeting point of forests and lower hills; lack of clearings and open spaces with a view.

Region Bilogorsko-Moslovačka

Between the mountains of Psunj and Papuk on one side and Kalnik and Medvednica on the other a region of gentle hills at 100 – 200 m above the sea-level is located. It is only at the border to the Drava basin that these hills become more pronounced and higher – up to 300 m. This is an elongated zone of the Bilogora mountain. Although the height differences are negligible, Bilogora stands out by its landscape as a wooded strip in contrast with the rest of the primarily agrarian landscape (Fig. 9). More significant areas of lowland forests may be found along the Česma River running through the middle of this space.

Still, the agricultural areas at large give the predominant impression in this landscape.

Basic features:

- A. Agrarian landscape on gentle hills; although less than 300 m above the sea-level, Bilogora is mostly a continuous woodland strip
- B. In some places a picturesque relationship between agricultural and woodland areas
- C. Geometrical regulations of watercourses with the loss of groves along the brooks; building activities on sites with landscape prominence.



Figure 10. Hrvatsko zagorje, the Veliki Tabor Castle
(photo by I. Bralić)



Figure 9. The Bilogora mountain
(photo by D. Grlica)

North-western Croatia

This is the region to the north-west of the line connecting Zagreb, Križevci and Koprivnica. The beginning of this landscape area resembles the region of Bilogorsko-Moslovačka, but here new mountains come into view – Medvednica and Kalnik, followed by Ivančica, Strahinjčica, Macelj and Ravna gora behind them. Between and round these mountains there is an area of hills that are higher and have steeper slopes, making them more prominent in the landscape.

Basic features:

- A. From the aspect of landscape a heterogeneous region with predomination of hills (“foothill” and “behind-hill” areas) (Fig. 10), surrounded by wooded peripannonian mountains (Kalnik, Ivančica, Medvednica, etc.)
- B. A picturesque “ribbed” relief, chiefly cultivated; in warmer expositions the landscape is often characterized by vineyards; wooded mountain massifs stand markedly out from cultivated hills
- C. Construction of residential buildings inadequate (with respect to siting and architecture); lack of mountain clearings; geometrical regulation of brooks.

Žumberak and the highlands of Samobor

Although geographically and, partly, stratigraphically Žumberak and the highlands of Samobor belong to the previous, peripannonian highland group, the classification of these mountains into a separate unit is justified by considerable landscape differences. A higher share of dolomites and a more heterogeneous petrographical composition in general caused a highly diversified relief with deep brook valleys (Kupčina, Bregana, etc.) and outstanding peaks (Oštrc, Japetić, etc.). These natural variations are accompanied by the anthropogenic ones, which are, in this case, perhaps even more decisive for the landscape. It is only here that settlements have spread high, followed by clearing the forests up to the highest peaks. However, the clearing of forests brought about no landscape degradation, but, to the contrary, enriched the landscape by a picturesque exchange of open and woodland areas. The foothill region of Plješivica (Fig. 11) is almost completely covered by vineyards, making them with good reason one of the trademarks of this landscape unit.



Figure 11. The Plješivica mountain and foothills

(photo by I. Bralić)

Basic features:

- A. A richly diversified mountain-range with significant landscape variations in relation to other Pannonian and peripannonian mountains; here settlements spread up to 800 m above the sea-level, which is the cause of clearing considerable woodland areas
- B. The landscape diversity caused by the exchange of woodland and open areas (arable land, meadows, pastures) up to the highest peaks; the southern foothill area is one of the country's most attractive vineyard landscapes
- C. Depopulation causes the desertion of agricultural areas, therefore many meadows and pastures become choked with forest vegetation; inadequate weekend facilities (by their siting and architecture).

Plateau of Kordun

The plateau of Kordun is a wide limestone plateau starting to the west of the line connecting the Petrova mountain and Žumberak and ending as the foot of the mountains of Gorski kotar and Lika, i.e. at the line connecting Zdihovo, Ogulin,



Figure 12. The Mrežnica River

(photo by I. Bralić)

Plaško, Rakovica and Ličko Petrovo Selo. The absolute height of this rolling plateau is, on the average, between 300 and 400 m, with the Kupa, Dobra, Mrežnica and Korana canyons deeply cut in and some rare, isolated hills reaching some 500 m. The plateau in general rises from the north-east towards the south-west. The main landscape features of this plateau are numerous sinkholes – in the dolomites with wider bottoms and milder sides, and in the limestone area funnel-shaped and on the average up to 10 m deep. The following geomorphological and hydrological feature of this area are picturesque canyons of the Kupa, Dobra, Mrežnica and Korana river. The rivers are characterized by the quality of clear karst rivers and river Mrežnica (Fig. 12) by travertine waterfalls as well.

