



Action A.5
Natura 2000 - Drava Management Strategy
rkm 324.5 - 15

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Federal Ministry
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For more information, visit www.drava-life.hr



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Natura 2000 – Drava Management Strategy

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Client

WWF Austria
Ottakringerstrasse 114-116
1160 Vienna

Contractor

REVITAL Integrative Naturraumplanung GmbH
Nußdorf 71
9990 Nußdorf-Debant
Tel.: +43 4852 67499-0; Fax: DW 19
office@revital-ib.at; www.revital-ib.at



Authors

Klaus Michor, Lukas Umgeher, Revital
Arno Mohl, Tanja Nikowitz, Emöke Györfi, Branka Španiček, WWF

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Summary

The current report is part of the “DRAVA LIFE - Integrated River Management” project, which is the first example of cross-sector cooperation and integrated management of Croatian rivers. It aims at an integrated implementation of various EU Directives (Water Framework, Floods, Habitat and Birds) to solve contemporary problems of river ecosystems using a synergistic approach. This project is a shift from river regulation to river restoration and is therefore an important showcase for Croatia and the Western Balkans. It is funded by the European Union and coordinated by the WWF Austria.

Within the DRAVA LIFE project, “Action A.5 Natura 2000 - Drava Management Strategy” serves as a strategic basis for a later Natura 2000 management plan for the Croatian Natura 2000 areas along the Drava River. At the moment, there is no overall strategy or management plan for the Natura 2000 sites along the Drava in Croatia. Therefore, the Management Strategy is a baseline for further detailed planning along the Drava, for example restoration actions, visitor guidance plans, action plans for river birds, public awareness campaigns and, later, the Natura 2000 management plan. Action A.5 will improve the integrative agreement process and the participation of different stakeholders considerably. The development process was done by taking into consideration provisions of the EU Habitats Directive, the EU Birds Directive and EU Water Framework Directive, as well as potential synergies among them.

The Management Strategy was elaborated in a process with the project partners and several stakeholders from different sectors (see chapter 1.4). The present report is the result of the working process of the partners and stakeholders involved and represents the common opinion and strategy at the present time. The report serves to offer orientation for further planning and is not a final document. Rather, it should be considered an evolving document, as it must be evaluated and adapted after a longer period. For this reason, the present document does not claim to be exhaustive.

The current report (including maps, see annexes) gives an overview on the present situation concerning specific nature-related topics relevant for the project area along the Croatian Drava between Dubrava Križovljanska and Osijek (see chapter 2). After analysing the present situation, focusing on positive and negative aspects (see chapter 3), the involved partners and stakeholders developed several aims and strategies for the whole project area (see chapter 4). These aims and strategies were defined in particular for the topics of water bodies, flood protection, hydropower, fishery, forestry, agriculture, hunting, tourism, recreation, education, conservation, Natura 2000 and monitoring.

The aims and strategies focus on the Drava within the project area, but can of course also be used, in adjusted form, in neighbouring protected areas or river sections.

1 Introduction

1.1 Initial position and aim of the Management Strategy

There currently is no overall strategy or management plan for the Natura 2000 sites along the Drava in Croatia. Action A.5 serves as an important strategic basis for a later Natura 2000 management plan. Integrative cooperation in the Natura 2000 areas has not yet been satisfactorily established. Action A.5 will improve the integrative agreement process and the participation of different stakeholders considerably. It serves as a strategic foundation for the whole LIFE project, including detailed planning for restoration actions, a visitor guidance plan, an action plan for river birds, public awareness campaigning and for a later Natura 2000 management plan.

In the long term, the Republic of Croatia plans the development of a management framework for Natura 2000 sites under its Operational Program (OP) Competitiveness and Cohesion 2014 – 2020. Among other things, Croatia plans to develop management plans for at least 40% of Natura 2000 surface area in Croatia in this context. The present Management Strategy for the Drava was developed in close cooperation with the Croatian Agency for Environment and Nature (CAEN) to align with its planned activities within this OP. The present strategy serves as a baseline study, and so as input for the public institutions and stakeholders involved in the creation process of the planned management plan for Natura 2000 sites along the Drava River. It also integrates the guidelines mentioned in the Guidelines for a Dynamic River Corridor – the first component of the „Transboundary Cooperation Programme Mura-Drava-Danube”.¹

The information given in this document is based on a variety of sources, including studies, mappings, questionings and workshops. It is a snapshot of the current situation, strategy and common opinion of the participants of this action, as it is the result of the working process of the involved partners and stakeholders. For this reason, the present document does not claim exhaustiveness or finality. Rather, it offers a starting point for further planning to be evaluated and adapted after a longer period.

1.2 Project area

The project area covers the Natura 2000 areas at the Croatian Drava, including a side buffer area of 100 m (see figure below). The area is approximately 756 km².

The Natura 2000 areas along the Drava between rkm 322.80 at Dubrava Križovljanska and rkm 15 at Osijek are:

- **Drava akumulacije** (SPA HR1000013, SCI HR2001307)
- **Gornji tok Drave (od Donje Dubrave do Terezinog polja)** (SPA HR1000014, SCI HR5000014)
- **Srednji tok Drave (od Terezinog polja do Donjeg Miholjca)** (SPA HR1000015, SCI HR5000015)

¹ Transboundary Cooperation Programme Mura-Drava-Danube (2018): Project coop MDD DTP1-259-2.3, Interreg Danube Transnational Programme

- **Donji tok Drave** (SPA HR1000016 (western part of the larger area Podunavlje - Donje Podunavlje), SCI HR2001308)

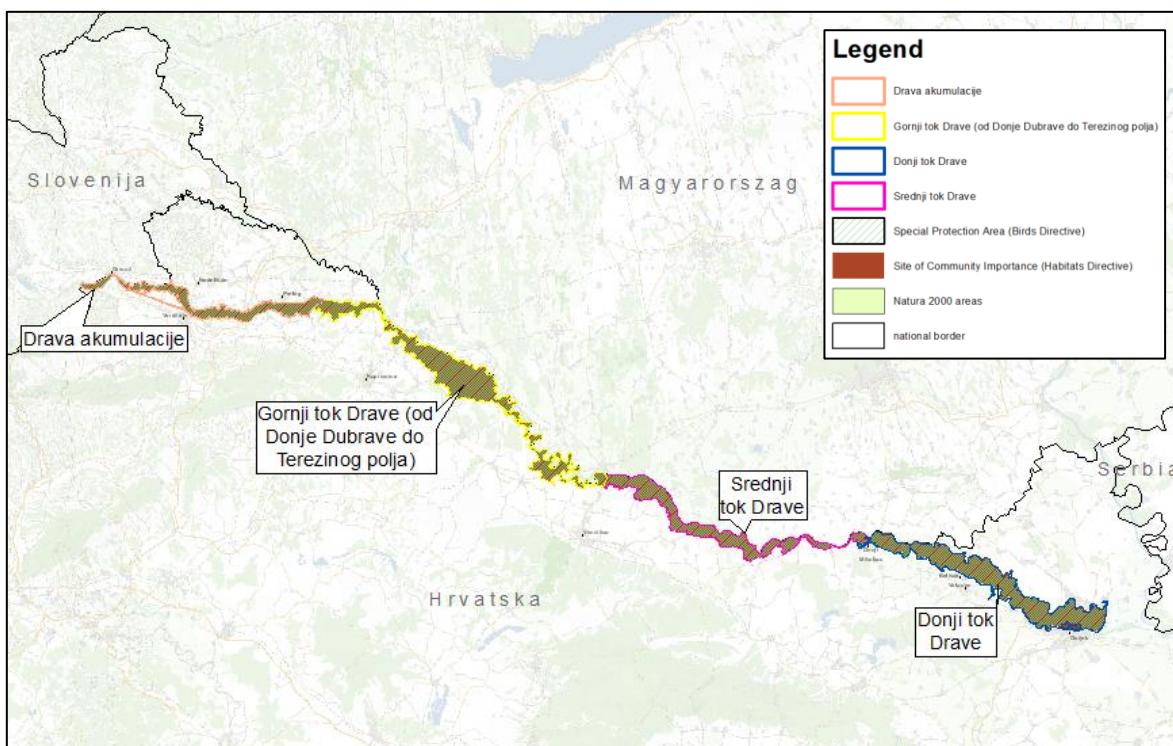


Figure 1-1: Overview of the Natura 2000 areas within the project area

1.3 Applicability of the current Natura 2000 management strategy to the TBR MDD² network of Natura 2000 Areas

As mentioned, the current document is meant to be a strategic basis for further planning within the project area, as there is currently no overall strategy or management plan for the Natura 2000 sites along the Drava in Croatia. The aims and strategies presented in this document should also contribute to the harmonisation of aims and strategies between the project area and its neighbouring protected areas, as management plans exist in Slovenia and are being developed in Hungary.

For instance, this approach also includes the first 15 rkm of the Drava, which are not part of the project area as such, but are of course closely linked to it. Therefore, the aims and strategies of the present document also account for the area along the first 15 rkm from Osijek to the confluence of Drava and Danube, where management measures are already being undertaken (e.g. in Kopački Rit Nature Park). At this point, it has to be mentioned that for this area, compared to the project area of this action, specific and additional strategies and measures have to be developed as a consequence of the influence of the Danube.

Parts of the following Hungarian Natura 2000 areas are also located within the project area. They are not part of Croatian management plans and actions for which this Management Strategy is a basis.

² Transboundary Management Programme Mura-Drava-Danube (2018): Project coop MDD DTP1-259-2.3, Interreg Danube Transnational Programme

- **Zákány-őrtilosi dombok (SPA HUDD20055, SAC/SCI/pSCI)**
- **Nyugat-Dráva (SPA HUDD10002, SAC/SCI/pSCI)**
- **Nyugat-Dráva (SPA HUDD20054, SAC/SCI/pSCI)**
- **Nyugat-Dráva-sík (SPA HUDD20062, SAC/SCI/pSCI)**
- **Közép-Dráva (SPA HUDD20056, SAC/SCI/pSCI)**
- **Darányi borókás (SPA HUDD20051, SAC/SCI/pSCI)**
- **Kelet-Dráva (SPA HUDD20007, SAC/SCI/pSCI)**

Parts of the following Slovenian Natura 2000 areas are also located within the project area. They are not part of Croatian management plans and actions for which this Management Strategy is a basis.

- **Drava (SI 3000220, SAC/SCI/SPA)**
- **Drava (SI 5000011, SAC/SCI/SPA)**

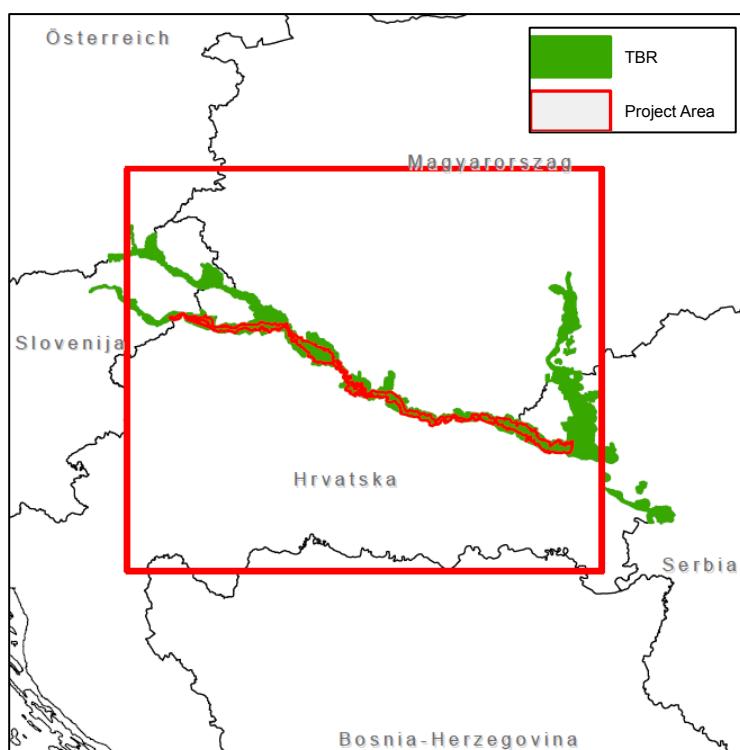


Figure 1-2: Overview of the project area and its location within the TBR³

³ TBR = Transboundary Region of the Transboundary Management Programme Mura-Drava-Danube (2018): Project coop MDD DTP1-259-2.3, Interreg Danube Transnational Programme

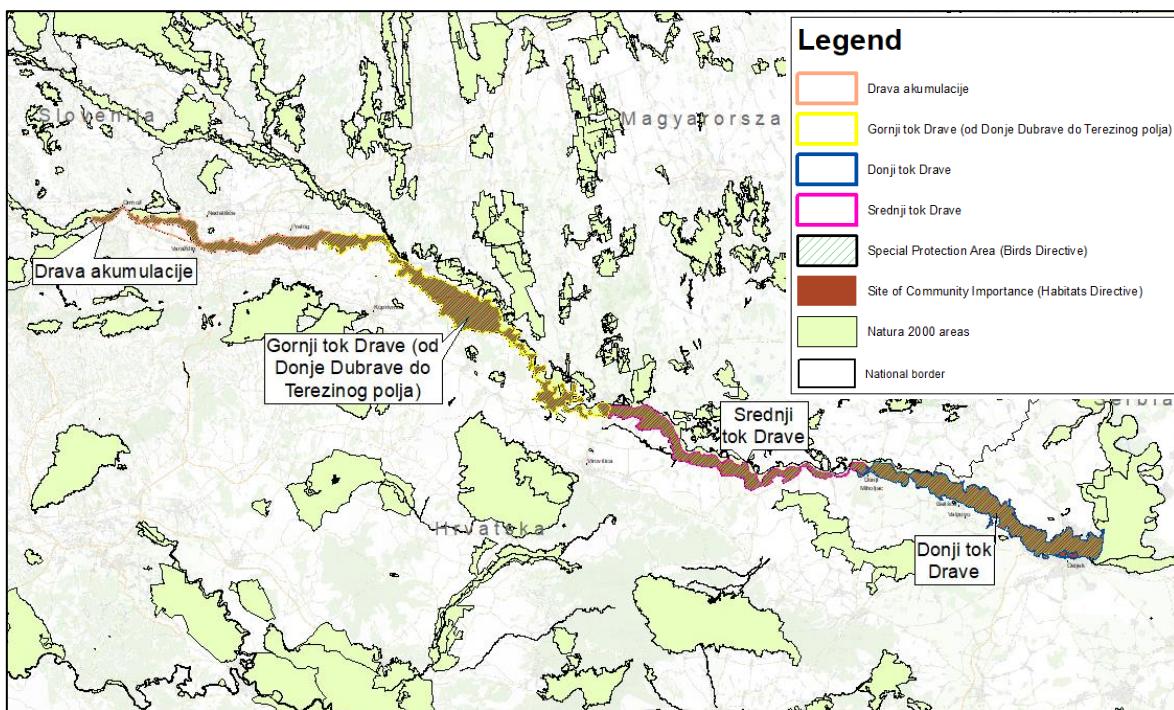


Figure 1-3: Overview of the project area and its neighbouring Natura 2000 areas

1.4 Development process

As part of the process, different stakeholders from the region and responsible institutions were brought together and given the chance for intensive discussion on the Management Strategy.

Apart from the project team, this included:

- Croatian Waters (Hrvatske vode)
 - Public institution for management of protected natural areas and ecological network in Virovitica-Podravina County (Javna ustanova za upravljanje zaštićenim dijelovima prirode i ekološkom mrežom Virovitičko-podravske županije)
 - Public institution for the management of protected natural values in Varaždin County (Javna ustanova za upravljanje zaštićenim vrijednostima na području Varaždinske županije)
 - Public institution for the management of protected natural values in Koprivnica-križevci County (Javna ustanova za upravljanje zaštićenim vrijednostima na području Koprivničko-križevačke županije)
 - WWF Austria (Umweltverband WWF Österreich)
 - Association for nature and environment protection Green Osijek (Udruga za zaštitu prirode i okoliša Zeleni Osijek)

The present Management Strategy is a result of the close cooperation with several further stakeholders:

- Balaton National Park Directorate
- Udruga za istraživanje i popularizaciju znanosti (Baobab - Association for research and the popularisation of science)
- Udruga BIOM (Association BIOM)
- Croatian Agency for Environment and Nature (CAEN)
- County Institution for Nature Protection of Međimurje County
- County Institution for Nature Protection of Osijek-Baranja County
- Croatian Society for Birds and Nature Protection
- DOPPS (Birdlife Slovenia)
- Duna-Dráva National Park Directorate
- Ministry of Environment and Energetics
- Kopački Rit Nature Park Directorate
- Drava Nature History Trust
- The Institute of the Republic of Slovenia for Nature Conservation
- Zaštitarsko-ekološka udruga Senjar - ZEUS (Protective-ecological association Senjar - ZEUS)

The process for the development of the Management Strategy was as follows:

- **1st workshop (April 4th, 2017), Koprivnica (Croatia)**

During an all-day workshop, the DRAVA-LIFE project as well as the planned process for Natura 2000 management plans in Croatia were presented by the Croatian Agency for Environment and Nature. Afterwards, current negative influences on the existing Natura 2000 areas along Drava as well as possible approaches or strategies to deal with the identified main problems were discussed and noted for the following topics: water bodies, flood protection, fishery, forestry, woods, hunting, agriculture, visitors, tourism, leisure, recreation and education.



Figure 1-4: First workshop in Koprivnica with excursion to Legrad

- **Draft of the Management Strategy**

Based on the output of the 1st workshop, a draft of the Management Strategy was compiled.

- **2nd workshop (November 6th, 2017), Kopačovo Visitor Centre, Kopački Rit NP (Croatia)**

During a half-day workshop, the status of the Action A.5 (report and maps) was presented to the partners and participants of the workshop. Open questions and comments on the first draft of the report were discussed. Afterwards, possible strategies and aims for the topics water bodies, flood protection, fishery, forestry, woods, hunting, agriculture, visitors, tourism, leisure, recreation, education natural space/conservation, Natura 2000 and monitoring were discussed in groups.





Figure 1-5: Second workshop in Kopačko Rit Visitor Centre, NP Kopački Rit

- **2nd Draft of the Management Strategy**

Based on the output of the 1st and 2nd workshop, a second draft of the Management Strategy and attached maps was compiled and sent to the partners for further use.

2 Analysis of the current situation

2.1 Natural space and protected areas

2.1.1 Natural space

Habitats

The project area contains several types of habitats (see table below). Almost a third of the project area is arable land, another third is woodland. About 15 % of the area is covered by different tree plantations. The rest of the area consists of various water habitats, roads, buildings, sand, gravel and mud banks or industrial sites.

Table 1: Habitat types in the project area (habitats with high importance for nature conservation in **bold**). The names of the habitat types are based on the European EUNIS habitat classification and Drava Map.⁴

Name	Type	ha
Arable land with unmixed crops grown by low-intensity agricultural methods	arable land	16,048
Riparian and gallery woodland, with dominant Alnus, Betula, Populus or Salix	woodland	12,191
Populus plantations	plantation	9,627
Intensive unmixed crops	arable land	5,542
Permanent non-tidal, smooth-flowing watercourses	waterbodies	4,687
Woodland fringes and clearings and tall forb stands	woodland	4,054
Moist or wet eutrophic and mesotrophic grassland	grassland	4,034
Mesic grasslands	grassland	3,394
Meso- and eutrophic oak, hornbeam, ash, sycamore, lime, elm and related woodland	woodland	3,116
Permanent mesotrophic lakes, ponds and pools	lakes, ponds and pools	2,884
Mixed riparian floodplain and gallery woodland (Fraxinus-Alnus-Quercus-Ulmus-Fraxinus)	woodland	2,401
Other broadleaved deciduous plantations (Alder, Willow)	plantations	1,571
Water-fringing beds of tall canes	waterbodies	1,530
Road networks	Roads	1,044
Permanent eutrophic lakes, ponds and pools	lakes, ponds and pools	771
Residential buildings of villages and urban peripheries	buildings	715
Free-floating and rooted floating vegetation of eutrophic waterbodies	waterbodies	553
Mixed crops of market gardens and horticulture	arable land	532
Bare tilled, fallow or recently abandoned arable land	arable land	371
Unvegetated river gravel banks	sand, gravel and mud banks	133
Littoral zone of inland surface waterbodies	waterbodies	112
Highly artificial man-made waters and associated structures	buildings	93

⁴ Schwarz, U. (2017): DRAVA Map. LIFE-Project “DRAVA LIFE – Integrated River Management” Action A.2 LIFE Drava Map. FLUVIUS, Vienna. 115p.

