

# TRANSBOUNDARY ZONATION CONCEPT FOR THE NERETVA DELTA INCLUDING HUTOVO BLATO

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## 1 Introduction

For several years, a transboundary protected area has been promoted in the Neretva Delta, as this important wetland is shared by Bosnia and Herzegovina and Croatia (Croatia & Bosnia and Herzegovina 2003, REC 2001, 2002). Both countries have declared mayor parts of the wetland as Ramsar Sites, protecting large areas on both sides of the border at the national scale (Tab. 1). The key question, i.e. do these protected areas form a transboundary protected area, has never been discussed.

Based on the vegetation map (Schwarz this pub.) and bird counts (e.g. Stumberger et al. 2009), we have prepared a zonation concept for the Neretva Delta to answer the following questions:

- Is it possible to form a transboundary protected area Neretva Delta and which habitats should be integrated into this transboundary conservation concept?
- Which habitats need to be better protected due to their natural values and indicator species, e.g. for the EU Natura 2000 network.

- How to develop sustainable tourism using the MAB criteria for transboundary biosphere reserves according to UNESCO to protect birds and nature as a special asset.

## 2 Selected Results of the Bird Surveys

The value of the different habitats in the Neretva Delta can be described not only by habitats, but also by selected indicator species. We have chosen birds (Stumberger et al. 2009), as the area is well known for their international value (Dalmatin 2009, Kitonic 2007 – 2010, Rucner 1954, 1959 and 1963), although there are many other groups of fishes or reptiles that can easily document the value of the Neretva Delta's different parts and habitats (compare Drzavni Zavod 2007, Lijepa nasa 2009), including the rivers and channel system, as well as the cultural landscape.

### 2.1 Short-toed Eagle (*Circaetus gallicus*)

The density of Short-toed Eagle well surpasses comparable areas in the Western Balkans. Two different habitats form excellent preconditions for the bird's hunting grounds: both areas, the wetlands of the Delta and the surrounding karst hills, are important reptile habitats.

Table 1: Existing protected areas in the Neretva Delta

Name	Country	Size (ha)	Protection status / Category
Ramsar Site Neretva Delta	HR	11,500	Wetland of International Importance
Ramsar Site Neretva Delta	BA	7,411	Wetland of International Importance
Usce Neretve	HR	250	Ichthyological-ornithological Reserve
Modro oko i Jezero Desne	HR	370	Significant Landscape
Orepak	HR	100	Ornithological Reserve
Pod gredom	HR	587	Ornithological Reserve
Prud	HR	250	Ornithological Reserve
Park prirode Hutovo blato	BA	8,000	Nature Park

**As the Short-toed Eagle is a priority species of the EU Bird Directive, the planned impacts of roads, wind parks and melioration areas have to be reviewed with regard to the species' dense population.**