Basic features:

- A. The area of the “shallow”, covered karst, with the average height of 300 to 400 m; shallow karst depressions (sinkholes, valleys, small fields) represent one of the essential landscape features; forests are to the most cut down and degraded
- B. Picturesque, primarily canyon valleys of four karst rivers with exceptional hydrologic values (Kupa, Dobra, Mrežnica, Korana); the Mrežnica River is meant for protection in the category of a nature park
- C. Pollution of river courses and valleys; water-management undertakings; in some places the shortage of high forests.

Gorski kotar

Gorski kotar is the only markedly mountainous region of Croatia. From the aspect of landscape its eastern border lies on the plateau described, the western one is primarily determined by the border of high forests (about 700 m) and the southern penetrates partly into historical and geographical notion of Lika, following approximately the line of Vratnik – Brinje – Plaški. The main relief feature of Gorski kotar are numerous mountain massifs and peaks reaching 1500 m. With the exception of narrow valleys of the upper Kupa and Dobra, the entire Gorski kotar lies above



Figure 13. Matić poljana at the foot of the Jančarica in winter

(photo by T. Nikolić)

600 m. Another characteristic of the landscape of Gorski kotar are forests. Except some smaller karst fields that are partly agricultural land, everything else is covered by beeches and conifers. Only here and there an isolated mountain peak of white stone makes a contrast to dark forest tints. The rocks Bijele and Samarske in the Velika Kapela mountain are famous for the wealth of diversely formed rocks (Fig. 31). So far man has not affected the landscape of Gorski kotar too much. His activities were limited to clearing of smaller areas in karst fields where settlements are located, and to road construction.

Basic features:

- A. Markedly mountainous, wooded region, with basically the karst morphology and smaller karst fields; these features spread to a part of the geographical area of Lika (approximately up to the road between Kapela and Senj)
- B. High, mixed forests cover over 60 % of Gorski kotar, thus creating its macro-identity: therefore open areas, particularly forest clearings, appear as landscape values and elements of micro-identity (Fig. 13)
- C. Since people have given up mowing numerous picturesque clearings, they became choked with the forest; major construction works related to building of roads; plans for flooding the upper part of the Kupa valley; "acid rains" endangering the structure of forests (affecting mostly fir-trees).

Lika

As distinguished from Gorski kotar dominated by mountains with smaller valleys and fields in between (Fig. 14), Lika is to the most part a region of wide karst fields, with mountain ridges extending along its edge and between individual fields. Bottoms of the fields are fairly flattened. Some of them are covered by recent alluvial deposits (Gacko, Krbavsko) and others are in fact limestone plateaus (or a combination of both) in which limestones often project through loose surface layers (Ličko polje). The former are covered by crops and meadows, the latter more by pastures. Interesting and frequent phenomena are isolated, smaller or bigger "hummocks" rising above the fields, characterized usually by a fairly regular shape of cone. Two greatest hummocks are Zir between Lovinac and Medak and Um near Otočac. Rivers flowing through karst fields have strong springs on one side of the field and disappear through chasms on the other. Due to the insufficient porosity of these chasms the lower parts of the fields are in winter often flooded, thus forming periodical lakes. Thanks to recent water management measures the Ličko and Gacko polje are not flooded any more, but an artificial lake was made – the Kruščica storage lake. In the mountain frame rising abruptly out of karst fields the most prominent are the peripheral Velebit and Plješivica.