Fruit and nut tree orchards	plantations	82
Active opencast mineral extraction sites, including quarries	mineral extraction sites	76
Unvegetated river sand banks	sand, gravel and mud banks	71
Residential buildings of city and town centers	buildings	44
Dry grasslands	grassland	37
Urban and suburban industrial and commercial sites still in active use	buildings	30
Recently abandoned above-ground spaces of extractive industrial sites	industrial wasteland	30
Rail networks	roads	18
Highly artificial coniferous plantations	plantations	12
Unvegetated river mud banks	sand, gravel and mud banks	5
SUM		75,808

Animals

The project area provides habitats for different animal groups and species which are listed in the Habitats Directive 92/43/EEC and Birds Directive 2009/147/EC or the national Red List:

Mammals	
<i>Barbastella barbastellus</i>	Barbastelle
<i>Castor fiber</i>	Beaver
<i>Lutra lutra</i>	Otter
<i>Muscardinus avellanarius</i>	Hazel dormouse
<i>Myotis bechsteinii</i>	Bechstein's bat
<i>Myotis dasycneme</i>	Pond bat
<i>Neomys anomalus</i>	Mediterranean water shrew
<i>Neomys fodiens</i>	Eurasian water shrew
<i>Plecotus austriacus</i>	Gray big-eared bat
<i>Rhinolophus ferrumequinum</i>	Greater horseshoe bat

Birds	
<i>Acrocephalus melanopogon</i>	Moustached warbler
<i>Actitis hypoleucos</i>	Common sandpiper
<i>Alcedo atthis</i>	Kingfisher
<i>Anas acuta</i>	Northern pintail
<i>Anas clypeata</i>	Northern shoveler
<i>Anas crecca</i>	Eurasian teal
<i>Anas penelope</i>	Eurasian wigeon
<i>Anas platyrhynchos</i>	Mallard
<i>Anas querquedula</i>	Garganey
<i>Anas strepera</i>	Gadwall

<i>Anser albifrons</i>	Greater white-fronted goose
<i>Anser anser</i>	Greylag goose
<i>Anser fabalis</i>	Bean goose
<i>Aquila clanga</i>	Greater spotted Eagle
<i>Aquila pomarina</i>	Lesser spotted Eagle
<i>Ardea purpurea</i>	Purple heron
<i>Ardeola ralloides</i>	Squacco heron
<i>Asio flammeus</i>	Short-eared owl
<i>Aythya ferina</i>	Common pochard
<i>Aythya fuligula</i>	Tufted duck
<i>Aythya nyroca</i>	Red-crested pochard
<i>Botaurus stellaris</i>	Eurasian bittern
<i>Bucephala clangula</i>	Common goldeneye
<i>Caprimulgus europaeus</i>	European nighjar
<i>Charadrius dubius</i>	Little ringed plover
<i>Chlidonias hybridus</i>	Wiskered tern
<i>Chlidonias niger</i>	Black tern
<i>Ciconia ciconia</i>	White stork
<i>Ciconia nigra</i>	Black stork
<i>Circus aeruginosus</i>	Western marsh harrier
<i>Circus cyaneus</i>	Northern harrier
<i>Cygnus olor</i>	Mute swan
<i>Dendrocopos medius</i>	Middle spotted woodpecker
<i>Dendrocopos syriacus</i>	Syrian woodpecker
<i>Dryocopus martius</i>	Black woodpecker
<i>Egretta alba</i>	Great egret
<i>Egretta garzetta</i>	Little egret
<i>Falco columbarius</i>	Merlin
<i>Falco vespertinus</i>	Red-footed falcon
<i>Ficedula albicollis</i>	Collared flycatcher
<i>Fulica atra</i>	Eurasian coot
<i>Gallinago gallinago</i>	Common snipe
<i>Grus grus</i>	Common crane
<i>Haliaeetus albicilla</i>	White-tailed eagle
<i>Himantopus himantopus</i>	Black-winged Silt
<i>Hippolais icterina</i>	Icterine warbler
<i>Ixobrychus minutus</i>	Little bittern
<i>Lanius collurio</i>	Red-backed shrike
<i>Lanius minor</i>	Lesser grey shrike
<i>Limosa limosa</i>	Black-tailed godwit
<i>Luscinia svecica</i>	Bluethroat
<i>Merops apiaster</i>	European bee-eater
<i>Milvus migrans</i>	Black kite

<i>Netta rufina</i>	Red-crested pochard
<i>Numenius arquata</i>	Eurasian curlew
<i>Nycticorax nycticorax</i>	Black-crowed night heron
<i>Pandion haliaetus</i>	Osprey
<i>Pernis apivorus</i>	European honey buzzard
<i>Phalacrocorax pygmeus</i>	Pygmy cormorant
<i>Philomachus pugnax</i>	Ruff
<i>Picus canus</i>	Grey-headed woodpecker
<i>Platalea leucorodia</i>	Eurasian spoonbill
<i>Porzana parva</i>	Little crake
<i>Porzana porzana</i>	Spottet crake
<i>Rallus aquaticus</i>	Water rail
<i>Recurvirostra avosetta</i>	Pied avocet
<i>Riparia riparia</i>	Sand martin
<i>Sterna albifrons</i>	Little tern
<i>Sterna hirundo</i>	Common tern
<i>Sylvia nisoria</i>	Barred warbler
<i>Tringa erythropus</i>	Spotted redshank
<i>Tringa glareola</i>	Wood sandpiper
<i>Tringa nebularia</i>	Common greenshank
<i>Tringa totanus</i>	Common redshank
<i>Vanellus vanellus</i>	Northern lapwing

Invertebrates	
<i>Aeshna grandis</i>	Brown hawker
<i>Aeshna viridis</i>	Green hawker
<i>Cerambyx cerdo</i>	Great capricorn beetle
<i>Coenagrion ornatum</i>	Ornate bluet
<i>Coenonympha oedippus</i>	False ringlet
<i>Epitheca bimaculata</i>	Eurasian baskettail
<i>Euphydryas maturna</i>	Scarce fritillary
<i>Euplagia quadripunctaria</i>	Jersey tiger
<i>Hemianax ephippiger</i>	Vargrant emperor
<i>Lestes virens</i>	Small emerald damselfly
<i>Leucorrhinia caudalis</i>	Lilypad whiteface
<i>Leucorrhinia pectoralis</i>	Large white-faced darter
<i>Lucanus cervus</i>	Stag beetle
<i>Lycaena dispar</i>	Large copper
<i>Maculinea alcon</i>	Alcon blue
<i>Maculinea teleius</i>	Scarce large blue
<i>Maculinea nausithous</i>	Dusky large blue
<i>Phengaris arion</i>	Large blue

<i>Ophiogomphus cecilia</i>	Green gomphid
<i>Sphingonotus caerulans</i>	Blue sand grasshopper
<i>Sympetrum depressiusculum</i>	Spottet darter
<i>Sympetrum flaveolum</i>	Yellow winged darter
<i>Unio crassus</i>	Thick shelled river mussel

Amphibians	
<i>Bombina bombina</i>	European fire-bellied toad
<i>Bufo viridis</i>	European green frog
<i>Hyla arborea</i>	European tree frog
<i>Rana arvalis</i>	Moor frog
<i>Rana dalmatina</i>	Agile frog
<i>Triturus dobrogicus</i>	Danube crested newt

Reptiles	
<i>Coronella austriaca</i>	Smooth snake
<i>Elaphe quatuorlineata</i>	Four lined snake
<i>Emys orbicularis</i>	European pond turtle
<i>Lacerta viridis</i>	European green lizard
<i>Natrix tessellata</i>	Dice snake
<i>Zamenis longissimus</i>	Aesculapian snake

Fish	
<i>Acipenser nudiventris</i>	Ship sturgeon
<i>Acipenser ruthenus</i>	Sterlet
<i>Aspius aspius</i>	Asp
<i>Alopecurus aequalis</i>	Orange foxtail
<i>Cobitis elongata</i>	Balcan loach
<i>Cobitis elongatoides</i>	Spined loach
<i>Cobitis taenia</i>	Spined loach
<i>Cottus gobio</i>	European bullhead
<i>Eudontomyzon mariae</i>	Ukrainian brook lamprey
<i>Eudontomyzon vladykovi</i>	Vladykov's lamprey lamprey
<i>Gobio kessleri</i>	Kessler's gudgeon
<i>Gobio uranoscopus</i>	Danube gudgeon
<i>Gymnocephalus baloni</i>	Balon's ruffe
<i>Gymnocephalus schraetser</i>	Schraetzer
<i>Hucho hucho</i>	Huchen
<i>Leuciscus idus</i>	Ide
<i>Lota lota</i>	Burbot
<i>Misgurnus fossilis</i>	Weatherfish

<i>Pelecus cultratus</i>	Saberfish
<i>Rhodeus amarus</i>	European bitterling
<i>Romanogobio vladkovi</i>	Whitefin gudgeon
<i>Rutilus virgo</i>	Cactus roach
<i>Sabanejewia balcanica</i>	Balkan golden loach
<i>Umbra krameri</i>	European mudminnow
<i>Vimba vimba</i>	Vimba
<i>Zingel streber</i>	Streber
<i>Zingel zingel</i>	Common zingel

Plants

Plants	
<i>Alopecurus aequalis</i>	Shortawn foxtail
<i>Carex bohemica</i>	Bohemian Sedge
<i>Carex riparia</i>	Greater pond sedge
<i>Carex vesicaria</i>	Bladder-sedge
<i>Cyperus fuscus</i>	Brown galingale
<i>Cyperus glomeratus</i>	Fostail sedge
<i>Cyperus michelianus</i>	Tiny galingale ⁵
<i>Dactylorhiza majalis</i>	Eurasian orchid
<i>Equisetum hyemale</i>	Rough horsetail
<i>Fritillaria meleagris</i>	Snake's head fritillary
<i>Galium uliginosum</i>	Fen bedstraw
<i>Glyceria fluitans</i>	Floating sweet-grass
<i>Hippuris vulgaris</i>	Mare's-tail
<i>Hottonia palustris</i>	Water violet
<i>Limosella aquatica</i>	Water mudwort
<i>Myricaria germanica</i>	German tamarisk
<i>Ophrys sphegodes</i>	Early spider-orchid
<i>Orchis militaris</i>	Orchis italica
<i>Orchis tridentate</i>	Three-toothed orchid
<i>Plantago indica</i>	Branched plantain
<i>Stratiotes aloides</i>	Water soldiers
<i>Wolffia arrhiza</i>	Spotless watermeal

2.1.2 Protected areas

The project area contains four Natura 2000 areas, which are also protected by Croatian nature protection law as Regional Parks and will be described in the following chapters. Parts of Hungarian and Slovenian Natura 2000 areas are also located within the project area. As they are not part of Croatian management plans or actions, for which this Management Strategy is a basis, they won't be de-

⁵ No official english term known

scribed in greater detail in this strategy. The project area is also part of the designated Biosphere Reserve along the rivers Mura, Drava and Danube⁶. All the information is based on the specific Natura 2000 - standard data form (SDF). For detailed information, see the data form, conservation goals and basic measures for the conservation of birds in the Special Protection Areas (SPA)⁷ as well as for most important regulations related to Natura 2000 areas in Croatia⁸.

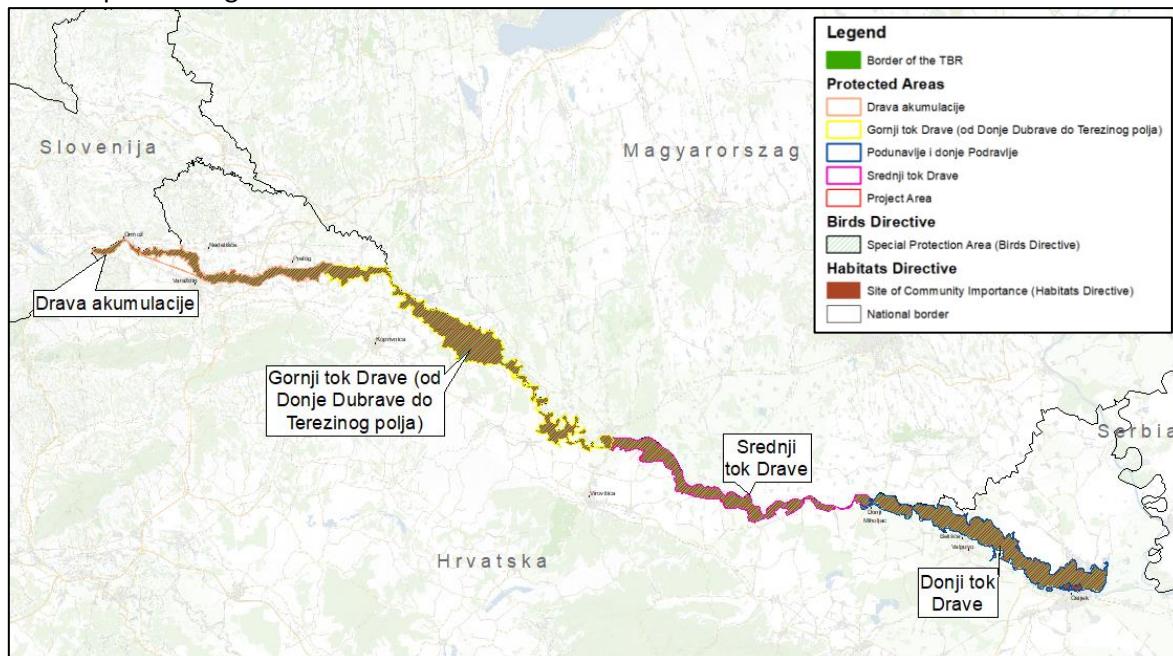


Figure 2-1: Overview of the Croatian Natura 2000 areas within the project area

⁶ Transboundary Cooperation Programme Mura-Drava-Danube (2018): Project coop MDD DTP1-259-2.3, Interreg Danube Transnational Programme

⁷ See <https://narodne-novine.nn.hr/clanci/sluzbeni/dodatni/430424.pdf>

⁸ <http://www.zastita-prirode.hr/eng/Legislation-Registers-Tenders/Legislation>, requested 27.03.2017
<http://www.zastita-prirode.hr/eng/Projects-International-Cooperation/International-agreements>, requested 27.03.2017

<http://www.dzzp.hr/eng/regulations/k/laws-and-regulations-702.html>, requested 27.03.2017

<http://www.mzoip.hr/en/nature/regulations-and-international-treaties.html>, requested 27.03.2017

2.1.2.1 Drava akumulacije (Natura 2000 area)⁹

SPA HR1000013

SCI HR2001307)

Size

9,667 ha

Site characteristics

The area encompasses the stretch of the river Drava from Dubrava Križovljanska to Donja Dubrava as well as three hydropower plant storage reservoirs built in this part of the river. Remaining free flow of the river creates a system of shingle bars, islands, oxbow lakes, ponds and gravel pits. This area is important for wintering waterbirds – it regularly hosts more than 20,000 waterbirds (geese, ducks, coots, etc.). Furthermore, it is an important breeding area for the common sandpiper, which is threatened on a national level. This SPA is a part of the MuraDrava Regional Park, which includes the whole section of the Mura and Drava Rivers in Croatia. The Regional Park is included in the Croatian-Hungarian part of the planned 5-country UNESCO Biosphere Reserve “Mura-Drava-Danube”, which was officially approved by UNESCO’s Man and the Biosphere Committee in Paris in 2011. The lithostratigraphic units in this area are Holocene alluvial deposits and alluvial flat deposits. Hydro-morphic soils are: Mollic and Calcaric Fluvisols sands.

Quality and importance¹⁰

- The area is thought to host a significant population of *Castor fiber*.
- Important site for *Lutra lutra*
- Site with occurrences of habitat type 6430, threatened by invasive alien species (e.g. *Echinocystis lobata* and *Impatiens glandulifera*)
- Important site for 91E0, *Salici-Populetum nigrae*
- Important site for fish species *Aspius aspius*, *Gymnocephalus baloni*, *Gymnocephalus schraetser*, *Romanogobio vladykovi*, *Sabanejewia balcanica* and *Zingel zingel*

Present habitat types listed in Annex I of Directive 92/43/EEC

- 3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation
- 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
- 6510 Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*)
- 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)

⁹ Source: Standard data form N2K HR1000013,

<http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=HR1000013>, requested 27.03.2017

¹⁰ Also an important historical site for *Hippophaë rhamnoides* and *Myricaria germanica* and their habitats as well as for *Umbra krameri* and *Hucho hucho* (information given by one partner)

- 91F0 Riparian mixed forests of *Quercus robur*, *Ulmus laevis* and *Ulmus minor*, *Fraxinus excelsior* or *Fraxinus angustifolia*, along the great rivers (*Ulmenion minoris*)

Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Mammals	
<i>Castor fiber</i>	Beaver
<i>Lutra lutra</i>	Otter
<i>Rhinolophus ferrumequinum</i>	Greater horseshoe bat

Birds¹¹	
<i>Actitis hypoleucos</i>	Common sandpiper
<i>Alcedo atthis</i>	Kingfisher
<i>Anas acuta</i>	Northern pintail
<i>Anas crecca</i>	Eurasian teal
<i>Anas Penelope</i>	Eurasian wigeon
<i>Anas platyrhynchos</i>	Mallard
<i>Anas querquedula</i>	Garganey
<i>Anas strepera</i>	Gadwall
<i>Anser albifrons</i>	Greater white-fronted Goose
<i>Anser anser</i>	Greylag goose
<i>Anser fabalis</i>	Bean goose
<i>Aythya ferina</i>	Common pochard
<i>Aythya fuligula</i>	Tufted duck
<i>Bucephala clangula</i>	Common goldeneye
<i>Ciconia nigra</i>	Black stork
<i>Circus aeruginosus</i>	Western marsh harrier
<i>Circus cyaneus</i>	Northern harrier
<i>Cygnus olor</i>	Mute swan
<i>Dendrocopos medius</i>	Middle spotted woodpecker
<i>Egretta alba</i>	Great egret
<i>Egretta garzetta</i>	Little egret
<i>Falco columbarius</i>	Merlin
<i>Ficedula albicollis</i>	Collared flycatcher
<i>Fulica atra</i>	Eurasian coot
<i>Ixobrychus minutus</i>	Little bittern
<i>Lanius collurio</i>	Red-backed shrike
<i>Netta rufina</i>	Red-crested pochard
<i>Nycticorax nycticorax</i>	Black-crowed night heron

¹¹ Source: Standard data form N2K HR1000013,
<http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=HR1000013>, requested 29.11.2017

<i>Phalacrocorax pygmeus</i>	Pygmy cormorant
<i>Picus canus</i>	Grey-headed woodpecker
<i>Rallus aquaticus</i>	Water rail
<i>Riparia riparia</i>	Sand martin
<i>Sterna hirundo</i>	Common tern
<i>Sylvia nisoria</i>	Barred warbler

Fish	
<i>Aspius aspius</i>	Asp
<i>Cobitis elongatoides</i>	Spined loach
<i>Gymnocephalus baloni</i>	Balon's ruffe
<i>Gymnocephalus schraetser</i>	Schraetzer
<i>Romanogobio vladykovi</i>	Whitefin gudgeon
<i>Sabanejewia balcanica</i>	Balkan golden loach
<i>Zingel streber</i>	Streber
<i>Zingel zingel</i>	Common zingel

2.1.2.2 Gornji tok Drave (od Donje Dubrave do Terezinog polja) (Natura 2000 area)¹²

SPA HR1000014

SCI HR5000014

Size

22,981 ha

Site characteristics

The area encompasses the upper stretch of the Drava River (from Donja Dubrava to Terezino polje). This is the only extensive area in Croatia with well-developed gravel banks, bars and islands. The river system includes many small tributaries, oxbow lakes, ponds and gravel pits. The area also comprises the pedunculate oak forest Repaš, riverine forests (willow and poplar) and agricultural land. Lithostratigraphic units represented in this area are Holocene eolian sand, alluvial deposits and marsh deposits. Hydromorphic soils are: Mollic, Calcaric Fluvisols - sands; eutric, mollic, calcareous gleysols-clay soil. It is one of the most important breeding areas for the common and little tern. This SPA is a part of Mura-Drava Regional Park that includes the whole section of Mura and Drava Rivers in Croatia. The Regional Park is included in the Croatian-Hungarian part of the planned 5-country UNESCO Biosphere Reserve "Mura-Drava-Danube", which was officially approved by UNESCO's Man and the Biosphere Committee in Paris in 2011. The Mura-Drava Regional Park also includes a part of the Special Reserve Veliki Pažut, the Significant Landscapes Čambina, Križnica, Jelkuš and Širinski otok as well as the wetland habitat Vir.

¹² Source: Standard data form N2K HR5000014,
<http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=HR1000013>, requested 27.03.2017

Quality and importance

- Important site for amphibian species *Bombina bombina* and *Triturus dobrogicus*
- The area is considered to host a significant population of *Emys orbicularis*.
- The area is considered to host a significant population of *Castor fiber* and *Lutra lutra*
- The site represents one of five where the species *Euphydryas maturna* can be found.
- Important site for *Lycaena dispar* and *Euplagia quadripunctaria*.
- The site represents an important habitat for saproxylic beetles (*Cerambyx cerdo* and *Lucanus cervus*), especially in Repaš forest. Furthermore, it is an important transboundary site.
- The site is of importance for the conservation of *Coenagrion ornatum* in the Continental Biogeographical Region.
- Because of its large population, the site is very important for the conservation of *Leucorrhinia pectoralis* in the Continental Biogeographical Region.
- The site has a very large population of *Ophiogomphus cecilia*, and is thus very important for the conservation of this species in Croatia
- The site encompasses a small part of the river Drava upstream of Legrad, which is partially degraded and has value for the conservation of *Ophiogomphus cecilia*.
- The only site for habitat type 3230 and only known locality of critically endangered species *Myricaria germanica*¹³ in Croatia.
- One of only four sites for habitat type 3270.
- Important site for 9160, *Carpino betuli-Quercetum roboris*
- Important site for 91E0, *Salici-Populetum nigrae*
- Important site for 91F0, *Genisto elatae-Quercetum roboris* and *Leucoio-Fraxinetum angustifoliae*
- Important site for *Aspius aspius*, *Gymnocephalus baloni*, *Gymnocephalus schraetser*, *Misgurnus fossilis*, *Pelecus cultratus*, *Rhodeus amarus*, *Romanogobio vladkovi*, *Rutilus virgo*, *Sabanejewia balcanica*, *Umbra krameri*, *Zingel streber* and *Zingel zingel*
- Important feeding and roosting site for *Barbastella barbastellus* and *Myotis bechsteinii*

¹³ According to field research from August to October 2017, no German tamarisk has been recorded on previously known discovery sites within the project area (LIFE Project „DRAVA LIFE – Integrated River Management“ LIFE14 NAT/HR/000115 – DRAVA LIFE Action C.9. (2017): Habitat management and re-introduction of riverine plants German tamarisk (*Myricaria germanica*) and Dwarf cattail (*Typha minima*) on Drava in Croatia. Dragica Purger, BioRes UP.