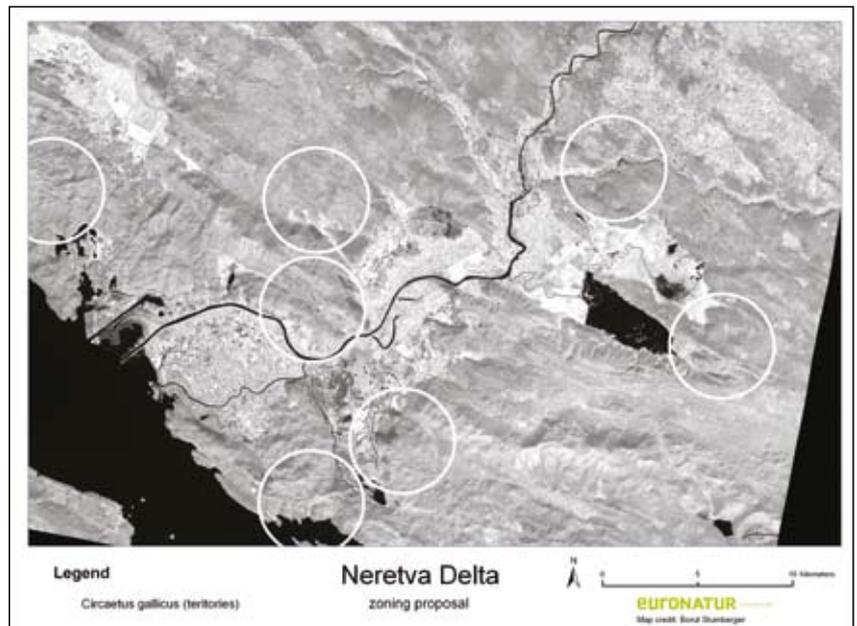


Figure 1: The Short-toed Eagle's (*Circaetus gallicus*) territory distribution across the Neretva Delta during the 2007 – 2010 period

The Short-toed Eagle can be seen often and is an attractive bird for visitors. Hutovo Blato Nature Park and the proposed nature park in Croatia are well designed, as the surrounding hills are included in the protected areas.

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These eagles can be easily seen by guests. The location of the Nature Park administration Karaotok is regularly visited by hunting Short-toed Eagles, their hunting grounds being the entire Delta with its channels and dikes. The map indicates the location of territories where pairs and displaying birds have been observed during the recent years (Fig. 1).

## 2.2 Great Bittern (*Botaurus stellaris*)

The Great Bittern is a priority species of the EU Bird Directive. With its 44 booming males in 2001 (Stumberger 2001), 18 in 2008 and 15 in 2010, the species is the best indicator for the large reed beds in the Neretva Delta (Fig. 2). The recent population decline is alarming and reflects the need for better protection of the Great Bittern habitats.

Full protection off the whole reed bed complex is necessary to maintain the population of this species. The actual size of the protected reed beds and marshes does not cover the priority habitats (structured reed beds on peat layers) for the protection of the large bittern population. It is also important to use the Great Bittern as an argument against the still pending melioration and drainage programs in the Delta (compare Physical Plan for the Dubrovnik Neretva counting).

Great Bittern has been observed in Hutovo Blato Nature Park, too, but its breeding status is doubtful. The establishment core zones will help to mitigate the impacts of fishing and poaching. The goal is to stabilize the population of 50 booming males in the Neretva Delta and to create new territories in Hutovo Blato Nature Park.

The booming by this bird is a great tourist attraction in the Neretva Delta. Very attractive is Vid, from where the large reed beds can be seen from above and the Bittern's calls heard during day and night time in spring.

## 2.3 Lesser Grey Shrike (*Lanius minor*)

The value of the Neretva Delta and the cultural landscape is characterized not only by indicators of the cultural landscape, but by wetland indicators as