Basic features:

- A. The landscape is dominated by large karst fields at a height of 450 – 700 m and mountain chains located on the edges; the mountains are mostly wooded
- B. The western part of Lika is dominated by the wooded bulwark of Velebit and among the fields the south-eastern part of the Gacko polje with meanderings of the river Gacka stands out as a landscape value; the Plitvice Lakes are a part of the identity of the east, mountainous edge of Lika; interesting landscape phenomena are limestone cones (hummocks) "growing" like islands all over the Ličko and the Gacko polje



C. The south-eastern area of Lika is characterised by degraded forests and a higher share of bare countryside.

Figure 14. Lika, Ličko polje with the massif of Velebit in the background
(photo by I. Bralić)

Istria

A general look at the relief of Istria reveals that its inner region is distinctly separated by the mountain range of Čičarije (the average height is 1000 m) and Učka (1396 m). These massifs fall down relatively steeply to the height of some 450 m after which Istria gradually descends westwards. This is, of course, a generalised picture, because the river valleys of Raša and Boljunčica lie, for example, considerably lower than the central regions of Istria. The well-known division of Istria into the White, Grey and Red Istria illustrates its landscape peculiarities. The White Istria is

Figure 15. Castle-type settlements characterizing the Istrian landscape, Draguč in central Istria
(photo by I. Bralić)



dominated by the massifs with a deforested top zone. Below the peaks there is first of all a strip of beech forests, followed by considerably degraded forests of pubescent oak and oriental hornbeam. The Grey Istria was named after a flysch series of layers (grey marl, limestone and sandstone) spreading throughout the central Istria from Učka to the line connecting Labin, Pazin and Umag. The main relief and landscape peculiarity of the Grey Istria is a considerable dissection of the flysch deposits. They are to the most part impermeable and therefore subject to surface washout, and man has cut down the forest and opened the way to erosion. The Red Istria includes the western and southern part of the region. This is again an area of Mesozoic limestone, but now this limestone is covered by red soil and lie in horizontal layers making Istria one of the gentlest regions in our karst; this is where the main Istrian agricultural areas may be found. The narrow coastal strip of Istria, with its Holm oaks, pine-trees and high evergreen underbrush, is already under the influence of the evergreen Mediterranean vegetation. The coast is low, sloping and to the most part well indented. An important anthropogenic feature of Istria are agglomerations of castle-type settlements in prominent spots dominating the relief (Fig. 15).

Basic features:

- A. The Istrian peninsula is characterized by three geological, morphological and landscape regions: the mountainous edge, Učka, Čićarija (the White Istria), the dissected flysch relief of the central Istria (the Grey Istria) and the limestone, red soil covered plain of the western Istria (the Red Istria); the Grey and the Red Istria are to the most part agrarian landscapes
- B. Although the flysch and the limestone Istria show considerable geomorphologic differences, from the aspect of landscape they are united by the type of Istrian settlements: located as castles or acropolises in high places dominating the landscape; with the exception of the bays of Lima and Raška the littoral values belong mainly to the sphere of micro-identity
- C. The construction of tourist facilities is concentrated on a narrow coastal strip; decay of old urban units in the inland; erosion processes in the flysch area of Istria.

Kvarner and Velebit region

This region is undoubtedly abundant in diversity as well as in common features that give us the right, for the purpose of this work, to join it together into one landscape unit. This is first of all a mountainous barrier rising immediately along the coast, from Učka to the end of Velebit, thus narrowing the littoral area to the minimum. It is, of course, not uniform and may be in rough lines divided into a wider coastal area of Rijeka (from Rabac to Novi Vinodolski) and zone between Novi Vinodolski and the Zrmanja river. The former is more populated and has relatively a fair amount of high vegetation. This coastal zone includes the tectonic depression of Vinodol as the only one on the Rijeka – Zrmanja stretch to have flysch deposits and consequently the only important agricultural land. The littoral side of the Velebit mountain is characterized by poor high vegetation and together with the eastern sides of the islands of Krk, Rab and Pag this is the barest and the most rocky area in the country as a whole. This is a consequence of extremely fierce north-easterly wind (bora) with salation and certainly of human (stockbreeders) activities. The relief is furrowed by deep ravines descending from the Velebit mountain and ending like coves along the coast. The bora and salation have by their effects divided islands into the bora-affected and sheltered sides. On the islands of Krk, Rab and Pag the bora-affected sides are completely bare, rocky and steep, and those sheltered are



Figure 16. Kvarner, a view of the island of Pag from the Velebit mountain

(photo by I. Bralić)

sloping and often wooded (particularly the western coasts of the islands of Krk and Rab) (Fig. 16). Another group consisting of the islands of Cres and Lošinj is less exposed to influences of the bora which makes the difference between the eastern and the western side less pronounced. Both island groups reach considerable heights above sea level which is a very frequent landscape feature. There are, besides, flysch zones in the landscape highly noticeable by their being low (petrographically subject to washout) and covered by crops, mainly vineyards. In the places where flysch reaches the coast, coves and sand beaches may be regularly found.