Present habitat types listed in Annex I of Directive 92/43/EEC

- 3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*
- 3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation
- 3230 Alpine rivers and their ligneous vegetation with *Myricaria germanica*
- 3270 Rivers with muddy banks with *Chenopodion rubri p.p.* and *Bidention p.p.* vegetation
- 6110 *¹⁴ Rupicolous calcareous or basophilic grasslands of the *Alyso-Sedion albi*
- 6510 Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*)
- 9160 Sub-Atlantic and medio-European oak or oak-hornbeam forests of the *Carpinion betuli*
- 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)
- 91F0 Riparian mixed forests of *Quercus robur*, *Ulmus laevis* and *Ulmus minor*, *Fraxinus excelsior* or *Fraxinus angustifolia*, along the great rivers (*Ulmenion minoris*)

Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Amphibians	
<i>Bombina bombina</i>	European fire-bellied toad
<i>Triturus dobrogicus</i>	Danube crested newt
<i>Bombina bombina</i>	European fire-bellied toad

Reptiles	
<i>Emys orbicularis</i>	European pond turtle

Mammals	
<i>Castor fiber</i>	Beaver
<i>Lutra lutra</i>	Otter
<i>Barbastella barbastellus</i>	Barbastelle
<i>Myotis bechsteinii</i>	Bechstein's Myotis

Birds ¹⁵	
<i>Alcedo atthis</i>	Kingfisher
<i>Anas acuta</i>	Northern pintail
<i>Anas crecca</i>	Eurasian teal

¹⁴ * = priority habitat type

¹⁵ Source: Standard data form N2K HR1000014,
<http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=HR1000014>, requested 28.11.2017

<i>Anas penelope</i>	Eurasian wigeon
<i>Anas platyrhynchos</i>	Mallard
<i>Anas querquedula</i>	Garganey
<i>Anas strepera</i>	Gadwall
<i>Ardea purpurea</i>	Purple heron
<i>Aythya ferina</i>	Common pochard
<i>Aythya fuligula</i>	Tufted duck
<i>Botaurus stellaris</i>	Eurasian bittern
<i>Bucephala clangula</i>	Common goldeneye
<i>Ciconia ciconia</i>	White stork
<i>Ciconia nigra</i>	Black stork
<i>Circus cyaneus</i>	Northern harrier
<i>Cygnus olor</i>	Mute swan
<i>Dendrocopos medius</i>	Middle spotted woodpecker
<i>Dryocopus martius</i>	Black woodpecker
<i>Egretta alba</i>	Great egret
<i>Egretta garzetta</i>	Little egret
<i>Falco columbarius</i>	Merlin
<i>Ficedula albicollis</i>	Collared flycatcher
<i>Fulica atra</i>	Eurasian coot
<i>Haliaeetus albicilla</i>	White tailed Eagle
<i>Ixobrychus minutus</i>	Little bittern
<i>Lanius collurio</i>	Red-backed shrike
<i>Lanius minor</i>	Lesser grey shrike
<i>Luscinia svecica</i>	Bluethroat
<i>Netta rufina</i>	Red-crested pochard
<i>Nycticorax nycticorax</i>	Black-crowned night heron
<i>Pernis apivorus</i>	European honey buzzard
<i>Phalacrocorax pygmeus</i>	Pygmy cormorant
<i>Picus canus</i>	Grey-headed woodpecker
<i>Rallus aquaticus</i>	Water rail
<i>Sternula albifrons</i>	Little tern
<i>Sterna hirundo</i>	Common tern
<i>Sylvia nisoria</i>	Barred warbler
<i>Vanellus vanellus</i>	Northern lapwing

Invertebrates	
<i>Euphydryas maturna</i>	Scarce fritillary
<i>Lycaena dispar</i>	Large copper
<i>Euplagia quadripunctaria</i>	Jersey tiger
<i>Cerambyx cerdo</i>	Great capricorn beetle
<i>Lucanus cervus</i>	Stag beetle
<i>Ophiogomphus cecilia</i>	Green gomphid

Fish	
<i>Aspius aspius</i>	Asp
<i>Gymnocephalus baloni</i>	Balon's ruffe
<i>Gymnocephalus schraetser</i>	Schraetzer
<i>Misgurnus fossilis</i>	Weatherfish
<i>Pelecus cultratus</i>	Saberfish
<i>Rhodeus amarus</i>	European bitterling
<i>Romanogobio vladykovi</i>	Whitefin gudgeon
<i>Rutilus virgo</i>	Cactus roach
<i>Sabanejewia balcanica</i>	Balkan golden loach
<i>Umbra krameri</i>	European mudminnow
<i>Zingel streber</i>	Streber
<i>Zingel zingel</i>	Common zingel

2.1.2.3 Srednji tok Drave (od Terezinog polja do Donjeg Miholjca) (Natura 2000 area)¹⁶

SPA HR1000015

SCI HR5000015

Size

13,504 ha

Site characteristics

The area encompasses the middle stretch of the Drava River (from Terezino polje to Donji Miholjac). It comprises well-developed river habitats with sandbanks, sand-bars and islands and vertical, eroded, bare riverbanks, oxbow lakes and ponds. The river is surrounded by riverine forests and arable land with scattered pastures. The site is part of the Mura-Drava Regional Park, and includes a monument of park architecture – a group of trees in Noskovačka Dubrava. The Regional Park is included in the Croatian-Hungarian part of the planned 5-country UNESCO Biosphere Reserve “Mura-Drava-Danube”, which was officially approved by the UNESCO’s Man and the Biosphere Committee in Paris in 2011. Lithostratigraphic units represented in this area are Holocene alluvial deposits and alluvial flat deposits. Hydromorphic soils are: Mollic, Calcaric Fluvisols - sands.

Quality and importance

- Important site for *Triturus dobrogicus*
- The area is considered to host significant populations of *Emys orbicularis*.
- Important site for *Lutra lutra*
- The area is considered to host significant populations of *Castor fiber*.
- The site represents one of five important for *Euphydryas maturna*.

¹⁶ Source: Standard data form N2K HR5000015,
<http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=HR1000015>, requested 27.03.2017

- The site is of importance for the conservation of *Coenagrion ornatum* in the Continental Biogeographical Region.
- Although the habitat is under anthropogenic influence, the population of *Leucorrhinia pectoralis* is quite large, so the site is very important for its conservation in the Continental Biogeographical Region.
- The site has a very large population of *Ophiogomphus cecilia*, thus being of great importance for the conservation of this species in Croatia.
- The site is important for the conservation of *Unio crassus* in the Continental Biogeographical Region, with the estimated population size of ca. 10% of the national population.
- Important site for 91E0, *Salici-Populetum nigrae*
- Important site for *Aspius aspius*, *Cobitis elongatoides*, *Eudontomyzon vladaykovi*, *Gymnocephalus baloni*, *Gymnocephalus schraetser*, *Misgurnus fossilis*, *Pelecus cultratus*, *Rhodeus amarus*, *Romanogobio vladaykovi*, *Rutilus virgo*, *Sabanejewia balcanica*, *Umbra krameri*, *Zingel streber* and *Zingel zingel*

Present habitat types listed in Annex I of Directive 92/43/EEC

- 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)

Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Amphibians	
<i>Triturus dobrogicus</i>	Danube crested newt

Reptiles	
<i>Emys orbicularis</i>	European pond turtle

Mammals	
<i>Lutra lutra</i>	Otter
<i>Castor fiber</i>	Beaver

Birds¹⁷	
<i>Alcedo atthis</i>	Kingfisher
<i>Anas acuta</i>	Northern pintail
<i>Anas crecca</i>	Eurasian teal
<i>Anas penelope</i>	Eurasian wigeon
<i>Anas platyrhynchos</i>	Mallard
<i>Anas querquedula</i>	Garganey
<i>Anas strepera</i>	Gadwall
<i>Ardea purpurea</i>	Purple heron
<i>Aythya ferina</i>	Common pochard
<i>Aythya fuligula</i>	Tufted duck
<i>Bucephala clangula</i>	Common goldeneye
<i>Ciconia ciconia</i>	White stork
<i>Ciconia nigra</i>	Black stork
<i>Circus cyaneus</i>	Northern harrier
<i>Cygnus olor</i>	Mute swan
<i>Dendrocopos medius</i>	Middle spotted woodpecker
<i>Egretta alba</i>	Great egret
<i>Egretta garzetta</i>	Little egret
<i>Falco columbarius</i>	Merlin
<i>Ficedula albicollis</i>	Collared flycatcher
<i>Fulica atra</i>	Eurasian coot
<i>Haliaeetus albicilla</i>	White-tailed eagle
<i>Ixobrychus minutus</i>	Little bittern
<i>Lanius collurio</i>	Red-backed shrike
<i>Luscinia svecica</i>	Bluethroat
<i>Milvus migrans</i>	Black kite
<i>Netta rufina</i>	Red-crested pochard
<i>Nycticorax nycticorax</i>	Black-crowed night heron
<i>Picus canus</i>	Grey-headed woodpecker
<i>Rallus aquaticus</i>	Water rail
<i>Sylvia nisoria</i>	Barred warbler
<i>Vanellus vanellus</i>	Northern lapwing

Invertebrates	
<i>Euphydryas maturna</i>	Scarce fritillary
<i>Coenagrion ornatum</i>	Ornate bluet
<i>Leucorrhinia pectoralis</i>	Large white-faced darter
<i>Ophiogomphus cecilia</i>	Green gomphid

¹⁷ Source: Standard data form N2K HR1000014,
<http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=HR1000014>, requested 28.11.2017

<i>Unio crassus</i>	Thick shelled river mussel
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Fish	
<i>Aspius aspius</i>	Asp
<i>Cobitis elongatoides</i>	Spined loach
<i>Eudontomyzon vladkykovi</i>	Vladkyk's lamprey
<i>Gymnocephalus baloni</i>	Balon's ruffe
<i>Gymnocephalus schraetser</i>	Schraetzer
<i>Misgurnus fossilis</i>	Weatherfish
<i>Pelecus cultratus</i>	Saberfish
<i>Rhodeus amarus</i>	European bitterling
<i>Romanogobio vladkykovi</i>	Whitefin gudgeon
<i>Rutilus virgo</i>	Cactus roach
<i>Sabanejewia balcanica</i>	Balkan golden loach
<i>Umbra krameri</i>	European mudminnow
<i>Zingel streber</i>	Streber
<i>Zingel zingel</i>	Common zingel

2.1.2.4 Donji tok Drave (Natura 2000 area)¹⁸

SPA HR1000016 (Podunavlje i donje Podravlje)

SCI HR2001308

Size

21,498 ha

Site characteristics

This site consist of alluvial lowlands of the Drava River mouth at its confluence with the Danube. The prevailing habitats are rivers, wetlands and riverine forests (mostly willow and poplar). The largest wetlands are Kopački Rit and the fishponds Donji Miholjac and Podunavlje. Rivers are surrounded by oxbows, ponds and smaller river channels. Important river habitats include sandbanks, sand bars, sand islands and vertical, eroded, bare riverbanks. The area is an important breeding site for herons and egrets, white-tailed eagles and ferruginous ducks, as well as a wintering site for many waterbirds and a stopover site for spoonbills. This area regularly hosts more than 20.000 waterbirds during the migration and wintering period. This SPA is a part of the Mura-Drava Regional Park, which includes the whole section of the Mura and Drava Rivers in Croatia. The Regional Park is included in the Croatian-Hungarian part of the planned 5-country UNESCO Biosphere Reserve "Mura-Drava-Danube", which was officially approved by UNESCO's Man and the Biosphere Committee in Paris in 2011. It includes the world-famous Nature Park Kopački rit, which is also included in the Ramsar list, as well as the protected landscape Dravske šume, with its large complex of riverine willow and poplar for-

¹⁸ Source: Standard data form N2K HR5000016,
<http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=HR1000016>, requested 27.03.2017

ests. Lithostratigraphic units represented in this area are Holocene deluvial-proluvial deposits and alluvial deposits. River-wetland lowlands, alluvial flat, lowland river terraces, river-eolian lowlands. Hydromorphic soils are: Mollic, Calcaric Fluvisols - sands, gravel; Eutric, Mollic, Calcaric Gleysols-clay soil; Aric Anthrosols.

Quality and importance

- Important site for amphibian species *Triturus dobrogicus* and *Bombina bombina*
- Important site for *Emys orbicularis*
- The area is considered to host significant populations of *Lutra lutra*
- Important site for butterfly species *Lycaena dispar*
- The site is of importance for the conservation of *Coenagrion ornatum* in the Continental Biogeographical Region
- The site is important for the conservation of *Graphoderus bilineatus* in Croatia
- Because of the large population, the site is very important for the conservation of *Leucorrhinia pectoralis* in the Continental Biogeographical Region.
- The site has very large population of *Ophiogomphus cecilia* and is thus of great importance for the conservation of this species in Croatia.
- Important site for 91E0, *Salici-Populetum nigrae*
- Important site for fish species *Aspius aspius*, *Cobitis elongatoides*, *Eudontomyzon mariae*, *Gymnocephalus baloni*, *Gymnocephalus schraetser*, *Pelecus cultratus*, *Rhodeus amarus*, *Romanogobio vladykovi*, *Rutilus virgo*, *Sabanejewia balcanica*, *Zingel streber* and *Zingel zingel*.

Present habitat types listed in Annex I of Directive 92/43/EEC

91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)

Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Amphibians	
<i>Bombina bombina</i>	European fire-bellied toad
<i>Triturus dobrogicus</i>	Danube crested newt

Reptiles	
<i>Emys orbicularis</i>	European pond turtle

Mammals	
<i>Lutra lutra</i>	Otter

Birds¹⁹	
<i>Acrocephalus melanopogon</i>	Moustached warbler
<i>Alcedo atthis</i>	Kingfisher
<i>Anas clypeata</i>	Northern shoveler
<i>Anas acuta</i>	Northern pintail
<i>Anas crecca</i>	Eurasian teal
<i>Anas penelope</i>	Eurasian wigeon
<i>Anas platyrhynchos</i>	Mallard
<i>Anas querquedula</i>	Garganey
<i>Anas strepera</i>	Gadwall
<i>Anser anser</i>	Greylag goose
<i>Anser fabalis</i>	Bean goose
<i>Aquila clanga</i>	Greater spotted eagle
<i>Aquila pomarina</i>	Lesser spotted eagle
<i>Ardea purpurea</i>	Purple heron
<i>Ardeola ralloides</i>	Squacco heron
<i>Asio flammeus</i>	Short-eared owl
<i>Aythya ferina</i>	Common pochard
<i>Aythya fuligula</i>	Tufted duck
<i>Aythya nyroca</i>	Red-crested pochard
<i>Botaurus stellaris</i>	Eurasian bittern
<i>Bucephala clangula</i>	Common goldeneye
<i>Caprimulgus europaeus</i>	European nighjar
<i>Chlidonias hybridus</i>	Wiskered tern
<i>Chlidonias niger</i>	Black tern
<i>Ciconia ciconia</i>	White stork
<i>Ciconia nigra</i>	Black stork
<i>Circus aeruginosus</i>	Western marsh harrier
<i>Circus cyaneus</i>	Northern harrier
<i>Cygnus olor</i>	Mute swan
<i>Dendrocopos medius</i>	Middle spotted woodpecker
<i>Dendrocopos syriacus</i>	Syrian woodpecker
<i>Dryocopus martius</i>	Black woodpecker
<i>Egretta alba</i>	Great egret
<i>Egretta garzetta</i>	Little egret
<i>Falco columbarius</i>	Merlin
<i>Falco vespertinus</i>	Red-footed falcon
<i>Ficedula albicollis</i>	Collared flycatcher
<i>Fulica atra</i>	Eurasian coot
<i>Gallinago gallinago</i>	Common snipe

¹⁹ Source: Standard data form N2K HR1000014,
<http://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=HR1000014>, requested 28.11.2017

<i>Grus grus</i>	Common crane
<i>Haliaeetus albicilla</i>	White-tailed eagle
<i>Himantopus himantopus</i>	Black-winged silt
<i>Ixobrychus minutus</i>	Little bittern
<i>Lanius collurio</i>	Red-backed shrike
<i>Limosa limosa</i>	Black-tailed godwit
<i>Luscinia svecica</i>	Bluethroat
<i>Milvus migrans</i>	Black kite
<i>Netta rufina</i>	Red-crested pochard
<i>Numenius arquata</i>	Eurasian curlew
<i>Nycticorax nycticorax</i>	Black-crowed night heron
<i>Pandion haliaetus</i>	Osprey
<i>Pernis apivorus</i>	European honey buzzard
<i>Phalacrocorax pygmeus</i>	Pygmy cormorant
<i>Philomachus pugnax</i>	Ruff
<i>Picus canus</i>	Grey-headed woodpecker
<i>Platalea leucorodia</i>	Eurasian spoonbill
<i>Porzana parva</i>	Little crake
<i>Porzana porzana</i>	Spottet crake
<i>Rallus aquaticus</i>	Water rail
<i>Recurvirostra avosetta</i>	Pied avocet
<i>Sterna hirundo</i>	Common tern
<i>Sylvia nisoria</i>	Barred warbler
<i>Tringa erythropus</i>	Spotted redshank
<i>Tringa glareola</i>	Wood sandpiper
<i>Tringa nebularia</i>	Common greenshank
<i>Tringa totanus</i>	Common redshank
<i>Vanellus vanellus</i>	Northern lapwing

Invertebrates	
<i>Lycaena dispar</i>	Large copper
<i>Leucorrhinia pectoralis</i>	Large white-faced darter
<i>Ophiogomphus cecilia</i>	Green gomphid

Fish	
<i>Aspius aspius</i>	Asp
<i>Cobitis elongatoides</i>	Spined loach
<i>Eudontomyzon mariae</i>	Ukrainian brook lamprey
<i>Gymnocephalus baloni</i>	Balon's ruffe
<i>Gymnocephalus schraetser</i>	Schraetzer
<i>Pelecus cultratus</i>	Saberfish
<i>Rhodeus amarus</i>	European bitterling

<i>Romanogobio vladykovi</i>	Whitefin gudgeon
<i>Rutilus virgo</i>	Cactus roach
<i>Sabanejewia balcanica</i>	Balkan golden loach
<i>Zingel streber</i>	Streber
<i>Zingel zingel</i>	Common zingel

See also map charge 1 “Protected Areas” in attachment.

2.2 Water bodies / flood protection / fishery

2.2.1 Water bodies

The project area is located within the catchment area of the Drava, restricted to the Croatian and Hungarian-Croatian part of the river itself. The figure below shows the catchment area of the Drava.



Figure 2-2: Overview of the catchment area of the Drava

The project area is built up by following water bodies, with different sizes and ecological qualities. The table below shows habitats which are mainly characterized by their water bodies.

Table 2: Water bodies inside the project area. The name of the habitat types are based on the European EUNIS habitat classification and Drava Map.²⁰

Name	Type	ha
Permanent non-tidal, smooth-flowing watercourses	waterbodies	4,687
Water-fringing beds of tall canes	waterbodies	1,530
Free-floating and rooted floating vegetation of eutrophic waterbodies	waterbodies	553

²⁰ Schwarz, U. (2017): DRAVA Map. LIFE-Project “DRAVA LIFE – Integrated River Management” Action A.2 LIFE Drava Map. FLUVIUS, Vienna. 115p.