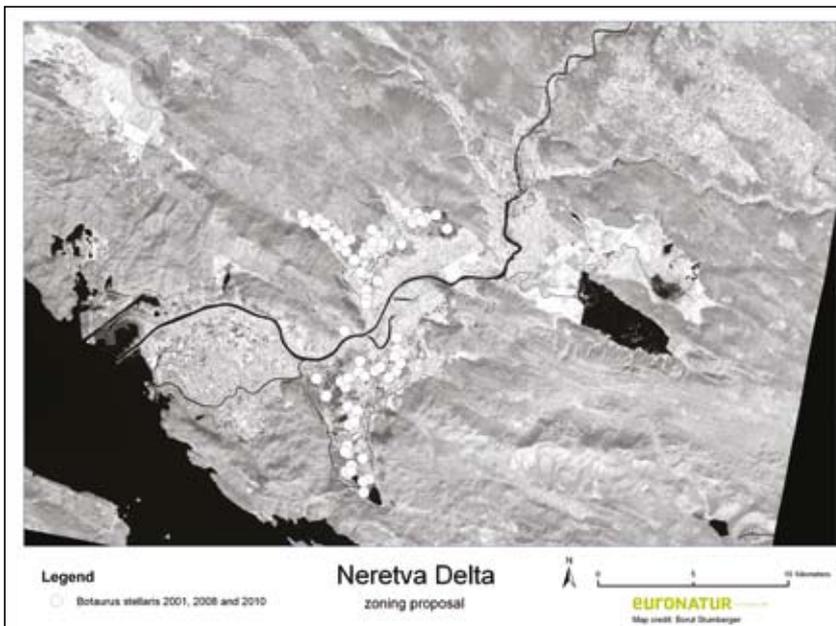


Figure 2: Great Bittern (*Botaurus stellaris*) booming males during the 2001, 2008 and 2010 surveys

**The booming by this bird is a great tourist attraction in the Neretva Delta.**

well. A priority species of the EU Bird Directive is the Lesser Grey Shrike. Fig. 3 presents breeding sites in the Neretva Delta, which are distributed mostly along dryer river levees. These levees, called “greda”, are river deposits on the banks of the Neretva River and its branches. The census of the breeding population of the Lesser Grey Shrike is still incomplete, as some areas especially between Gabela and Čapljina in Bosnia and Herzegovina have been not controlled.

### 3 Proposed Zonation

#### **Zone 1: Core Area – Wilderness Area – restricted use, natural processes**

##### **1a Natural Landscapes and Wilderness Area (without human use)**

The proposed core areas include natural habitats in the Neretva Delta, which are currently protected only in part or generally as Ramsar Sites without special management. Key habitats are the large karst lakes, such as Deransko Jezero and Lake Kutu, and the marshes and reed beds (Fig. 4). The uniqueness of the delta depends on the protection of these natural and pristine areas. In addition, natural streams and rivers are important habitats in the Neretva Delta,

and simply have to be protected. In the core areas, only a limited and guided access is possible for the visitors and research and environmental education. Very important is the protection of the colonial waterbirds’ breeding sites in Hutovo blato (Pygmy Cormorant *Phalacrocorax pygmeus*, Great Cormorant *P. carbo*, Grey Heron *Ardea cinerea*, Little Egret *Egretta garzetta*, Squacco Heron *Ardeola ralloides*), the marshes and reed beds NE from Opuzen (Purple Heron *Ardea purpurea*) and in the Neretva mouth (Common Tern *Sterna hirundo*, Little Tern *S. albifrons*, Black-winged Stilt *H. himantopus*, etc.). Each year in the 2001-2010 period, colonies in the mouth of the Neretva and in the marshes NE Opuzen were disturbed or even destroyed, as there are still no guarded core zones protecting the breeding sites of the priority species.

Further at the coast, there is an urgent need for better protection of the core areas. Several rare and endangered breeding birds like Kentish Plover (*Charadrius alexandrinus*) and Oystercatcher (*Haematopus ostralegus*) are impacted there due to disturbance. Only if strict protected core zone is implemented, the breeding colonies and shorebird populations can be re-established. The Parila lagoon is of great importance as a shallow bay. It has been