Basic features:

- A. The principal macro-features of the region are massive corpuses of the Kvarner islands and the markedly mountainous frame from Učka to Velebit; due to the north-easterly wind (bora) and salation the eastern sides of the first line of islands are almost without any vegetation and the littoral slope of Velebit is additionally characterized by the rocky ground; the western coasts of the islands are, on the contrary, often green and wooded
- B. The mountainous frame mentioned provides unique and comprehensive views; the views of this frame from the sea are as impressive, particularly of its Velebit part
- C. Construction activities along the coastline lacking any plan and degraded physiognomy of old settlements; degraded forest covering.

Top strip of Velebit

Velebit is said to be a mountain with “two faces”: one belonging to Lika is wooded, the other, littoral one, is bare and stony. These two faces belong to different landscape units. However, this metaphorical illustration neglects the fact that Velebit, in its major portion, has the third face too, the one in the top zone that does not belong either to the Ličko polje of vision or to the littoral one. Admittedly, this top zone is not wide, but its length as well as its relief and landscape values justifies the singling out of a this separate landscape unit in the northern and central part of Velebit. Velebit is as a whole the most important and, by its natural



Figure 17. Velebit, Varnjača in the Rožanski Kukovi

(photo by I. Bralić)

features, the most interesting mountain in Croatia. The top strip contains immense wealth of karst relief forms: from bizarrely shaped “hips”, “beams” and various high-rise rocks to deep karst valleys, pits and other karst depressions (Fig. 17). Through white limestone rocks dark, wooded fields and green grassland work their way, creating extremely picturesque panoramas, and many sites are with good reason given the dimension of a “micro-identity”.

Basic features:

- A. The slopes of Velebit (continental and littoral) belong to different landscape units, but regarding the size of the mountain the top strip may be singled out as a special unit with all the characteristics of the high-mountain relief and transitional vegetation features
- B. Extraordinary wealth of karst “sculptures” (hips, beams, diverse high-rise rocks) in a constant exchange with wooded fields and open mountain grassland
- C. Deficiency of forests in the top strip of the southern part of Velebit (on the other hand, the process of natural renewal of forests has over the last decades considerably advanced on the littoral side of Velebit).

North Dalmatian plateau

A general characteristic of this region is its flatness or rather its poorer orographic indentation in comparison with adjacent areas. There is only a part of Bukovica that stands out as a highland with the highest peak of 674 m. The rest is a limestone plateau covering the area between the rivers Zrmanja and Krka (partly across Krka too) and the line connecting Skradin, Benkovac and Smilčić. It is characterized by very small height differences (mean absolute height of 250 m) and the surface area is a typical rocky tract with smaller oases of red soil. The main vegetation forms are low bushes of Sub-Mediterranean deciduous plants with occasional fenced patches of forests of the same type. The plateau descends gradually towards the west and turns into Ravni Kotari. The most important feature of the Ravni Kotari relief is the alternation of relatively mild elevations and valleys or rather karst fields showing typical Dinaric

extension. They are characterized by considerable elongation in relation to their width, with the relief gradually rising from the coast towards the hinterland and from the north-west to the south-east. The elevations are made of limestone and valleys and fields of marl and sandstone providing northern Dalmatia with the largest agricultural areas. The coastal zone of Ravni Kotari is covered by evergreen vegetation: underbrush and planted pine forests. The main natural and landscape values may be found on the edges of the North-Dalmatian plateau. They include the Krka and Zrmanja rivers with their picturesque valleys, the Vransko Lake (flooded karst valley) and the sea of Novigrad and Karin (also “lakes” in terms of landscape) (Fig. 18).