Name	Type	ha
Unvegetated river gravel banks	sand, gravel and mud banks	133
Littoral zone of inland surface waterbodies	waterbodies	112
Unvegetated river sand banks	sand, gravel and mud banks	71
Unvegetated river mud banks	sand, gravel and mud banks	5
SUM		7,091

The following rivers are located within the project area:

- Drava
- Mura
- Karašica
- Bednja
- Plitvica

The following oxbows/side arms are located within the project area:

- Čambina - Drava
- Ješkovo
- Stara Drava - Križnica
- rukav Komatnica
- Stara Drava (in the villages/towns of: Gabajeva Greda, Podgajci Podravski, Donji Miholjac, Budakovac, Baranjsko Petrovo Selo, Nard, Ferdinandovac, Vaška, Detkovac, Bilje, Bijelo Brdo, Županijski kanal Zidine - Barje)
- Dombo
- Melačka
- Stružer

The following streams/creeks are located within the project area:

- Bistra Koprivnička
- Gliboki potok
- Pačica
- Vetec
- Ođenica
- Čađavica

The following channels are located within the project area:

- odvodni kanal HE Čakovec
- odvodni kanal HE Varaždin

- odvodni knl HE Formin
- D. drenažni jarak knl.HEV
- drenažni knl.akum.varaždin
- L. drenažni knl.akumulacije HE
- L. drenažni jarak knl.HEV
- L. drenažni knl. uz HED
- L. drenažni knl.akum.HED
- L. drenažni knl.akumulacije HE
- L. obodni knl.akum.HEČ
- L. obodni knl.dovodnog knl.HEČ
- L. obodni knl.HEČ
- Obodni kanal Bistrec Gorenjak
- Obodni kanal HE Dubrava
- odušni kanal Plitvica
- dovodni kanal HE Dubrava
- dovodni kanal HE Varaždin
- dovodni kanal HE Čakovec
- Bistrec-Rakovnica
- Kopanjek
- Rog-Strug
- Ždalica

The following lakes are located within the project area:

- akumulacijsko jezero HE Dubrava (reservoir HPP Dubrava)
- akumulacijsko jezero HE Čakovec (reservoir HPP Čakovec)
- akumulacijsko jezero HE Varaždin (reservoir HPP Varaždin)
- Šoderica
- lakes in Gabajeva Greda
- Čingi lingi
- Jegenički
- lakes Autoput in Drnje
- lakes Mlađ in Drnje
- lakes Sekuline
- lakes in Podravske Sesvete – Đuraševa greda

The following hydropower plants are located within the project area:

- Varaždin HPP (Location: Varaždin)

- Čakovec HPP (Location: Međimurje)
- Dubrava HPP (Location: Međimurje)

See also map charge 2 “Rivers and Lakes” in attachment.

2.2.2 Flood protection

Within the project area, different types of constructions for flood protections are installed:

- Rip-raps: 50.73 km, within the project area along the whole river on both sides, mainly on the main channel.
- Rip-raps old: 10.24 km, overgrown, within the project area along the whole river on both sides, often on side arms.
- Groynes: 1.92 km, within the project area along the whole river on both sides, mainly in the lower sections.
- Dikes: approximately 510 km, within the project area along the whole river on both sides.

See also map charge 3 “River Embankment” in attachment.

2.2.3 Fishery

General Regulations

Freshwater sports fishing (angling) as well as freshwater commercial fisheries and freshwater aquaculture are regulated by the Freshwater Fisheries Law as well as the Freshwater Sports Fishing Act. Anglers buy angling licenses valid for a particular fishing area or fishing zone from owners of the fishing rights. These licenses are valid for the particular fishing zone and for some fishing zones of other nearby owners of fishing rights (if reciprocal contracts exist).

Sports fishing is allowed with at most three (3) fishing rods with one hook each (except for artificial bait, where a maximum of two hooks per fishing rod are allowed). Sport fishing on all the salmonid species is allowed with one fishing rod and one artificial fly or bait. Angling of wels from the boat is allowed with one wels attractant and one fishing rod or fishing lure with one hook.

Apart from the common fishing regulations explained above, owners of fishing rights have their own internal regulations (regarding daily allowed catch in kilograms or pieces, night fishing, etc.), which are based on verified fishery management studies and yearly plans, as well as internal financial regulations regarding membership.²¹

Fishery along Drava River

The Drava River as well as its backwaters, oxbow lakes and artificially created lakes (Šoderica) popular fishing places. Desirable fish species that live in these waters are catfish, carp, pike, perch and others. The fish ponds near Donji Miholjac are the fourth largest fish farm in Croatia, with a total area of 925 ha. These ponds are places where different kinds of birds gather and they are important for

²¹ Ministry of Agriculture, Directorate of Fisheries: <http://www.mps.hr/ribarstvo/default.aspx?id=2802>, requested 29.11.2017

the conservation of wetland bird populations. They are therefore included in the Natura 2000 sites as part of an important area for birds called “Lower Danube Region and Podravljе”.²² In the tables below, SRK/ŠRK stands fishing club, ŠRD/ŠRU for a fishing association.

Table 3: **Fishing associations in Virovitica-Podravina County in Mura-Drava Regional Park**

Holder of fishing rights	Fishing zone (administrative borders city/municipality)
ZŠRU VIROVITICA	municipalities of Lukač, Suhopolje, Gradina i Špišić Bukovica
ZŠRK OPĆINE PITOMAČA	municipality of Pitomača
ŠRU „ŠARAN“ – Bakić	municipalities of Sopje and Čađavica

²² Source: SEE river project, National Drava River Corridor Analysis Report of Croatia, February 2014

Table 4: Data on fishing, based on a questionnaire distributed among fishing associations (2016)²³

COUNTY	NO OF ASSOCIA-TIONS/CLUBS (DRAVA RELATED)	LIST OF ASSOCIATIONS/CLUBS (DRAVA RELATED)	AREA (KM ² -DRAVA RELATED)	CAUGHT FISH (KG)	SPECIES (TOP 5 - kg)	FISHING METHODS	FORBIDDEN METHODS	FORBIDDEN AREAS	FISHING INFRA-STRUCTURE
Varaždin County	5	SRK Općine Cestica 1995, Cestica	2.22	1449	Carassius auratus gibelio, Vimba vimba, Leuciscus cephalus, Rutilus rutilus, Chondrostoma danasus	3 fishing rods with one hook per rod	nets, explosives, traditional fishing (nets)	100m up- and downstream of HPP Varaždin	sites available by car, only 10 registered boats (no unregistered), fishing lodge in Veliki Lovrečan
		ŠRK Varaždin, Varaždin							
		ŠRD Ludbreg, Ludbreg	12.69	3151.92	Abramis brama danubii, Cyprinus carpio, Carassius auratus gibelio, Esox Lucius, Silurus glanis	poaching	from Kapela Podravskva to Bednja –Drava confluence + Minski channel (from 1.1. to 31.3)	it is forbidden to build any kind of fishing infrastructure besides existing fishing houses	
		ŠRU Općina Petrijane, Petrijane							
		ŠRK Linjak, Veliki Bukovec							
SRK/ŠRK – fishing club, ŠRD/ŠRU – fishing association									

²³ A questionnaire was sent to all three levels of fishing associations on a County/regional level (1: local small clubs and private clubs; 2: municipality associations; 3: county level associations). Županijski ribolovni savez (county level associations in Varazdin) responded to the questionnaire.

2.3 Forestry and woods / agriculture / hunting

2.3.1 Forestry and woods

In the project area different types of woods with different sizes and ecological qualities exist. The table below shows the different types of woodlands as well as plantations.

Table 5: Woods inside the project area. The name of the biotope types are based on the European EUNIS habitat classification and Drava Map²⁴

Name	Type	ha
Riparian and gallery woodland, with dominant <i>Alnus</i> , <i>Betula</i> , <i>Populus</i> or <i>Salix</i>	Woodland	12,191
<i>Populus</i> plantations	Plantation	9,627
Woodland fringes and clearings and tall forb stands	Woodland	4,054
Meso- and eutrophic oak, hornbeam, ash, sycamore, lime, elm and related woodland	Woodland	3,116
Mixed riparian floodplain and gallery woodland (<i>Fraxinus-Alnus-Quercus-Ulmus</i>)	Woodland	2,401
Other broadleaved deciduous plantations (alder, willow)	Plantation	1,571
Highly artificial coniferous plantations	Plantation	12
SUM		32,972

In general, most of the woodland and plantations are located along the upper and lower parts of the river Drava within the project area, whereas along the middle part (between Terezino Polje and Donji Miholjac) forests are present only in the active floodplain, while open land is dominant in the former floodplain. Riparian and gallery woodland with dominant *Alnus*, *Betula*, *Populus* or *Salix* is mainly located along the upper and middle parts along the river Drava. In the lower parts, *Populus* plantations, woodland fringes, clearings, tall forb stands as well as mixed riparian floodplain and gallery woodlands (*Fraxinus-Alnus-Quercus-Ulmus*) are dominant. Furthermore, there is a notable continuously connected meso- and eutrophic oak, hornbeam, ash, sycamore, lime, elm and related woodland near Repas with an area of approximately 2,400 ha.

See also map charge 4 “Forestry and Woods” in attachment.

2.3.2 Agriculture

In the project area, different types of agricultural land with different sizes and ecological qualities exist, as shown in the table below.

²⁴ Schwarz, U. (2017): DRAVA Map. LIFE-Project „DRAVA LIFE – Integrated River Management“ Action A.2 LIFE Drava Map. FLUVIUS, Vienna. 115p.

Table 6: Agricultural land inside the project area. The name of the habitat types are based on the European EUNIS habitat classification and Drava Map.²⁵

Name	Type	ha
Arable land with unmixed crops grown by low-intensity agricultural methods	arable land	16,048
Intensive unmixed crops	arable land	5,542
SUM		21,590

Table 7: Grassland inside the project area. The name of the habitat types are based on the European EUNIS habitat classification and Drava Map²⁶

Name	Type	ha
Moist or wet eutrophic and mesotrophic grassland	grassland	4,034
Mesic grasslands	grassland	3,394
Mixed crops of market gardens and horticulture	arable land	532
Bare tilled, fallow or recently abandoned arable land	arable land	371
Dry grasslands	grassland	37
SUM		8,368

Most of the arable land within the project area is located along the middle part of the river Drava (between Terezino Polje and Donji Miholjac). Along the upper and lower parts, continuously connected arable land with bigger plot sizes is concentrated at a few locations (e.g. between Gotalovo and Gola or in the north of Osijek). As the table above shows, agriculturally used land mainly consists of unmixed crops grown by low-intensity agricultural methods, which is present in almost every part of the project area. The second largest category are intensive unmixed crops, which are present in almost all parts within the project area, but mainly along the middle part of the Drava River. It is notable that bigger or continuously connected moist or wet eutrophic and mesotrophic grasslands are present in the area northeast of Osijek.

See also map charge 5 “Agriculture” in attachment.

2.3.3 Hunting

In the river corridor area hunting is developed. There are about 60 registered hunting grounds in the area.^{27 28}

²⁵ Schwarz, U. (2017): DRAVA Map. LIFE-Project „DRAVA LIFE – Integrated River Management“ Action A.2 LIFE Drava Map. FLUVIUS, Vienna. 115p.

²⁶ Schwarz, U. (2017): DRAVA Map. LIFE-Project „DRAVA LIFE – Integrated River Management“ Action A.2 LIFE Drava Map. FLUVIUS, Vienna. 115p.

²⁷ Source: SEE river project, National Drava River Corridor Analysis Report of Croatia, February, 2014

²⁸ The hunting grounds, their surface area and maps can be found on the webpage of the Ministry of Agriculture (https://lovistarh.mps.hr/lovstvo_javnost/Lovista.aspx)

Table 8: List of hunting areas and licensors of hunting rights in the area of Mura-Drava RP in Virovitica-Podravina county

Broj i naziv lovišta	Ovlaštenik prava lova
X/1 - Banov Brod	LRUVDR VIDRA Pitomača
X/102 - Špišić Bukovica	LU Fazan Špišić Bukovica
X/103 - Stari Gradac	LU Fazan Stari Gradac
X/105 - Lukač	LU Jastreb Lukač
X/106 - Rušani	LD JELEN Rušani
X/107 - Gradina	LU Sokol Gradina
X/108 - Detkovac	LU Kuna Detkovac
X/109 - Suhopolje	LU Suhopolje Suhopolje
X/111 - Gornji Miholjac	LU SOKOL Gornji Miholjac
X/112 - Sopje	LU Fazan Sopje-Kapinci
X/114 - Gornje Predrijevo	LU Jelen Noskovci
X/115 - Čađavica	LU Sokol Čađavica

Table 9: Data on hunting, based on questionnaire among hunting associations (2016)²⁹

COUNTY	NO OF ASSOCIATIONS/CLUBS (DRAVA RELATED)	LIST OF ASSOCIATIONS/CLUBS (DRAVA RELATED)	AREA (KM ²)	CAUGHT ANIMALS (NO)	CAUGHT SPECIES	HUNTING METHODS	FORBIDDEN METHODS	FORBIDDEN AREAS	HUNTING INFRASTRUCTURE
Varaždin County	9	LD Sv. Hubert, Čestica UZ Zelendvor, Vinica LD Šljuka, Petrijanec LD Fazan, Varaždin LD Kobac, Bartolovac Zlengaj d.o.o., Martijanec LD Patka, Sv. Đurd LD Fazan, Velik Bukovec LD Prepelica, Mali Bukovec	- - - - - - - - -	- - - - - - - - -	red deer, wild boar, European roe deer, rabbits, pheasants, wild ducks, wild geese, predators (fox, <i>mustelidae</i> and jackal)	group hunting for small game (rabbit, pheasant) and wild boar	poaching with deadfall, forbidden calibre rifles, hunting outside the hunting season from shooting stand or land (hunting throngs)	hunting is not allowed within a 300m zone around inhabited areas, factories and other business objects	10 shooting stands per HA/HG

²⁹ A questionnaire was sent to all three levels of hunting associations on a County/regional level (1: locally small clubs and private clubs; 2: municipality associations; 3: county level associations). Lovački savez (county level associations in Varazdin) responded to the questionnaire.

2.4 Visitors / tourism / leisure and recreation / education

Various types of infrastructure for touristic or recreational purposes, uses and activities exist within the project area:

- benches
- bike trails
- bird watching towers
- camp sites and fire places
- canoeing routes
- ferry terminal
- information points and boards
- parking lots
- picnic sites
- restaurants, cafés, a bar
- a supermarket
- swimming areas
- a stadium
- toilets
- viewpoints
- fishing places
- memorials, graveyards, places of worship

Additional infrastructure not listed above consists of several information centres and institutions that have special offers such as guided tours, indoor classrooms and exhibitions, lectures and nature trails. Examples of such institutions close to the Drava River include the "Informative and Educational Centre – Hostel Drava Story" in Noskovci or the Nature Park "Kopački Rit" close to Kopačovo. In addition, several "River' scools" are built along the river Drava within the Transboundary Cooperation Programme Mura-Drava-Danube (Project coop MDD DTP1-259-2.3). Furthermore, "Visitor Centre Križnica - Interpretation Centre of Biosphere Reserve Mura-Drava-Danube ", is going to be built under the Operational Program (OP) Competitiveness and Cohesion 2014 – 2020 of European Regional Development Fund (Project KK.06.1.2.02.0018.).

See also map charge 6 "Tourism" in attachment.

2.5 Monitoring of natural values

Monitoring is done within the Natura 2000 areas according to the relevant plans, as well as in accordance with the current LIFE project.

The following research and monitoring is done in the protected areas in Varaždin County, Koprivnica-Križevci County, Međimurska priroda (Međimurje County), Nature Park Kopački Rit, Osijek-Baranja County and Virovitica-Podravina County.

Protected areas of Varaždin County – monitoring done by external experts³⁰		
	year	title of research/monitoring
1.	1994-1995	Research of distribution of plants, animals and phytocenoses of Drava park-forest ³¹
2.	2002-2005	Inventory of plant and animal species of Drava as the part of the project „Inventory of threatened plant and animal species of Varaždin County“ ³²
3.	2011	Research of <i>Pulsatilla pratensis</i> (L.) Miller ssp. <i>nigricans</i> (Störck) Zam in Varaždin County (plant was found also near the Drava River)
4.	2013	Research of herpetofauna of Varaždin County
5.	2014	Monitoring of birds and habitats along Drava River in Varaždin County
6.	2015	Monitoring of birds and habitats along Drava River in Varaždin County – section between Dubrava Križovljanska and Otok Virje
7.	2017	Mapping of habitats of the species: <i>Bombina bombina</i> , <i>Emys orbicularis</i> and <i>Triturus dobrogicus</i> in the area of NATURA 2000 - HR5000014 Gornji tok Drave in Varaždin County
8.	2017	Notifying the findings of NATURA 2000 Coleoptera (beetles): <i>Lucanus cervus</i> , <i>Cerambyx cerdo</i> , <i>Rosalia alpine</i> , <i>Morimus funereus</i> and <i>Cucujus cinnaberinus</i> in the area of NATURA 2000 - HR5000014 Gornji tok Drave in Varaždin County
9.	2017	Monitoring of <i>Ciconia ciconia</i> – continuous monitoring from 2017 onwards

Protected areas of Koprivnica-Križevci County – monitoring happening throughout the year, repeating for several years³³	
	title of research/monitoring
1.	Monitoring of <i>Ciconia ciconia</i> in Koprivnica-Križevci County
2.	Monitoring of protected beetle species in Koprivnica-Križevci County: <i>Lucanus cervus</i> , <i>Cerambyx cerdo</i> , <i>Morimus funereus</i> and <i>Rosalia alpina</i>
3.	Monitoring of Astacidae in Koprivnica area (Legrad – Molve area of Drava)

³⁰ Public Institution for Management of Protected Natural Values in Varaždin County.

³¹ Ecological Association „Lijepa naša“ – Varaždin branch

³² Ecological Association „Lijepa naša“ – Varaždin branch

³³ Public Institution for Management of Protected Natural Areas in Koprivnica – Križevci County

Međimurska priroda (Međimurje County) – monitoring done every year³⁴		
	title of research/monitoring	year period
1.	Monitoring of <i>Fritillaria meleagris</i>	mid-March-mid April
2.	Monitoring of <i>Pulsatilla pratensis ssp. nigricans</i>	mid-March-mid April
3.	Monitoring of <i>Ciconia nigra</i>	mid-March-mid April
4.	Monitoring of <i>Ciconia ciconia</i>	April-August
5.	Monitoring of <i>Dryocopus martius</i>	mid-March-mid May
6.	Monitoring of <i>Merops apiaster</i>	mid May-Mid July
7.	Monitoring of <i>Hirundo rustica</i> and <i>Delichon urbicum</i>	June
8.	Monitoring of <i>Lutra lutra</i> 2 x per year (during 6 years)	winter/spring
9.	Monitoring of bats in objects above ground	June
10.	Winter counting of water birds in coordination with Birdlife International	Mid-January
11.	Record the data on deaths of otters and beavers along the Drava River	
12.	Record the findings of aproxylic beetles (Coleoptera) - <i>Lucanus cervus</i> , <i>Rosalia alpine</i> and <i>Morimus funereus</i>	

Nature Park Kopački Rit – monitoring done every year³⁵		
	title of research/monitorin	year period
1.	Winter counting of water birds	January
2.	Monitoring of water birds	whole year
3.	Monitoring and mapping of nests of <i>Haliaeetus albicilla</i>	January-15h July
4.	Monitoring and mapping of nests of <i>Ciconia nigra</i>	March-July
5.	Monitoring of ichthyofauna	mid April and mid September
6.	Monitoring of underground waters (4 locations: Tikveš castle, Tikveš village, Zlatna greda, Malomkut + Tikver well, since 2016)	once per week
7.	Monitoring of precipitation (location Tikveš castle)	every month
8.	Monitoring of water levels of Danube, Drava and inland waters of Kopački Rit	every month
9.	Monitoring of surface waters quality (7 locations: Bodorfolk, Menetfok, Sighet, Zlatna greda, Sakadaš, pump station Podunavlje and pump sta-	once per month

³⁴ Međimurska priroda – Public Institution for Nature Protection of Međimurje County

³⁵ Public Institution "Nature Park Kopački Rit"

Nature Park Kopački Rit – monitoring done every year³⁵		
	tion Tikveš)	
10.	Monitoring of epidemiology and bird epizootics	whole year
11.	Monitoring of <i>Cervus elaphus</i>	September
12.	Inventory of water and marsh vegetation in the scope of development of the Action plan for protection of water and marsh vegetation	whole year
13.	Monitoring of <i>Castor fiber L.</i>	whole year

Protected areas of Osijek-Baranja County – monitoring happening throughout the year³⁶		
title of research/monitoring		
1.	Monitoring of <i>Ciconia ciconia</i> in Osijek-Baranja County (Regional park Mura-Drava area)	
2.	Winter counting of water birds	

Protected areas of Virovitica-Podravina County – monitoring happening throughout the year³⁷		
title of research/monitoring		
Num	Year	
		implementation
1	2014.	Monitoring of <i>Ciconia ciconia</i> in Virovitica-Podravina County
2	2015.	Monitoring of <i>Hirundo rustica</i> , <i>Delichon urbica</i> in Virovitica-Podravina County
3	2016.	Monitoring of <i>Fritillaria meleagris</i> in Virovitica-Podravina County
4	2017.	Monitoring of <i>Lycane dispar</i> in Virovitica-Podravina County
5	2018.	Monitoring of fish specy <i>Umbra krameri</i> in Virovitica-Podravina County
6	2017.	Monitoring of <i>Merops apiaster</i> in Virovitica-Podravina County
7	2017.	Monitoring of <i>Haliaeetus albicilla</i> in Virovitica-Podravina County
8	2017.	Monitoring of <i>Ciconia nigra</i> in Virovitica-Podravina County
9	2015.	Monitoring of <i>Dryocopus martius</i> in Virovitica-Podravina County
10	2018.	Monitoring of <i>Lutra lutra</i> in Virovitica-Podravina County
11	2018.	Monitoring of <i>Lucanus cervus</i> in Virovitica-Podravina County
12	2017.	Monitoring of <i>Populus nigra</i> in Virovitica-Podravina County
13	2014.	Monitoring of fish species and water habitats on Stara Drava in Virovitica-Podravina County
14	2017.	Winter counting of water birds in coordination with Birdlife International

³⁶ Public Institution Agency for Management of Protected Natural Values in Osijek-Baranja County

³⁷ Public Institution for Management of Protected Natural Areas and Ecological Network in Virovitica-Podravina County

3 Analysis of strengths and weaknesses

The following chapters are based on the output of several workshops which took place during the LIFE project as well as literature research and questionnaires (see chapter 2). They are all discussed on the background of natural space, nature conservation and Natura 2000 as overarching goal. There is no claim for completeness concerning topics or content. They have to be seen as an agreement of the different stakeholders and participants upon those aspects considered to be most important.