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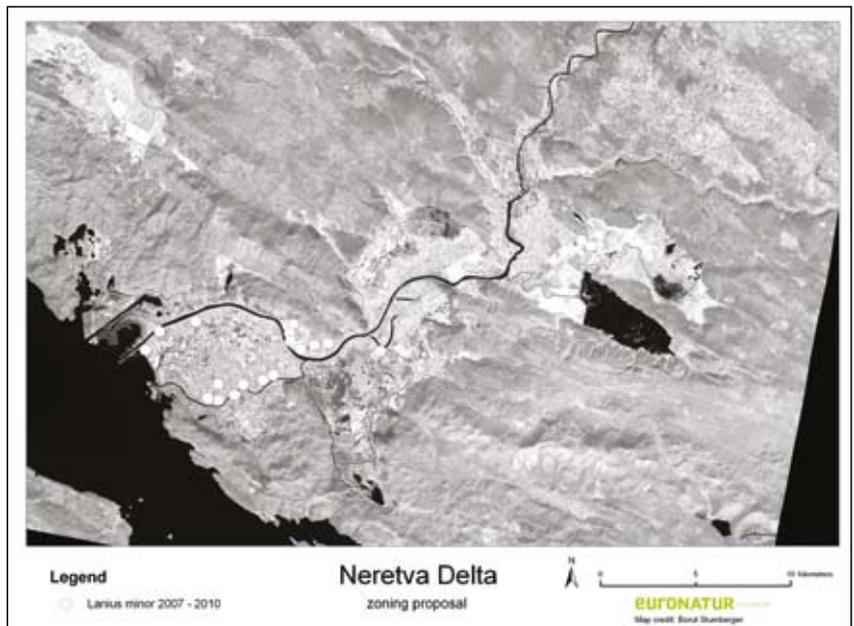


Figure 3: The Lesser Grey Shrike (*Lanius minor*) distribution (breeding sites) in the Neretva Delta during the 2007 – 2010 period

proposed for protection years ago due to its high natural role.

Most important is protection of the reed beds in Croatia, which are impacted by illegal excavation (plantation, hunting pools). It is quite unbelievable that unique sites such as Lake Kutu are not protected as Ramsar Sites, and even melioration of large areas is mentioned in the recent Physical Plan. Very important is the protection of the riverine corridors to save the connectivity between the protected areas in Bosnia and Herzegovina and Croatia. A good example is the Krupa, Trebižat and the Bregava River corridor, which is linked to the Neretva. Only if the natural riverine habitats are protected, the commercially important fish such as the European Eel (*Anguilla anguilla*), or endemic species such as the Neretvan Nase (*Chondrostoma knerii*) can migrate between the different habitats (compare Glamuzina 2009). Other animals, such as the European Otter (*Lutra lutra*), also need secure migration corridors to survive in the Delta.

The Neretva Delta is a unique and very attractive landscape at the European level if not on the global scale. The proposed core areas are an important Unique Selling Point (USP) for Bosnia & Herzegovina and Croatia. There is no comparable karst Delta

worldwide. Only if the mixed landscape of cultivated land and natural areas is supplied by enough fresh water, all use values of the Delta including fishing, fresh water and tourism will be maintained (compare ERSAF 2006, Lijepa nasa 2009).

### **1b Natural Landscape with low pressure grassing**

In the past, wetlands in the Neretva Delta were used in the traditional way. Large areas at the edge of the flood plains were exploited as meadows and pastures. Today, open grasslands are rare in the Delta. Grassland use is still practiced in Hutovo Blato Nature Park, where meadows are maintained around Deransko Jezero, but totally abandoned in some other areas (compare Dalmatin 2009). A regularly flooded meadow between the Krupa River and the karst hills is an important resting site for ducks, gulls, terns, herons and the Glossy Ibis (*Plegadis falcinellus*) during migration (Bem 1990, Stumberger 2009).

In Croatia, only small areas are still grazed. A good example is the Luke area, north of Opuzen. But in the last 10 years, the periodically flooded pastures almost disappeared, like those in Mlinište. In the large depression between Metković and Vid, ideal wetlands for large scale grazing projects can still be