Basic features:

- A. Apart from the peripheral plateau and the slightly higher Bukovica the entire area is orographically poorly indented, with the inner part being a typical limestone plateau with extremely poor vegetation and fertile soil and the area closer to the sea alternating between mild elevations and valleys – karst fields (Ravni Kotari)
- B. The principal landscape values, and partly the identity too, are provided by two rivers – Krka and Zrmanja, the Vransko Lake and the Sea of Novigrad and Karin also considered “lakes” from the aspect of landscape
- C. The entire region is short of forests; hydropower plants are planned to be built on the rivers of Zrmanja and Krka that are foreseen for the protection in the nature park category; possible pollution of river courses (Krka in particular).

Figure 18. River Krka with the Promina mountain in the background

(photo by I. Bralić)



Archipelago of Zadar and Šibenik

This is the most indented area of the Croatia’s littoral containing several bigger and a great number of smaller islands and islets. If it had been no post-glacial rising of the sea level, this space would have been the landscape continuation of the North Dalmatian plateau, or rather of Ravni Kotari; the islands are analogous with mainland elevations and valleys and fields ended up below the sea. And it is precisely this newly created labyrinth of the sea and



Figure 19. The Kornati islands
(photo by D. Grlica)

islands that resulted in a new landscape with pronounced Dinaric direction of extension (from north-west to south-east). By their vegetation the islands belong to the evergreen area, evading the fierce bora and salination. Therefore there are in this regard no substantial differences between the north-eastern and south-western coasts. However, there are also no major integral forest zones, since the area has been used for vineyards, olive orchards, stockbreeding and other from ancient times. What the archipelago of Zadar and Šibenik is in relation to the Adriatic, the Kornati islands are inside the archipelago – the “densest” island group (Fig. 19).

Basic features:

- A. This is the most indented area of the Croatia’s littoral; the labyrinth of bigger and smaller islands resulted in special landscape features
- B. Indentation is a feature of a general identity; here the Kornati islands are particularly prominent as the “densest” island group of the European Mediterranean
- C. The physiognomy of old settlements is often degraded by new construction activities.

Dalmatinska Zagora

As distinguished from the northern Dalmatia the central Dalmatia has a mountain barrier (Boraja, Kozjak, Mosor, Biokovo, Rilić) along the coast that divides the littoral part from Zagora. Zagora is a heterogeneous area of karst depressions, plateaus and mountain chains. In the western part there is a line of three connected fields: Kninsko, Kosovo and Petrovo polje. This is followed by a primarily mountainous region consisting of Kozjak, Svilaja and Moseća and a slightly lower, undulating tablelands from Kozjak to Mosor. Further to the east there spreads the valley of river Cetina that at first flows through Zagora through the valley consisting of a number of fields and gorges and then through a limestone canyon (Fig. 20). In the upper Cetina a new landscape element was created – the Peruća storage lake. To the east of the upper Cetina the Dalmatia’s main mountain chain Dinara spreads with the peaks reaching from 1200 to 1900 m. This massif descends gradually towards the south-east changing into limestone plateaus and all together again into the massif of Biokovo (1762 m) or rather into a highland area to the north of Biokovo (between 600 and 900 m). In the very borderland another great depression called Imotsko polje is situated. Finally, in the far south-east of Dalmatinska Zagora there are mountain groups of Šibenik,

Matokit and Rilić with the fields of Rastok and Vrgoračko. Beside basins and small valleys covered by red soil and showing the same characteristics as all over the karst anyway, it is here that the fields mentioned are particularly prominent. The greatest are Imotsko polje (100 km²) and Sinjsko polje (60 km²). Since fields are main agricultural areas the major settlements are located along their edges. Plateaus spread regularly round the fields, they are by 100 to 200 meters higher and formed in cretaceous limestone. Therefore these are to the most part rocky tracts with smaller, isolated patches of red soil and oases of degraded Sub-Mediterranean oak and hornbeam forests. The mountain massifs are also made of cretaceous sediments, primarily bare limestone. Higher sections go deeper into the vegetation zone of beeches (Dinara, Svilaja, Biokovo) and the highest (Dinara) even into the scrub mountain pine.