3.1 Water bodies / flood protection / fishery

The main strengths concerning the topics **water bodies, flood protection and fishery** at the river Drava are:

- The Drava is part of the Europe-wide network of Natura 2000.
- The Drava still offers habitats for several protected and threatened species of plants and animals.
- At the Drava, unobstructed river banks are still present in many places.
- The Drava contains several important and sensitive habitat types, for example permanent non-tidal, smooth-flowing watercourses, floodplain woodlands, beds of tall canes fringing the waters, free-floating and rooted floating vegetation of eutrophic waterbodies, unvegetated river gravel banks, littoral zones of inland surface waterbodies or unvegetated river mud banks.
- Downstream from Dubrava HPP, close to Međimurje, the Drava flows freely and not disturbed by hydro power plants.
- All three hydropower dams are equipped with working fish passes; their functioning is monitored during the fish migration period by Hrvatska Elektroprivreda (HEP).³⁸
- Methods of fishing and angling are regulated by law.

Good practice example: Three Rivers - One Aim Hungarian-Croatian IPA project³⁹

This project was implemented in 2014 and 2015 and one of the actions was the renovation of angling infrastructure within the Duna-Drava National Park (DDNP). The target area was the Belső-Béda oxbow lake, situated south of Mohács, next to the Hungarian-Croatian state border.

This water body had been used for angling for several decades, and was formerly managed by the local angling association. Hundreds of angling piers had been constructed without any plan or permission, most of them abandoned, when the national park directorate acquired the fishing manage-

³⁸ Information provided by HEP

Monitoring data regarding fish passes can be officially requested from Hrvatska elektroprivreda (HEP)

³⁹ Transboundary Cooperation Programme Mura-Drava-Danube (2018): Project coop MDD DTP1-259-2.3, Interreg Danube Transnational Programme

ment rights.

During this project, all angling piers were demolished and removed from the protected area. At the beginning of the project, more than 400 piers were counted in total and few of them were in use. Many had completely or partially collapsed and sometimes only some columns were left visible above the water surface. The removed piers and litter were transported off the protected land.

During the project, only 65 new angling piers of different sizes were constructed, and a few of them incorporate shelters for overnight fishing. Furthermore, four traditional wooden boats were purchased. The boats and new piers can be used by anglers who purchase licenses from DDNP Directorate.

Croatian partners installed 11 monitoring towers in the project area, finished the reconstruction of the basement of the Informative and educational center in Noskovačka Dubrava, revitalise the protected park and installed the park infrastructure, cleaning and fencing Ornithological Reserve Potpanj, set up a geological educational path in Vukovar, revitalise pasture along the Mura and purchased eight horses indigenous breeds.⁴⁰



The main negative aspects (effects, weaknesses, threats or obstacles) concerning the topics **water bodies** and **flood protection** at the river Drava are:

constructions	<ul style="list-style-type: none"> ▪ A deficit of sediments within the river occurs because of the interruption of free flow, mainly caused by hydro-power plants and embankment constructions, and because of sediment extraction. This leads to river bed deepening and degradation. ▪ The Drava lacks river dynamics (side erosion sediment transportation, natural floods, high and low water levels etc.), which negatively affects flora and fauna and their habitats. ▪ Hydro-power plants negatively affect flora and fauna and their habitats by disturbing the water regime, hydropoeaking, as well as by reservoir flushing and a minimum water flow in the Stara Drava. In the section downstream of the Du-
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⁴⁰ See also: <http://ipa3r-1a.eu/> and www.hu-hr-ipa.com/uploads/editors/Three%20Rivers_One%20Aim-brochure.pdf

	<p>brava HPP, hydropoeaking, sediment transport and reservoir flushing are existing negative effects.</p> <ul style="list-style-type: none"> ▪ Further planned or proposed dams on the Drava would destroy the existing habitats and negatively affect the wildlife in and around the Drava, as explained above. ▪ In some cases, the floodplain is too narrow and dikes are too close to the river, which leads to a lack of space in case of floods. ▪ Illegally constructed buildings exist within the floodplain and their use can disturb existing wildlife.
navigation routes	<ul style="list-style-type: none"> ▪ Planned navigation routes will affect the wildlife in and around the Drava.
Lack of co-operation	<ul style="list-style-type: none"> ▪ Intersectoral information exchange and cooperation is lacking, which can lead to misunderstandings, lack of knowledge concerning nature protection and can eventually lead to loss or deterioration of wildlife. ▪ Insufficient cooperation on the institutional as well as the transboundary level (concerning cross-border Natura 2000 sites of Slovenia and Hungary)

<p>The main negative aspects (effects, weaknesses, threats or obstacles) concerning the topic fishery at the river Drava are:</p>	
Fishing methods	<ul style="list-style-type: none"> ▪ Illegal fishing methods harm the fish populations, because they do not follow rules or laws which aim to conserve a healthy fish population.
Management plans	<ul style="list-style-type: none"> ▪ The existing management plans for fish are not appropriate to conserve a healthy fish population. ▪ There are no spawning protection zones which would help the fish population to recover or to reproduce in a natural way and number.⁴¹

3.2 Forestry and woods / agriculture / hunting

<p>The main strengths concerning the topics forestry / woods, agriculture and hunting at the river Drava are:</p>	
	<ul style="list-style-type: none"> ▪ Woodland and agricultural land close to the river Drava is part of the Europe-wide network of Natura 2000. ▪ The woodland in the Natura 2000 areas still offers habitats for several protected and threatened species of plants and animals.

⁴¹ An initiative with Croatian Waters and fishing association for the revitalisation of the Natura 2000 habitat Noskovačka bara and arranging the spawning protection zone for fish has been launched (information by partner).

- The Croatian Natura 2000 areas along the river Drava contain several important and sensitive habitat types of woodland - for example riparian and gallery woodland (with dominant *Alnus*, *Betula*, *Populus* or *Salix*), meso- and eutrophic oak, hornbeam, ash, sycamore, lime, elm and related woodland, mixed riparian floodplain and gallery woodland (*Fraxinus-Alnus-Quercus-Ulmus*).
- The Croatian Natura 2000 areas along the river Drava contain dry grasslands, which are an important and sensitive habitat type for several plants and animals.

Good practice example: "Three Rivers = One Aim" in Croatia⁴²

Within the frame of the project "Three Rivers = One Aim", implemented in Croatian and Hungarian protected areas (project ended in November 2015), a total of 8 hectares of native pasture along the Mura river in Međimurje County, Croatia was restored through reintroduction of the domesticated but critically endangered native breed of Međimurje's Horse. Eight mares (female horses) were purchased from local farmers and released to graze freely on the field to restore the pasture's vegetation, consisting of native flora. Within only two years, a succession of the vegetation from invasive to native floristic species was already visible. Not only the flora benefited from this project – but also the fauna did. Birds, several species of bugs (*Scarabeidae*) as well as other wildlife are now present in the pasture in higher population densities than before the project. The pasture is completely managed as grazing area, i.e. as open range for eight horses of this project and 20+ cows from a neighbouring farmer.

Good practice example: Cooperation with hunters in Medjimurje County⁴³

Medjimurje Priroda, the public institution responsible for Protected Area management in Medjimurje County in Croatia, is a rather small institution with only five staff members and therefore needs to prioritise its work, including also the work with stakeholders.

Their approach is to intensively focus on a different stakeholder group every year and establish a relationship with them. These build the basis for continuous work on a smaller scale.

In 2017, they focused on hunters as a stakeholder group. Actions included workshops on species knowledge (e.g. protected species that might be mistaken for a hunted species), setting up a volunteer group among hunters, who also use their time in the forest for monitoring activities and contribute valuable knowledge to the nature protection institution, and general awareness-raising on the ecology of the floodplains.

⁴² Transboundary Cooperation Programme Mura-Drava-Danube (2018): Project coop MDD DTP1-259-2.3, Interreg Danube Transnational Programme

⁴³ Transboundary Cooperation Programme Mura-Drava-Danube (2018): Project coop MDD DTP1-259-2.3, Interreg Danube Transnational Programme



The main negative aspects (effects, weaknesses, threats or obstacles) concerning the topic **forestry and woods** at the river Drava are:

Forestry methods	<ul style="list-style-type: none"> ▪ Clearing as a harvesting method has a big impact on the quality of habitats and biodiversity. It means a prompt and big loss of habitats, plants and animals. Furthermore, it takes a long time to restore the former habitat quality. ▪ The cutting of old oaks, which are a key species in the forest, has a big impact on the quality of habitats and biodiversity. Many other different species (plants and animals) rely on the existence of oak trees as a key species to provide food and habitats, to regulate the water and material cycles, to influence the microclimate etc. ▪ Existing intensive forestry practices (for instance monocultures), are not in line with nature protection and reduce the quality of habitats and biodiversity. From the point of view of nature protection, a great diversity of autochthonous species (plants and animals), ages and natural processes is important. Some forest management methods and plans inhibit those aspects. ▪ Homogenous forests (single-aged, few tree species etc.) exist, which are lower in their habitat quality compared to heterogeneous forests. They are lower in number of species (animals and plants), provide less ecosystem services (food, habitats etc.) and infections can cause larger damage compared to heterogeneous forests.
Invasive species	<ul style="list-style-type: none"> ▪ Invasive species and plantations of non-native species (hybrid poplar, black walnuts etc.) exist. They are still being planted, and influence the autochthonous flora and fauna. They can be very dominant and therefore displace native species.
Constructions	<ul style="list-style-type: none"> ▪ The building of new forest roads for harvesting in floodplains harm flora and fauna of the forest. Habitats are lost and they can cut and disturb migration routes.

Lack of cooperation	<ul style="list-style-type: none"> ▪ There is a lack of communication between sectors (nature protection, forestry, agriculture, hunting, land owners, etc.).
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<p>The main negative aspects (effects, weaknesses, threats or obstacles) concerning the topic agriculture at the river Drava are:</p>	
Agricultural methods	<ul style="list-style-type: none"> ▪ The use of chemicals and the intensification of agricultural management (e.g. fertilisation of meadows) reduce the species variety of flora and fauna. In some cases, intensively used arable land is too close to protected areas, which are then influenced negatively. ▪ Monocultures provide habitats only for very few species, the level of biodiversity is lowered. ▪ Agricultural areas are growing at the expense of wood and grassland. This means a loss of habitats for many plant and animal species. ▪ Oxbow lakes and side arms are becoming eutrophic near intensively used arable land. This leads to a reduction of water quality, which affects many animal and plant species which are dependent on good water conditions.
Lack of knowledge	<ul style="list-style-type: none"> ▪ There is a lack of education concerning Natura 2000 and its benefits to the region, which can lead to misunderstandings, lack of knowledge concerning nature protection and to the eventual loss or deterioration of wildlife.
Lack of cooperation	<ul style="list-style-type: none"> ▪ There is a lack of communication between sectors (nature protection, forestry, agriculture, hunting, land owners, etc.), which can lead to misunderstandings, lack of knowledge concerning nature protection and eventually to the loss or deterioration of wildlife.

<p>The main negative aspects (effects, weaknesses, threats or obstacles) concerning the topic hunting at the river Drava are:</p>	
Hunting methods	<ul style="list-style-type: none"> ▪ Animal populations (for example of deer and wild boar) are too numerous and are fed during the winter time as well. This leads to damage of the wood and prevents natural forest rejuvenation. ▪ Some cases of predator species (for example jackals and foxes) poisoning occur. This illegal use of poison leads to secondary poisoning of strictly protected species e.g., raptors. ▪ Use of lead ammunition in wetlands poisons water, soils and animals. ▪ Illegal hunting methods are used (e.g. traps, decoys, illegal gun types etc.), which can lead to the loss or deterioration of wildlife. ▪ A high priority of trophy hunting can lead to the loss or deterioration of habitats

	(due to overgrazing). <ul style="list-style-type: none"> ▪ Fencing off the hunting grounds prevents natural migration of wildlife
Law	<ul style="list-style-type: none"> ▪ The existing hunting law and system are not serving to a large enough extent nature protection purposes. ▪ Cooperation between hunting and nature protection is lacking, which can lead to misunderstandings, lack of knowledge concerning nature protection and eventually to the loss or deterioration of wildlife.

3.3 Visitors / tourism / leisure and recreation / education

The main strengths concerning the topics visitors, tourism, leisure and recreation, education at the Drava are:
<ul style="list-style-type: none"> ▪ The Drava offers several extensive recreational uses, for example swimming, cycling, canoeing, etc. ▪ Various educational trails or bird watching towers explain and show the wildlife along the Drava and in its surroundings. ▪ Free access to the Drava is possible. ▪ At several information centres and institutions, there are special offers like guided tours, indoor classrooms and exhibitions, lectures, nature trails etc.

Good practice example: PE Virovitica Podravina County⁴⁴
Nationally recommended school programs in Croatia: In Croatia, most children go to a „school in nature“ in 3 rd or 4 th grade of elementary school. Therefore, the Public Institution for Nature Protection of Virovitica-Podravina County developed their programme based on the school curriculum of those grades. It was approved and officially recommended by the Agency for Education and the Ministry of Education of Croatia. The program includes school subjects of nature and society, art, physical education and hygiene. It is based on the accommodation capacities of their centre, nature-related content presented at the centre, equipment of the bio research station, and natural values in the park around the centre and in the nearby surrounding areas (educational trail, bird watching, Natura 2000 areas). The program promotes a healthy attitude toward nature, raises the awareness of young people about the values and importance of preserving nature and encourages research spirit and socialisation of young people.

⁴⁴ Transboundary Cooperation Programme Mura-Drava-Danube (2018): Project coop MDD DTP1-259-2.3, Interreg Danube Transnational Programme

Good practice example: PE Virovitica Podravina County⁴⁵

Cooperation with Universities:

The Public Institution for Nature Protection of Virovitica-Podravina County collaborates with Universities and welcomes groups of students at their centre. They have designed field education programs for students on the basis of the requirements of the student's teachers - exploration of aquatic habitats, watching and ringing birds, seeding and microscopy of collected samples from nature. Programs usually last for three days and they are part of the regular classes of students.

In autumn 2017, the results of the project evaluation were presented, which reported the didactic development of students of the faculty of natural sciences during four of these three-day programs.

Good practice example: Educational centres

Within the project area and its close surroundings, several information centres and institutions offer guided tours, indoor classrooms, exhibitions, lectures, nature trails etc. and accommodations as well:

“Informative and Educational Centre – Hostel Drava Story” in Noskovci: The visitor centre of the Public Institution for the management of protected parts of nature and the ecological network of Virovitica-Podravina County is located near the Drava River in the municipality Čadavica, Virovitica-Podravina County. It offers different activities (e.g. school in nature, students field work), space for presentations and education, accommodations, a souvenir shop and an educational path including educational boards, resting areas, a bird-watching tower and a recovery center for white storks and a CITED educational corner.⁴⁶

Eco centre Zlatna Greda: The centre is located in the middle of the Baranja region, about twenty kilometres north of Osijek. It offers different programs (e.g. school in nature, canoe tours, photo safari, teambuilding programs), an adventure park, accommodations, food and drinks.⁴⁷

Nature Park “Kopački Rit”: The Nature Park is located close to Kopačovo and Osijek. The park offers a variety of activities and actions, e.g. exhibitions, space for presentations, an educational path, hiking and bike routes, boat and train tours, accommodations, a souvenir shop and a restaurant.⁴⁸



⁴⁵ Transboundary Cooperation Programme Mura-Drava-Danube (2018): Project coop MDD DTP1-259-2.3, Interreg Danube Transnational Programme

⁴⁶ <http://virovitica-nature.hr/2016/10/10/the-drava-story/>

⁴⁷ <http://zlatna-greda.org/>

⁴⁸ <https://pp-kopacki-rit.hr/>, requested 29.11.2017

<p>The main negative aspects (effects, weaknesses, threats or obstacles) concerning the topic visitors, tourism, leisure, recreation and education at the river Drava are:</p>	
Visitor management	<ul style="list-style-type: none"> ▪ No visitor management or visitor action plans or rules for touristic activities exist. This leads to a lack of knowledge about what is allowed within the protected area and what is not. Often, there are too many people in sensitive spots or they visit at the wrong time (e.g. breeding season), thus harming nature. In those spots, the nature experience is lost. Visitor numbers are unlimited. ▪ Not enough visitor centres exist. ▪ There are too few people in charge of visitor management and the use of nature, which can lead to damage and disturbances of wildlife. ▪ No rules on how to access the river exist, which can lead to damage and disturbances of wildlife. ▪ Public institutions lack funding and employees.
Zoning	<ul style="list-style-type: none"> ▪ A proper zoning (go and no-go areas) and visitor guiding is lacking, which can lead to damage and disturbances of wildlife.
Activities	<ul style="list-style-type: none"> ▪ Existing activities with a high potential impact on nature are: biking, canoeing, rubber boating, off-road driving (e.g. on gravel shores and sandbanks, which harms nesting birds or protected plants).
Lack of cooperation	<ul style="list-style-type: none"> ▪ Local tourist information offices do not work together with protected areas, which can lead to misunderstandings, lack of knowledge concerning nature protection and eventually to the loss or deterioration of wildlife.⁴⁹
Lack of knowledge	<ul style="list-style-type: none"> ▪ People are interested in nature but do not know about the effects of certain activities (e.g. camp fires, biking, etc.), which can lead to damage and disturbances of wildlife. ▪ The education and knowledge of local people concerning Natura 2000 species and habitats is incomplete, which can lead to damage and disturbances of wildlife. ▪ The public media do not explain current situations in the Natura 2000 sites correctly and are influenced by local authorities, which can lead to misunderstandings.

⁴⁹ Since last year, first cooperations have been started (e.g. organisation of a 5-day training for tourist guides in protected areas of Virovitica-Podravina County, the operational program of development of cyclotourism in Virovitica-Podravina County was presented, the Dravska story Touristic Board presented the new brochures "Bird watching along the Drava River" and "With a bicycle in Slavonia and Podravina" (information given by one partner)

	<p>ings, lack of knowledge concerning nature protection and eventually to the loss or deterioration of wildlife.⁵⁰</p> <ul style="list-style-type: none"> The local media does not cover Natura 2000 topics, which can lead to misunderstandings, lack of knowledge concerning nature protection and to the eventual loss or deterioration of wildlife.
Construction	<ul style="list-style-type: none"> Illegal buildings/houses (fishermen huts and weekend houses) within the protected or flooded areas exist in some places, e.g. in the lower section of the Drava. The houses and their flood protection measures (e.g. embankments) harm or destroy habitats for flora and fauna.

3.4 Monitoring

The main strengths concerning the topic **monitoring** at the river Drava are:

- Monitoring of different plants, animals and habitats is done within Natura 2000 areas and protected along the Drava areas according to the relevant plans as well as in accordance with the current LIFE project.



The main negative aspects (effects, weaknesses, threats or obstacles) concerning the topic **monitoring** at the river Drava are:

Lack of monitoring	<ul style="list-style-type: none"> There is a lack of monitoring or research into the impacts of dams on the river. There is a lack of coherent monitoring programmes of key natural features (species and habitats) along the river continuum Public institutions lack funding and employees.
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⁵⁰ Recently, every second Monday, a program on the county radio informs about activities, projects, events and Natura 2000 species and tries to raise public awareness for the need for conservation and improving the ecological status of Natura 2000 species.

4 Overall management strategies and aims

The following strategies are based on the discussions between the project partners during the first and second workshop as well as on the analysis of the current situation (see chapter 2) and the analysis of the current strengths and weaknesses (see chapter 3) within the project area. Aims of the Guidelines for a Dynamic River Corridor – the first component of the Transboundary Cooperation Programme Mura-Drava-Danube⁵¹ (TCP) are also taken into consideration and have been discussed during the second workshop. Possible guidelines of the TCP are considered as strategies where suitable for the present Management Strategy.

Intensive discussions during the alignment process have shown that some of the aspects considered for strategy definition require further stakeholder alignment before reaching a common understanding and goal-setting. In the next stage, i.e. during the elaboration of Natura 2000 area management plans that should concretize some of the strategies formulated in the present strategy document, as well as for implementation of various actions within these areas, further in-depth discussion on some of the topics will be required. Such strategy points are recognizable by the fact that two positions have been formulated for individual strategies: one formulated on behalf of Nature Conservation, whereas the other one has been formulated by Croatian Water management.

⁵¹ Transboundary Cooperation Programme Mura-Drava-Danube (2018): Project coop MDD DTP1-259-2.3, Interreg Danube Transnational Programme

4.1 Waterbody / flood protection / hydropower / fishery

Goal: Preservation and restoration of a natural and free-flowing Drava to improve flood protection and increase biodiversity.