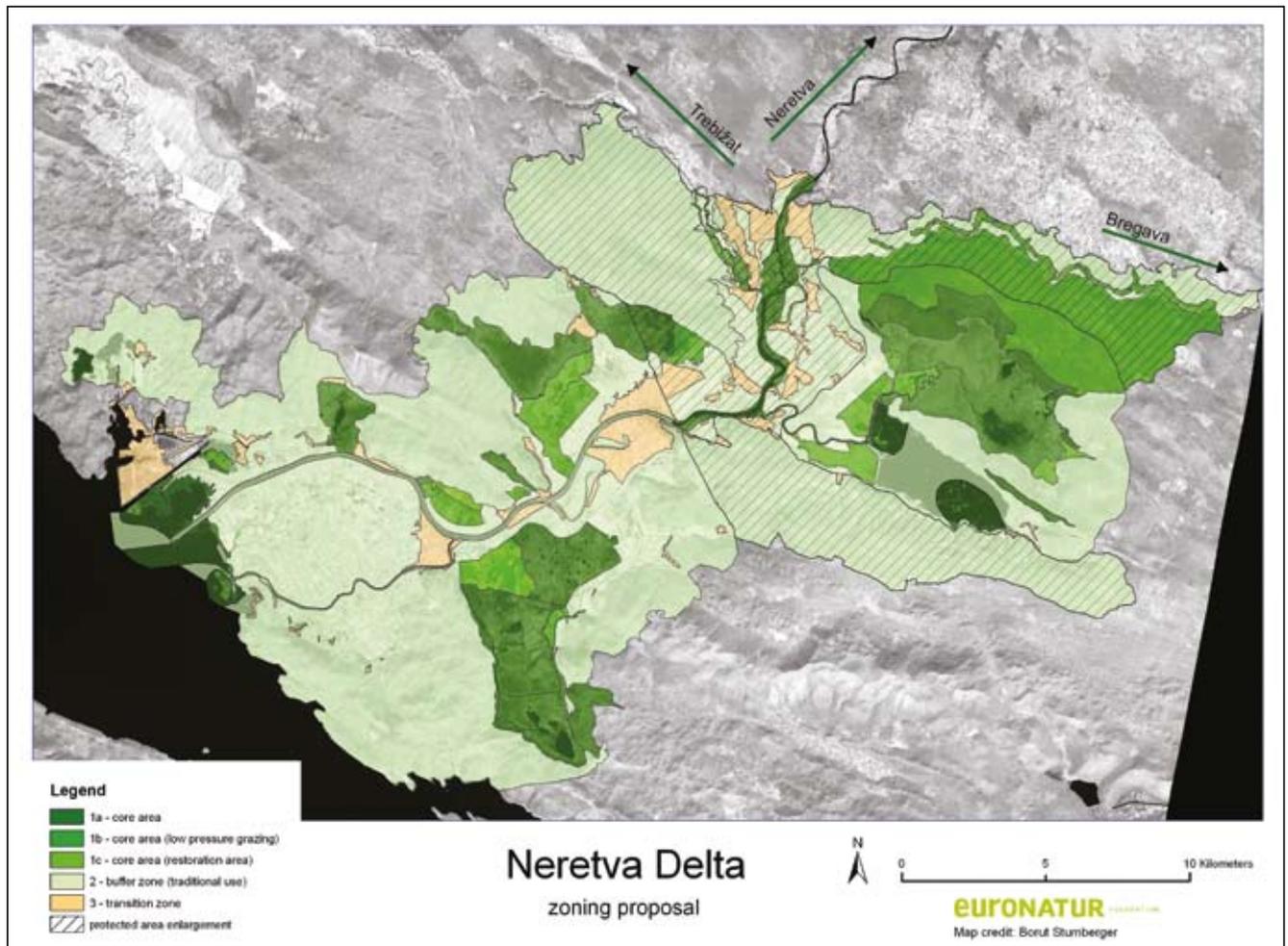


Figure 4: Zoning proposal for the Neretva Delta based on the Biosphere Reserve concept (MAB)

found. Such areas would be very attractive not only for birds, but for tourists as well.

### 1c Natural Landscape with high restoration potential

Lake Kuti in Croatia and the area between Metković and Opuzen is still the largest reed complex in the whole Delta. The area is impacted by dikes and channels as well as by many excavated hunting pools and numerous plantations. The progressing illegal land reclamation can be seen during each visit and on Google Earth. The high conservation value of this area is indicated by a small Purple Heron colony and a great number of Great Bittern territories. Here an area is proposed for restoration to complete the unique habitat complex on the Ramsar Site.