Basic features:

- A. From the aspect of relief and landscape this is a heterogeneous region, to some extent characterized by three relief elements: karst depressions (fields, basins, small valleys, sinkholes), limestone plateaus around fields and mountain chains
- B. The most prominent mountains are Promina, Dinara (in a wider sense), Svilaja, Biokovo and Mosor; among other elements of identity and value it is to mention the Cetina valley with fields and the canyon including the hydrographical and morphological phenomenon of the lakes of Imotski
- C. The landscape is short of forests; the construction of buildings in settlements is lacking plans and elements of traditional architecture.

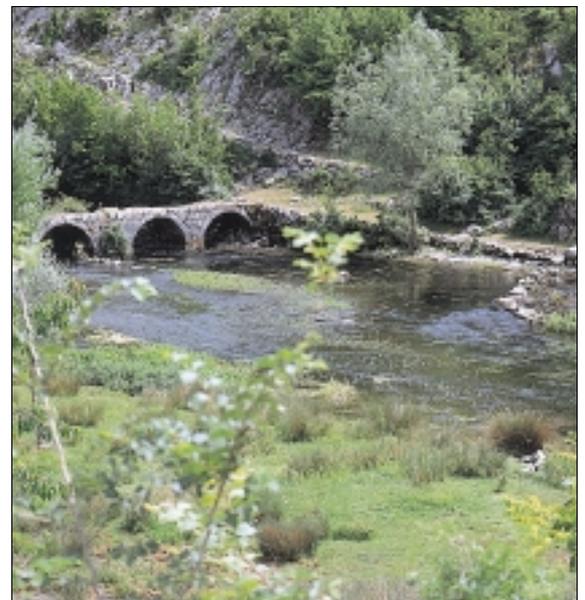


Figure 20. River Cetina
(photo by D. Pelić)

Coastal region of central and southern Dalmatia

In the central Dalmatia the mountain line Boraja – Kozjak – Mosor – Biokovo – Rilić mentioned separate the coastal zone from Zagora. After crossing the Neretva valley the state boundary moves to coastal mountains and therefore the landscape of the Zagora type belongs already to Herzegovina. These mountains give the main imprint to the



Figure 21. Biokovo and the Makarska littoral

(photo by I. Bralić)

landscape of the mainland-coastal strip (magnificent cliffs of Biokovo in particular) (Fig. 21). They are of limestone origin and the forest vegetation is scarce. However, the foot of these mountains from Trogir to the Makarska littoral, and then with greater interruptions to Boka Kotorska as well, is characterized by somewhere narrower and somewhere wider flysch strip which, as usually, stands out in the landscape by its gentleness and vegetation. In some places these are agricultural crops (Kaštela, Omiš and Konavle) and in others integral forest zones (the Makarska littoral). Islands pertaining to the area differ substantially from those in the northern Dalmatia, they can be found in small numbers, but with greater surface areas and orographically more indented. Since flysch deposits are few (a little bit on the island of Hvar and the Pelješac peninsula) the relief is to the most part characterized by limestone, i.e. the karst morphology. It is true that on the islands no such large fields as in Zagora may be found, but they are abundant in other, smaller forms of karst depressions: basins, small valleys and karst valleys. The islands are quite richly covered by evergreen underbrush and deciduous thicket in greater heights, but high pine and holm oak forests can often be found too. This applies particularly to south Dalmatian islands Elafiti, Mljet and Lastovo.

Basic features:

- A. The greater part of this region is characterized by the coastal mountain chain and a line of big islands (from the aspect of landscape it includes the Pelješac peninsula too); the landscape at the foot of coastal mountains includes often a narrow green flysch area, while the majority of islands are characterized by the relative richness of woods
- B. The high cliffs of Biokovo and the wooded coast of Makarska with unique beaches represent the impressive landscape domination and value; evergreen forests and partly a characteristic indentation emphasize the value of the islands of Elafiti, Mljet and Lastovo
- C. Frequent forest fires; construction activities along the coastline lacking any plan and degraded physiognomy of old settlements.