1.1 Aim: River development and risk management concept including river-restorations.⁵²

Related objectives and sub-objectives of the TCP:

Strategies	Background	Addressees
<ul style="list-style-type: none"> Develop and implement a river-development and risk management concept for the whole project area including river-restoration measures in line with the EU Water Framework Directive, EU Habitats Directive and EU Birds Directive. 	<ul style="list-style-type: none"> This helps to include stakeholders and interests and to coordinate measures of nature protection with human activities and uses (e.g. forestry, agriculture, recreation, etc.). To reach several goals concerning Natura 2000 and to preserve or restore an intact ecosystem and wildlife concrete measures are needed. 	<ul style="list-style-type: none"> Ministry of Environment and Energy Nature protection sector: Croatian Agency for Environment and Nature Water management sector: Hrvatske vode (Croatian Waters) Forestry sector: Croatian forests County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) Hydro power plant owners/operators: HEP group (Hrvat-
<ul style="list-style-type: none"> Encourage and implement cooperation between sectors (integrative planning) on a regional and transboundary level. 	<ul style="list-style-type: none"> This helps to increase the understanding of everybody's needs, mutual respect, trust and efficiency. Sectors are for example nature conservation, agriculture, forestry, water management, etc. 	

⁵² Done within LIFE projects

	<ul style="list-style-type: none"> • Škola elektroprivreda) • Counties: Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County – spatial planning department and County representatives • Communities • Landowners 	
1.2 Aim: Natural, free-flowing Drava within a well-connected active floodplain.		
Related objectives of the TCP:		
-		
Related sub-objectives of the TCP:		
<ul style="list-style-type: none"> • In consultation with all relevant stakeholders and institutions, the rivers can move freely between the dykes or within the natural terraces. • The longitudinal connectivity of the rivers is restored; no new hydropower plants will interrupt free flow. • A compensation program for private land, which is affected by river restoration measures, exists. • In sections of the river without legally built buildings or other main infrastructure like bridges, the waterbody can change its bed freely. • Flood protection of existing legal buildings or major infrastructure is done in the ecologically most sensitive way. • Oxbows are neither cleaned nor spilled. 		
Strategies	Background	Addressees
<ul style="list-style-type: none"> • Implement EU Water Framework Directive and EU Habitats Directive. 	<ul style="list-style-type: none"> • Both directives contain aims and regulations concerning surface and groundwater, species and habitats, which help to reach a natural and free-flowing river dynamic. 	<ul style="list-style-type: none"> • Croatian Government at all levels (especially Ministry of Environment and Energetics)

<ul style="list-style-type: none"> Continue and extend the already successful transboundary cooperation in comprehensive river basin management. 	<ul style="list-style-type: none"> A cooperation between stakeholders and authorities of different sectors on national and trans-boundary level helps increase the understanding of everybody's needs, mutual respect, trust and efficiency. E.g. cooperation between nature conservation, agriculture, forestry, water management, etc. 	<ul style="list-style-type: none"> Hrvatske vode (Croatian Waters) County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) HPP operators and owners: HEP Group (Hrvatska elektroprivreda) Counties: Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County – spatial planning department and County representatives Communities
<ul style="list-style-type: none"> Strategy Strategy for building of new HPPs <p>Position of nature conservation stakeholders: No new hydropower dams in the free-flowing section of the Drava.</p> <p>Position of Hrvatske vode: Building/not building new hydropower dams to comply with the Croatian Government's decisions and laws in force (especially National Strategy for Energy Development).</p>	<ul style="list-style-type: none"> Hydropower plants can have big impacts on the river dynamics and ecosystem (e.g. change of water runoff, sediment transport, etc.). 	<ul style="list-style-type: none"> A floodplain with no or only few constructions can develop and function in a more natural way.
<p>Construction of any new river training structures within the river and its active floodplain is in line with the Drava River Restoration Concept* and is restricted to the purpose of protection of main infrastructure such as dykes, bridges, roads, railways, power lines or settlements.</p>	<ul style="list-style-type: none"> For any new project involving building new structures a nature and environment impact assessment is made. 	<ul style="list-style-type: none"> This avoids or minimises nature impacts in advance, especially where longer river sections are affected (e.g. sediment transportation, waterflow, etc.). A wider floodplain gives the Drava back its former course and dynamics. Habitats, for

	<p>example floodplain forests, are dependent of floods and therefore could be connected to the river again.</p> <ul style="list-style-type: none"> Purchase privately owned land or implement compensation measures for restoration on private land. 	<ul style="list-style-type: none"> For doing projects or measures in context of nature protection, it would be easier to realise them on state owned land compared to private owned land. E.g. find (research) and buy or trade (private or state owned) land to compensate land which is directly affected by the river. Find “Buy and Trade Agency” for agricultural land on local level (PIs, NGOs). 	<ul style="list-style-type: none"> Take the potential of river revitalisation into consideration. Evaluate and implement revitalisations if possible. 	<ul style="list-style-type: none"> Revitalisations of the Drava will increase naturalness and therefore contributes to the preservation and development of a natural ecosystem along the Drava. The evaluation of revitalisation measures is important to guarantee their functionality. Revitalisation measures contribute to the preservation and development of a natural ecosystem along the Drava. 	<ul style="list-style-type: none"> Remove embankments and other river training structures and remove or relocate dykes to enlarge the active floodplain area where possible (without raising the risk of flood damage for settlement areas or main infrastructures). 	<ul style="list-style-type: none"> By doing so the natural flow and course, side erosion, etc. as well as the ecosystem of the river Drava and its connected land would exist and develop in a more natural way. A wider floodplain gives the Drava back its former course and dynamics. It offers more
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	<p>retention area and therefore has flood protection effects for downstream areas, including villages.</p> <ul style="list-style-type: none"> Habitats, for example floodplain forests, are dependent on floods and therefore could be connected to the river again. 	
<ul style="list-style-type: none"> Initiate channels and connect side arms to restore the former natural course of the Drava including its floodplain and extend floodplains in areas with dikes. 	<ul style="list-style-type: none"> By doing so a more natural situation of the river Drava and its connected ecosystem can be achieved. The sidearms would be more connected to the natural flows of the Drava throughout the year and therefore natural habitats can be restored. 	
<ul style="list-style-type: none"> Waterbody maintenance is minimised as much as possible. 	<ul style="list-style-type: none"> Waterbodies are not managed if possible. Maintenance work is reduced to sections where direct threats for people and infrastructure are present (e.g. near towns such as Varaždin, Osijek, Barcs etc.). Controlled degradation/no further maintenance of existing bank protections in situations where rip-rap mainly protects intensive agricultural fields but no settlements or infrastructure are endangered. 	

1.3 Aim: People living along the river Drava and their assets are protected from floods. (TCP)										
Related objectives of the TCP:										
-	<p>Related sub-objectives of the TCP:</p> <ul style="list-style-type: none"> • Passive flood protection by enlarging the active floodplain is promoted and implemented. • Flood protection measures are constructed in a nature friendly way, making use of the synergies between flood protection and nature protection. 									
	<table border="1"> <thead> <tr> <th>Strategies</th><th>Background</th><th>Addressees</th></tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> • Take the synergies of biodiversity conservation and flood protection into account and promote and use natural solutions for flood protection (take into account synergies between the Floods Directive, Water Framework Directive and Habitats Directive). </td><td> <ul style="list-style-type: none"> • This allows to protect people and their assets from floods and to develop a near natural river system. Natural solutions of flood protection are for example the revitalisation of floodplain forests, widening the floodplain area, bank protection with biological structures, etc. • The goals of the EU Water Framework (achieving good qualitative and quantitative status of all water bodies) would be followed. </td><td> <ul style="list-style-type: none"> • Hrvatske vode (Croatian Waters) • County Public institutions for management of protected areas along Drava in Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County • Counties: Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County </td></tr> <tr> <td> <ul style="list-style-type: none"> • Assure people that their safety is respected and will not decrease with river restoration and other measures that are proposed. </td><td> <ul style="list-style-type: none"> • Essential flood protection infrastructure like dikes should therefore regularly be maintained and if necessary upgraded to ensure better safety. Upgrades should be done in a nature-friendly way (e.g. using groynes against erosion or shifting constructions out of the floodplain). • If an upgrade for better safety is necessary, </td><td> <ul style="list-style-type: none"> • Communities </td></tr> </tbody> </table>	Strategies	Background	Addressees	<ul style="list-style-type: none"> • Take the synergies of biodiversity conservation and flood protection into account and promote and use natural solutions for flood protection (take into account synergies between the Floods Directive, Water Framework Directive and Habitats Directive). 	<ul style="list-style-type: none"> • This allows to protect people and their assets from floods and to develop a near natural river system. Natural solutions of flood protection are for example the revitalisation of floodplain forests, widening the floodplain area, bank protection with biological structures, etc. • The goals of the EU Water Framework (achieving good qualitative and quantitative status of all water bodies) would be followed. 	<ul style="list-style-type: none"> • Hrvatske vode (Croatian Waters) • County Public institutions for management of protected areas along Drava in Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County • Counties: Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County 	<ul style="list-style-type: none"> • Assure people that their safety is respected and will not decrease with river restoration and other measures that are proposed. 	<ul style="list-style-type: none"> • Essential flood protection infrastructure like dikes should therefore regularly be maintained and if necessary upgraded to ensure better safety. Upgrades should be done in a nature-friendly way (e.g. using groynes against erosion or shifting constructions out of the floodplain). • If an upgrade for better safety is necessary, 	<ul style="list-style-type: none"> • Communities
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	<p>synergies with biodiversity and river dynamics should be taken into consideration.</p>	
1.4 Aim: The groundwater sources provided by the river and floodplains are abundant enough and kept clean to ensure sustainable and healthy drinking water sources. (TCP)		
Related objectives of the TCP:		
-	<p>Related sub-objectives of the TCP:</p> <ul style="list-style-type: none"> • The local population benefits from sustainable and clean drinking water in a sufficient quantity. • The ground water sources are not affected by pollution. • The hydrological exchange between river and floodplain is maintained and improved. 	
Strategies	Background	Addressees
<ul style="list-style-type: none"> • Ensure natural self-purification and recharge capacity of groundwater through river restoration. 	<ul style="list-style-type: none"> • The natural dynamics of a river ecosystem is important for the self-purification and recharge capacity of groundwater (e.g. dynamics, infiltration, oxygen enrichment, etc.). This can be increased or supported by river restoration. • A continuous monitoring of the groundwater (quantity and quality, level) helps identify whether further measures are needed. 	<ul style="list-style-type: none"> • County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) • Counties: Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County
<ul style="list-style-type: none"> • Improve and promote the quality of surface and groundwater through elimination of point and non-point pollution sources. 	<ul style="list-style-type: none"> • A better water quality contributes to a healthier life for humans and wildlife and follows the intentions of the EU Water Framework Directive. 	<ul style="list-style-type: none"> • Communities • Local farmers

<ul style="list-style-type: none"> Stop water use or extraction for other uses than providing drinking water in case of significant decreases in the water level. Education for local people on the issues concerning water quality. 	<ul style="list-style-type: none"> This helps to keep important water quantities within the ecosystem of the river. This helps to raise the understanding of the ecosystem of the river and its closely related surroundings and therefore reduce negative impacts. 	<ul style="list-style-type: none"> Local people Major local industry / plants
1.5 Aim: Existing hydro power plants are operating in a way that their negative impacts on a dynamic river corridor are mitigated as much as possible. (TCP)		
Related objectives of the TCP: <ul style="list-style-type: none"> - Related sub-objectives of the TCP: <ul style="list-style-type: none"> The operation of existing hydropower plants, including the dotation of the residual flow stretch, is adjusted to the regulations specified in the Water Framework Directive.. 		
Strategies	Background	Addressees
<ul style="list-style-type: none"> Control whether the regulations specified in the Water Framework Directive are followed. Implement a financial and practical mechanism that encourages HPP operators and owners to operate HPPs in a way that mitigates their negative impacts on the dynamic river corridor as much as possible. 	<ul style="list-style-type: none"> The directive contains aims and regulations which help to reach a natural and free-flowing river dynamic. As hydropower plants can have big impacts on the river dynamics and ecosystem, changes of water runoff or sediment management would help to reduce those impacts. 	<ul style="list-style-type: none"> Bilateral water management commissions (Croatia-Hungary, Serbia-Croatia, etc.) Ministry of Environment and Energy Water management: Hrvatske vode

<ul style="list-style-type: none"> Strategy for ensuring natural flow dynamic in the free-flowing section of the Drava <p>Position of Nature Conservation: Adapt the operation of last Drava dam D. Dubrava to allow natural flow dynamic downstream. Stop hydropoeaking.</p> <p>Position of Hrvatske vode: Adapt the operation of last existing or planed downstream Drava dam according o National Strategy, to allow dynamic flow downstream</p>	<ul style="list-style-type: none"> Hydropoeaking has a big influence on the natural flow of the Drava (mainly in the upper parts of the free-flowing section) and therefore on the ecosystem and aquatic wildlife. Fish, for instance, are overstrained with rapidly occurring and artificial fluctuations of water levels. Another negative affect of hydropoeaking is sediment deposition on gravel banks (clogging), which affect the habitats of different animals, especially rheophilic fish species. Minimizing hydropoeaking effects would lead to a more natural development and conditions of the ecosystem of the Drava (see above). County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) HPP operators and owners: HEP Group (Hrvatska elektroprivreda)
<ul style="list-style-type: none"> Strategy for managing flow levels in residual flow stretches <p>Position of nature conservation stakeholders: The minimum flow should be increased in residual flow stretches ("Stara Drava") and a flow mimicking natural hydrological cycle enabled.</p> <p>Position of Hrvatske vode: Flow levels defined in work permits and conditions according to Croatian law must be complied with.</p>	<ul style="list-style-type: none"> With a higher water flow, the natural development and conditions of the ecosystem of the Drava can be restored and improved (see above). The Water Framework Directive describes steps to reach the common goal to achieve good qualitative and quantitative status of all water bodies.

<ul style="list-style-type: none"> • Adapt sediment management in reservoirs along the Drava to avoid negative ecological impact in free-flowing downstream sections, including floodplains. 	<ul style="list-style-type: none"> • The clouding of water, as a result of the flushing of the reservoir, can affect fish populations. • The blocking of the natural flow of the river diminishes gravel transport and causes a lack of sediments downstream. This leads to riverbed deepening.
<ul style="list-style-type: none"> • Develop and implement sediment management plan for the river Drava (including extraction of sediments upstream of existing dams and their transport to areas downstream of HPPs, especially sediment deficit areas in Croatia). 	<ul style="list-style-type: none"> • A management plan supports to regulate and maintain a natural sediment amount and transport within the river system.

1.6 Aim: Sediments are kept within the river ecosystem and their transport takes place in a natural way.		
Related objectives of the TCP:	<ul style="list-style-type: none"> - The sediment transport of the rivers Mura, Drava and Danube within the TBR area takes place in a natural way. 	
Related sub-objectives of the TCP:	<ul style="list-style-type: none"> ▪ The sediment balance ensures the continuous creation of natural habitats. ▪ The connection between the river and the active floodplain remains because riverbed deepening is stopped due to sufficient sediment transport. 	
Strategies	Background	Addressees
<ul style="list-style-type: none"> • Improve enforcement of laws (in particular inspection and execution) against illegal exploitation of gravel and sand from the river system. 	<ul style="list-style-type: none"> • The extraction of sediments (gravel and sand) from the river system leads to a deficit within the ecosystem of the river Drava. This can result in river bed deepening, which in turn leads to disconnection of the river with side arms, falling groundwater level in floodplain forests and less water availability for river connected habitat types and species.. If necessary, e.g. for restoration actions, gravel and sand should be not removed from the Drava river system. 	<ul style="list-style-type: none"> • Ministry of Economy (Directorate for Energy and Mining) Mining • Water management: Hrvatske vode • HPP operators and owners: HEP Group (Hrvatska elektroprivreda)
<ul style="list-style-type: none"> • Extraction of sediments from the river system should not be allowed and the prohibition incorporated into national water and nature protection legislation. 	<ul style="list-style-type: none"> • For example the removal of sediments from one site of a hydropower plant's dam to the other is acceptable, but not the extraction out of the river system. Extracting sediments out of the river system can influence the river and its ecosystem downstream as described above. 	

	<ul style="list-style-type: none"> • Keep sediments extracted by restoration measures within the river system.
	<ul style="list-style-type: none"> • Remobilisation of lateral erosion by river restoration where possible (removal of embankments, outward shifting/reallocation of dykes, reconnecting sidearms, etc.). • This contributes to a natural sediment amount and transport within the river system.
	<ul style="list-style-type: none"> • Implement a system of gravel transport from upstream sections to downstream (after HPPs). • HPP block the natural sediment transportation within the river system. This obstacle can be overcome if missing sediments are located from upstream to downstream sections.

1.7 Aim: The impacts of currently existing international navigation routes on nature are decreased and mitigated as much as possible. (TCP)			
Related objectives of the TCP: <ul style="list-style-type: none"> - 			
Related sub-objectives of the TCP: <ul style="list-style-type: none"> • The classification of the navigation routes on the Drava River is adjusted to the actual navigation conditions and use. 	<p>Strategies</p> <ul style="list-style-type: none"> • Evaluation of the actual use and classifications of navigation routes and their impact on the ecosystem at the Drava; review and adjust the classification of the navigation route on the Drava to the actual navigation status and use. 	<p>Background</p> <ul style="list-style-type: none"> • If navigation routes are not in use anymore, are not classified appropriately or run counter to nature conservations interests, actions to improve the current situation should be taken into consideration. This would help to decrease existing negative impacts on river ecosystems. 	<p>Addressees</p> <ul style="list-style-type: none"> • Croatian Government • Agency for Inland Waterways • Shipping companies
<p>Position of nature conservation: Adjust the navigation route's classification upstream of Osijek according to the current needs.</p> <p>Position of Hrvatske vode: Maintain existing navigation route's classification defined in Croatian and Hungarian International Agreement and continue developing new route's in touristic purposes.</p>	<ul style="list-style-type: none"> • As the river section between Osijek and the Dubrava HPP is natural or near natural, the impact on the Drava can be reduced 		

1.8 Aim: Fishers and Protected Area Managers work together to ensure sustainable fishery practices. (TCP)

Related objectives of the TCP:

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- Related sub-objectives of the TCP:**

 - All legal obligations and restrictions are followed by all fishers, and strongly supported by the fishery associations.
 - Ethical standards of fishing practices do not disturb any other species living in the dynamic river corridor in any sensitive season and place.

Strategies	Background	Addressees
<ul style="list-style-type: none"> • Include nature conservation restrictions in a fishery management plan. All fishery management plans should pass a nature impact assessment procedure prior to adoption. 	<ul style="list-style-type: none"> • This helps reduce negative impacts on fish populations and can improve the health of fish populations. E.g. fishing associations should be allowed to allocate only a limited number of fishing permits (or designate seasons, no-go areas or no-extraction areas etc.). • Protected areas management has to accept the management plan. For approval processes, the nature protection institution has to be involved. 	<ul style="list-style-type: none"> • County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) • Owners of fishing rights • Fishing association • Counties: Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County
<ul style="list-style-type: none"> • Actively promote nature-friendly behaviour of fishermen and improve their education to let them act in a more nature- or species-oriented way. 	<ul style="list-style-type: none"> • This helps to raise the understanding of nature conservation's needs and reduce negative impacts on fish populations (e.g. fishing practices tolerate fish-eating animals). • The strategy encourages fishers to be proud of their knowledge and their additional learnings. 	<ul style="list-style-type: none"> • Communities

<ul style="list-style-type: none"> Follow ethical standards to ensure the welfare of protected fish species. Conduct annual fish monitoring in order to define proper fishing quotas. Elaborate and implement measures for lowering the extent of illegal fishing. Promote catch and release fishing (sport fishing). 	<ul style="list-style-type: none"> This means that fishermen do not use prohibited methods of fishing. This helps to reduce negative impacts on fish populations. <ul style="list-style-type: none"> For example discussions, round tables or working groups can be organised. This helps to reduce negative impacts on fish populations and can improve the health of fish populations. This can improve the health of fish populations and should line up with considerations of animal welfare.
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Strategies	Background	Addressees
<ul style="list-style-type: none"> Define sanctuaries or no-go areas at main fish spawning areas, where no disturbance is caused by people (no fishing, no driving, etc.). 	<ul style="list-style-type: none"> Sanctuaries and no-go areas for fishing can reduce the negative impacts on aquatic wildlife caused by fishing. Important spawning sites for various native species can be protected by restricting fishing in this area. 	<ul style="list-style-type: none"> County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County)

<ul style="list-style-type: none"> Define legal fishing spots including small shelters for each village. 	<ul style="list-style-type: none"> This helps to regulate fishery and to minimise illegal fishery and negative impacts on fish populations. 	<ul style="list-style-type: none"> Owners of fishing rights Fishing association Counties: Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County Communities
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1.10 Aim: Fishery provides a great nature experience with as little infrastructure as possible. (TCP)

Related objectives of the TCP:

- The fish ponds within the TBR MDD are operating according to international nature protection standards.