### Zone 2: Buffer Zone – Landscape Protection – Cultural Landscape – traditional use

#### 2 Protected Landscape with traditional use in the Delta as well karst hills and surrounding landscape

Cultivated land in the Delta is rich in channels and different smaller larger waters such as oxbow, old meanders and canals around the new fruit plantations. Karst hills consist of maccie and garrigue including rock and cliff vegetation. Both landscapes are proposed as landscape protected zones, to buffer the natural habitats and to counter impacts.

The landscape protection zone will help to maintain the attractive landscape of the Neretva Delta and the rich fauna and flora with several priority species.

The habitat mosaic formed by the old arm channels of the Neretva, canals, gallery vegetation and large reed beds is the basis for the high biodiversity. A development concept is needed for adapted agriculture to preserve the water quality and natural elements in the landscape.

The karst hills around the Delta are not only important habitats, but are also significant for the landscape values of the whole area. Impacts, such as those exerted by the recently built highway connection to Ploče, need strategic environmental assessments

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to define the most suitable corridors. In general, crosscutting of the Delta should be avoided by traffic corridors.

**Zone 3 Transition Zone – Settlements** (in the Ramsar Site)

*Habitats:* Urban areas and larger settlements

The goal of the zoning is a clear delineation of the urban areas. The growing industrial zones and new facilities already impact large parts of the Delta (e.g. compare Stumberger and Sackl this pub.). Here concepts are needed, where and how urban areas can be placed without impacting the landscape. Further landfills in wetland areas, such as reed beds, should be avoided.

**Protected Area Enlargement: Core -, Buffer - and Transition Zones**

The zonation concept proposes a number of areas, which have not been included in a protected area

as yet. As in Croatia, the whole Delta is already protected as a Ramsar Site, in 1992 proposed as a nature park and currently included in the Ecological Network (CRO-NEN) to complete the EU Natura 2000 network. Quite different is the situation in Bosnia and Herzegovina. Here we have identified several areas suitable for the establishment of transboundary protected areas. Most important are, as follows: the wetland and marsh area between Vid, Metković and Gabela, already protected as a core zone in Croatia, the rivers and streams that form the backbone for the connectivity in the Delta, and the areas that could be included as a landscape protected area in the Karst hills linked to the proposed Croatian Neretva Delta Nature Park. Hutovo Blato Nature Park hosts large areas of pristine natural landscape, such as Deransko Jezero and karst landscape. Enlargement of the Park, for example up to the Bregava River, would be a great opportunity to upgrade the nature park into a national park.

#### **4 Conclusions**

The Neretva Delta is still characterized by its unique habitats and offers a great potential for nature conservation in the Mediterranean region. The two already existing Ramsar Sites Neretva Delta (Croatia) and Hutovo Blato (Bosnia and Herzegovina) are an excellent basis to protect the ecological values. The classification of core and buffer zones based on habitats and priority species is important to prevent a further loss of biodiversity and wetland areas. In contrast to our proposal, the recent physical plan for the Dubrovnik – Neretva County (Dubrovacko-Neretvanska Zupanja 2010) proposed large areas for melioration and land reclamation (Fig. 5). According to our distribution maps, these proposed projects would impact key habitats of the Ramsar Site in Croatia and have major transboundary impacts. The land re-parcelling would destroy important cultural landscapes and endanger species such as Short-toed Eagle or Lesser Grey Shrike (compare Figs. 1 and 3. with Fig. 5.). The areas proposed for melioration (Fig. 2) are important breeding sites for the Great Bittern and Nature 2000 priority sites, such as Estuaries (Natura 2000 code = 1130), Coastal lagoons (1150 \*) and Calcareous fens (7210 \*) with *Cladium mariscus* (European Commission 2007). We hope that our