Lower Neretva

The area of the lower Neretva is absolutely peculiar and unique in Croatia. For that reason it is singled out into a separate landscape unit despite its relatively small surface area (Fig. 22). As distinguished from other Dalmatia's rivers, the Neretva used to drift much more material from the upstream area, making the process of deposition quicker than the post-glacial rising of the sea level. And while the last kilometres of rivers Zrmanja, Krka and Cetina are overflowed, river Neretva created the only larger deposited area on the country's coast including its delta. The depressions are filled up and flattened, with the elevated parts of the inherited relief – the limestone knolls – “rising” out of the plain like islands and making the entire landscape picture remarkable. A special contributing factor to this picture is the abundance of water (not only from the Neretva, but from the adjacent springs too) which is, among others, reflected in the method of land cultivation (access to parcels often by boats) and numerous biologically rich fluvial and marshland units. A part of this aquatic wealth and peculiar landscape are certainly the neighbouring lakes Baćinska, a tangle of flooded karst depressions.

Basic features:

- A. The region small by its size, but exceptional by the landscape; this is the only greater flooded region on Croatia's coast, with limestone knolls of the former relief protruding like islands; partly cultivated and partly naturally flooded area
- B. The lower Neretva is as a whole a landscape value, with the identity provided, beside the bizarre relief image, by the abundance of water, characteristic parcelling “in water” and several top-quality marshland biotopes
- C. The former drainage for agricultural purposes has not produced expected results in all places, but has unnecessarily threatened ornithological reserves; the area has to be subject to a comprehensive, multipurpose evaluation.

Figure 22. Reclaimed areas in the Neretva delta

(photo by D. Kovačić)



State and threats causes

The relatively small surface area of Croatia is a mosaic of the most diversified natural features and a multitude of forms of human activities. The diversity of the relief, soil, waters, vegetation, climate and the economic and historical

circumstances resulted in various local traditions of space use. As the Croatia's territory was often a crossroad of civilisations, various patterns of inhabiting the space and types of settlements developed in individual regions.

All the causes mentioned contributed to an extraordinary wealth of landscape diversity of Croatia on the European scale. However, in the course of the last decades many landscape values were subject to degradation. Great social, economic and technological changes, big development projects in the field of industry, power production, transport, tourism and housing construction, as well as the prevailing modernism in construction brought about the abrupt expansion and standardization of all construction types, including the loss of the space identity for numerous Croatian towns and villages.

The complex process of urban development in Croatia is, as everywhere in the modern world, characterized by an ever-increasing growth of towns caused by migration of rural population and the decline or withering away of rural activities.

As a result of using large surface areas for new activities, striving for higher urban standards and planning an

unrealistic and unnecessary population growth (and thus the growth of uneconomical construction areas too), due to incomplete and inadequate town planning and technical requirements and conditions of architectural shaping, including the application of new construction technologies that use materials and shapes of the same type, numerous Croatia's settlements lost their original landscape peculiarities and values and old historical nuclei remained the sole guardians of the urban identity.

The rural regions and their landscapes cultivated through generations were in some places neglected as a result of depopulation, or too quickly modernized, abandoning the traditional construction.

Landscape changes developed as a result of both illegal and uncontrolled construction activities and of plans and planning guidelines in which natural features of the space and traditional construction forms acknowledged by a thousand-year-old experience were not respected. New constructions were not modelled on the rich tradition. The stock of traditional architecture is devastated by the lack of care and inadequate interventions. It is only in economically underdeveloped and undeveloped regions that traditional architecture has been to a higher extent preserved and regional differences more emphasized.

Similarly, agricultural areas were not evaluated as landscape elements, but almost exclusively in the function of food production. That was the reason why preservation of landscape values was not taken into account during the planning process.

In the course of planning and execution of major infrastructure projects (roads, main pipelines, power generation and power distribution plants) the impacts of such activities on the landscape were not sufficiently taken into consideration.

It is evident that neither Croatia's experts nor scientists have so far given the issues of evaluation and landscape preservation serious consideration. Therefore it is absolutely imperative to carry out a comprehensive analysis of this problem area and start resolving the relevant issues systematically.

Box 10. Causes of landscape threats

- Uneven, uniform urban development unharmonized with the surroundings
- Major infrastructure projects:
 1. roads
 2. power industry plants (power generating plants, storage lakes, transmission lines, piping, etc.)
 3. water management facilities (regulation of watercourses, channels, storage lakes – retention, dams, etc.)
- Agricultural activities (land reclamation, land consolidation, monocultures, cutting down small woods, lines of trees and hedges)
- Construction of residential buildings, holiday and tourist facilities in, from the aspect of landscape, prominent places, without any plan and inadequate in relation to siting and architecture.