Related sub-objectives of the TCP:

- All existing fishing infrastructure is legal starting from the moment of construction.
- Fishing infrastructure along the river is reduced to a small number of fishing spots with minor infrastructure (table, possibly small hut) per local village, and which are shared among the inhabitants of the villages.
- The fish pond management practices actively support the aims of the TBR MDD regarding healthy soils and water.
- Self-sustaining native fish populations can grow in the fish ponds and can be reintroduced into the rivers.
- Fish ponds are breeding habitats for all kinds of birds and other wetland related animals & plants (amphibians, reptiles, dragonflies etc.).
- A functioning market for native fish species makes breeding native fish in fishponds profitable for the local population, as well as for its sale in markets and restaurants.

Strategies	Background	Addressees
<ul style="list-style-type: none"> Ensure that all abandoned or illegal fishing infrastructure is removed. 	<ul style="list-style-type: none"> This helps to regulate and control fishing activities, which would lead to a nature-friendly fishing behaviour. 	<ul style="list-style-type: none"> County Public Institutions for management of protected areas along Drava (Varaždin, Međimur-

<ul style="list-style-type: none"> • Establish and operate fishponds in a nature-friendly way. • Improve the education for fishermen in a more nature- or species-oriented way. • No restocking of the fishing areas with non-native fish species • Promote buying native fish. 	<ul style="list-style-type: none"> • Ecological operation ensures the health of the ecosystem in the Natura 2000 area. • This increases the knowledge about species as well as nature-friendly methods of fishing and for building and operation of fishponds etc. • If the selling of native fish is profitable, the management of native fish species will become more important. • Raise the awareness of local people and tourists concerning buying local or regional fish. • Tourists and locals alike are responsible for sustainable fishing. 	<ul style="list-style-type: none"> • Owners of fishing rights • Fishing association • Counties: Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County • Communities
<ul style="list-style-type: none"> • Promote sustainable fishing tourism. • Stop the conversion of existing oxbows into sport angling sites. 	<ul style="list-style-type: none"> • Usually the conversion of oxbows into sport angling sites is associated with the removal of bank vegetation, dredging, restocking with desirable species etc. 	

4.2 Forestry / agriculture / hunting

Goal: Forestry, agriculture and hunting are carried out in the most nature-friendly way possible.

2.1 Aim: Forestry and forest management plans are in line with nature protection.

Related objectives of the TCP:

- Forestry companies and forest owners in the TBR are renowned Europe-wide for their nature-friendly forest use.

Related sub-objectives of the TCP:

Strategies	Background	Addressees
<ul style="list-style-type: none"> In areas of non-intervention no timber harvesting takes place. Within the used parts, timber tendering and harvesting practices replicate natural dynamics. Forestry companies within the TBR are aware of the market advantages of sustainably produced timber and see the benefit of using appropriate labelling and certifications. The certifications are the minimum standard for sustainable timber production. 	<ul style="list-style-type: none"> Harmonise forestry management plans and methods with those of the Natura 2000 management strategy and existing management plans. No more planting of non-native tree species and intensively managed forests (plantations) 	<ul style="list-style-type: none"> Extensive forestry management allows to increase the species and age variety, and to establish a more natural forest. Conflicts between forestry and nature conservation can be prevented. Harmonisation would ensure that forestry management and methods are in line with or not contradictory to Natura 2000 management. A less intensive forestry management includes ceasing to plant non-native species and the conversion of existing plantations into semi-natural, extensively used forests with continuous forest cover and a semi-natural mix of native tree. Especially for conversion itself, EU funds can be used.

<ul style="list-style-type: none"> • Develop an agreement on priorities between forestry and nature protection concerning forest management. 	<ul style="list-style-type: none"> • Such an agreement helps increase the understanding of nature conservation needs concerning forestry management and would contribute to achieve a more extensive forestry management. <ul style="list-style-type: none"> • For instance, PA managers and conservations participate in the development of forest management plans.
<ul style="list-style-type: none"> • All forest management plans must pass a nature impact assessment. 	<ul style="list-style-type: none"> • This would ensure that forest management plans and methods don't have a significant negative impact on forests from a nature conservation perspective. An amendment of the Nature Conservation Act including this aspect is being developed.
<ul style="list-style-type: none"> • Encourage communication between forestry sector and nature protection sector (e.g. PA managers) and involve the forestry sector in nature protection projects. 	<ul style="list-style-type: none"> • This helps increase the knowledge and understanding of nature conservations needs as well as mutual respect and trust between both sectors. • Possible measures are e.g. annual or semi-annual meetings or workshops discussing changes in forestry infrastructure.
<ul style="list-style-type: none"> • Find ecological yet profitable forms of forestry to stop dependence on forest clearcutting alone. 	<ul style="list-style-type: none"> • This would help decrease the demand for clearcutting, which has serious impacts on the ecosystem of woods, and the need of resources. <ul style="list-style-type: none"> • E.g. develop new techniques to replace the usage of pesticides (business as usual), which harms the ecosystem.

	<ul style="list-style-type: none"> The state could help forestry companies to produce their products in a nature-friendly way
<ul style="list-style-type: none"> Define a maximum percentage of a forest as clear-cutting area and continually reduce the allowed size of clear-cuts. 	<ul style="list-style-type: none"> Large-scale clear-cuts have a strong impact on the ecosystem of a forest, for example loss of habitats for a long period, extraction of nutrients, faster mineralisation of humus, etc. This should be done based on negotiations and contracts between forest management and nature protection authorities in a continuous process.
<ul style="list-style-type: none"> Adopt Natura 2000 protection status on the same level of importance as national parks, nature parks, etc. by law and in practice. Increase number of inspection activities to ensure respect for the existing laws. 	<ul style="list-style-type: none"> This would help accomplish aims of Natura 2000 more easily and to conserve and develop natural and near-natural forests. This would ensure that existing laws and regulations are followed.
2.2 Aim: The forests within the TBR offer a high habitat quality for all naturally occurring species. (TCP)	

Related objectives of the TCP:

- The forests within the project area follow natural dynamics and show a natural tree species composition. (TCP)
- Within areas of no intervention, the forests develop naturally by dynamic processes and thus form the backbone of a transboundary floodplain forest corridor.
- Forests within the TBR offer high habitat quality for typical floodplain forest species.

Strategies	Background	Addressees
<ul style="list-style-type: none"> Timber forests show characteristics of semi natural forests, including: natural mix of tree species, mix of age groups and a high amount of dead wood. Forestry companies and forest owners in the TBR take a leading role in nature protection within the TBR. They are financially compensated or subsidised for their active nature protection work. In areas of non-intervention, natural rejuvenation (without human intervention or support) of floodplain forests works again thanks to large-scale restoration projects restoring the necessary hydrological and hydro morphological dynamics. Populations of invasive alien species have decreased by coordinated, nature-friendly actions. Replanting of native species in commercial forests is easier due to a functioning market for samplings of native species and increased market demand for the timber of native species. 	<ul style="list-style-type: none"> Elaborate compensation measures for forest owners willing to change their way of operation. Define indicator species and monitoring to harmonise measures related to them. 	<ul style="list-style-type: none"> Compensation measures help to reduce negative impacts on nature caused by different practices or activities that require investment or loss of income to be adapted. Indicator species are species which are very useful to describe and identify various aspects of an ecosystem, for example habitat types, changes, negative impacts or influences. Measures for indicator species correlate with the habitat connected to them. With the monitoring it is possible to check whether measures are functional and effective or if adaptations are needed.
		<ul style="list-style-type: none"> Ministry of Agriculture Forestry inspection (Ministry of Agriculture) Croatian forests (Hrvatske Šume) County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) Private owners of forests Responsible authorities for protected area's management

<ul style="list-style-type: none"> Support the natural growth and spread of indigenous riparian vegetation by concrete measures. 	<ul style="list-style-type: none"> These measures contribute to the conservation and development of a natural or near-natural ecosystem of the river Drava (e.g. indigenous plant species, neophyte removal, embankment removal, etc.). Remove alien species by nature-friendly actions (e.g. without the use of pesticides) 	<ul style="list-style-type: none"> Increase the habitat quality. <ul style="list-style-type: none"> This helps to increase the species variety. E.g. define the amount of dead wood for different forest types (corresponding to the varying intensity of forest use). Dead wood is a habitat for numerous species, for example birds, beetles, fungi or mosses. Or e.g. increase the number of old trees, bushes and other forest vegetation. This helps to increase the species variety, age variety and generally leads to a more natural forest. Increase the number and size of natural habitats. <ul style="list-style-type: none"> This supports the development of a natural or near natural ecosystem along the Drava and decreases non-natural or intensively used areas. No active management and economic use of gallery forests in the active floodplain. Gallery forests are indication of natural river systems. They are already priority Natura habitats (91E0). Therefore they should be left alone to develop naturally (including their possible destruction due to meandering) and they should not be further managed.
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Strategies	Background	Addressees
<ul style="list-style-type: none"> Create areas where no human intervention takes place. 	<p>ther managed and harvested. One way to protect them from management and harvesting is to declare them as specially protected (forest) reserves within N2000 area.</p> <ul style="list-style-type: none"> By doing so the activities of people can be steered away from sensitive habitats and therefore negative impacts on nature can be avoided. Additional control surfaces allow to compare the success of extensification. 	
<ul style="list-style-type: none"> Enhance natural rejuvenation by river restoration, bringing back natural pioneer habitats. 	<ul style="list-style-type: none"> With this a former and more near-natural state of the ecosystem along the river Draava can be reached. 	
2.3 Aim: The maintenance and use of road infrastructure respects sensitive habitats and seasons and is reduced to the minimum necessary. (TCP)	Related objectives of the TCP: <ul style="list-style-type: none"> - Related sub-objectives of the TCP: 	

<ul style="list-style-type: none"> Reduce the number and use of existing forestry roads within natural or near-natural forests. 	<ul style="list-style-type: none"> This reduces the blockings of the natural river flow and its run-off area and contributes to achieve a more natural forest. This can be done e.g. by removing existing roads from the channels, opening the channels by building bridges instead of roads (or, in exceptional cases, installing large pipes) or closing forestry roads in forests without intervention. 	<ul style="list-style-type: none"> Ministry of Agriculture Forestry inspection (Ministry of Agriculture) Croatian forests (Hrvatske šume) Responsible authorities for protected area's management County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) Private owners of forests
<ul style="list-style-type: none"> Find an agreement on limiting forestry work to periods/seasons when the soil is either dry or frozen. 	<ul style="list-style-type: none"> Driving on wet soil with heavy machinery can cause great damage to the forest soil. The above described agreement can be reached with cooperation and contracts between forest managers and nature protection authorities. Such an agreement is also important to limit forestry work during the main breeding/spawning season (usually from March to July period) for the biodiversity protection reasons. 	

2.4 Aim: Agricultural land use is in line with nature protection.	<p>Related objectives of the TCP:</p> <ul style="list-style-type: none"> • Agriculture in the TBR MDD supports the protection of natural resources, biodiversity and mosaic habitats. <p>Related sub-objectives of the TCP:</p> <ul style="list-style-type: none"> • The core area and buffer zone offer a valuable habitat mosaic of extensively managed meadows, forests, bushes as well as small-structured arable land managed in a nature-friendly way. • Local farmers are sensitised in extensive and nature-friendly farming. • Farmers manage their land with the awareness of the impact on soil and water. 		
Strategies	Background	Addressees	
<ul style="list-style-type: none"> • Purchase privately owned land or implement compensation measures for restoration on private land. 	<ul style="list-style-type: none"> • Projects or measures in context of nature protection and are easier to realise on state-owned land than on privately owned land. • E.g. find (research) and buy or trade (private or state owned) land to compensate land which is directly affected by the river. 	<ul style="list-style-type: none"> • Croatian Government (at all levels) • Nature protection sector: Ministry of Environment and Energy, Croatian Agency for Environment and Nature • Ministry of Agriculture • County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje) 	

<ul style="list-style-type: none"> Promote and encourage ecological/extensive farming in Natura 2000 areas. 	<ul style="list-style-type: none"> Conventional (= intensive) farming can have more negative effects on nature and wildlife compared to ecological (= extensive) farming. <ul style="list-style-type: none"> E.g. education of farmers and producers on nature-friendly agricultural measures by nature protection institutions. Involve ecological farmers into the educational programs. Use/improve economic instruments: Farmers could be encouraged to apply for subsidies for organic/ecological farming or contractual measures, support systems, local and regional sales cooperation. 	<ul style="list-style-type: none"> je, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) <ul style="list-style-type: none"> Local Farmers Water management sector: Hrvatske vode (Croatian Waters) Energy sector: HEP Group (Hrvatska elektroprivreda Network of ecological farmers/best-practice ecological farmers involvement from abroad (e.g. Slovenia, Austria)
<ul style="list-style-type: none"> Develop a proper zonation concerning Natura 2000 areas and arable land to avoid negative impacts on Natura 2000 areas. 	<ul style="list-style-type: none"> In cases existing problems or negative impacts on Natura 2000 areas can be solved by a proper zonation. 	<ul style="list-style-type: none"> This helps to raise awareness and knowledge concerning Natura 2000 and nature conservation and local people may also benefit in an economical way.
<ul style="list-style-type: none"> Encourage and promote branding of products coming from Natura 2000 areas. 	<ul style="list-style-type: none"> Promote and implement ecological flow and develop e-flow assessment (with its implementation at water stages). 	<ul style="list-style-type: none"> The concept of the flow regime is necessary for achieving the environmental objectives of an ecosystem (see definition in ⁵³

⁵³ Ecological flows (e-flows) can be defined as the flow regime necessary for achieving the environmental objectives of an ecosystem. The concept of ecological flows is implicit in the European Water Framework Directive and can be defined as the hydrological regime necessary to achieve the values specified for the Biological Quality Elements to be classified as Good Status. In the context of the WFD, ecological flows can be also defined as the hydrological regime necessary to achieve the environmental objectives of the water bodies. Ecological flows are significant for the conservation of water-dependent habitats and species, and therefore must be adequate to meet "favourable conservation status".

	<ul style="list-style-type: none"> footnote).
<ul style="list-style-type: none"> Implement regulations for using chemicals in Natura 2000 areas and support the change towards nature-friendly agriculture. 	<ul style="list-style-type: none"> Some chemicals can have relevant negative impacts on the ecosystem, which could be avoided by using organic products (fertilisers etc.). E.g. implement a system for stricter control of the allowed amount of the usage of pesticides and fertilisers, which have negative impacts on the ecosystem or ban the use of fertilisers, pesticides and herbicides.
<ul style="list-style-type: none"> The area of intensively managed agricultural land is decreasing and being converted to extensive agriculture land. 	<ul style="list-style-type: none"> Extensively used agricultural land usually has a higher species variety compared to intensively used agricultural land and therefore has more value for nature protection.
<p style="text-align: center;">2.5 Aim: Meadows are managed nature friendly and extensively. (TCP)</p> <p>Related objectives of the TCP:</p> <p>-</p> <p>Related sub-objectives of the TCP:</p>	<ul style="list-style-type: none"> Local farmers and agriculture companies play a key role in the preservation of biodiversity in the TBR MDD through extensive management of their meadows. The agricultural use within the core area is limited to extensive use of valuable meadows, where the grazing and mowing regime will be defined together with the PA managers. Meadows with rough vegetation are kept open and the number of meadows can rise by reducing the number of crop fields in the buffer area.

Strategies	Background	Addressees
<ul style="list-style-type: none"> • Use or set up finance programs to enable farmers to do extensive farming (subsidies, EU projects, Natura 2000 etc.). 	<ul style="list-style-type: none"> • This helps farms to be economically less dependent on intensive farming measures. Extensive farming could refer to pasturing (grazing would also serve as a habitat management method, in particular for invasive species eradication) or practices of mowing should be modified to incorporate biodiversity protection (e.g. late mowing, etc.). 	<ul style="list-style-type: none"> • Nature protection sector: Ministry of Environment and Energy, Croatian Agency for Environment and Nature County Public Institutions for management of protected areas along Drava (Varaždin, Medimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) • Ministry of Agriculture • Local Farmers • Landowners
<ul style="list-style-type: none"> • Raise awareness and knowledge about extensive management practices. 	<ul style="list-style-type: none"> • This helps promote and implement extensive farming. • E.g. local farmers can be informed through training, workshops, information sharing etc. 	
<ul style="list-style-type: none"> • Establish management measures in cooperation between farmers and PA managers. 	<ul style="list-style-type: none"> • This helps to increase the knowledge and understanding of nature conservation's needs as well as mutual respect and trust between both sectors. 	

<ul style="list-style-type: none"> Manage meadows in an extensive way. 	<ul style="list-style-type: none"> Extensively managed meadows have a higher species variety and contribute to a more natural ecosystem of the river Drava. Establish a better support system for extensive agricultural land use and management similar to that available for conventional agricultural land use. Remove the cut grass in poor grassland or rough pasture to keep the meadow nutrient-poor. 	<ul style="list-style-type: none"> Meadows and woods have a greater species variety than arable fields, have a greater habitat value and contribute to a more natural ecosystem of the river Drava. E.g. by land purchase, financial or in-kind compensation measures, use of EU funds, etc.)
	<ul style="list-style-type: none"> Within the active floodplain, convert existing fields into meadows or woods wherever possible and promote the replacement of arable land by meadows (including grazing and mowing). 	<ul style="list-style-type: none"> With the conversion from meadows or forests into arable land a great species variety of flora and fauna is lost. Prevention could be implemented e.g. by changing land-use plans, including necessary compensation measures, setting up contracts with land owners or the (further) implementation of Natura2000 regulations etc.

2.6 Aim: Hunting infrastructure and methods are in line with nature protection.

Related objectives of the TCP:

- The populations of hunted species are self-sustaining, adjusted to their natural habitats, and regulated to a natural capacity of the area.
- Hunting infrastructure in the TBR respects the needs of natural habitats, species and their migration routes.
- Responsible hunting within the TBR MDD is important.

Related sub-objectives of the TCP:

- The regulation of the population size is determined by the natural occurrence of food, habitat size, predators and hunters.
- Migration barriers due to hunting infrastructure within the core area and buffer zone are minimised.
- The TBR MDD is known as a sustainable and natural area also outside the TBR MDD.
- The local economy benefits from high-quality hunting tourism based on an intensive nature experience instead of trophy hunting.

Strategies	Background	Addressees
• Harmonise hunting law with nature protection law.	<ul style="list-style-type: none"> • This helps to regulate or reduce overlaps between both laws and to avoid conflicts between hunting and nature protection. 	<ul style="list-style-type: none"> • County Public Institutions for management of protected areas along the Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County)
• Harmonise hunting law with nature protection law, hunting associations and TBR conservation goals.	<ul style="list-style-type: none"> • This helps to regulate or reduce contradictory overlaps between both sectors. 	<ul style="list-style-type: none"> • Hunters
• Contents of the Natura 2000 framework and aims are part of lectures which must be attended to receive hunting permits.	<ul style="list-style-type: none"> • This helps to increase the knowledge and understanding of nature conservations needs and Natura 2000 strategy. 	<ul style="list-style-type: none"> • Hunting associations

<ul style="list-style-type: none"> Hunting management plans must pass a nature impact assessment and harmonise management principles in hunting grounds with the aims of nature conservation. 	<ul style="list-style-type: none"> This would ensure that hunting management plans and methods do not have a significant negative impact on management plans, measures or interests of nature conservation. An amendment of the Nature Conservation Act including this aspect is in progress. 	<ul style="list-style-type: none"> Responsible authorities for a protected area's management
<ul style="list-style-type: none"> Animal populations must be kept to the natural capacity of the habitat or area. Stop supplemental feeding of game animals (particularly deer, wild boar and roe deer). 	<ul style="list-style-type: none"> This helps avoid damage or the suppression of other species. E.g. encourage nature protection authorities and hunting authorities/associations to work towards the reduction of feeding of hunted animals. 	
<ul style="list-style-type: none"> Ban lead ammunition in the project area. Define no-hunting areas. 	<ul style="list-style-type: none"> Lead ammunition can harm animals eating it. No-hunting areas can reduce the negative impacts on wildlife caused by hunting. E.g. a minimum requirement could be that core zones (or vodno dobro in Croatia) are defined as a no-hunting area. 	

<ul style="list-style-type: none"> Establish a legal network of rangers to control the compliance with current regulations and the controlling of measures and provide enough staff for it. 	<ul style="list-style-type: none"> Compliance with current regulations (e.g. hunting, forestry, fishing, etc.) can be controlled and makes people more aware of existing regulations. Monitoring is needed to identify non-functional or insufficient measures and to adapt them if needed. <ul style="list-style-type: none"> E.g. offer training for policemen, fish and game wardens, prosecutors, judges, etc. to improve control and punish illegal actions. Promote the use of animal friendly fences where the construction of fences cannot be avoided. <ul style="list-style-type: none"> E.g. smooth wire, woven wire, post and pole or buck and rail etc. help to avoid harming animals. Active suppression of illegal hunting in place within the project area.
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2.7 Aim: Hunters are active supporters of the protection of the ecosystem and its species. (TCP)		
Related objectives of the TCP:		
-	Related sub-objectives of the TCP: <ul style="list-style-type: none"> • Hunting practices in the TBR MDD do not have any side-effects on non-hunted species. • There is no more illegal hunting in the TBR. • Hunters are active and highly respected contributors to the monitoring of species, habitats, and human actions especially within the TBR MDD. 	
Strategies	Background	Addressees
<ul style="list-style-type: none"> • Provide education to hunters for a proper monitoring of species, habitats and human actions. 	<ul style="list-style-type: none"> • This would help educate hunters to recognise animal species and on the ecological importance of strictly protected species in order to reduce hunting (e.g. raptors). • Hunters already have knowledge about wildlife and could help doing research and monitoring of species and habitats. • E.g. lobbying for more funds for monitoring staff. 	<ul style="list-style-type: none"> • County Public Institutions for management of protected areas along the Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) • Hunters • Hunting associations • Responsible authorities for protected area's management
<ul style="list-style-type: none"> • Increased intensity of active measures against illegal killing. 	<ul style="list-style-type: none"> • This would help to avoid harming (protected) species and to have a controlled number of populations. • E.g. lobbying for more funds for controlling and court staff. 	