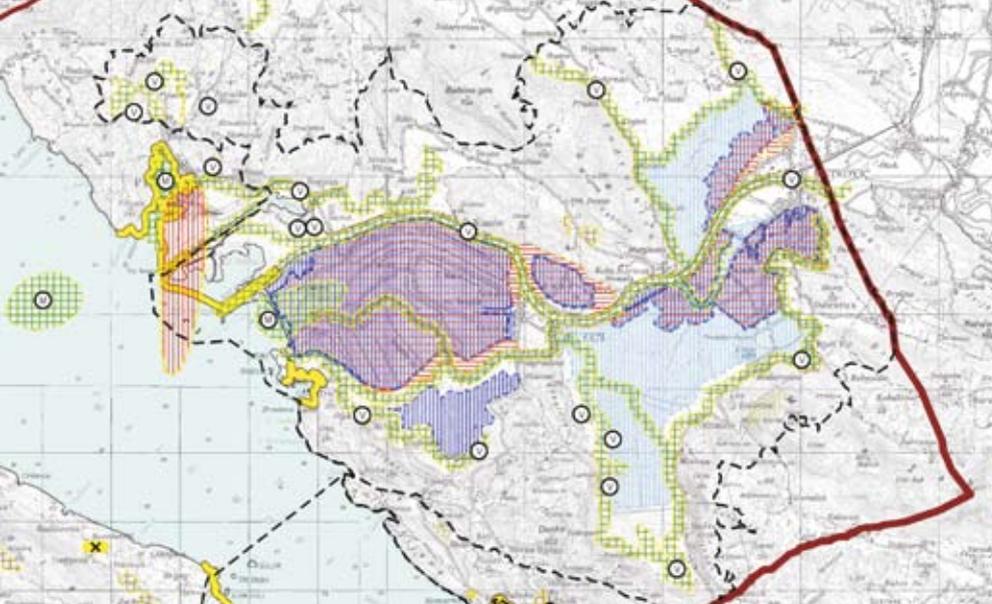


Figure 5: The Neretva Delta Section on the Physical Plan Map 12 (k12\_dio4) of the Dubrovnik-Neretva County (2010). Dark blue hatched areas are already meliorated, while the light blue areas are proposed for exploration. Red hatched zones are planned for land re-parcelling.

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findings will lead to a thorough review of the Physical Plan. The environmental impact assessment, which is needed for all these proposed projects in the Neretva Delta as a part of the ecological network of the country, will hopefully take our mapping results into consideration.

Establishment of a transboundary protected area is still possible, as the existing protected areas are linked by natural habitats, which can be protected both as core and buffer zones. The main connection is provided by the Neretva River and the Krupa tributary – this is most important as it is the outflow of Hutovo Blato Nature Park and the intact karst lakes – Bregava and Trebižat (compare Lijepa nasa 2006). Only in Metković, the Neretva river bed is heavily impacted by the embankment and the harbour. In Bosnia-Herzegovina, the river bed of the Neretva is still natural, although impacted by landfills. A growing number of embankments and regulation works are visible at different places. Here a better protection of the river and its dynamic landscape is needed to save the connectivity and territories of priority species such as Common Kingfisher (*Alcedo atthis*) and Stone-curlew (*Burhinus oedicanus*).

A special transboundary protection site is needed between Gabela and Vid. Here the large reed beds and, besides Livanjsko polje, the only Great Bittern

pairs in Bosnia and Herzegovina indicate the need to establish a transboundary wetland core zone.

The zonation concept for the Neretva Delta envisages inclusion of karst hills in the wider conservation concept to form a transboundary Neretva Delta Biosphere Reserve, which will serve as a brand not only to stimulate tourism, but also to label the products. Establishment of Nature Park administration is crucial for the management of the Delta in Croatia and the transborder cooperation in the protected area management of the whole Delta. The benefits of such transboundary protected areas have been demonstrated on many sites (IUCN, SNV & WWF 2010).

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