4.3 Visitors / tourism / leisure and recreation / education

Goal: Leisure and recreational uses by locals, visitors and tourists do not harm the wildlife and habitats within the project area.

3.1 Aim: A visitor guidance / action plan is in place.

Related objectives of the TCP:

- A visitor management plan that respects nature is implemented for the whole TBR.
- Local people and tourists have sufficient attractive, nature-friendly, well-known and highly accepted opportunities to access and enjoy the river system.

Related sub-objectives of the TCP:

- Visitors (local people and tourists) are seen and treated as a part of the TBR and protected areas including the active floodplain.
- Different educational and recreational offers are effectively steering visitors to less sensitive places that still offer impressive and positive nature experiences.
- Local stakeholders like hunters, fishermen or farmers respect nature and its needs.
- The river and floodplain are important sources of local identity and pride.
- The number of visitors is effectively reduced in sensitive areas and seasons by well-accepted access points to the river.

Strategies	Background	Addressees
<ul style="list-style-type: none"> • Develop and implement a visitor guidance/action plan (within management plans of PIs (Public institutions)) considering the existing uses within the area. 	<ul style="list-style-type: none"> • With a visitor/action plan it is possible to steer people away from sensitive habitats and therefore to avoid negative impacts on wildlife. At the same time visiting of interesting and impressive natural places is possible, so that the education goals can be fulfilled as well and people identify them- 	<ul style="list-style-type: none"> • County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) • Responsible authorities for pro-

	<p>selves with the free-flowing and natural river.</p> <p>A visitor/action plan can include:</p> <ul style="list-style-type: none"> • Regulation of max. numbers of visitors, times and zones of visiting. • Facilities (e.g. paths, resting points, information boards, etc.) and its related activities (e.g. swimming, birdwatching, biking, hiking, kayaking/boating) are planned and managed so that they do not disturb wild-life. • Marketing and coordination of touristic and recreational activities across bilateral borders along the Drava. 	<p>tected area's management</p> <ul style="list-style-type: none"> • Tourism sector: Tourism boards of Counties along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) • NGOs for nature conservation • Private companies
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3.2 Aim: Nature education is a main pillar within the project area and local people as well as visitors know about and respect Natura 2000 areas.		
Related objectives of the TCP:		
<ul style="list-style-type: none"> RIVER`SCOOLs are the main hubs in a well-visited environmental education network spanning across the whole TBR. 		
Related sub-objectives of the TCP: <ul style="list-style-type: none"> The eight RIVER`SCOOLs are established, well-functioning and well-visited, and their offer is enlarged continuously. A strong cooperation between PAs, tourism operators, landowners, NGOs, nature protection institutions, and educational institutions is established. All offered leisure activities include educational components of different scope, where visitors can learn about the TBR, its nature and its protection. 		
Strategies	Background	Addressees
<ul style="list-style-type: none"> Raise awareness and knowledge of local people and visitors concerning Natura 2000. 	<ul style="list-style-type: none"> By increasing their awareness and knowledge concerning Natura 2000 and nature conservation, it is possible that locals and visitors better understand and respect nature conservation's intentions and measures. 	<ul style="list-style-type: none"> County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) Responsible authorities for protected area's management Tourist Information Centres and Tourism boards of Counties along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) Communities
<ul style="list-style-type: none"> Adapt the education of school children. 	<ul style="list-style-type: none"> E.g. educate teachers = educate/inform multipliers (e.g. PI Međimurje county) more about nature, Natura 2000 and nature protection. Install info centre with different offers, for instance: "School in Nature", "Fieldwork for students", "Winter camp for scouts" (e.g. "Drava Story" of PI Virovitica-Podravina County). Develop specific info material for schools. 	

<ul style="list-style-type: none"> Creating new ways of informing people and promote public participation in the conservation and management of the flood plains of the river Drava. 	<ul style="list-style-type: none"> Develop specific info material for specific groups. <ul style="list-style-type: none"> E.g. Create/print info material (brochures, leaflets etc.). Use social media (Facebook, Instagram, etc.)/website. Create educational corners/info centres/study paths. Develop/implement volunteer programs (e.g. through NGO/PI cooperation) for concrete actions (cleaning river banks, removing invasive species, supporting amphibian migration (e.g. PI in Medimurje County) or restoring info boards (e.g. NP Kopački Rit) Information and education of local community about their rights and obligations (incentives, subsidies, etc.), highlight the positive sides/wins. Regular information of media and journalists about Natura 2000 issues. Capacity building and cooperation of/between public institutions and various stakeholders. 	<ul style="list-style-type: none"> Schools <ul style="list-style-type: none"> Farmers Media Rangers could help to spreads knowledge about nature, Natura 2000 and nature protection. <ul style="list-style-type: none"> E.g. Offer constant training of the guides and rangers (communication tools, keeping
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	up with trends, new know-how, models in tourism/visitor management, English language).	
• Sensitise local people and tourists on the reasons for temporary or permanent restrictions.	• This will help people to understand restrictions as a responsibility for protection of wildlife.	
• Encourage and promote branding of products coming from Natura 2000 areas.	• This will contribute to raise awareness and knowledge of local people and visitors concerning wildlife, Natura 2000 and nature conservation.	
3.3 Aim: Natura 2000 areas are free of illegally built infrastructure and existing uses are subject to clear rules.		
Related objectives of the TCP: -		
Strategies	Background	Addressees
• Existing infrastructure for recreational use is subject to clear rules and regular check-ups.	• Responsibilities for maintenance and control of the infrastructure for existing uses (biking, hiking, swimming, kayaking-canoeing, birdwatching, etc.) help to keep negative impacts on wildlife causes by recreational uses at a minimum.	<ul style="list-style-type: none"> • Ministry of Construction and Physical Planning • County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) • Responsible authorities for protected area's management
• Define zones (consider needs of sensitive habitats and species) within the project area, where building of houses, infrastructure and uses are allowed or forbidden – through cooperation with spatial planning.	• Areas and uses (e.g. canoeing/kayaking/education/bird watching, etc) are clearly delimited and subject to rules. This helps avoid construction and use of illegal infrastructure.	

<ul style="list-style-type: none"> • New infrastructure for recreational usage is subject to a clear authorisation process aligned with Natura 2000 management plans. 	<ul style="list-style-type: none"> • The present strategy, potential existing Natura 2000 management plans as well as land use categories and species protection areas are considered in the authorisation process for new infrastructure (such as bike road, camping sites, swimming areas or further site related to touristical usage). This helps avoid negative impacts on wildlife caused by recreational uses or reduce them to minimum (through forward looking planning). • Elaborate concept for handling illegally built infrastructure such as weekend houses or huts. 	<ul style="list-style-type: none"> • Land/house owners • Building Inspection • Illegally built infrastructure might be located within sensitive areas or habitats and therefore can harm wildlife. By eliminating and avoiding further addition of illegally built infrastructure it is possible to reduce or avoid such impacts. The management of illegally built infrastructure can include: <ul style="list-style-type: none"> • Setting up a ranger service (using the example of the PI in Medimurje county): <ul style="list-style-type: none"> ○ Rangers detect buildings, make a catalogue of illegal buildings and report to the relevant institutions (e.g. the building inspector, the Ministry of infrastructure, nature protection institutions, etc.). ○ Illegal buildings are removed or if ap-
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<ul style="list-style-type: none"> Raise awareness among local population requiring new infrastructure within Natura 2000 areas. 	<ul style="list-style-type: none"> Propriate they can be legalised through cooperation with spatial planning. This would help raise the understanding and knowledge concerning the Natura 2000 area and might avoid illegal buildings in the future. 				
<p>3.4 Aim: Stimulation of green tourism activities in Natura 2000 areas.</p> <p>Related objectives of the TCP:</p> <p>-</p>					
Strategies	<table border="1"> <thead> <tr> <th data-bbox="722 1089 778 1246">Background</th><th data-bbox="722 1246 778 1403">Addressees</th></tr> </thead> <tbody> <tr> <td data-bbox="778 1089 960 2077"> <ul style="list-style-type: none"> Stimulate and promote ecotourism and activities with the purpose of uniting conservation, communities and sustainable travel within the project area as well as in cross-border areas of the floodplains. </td><td data-bbox="960 1089 1325 2077"> <ul style="list-style-type: none"> Green tourism activities and ecotourism have a smaller impact on the wildlife compared to conventional tourism. It also contributes to raising awareness concerning wildlife, Natura 2000 and conservation. This could be done e.g. by Counties and municipalities organising festivals etc. or by creating campsites which are in line with nature protection, along the river. Regional development agencies could collect ideas for EU grants from locals. </td></tr> </tbody> </table>	Background	Addressees	<ul style="list-style-type: none"> Stimulate and promote ecotourism and activities with the purpose of uniting conservation, communities and sustainable travel within the project area as well as in cross-border areas of the floodplains. 	<ul style="list-style-type: none"> Green tourism activities and ecotourism have a smaller impact on the wildlife compared to conventional tourism. It also contributes to raising awareness concerning wildlife, Natura 2000 and conservation. This could be done e.g. by Counties and municipalities organising festivals etc. or by creating campsites which are in line with nature protection, along the river. Regional development agencies could collect ideas for EU grants from locals.
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4.4 Natural space / nature conservation / Natura 2000 / monitoring

Goal: The natural dynamic processes and a favourable conservation status for Natura 2000 species and habitats within the project area are improved, ensured and monitored.

4.1 Aim: A proper zonation within Natura 2000 sites including specific regulations, which are implemented and followed, exists.

Related objectives of the TCP:

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Strategies	Background	Addressees
<ul style="list-style-type: none"> • Develop a management plan by an integrative process with all stakeholders. 	<ul style="list-style-type: none"> • This allows developing measures which take the needs of other stakeholders or sectors into consideration. This in turn helps increase the understanding of everybody's needs, and build mutual respect and trust. 	<ul style="list-style-type: none"> • Ministry of Environment and Energy • Forestry sector: Hrvatske šume (Croatian forests) • Responsible authorities for protected area's management
<ul style="list-style-type: none"> • Harmonise and adapt existing different management plans within the project area and on a transboundary level. 	<ul style="list-style-type: none"> • By doing so conflicts between different sectors and nature conservation can be avoided. • As the Croatian Natura 2000 areas along the river Drava border on other Natura 2000 areas in Slovenia and Hungary, it is useful to coordinate planning and implementing measures to be more efficient and effective. • E.g. other existing management plans (e.g. for forestry, hunting, etc.) can be adapted and included into Natura 2000 manage- 	<ul style="list-style-type: none"> • County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) •

	ment plans.	
• Define zones and regulations for the project area and its protected areas in a management plan. Implement this management plan and regulations through legally binding regulations.	<ul style="list-style-type: none"> Having a defined zonation for different uses and purposes as well as concrete regulations (e.g. "go" and "no-go" areas, areas for forestry or agriculture, etc.) it is possible to avoid both negative impacts on nature and harming wildlife. Trained Rangers could check whether regulations are followed. 	
4.2 Aim: Within the TBR MDD natural dynamic processes are improved and preserved. (TCP)		
<p>Related objectives of the TCP:</p> <p>-</p> <p>Related sub-objectives of the TCP:</p> <ul style="list-style-type: none"> River and riverine habitats like flood plain forests or flood plains can develop in a natural way or a way close to nature. A network of securely protected sites exists to protect and monitor minimally disturbed ecosystems. Negative Impacts on natural dynamics are minimised or where necessary natural dynamics are stimulated/restored. 		
Strategies	Background	Addressees
• Ensure that in no-intervention no agriculture, forestry or other-human intervention takes place.	<ul style="list-style-type: none"> This allows nature to develop and grow in an undisturbed and natural way. This can be reached for example by defining "no-go" areas, a management plan etc.). 	<ul style="list-style-type: none"> Ministry of Environment and Energy County Public Institutions for

<ul style="list-style-type: none"> Develop, implement and monitor measures for revitalisation and conservation. 	<ul style="list-style-type: none"> For example, the Drava's revitalisation increases naturalness, reduces negative impacts on nature and wildlife and therefore contributes to the preservation and development of a natural ecosystem along the Drava. The evaluation of revitalisation measures is important to ensure a positive impact of such measures. 	<ul style="list-style-type: none"> management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) Responsible authorities for protected area's management
4.3 Aim: Natural conditions for indicator and flagship species of dynamic river and floodplain habitats are sustained or created. (TCP)		
Related objectives of the TCP: <ul style="list-style-type: none"> - 		
Related sub-objectives of the TCP: <ul style="list-style-type: none"> - 		
<ul style="list-style-type: none"> The number of individuals and indicator species and flagship species are increased. 		
<ul style="list-style-type: none"> There is a functioning transboundary harmonised monitoring system for indicator species of the rivers and their floodplains, based on common monitoring methodological approaches. 		
Strategies	Background	Addressees
<ul style="list-style-type: none"> Define indicator species and set specific actions for dynamic habitats and species. 	<ul style="list-style-type: none"> Indicator species are species which are very useful to describe and identify different aspects within an ecosystem, for example habitat types, transformations, negative impacts or influences. Measures for indicator species correlate with the habitat connected to them. 	<ul style="list-style-type: none"> Ministry of Environment and Energy County Public Institutions for management of protected areas along the Drava (Varaždin, Međimurje, Koprivnica-Križevci,

<ul style="list-style-type: none"> Ensure that the population of typical species can grow. 	<ul style="list-style-type: none"> Typical species are for example the white-tailed sea-eagle (<i>Haliaeetus albicilla</i>), black stork (<i>Ciconia nigra</i>), great capricorn beetle (<i>Cerambyx cerdo</i>), red flat bark beetle (<i>Cujus cinnaberinus</i>), stag beetle (<i>Lucanus cervus</i>) or the black coloured ground beetle (<i>Carabus variolosus</i>). 	<ul style="list-style-type: none"> Virovitica-Podravina and Osijek-Baranja County) Responsible authorities for protected area's management
4.4 Aim: Favourable conservation status for Natura 2000 species and habitats is reached and ensured on the long term. (TCP)		
<p>Related objectives of the TCP:</p> <p>-</p> <p>Related sub-objectives of the TCP:</p> <ul style="list-style-type: none"> No deterioration and improvement of species and habitats of the Habitats and Birds Directives. Management plans are developed and implemented, or objectives and measures are integrated in other sectoral plans for all Natura 2000 areas. Management measures for common Natura 2000 species and habitats are set and coordinated across borders 		
Strategies	Background	Addressees
<ul style="list-style-type: none"> Natura 2000 management plans to be included in other management plans. 	<ul style="list-style-type: none"> This helps to include several stakeholders and interests and to coordinate measures of nature protection with human activities and uses (e.g. forestry, agriculture, recreation, etc.) River basin management plans or water management plans can also be developed or implemented according to the Natura 2000 management plan. 	<ul style="list-style-type: none"> Ministry of Environment and Energy County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County)

<ul style="list-style-type: none"> Include nature conservation restrictions in all management plans dealing with use of natural resources (fishery, forestry, hunting, water management etc.). All such plans should be evaluated in mandatory nature impact assessments. Encourage Croatian Forests to follow the measures of Natura 2000 management plans for forestry management plans; introduce a mandatory nature impact assessment for forestry management plans. 	<ul style="list-style-type: none"> This would improve the health of key animal and plant populations. This would ensure that forestry management and methods are in line or not contradictory to Natura 2000 management. A nature impact assessment would ensure that forest management plans and methods don't have a significant negative impact on forests from a nature conservation perspective. 	<ul style="list-style-type: none"> Responsible authorities for protected area's management
<ul style="list-style-type: none"> PA managers and conservationists participate in the development of forest management plans. Enforce the no-net-loss principle of characteristic and key Natura 2000 habitats and as a fundamental principle of all management plans. 	<ul style="list-style-type: none"> This helps to increase the understanding of nature conservation needs and therefore to avoid negative impacts on nature. The connection of habitats is important for migration, exchange and distribution of species. 	

4.5 Aim: An extensive use by humans of habitats of the cultural landscape is maintained and established to ensure a good conservation status. (TCP)										
Related objectives of the TCP:										
<p>-</p> <p>Related sub-objectives of the TCP:</p> <ul style="list-style-type: none"> • The amount and size of extensively used areas are increased by the extensification of intensively used land. • Species protection projects on extensively used areas are monitored, the management is adapted if needed and shows positive effects. 	<table border="1"> <thead> <tr> <th>Strategies</th><th>Background</th><th>Addressees</th></tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> • Promote and encourage ecological (=extensive) farming in Natura 2000 areas. </td><td> <ul style="list-style-type: none"> • Conventional (= intensive) farming can have more negative effects on nature and wildlife compared to ecological (=extensive) farming. • E.g. education of farmers and producers on eco-friendly agricultural measures by nature protection institutions. • Farmers could be encouraged to apply for subsidies for organic/ecological farming or contractual measures, support systems, local and regional sales cooperation. </td><td> <ul style="list-style-type: none"> • Ministry of Environment and Energy • Responsible authorities for protected area's management County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) </td></tr> <tr> <td> <ul style="list-style-type: none"> • Within the active floodplain, convert existing arable fields into meadows or woods wherever possible and promote the replacement of arable land by meadows (including grazing and mowing). </td><td> <ul style="list-style-type: none"> • Meadows and woods have a greater species variety than arable fields, have a greater habitat value and contribute to a more natural ecosystem of the river Drava. • E.g. by land purchase, financial or in-kind compensation measures, use of EU funds, etc.) </td><td></td></tr> </tbody> </table>	Strategies	Background	Addressees	<ul style="list-style-type: none"> • Promote and encourage ecological (=extensive) farming in Natura 2000 areas. 	<ul style="list-style-type: none"> • Conventional (= intensive) farming can have more negative effects on nature and wildlife compared to ecological (=extensive) farming. • E.g. education of farmers and producers on eco-friendly agricultural measures by nature protection institutions. • Farmers could be encouraged to apply for subsidies for organic/ecological farming or contractual measures, support systems, local and regional sales cooperation. 	<ul style="list-style-type: none"> • Ministry of Environment and Energy • Responsible authorities for protected area's management County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) 	<ul style="list-style-type: none"> • Within the active floodplain, convert existing arable fields into meadows or woods wherever possible and promote the replacement of arable land by meadows (including grazing and mowing). 	<ul style="list-style-type: none"> • Meadows and woods have a greater species variety than arable fields, have a greater habitat value and contribute to a more natural ecosystem of the river Drava. • E.g. by land purchase, financial or in-kind compensation measures, use of EU funds, etc.) 	
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<ul style="list-style-type: none"> Extensively managed meadows have a higher species variety and contribute to a more natural ecosystem of the river Drava. Establish a system of better facilitation of extensive agricultural land use and management in relation to conventional agricultural outcome. Remove the cut grass in the area of poor grassland or rough pasture to keep the meadow nutrient-poor. 	<ul style="list-style-type: none"> Indicator species are species which are very useful to describe and identify different aspects within an ecosystem, for example habitat types, changes, negative impacts or influences. Measures for indicator species correlate with the habitat connected to them. With the monitoring it is possible to check whether measures are functional and effective or if adaptations are needed.
<ul style="list-style-type: none"> Define indicator species and monitoring to harmonise measures related to them. 	

4.6 Aim: Regular and comprehensive method for monitoring target species and habitats named in Natura 2000 data forms exists.	
Related objectives of the TCP:	
-	
Related sub-objectives of the TCP:	
-	
Strategies	Background
<ul style="list-style-type: none"> Define key species and ensure their proper monitoring (including staffing and funding). Implementing a process for definition of key species, methodologies and operational questions. Providing education for all people, who do or could do monitorings. 	<ul style="list-style-type: none"> It is necessary to identify proper measures for target species and habitats to reach Natura 2000 goals. By defining key species and a related monitoring, concrete measures can be developed in a next step. The process is important to define key species, method, costs, how to split the work of monitoring, etc. This helps realise a proper monitoring of species, habitats and human actions (e.g. training for example of hunters who do the monitoring).
Addressees	
	<ul style="list-style-type: none"> Ministry of Environment and Energy County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County) Administrative department for spatial planning, construction, environmental protection and nature conservation in Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County

<ul style="list-style-type: none"> • Implementing the monitoring for the whole project area. 	<ul style="list-style-type: none"> • By doing so, a database of species, understanding and knowledge can be achieved. • National monitoring programs can be used and developed to get better knowledge and data and also to develop more appropriate measures. 	<ul style="list-style-type: none"> • NGOs • Hunters
4.7 Aim: Monitoring is seen as an important aspect concerning Natura 2000 management.		
<p>Related objectives of the TCP:</p> <p>-</p>	<p>Strategies</p> <ul style="list-style-type: none"> • Raise awareness of all stakeholders (Ministries, Counties, local people, visitors, etc.) on the national and County level. 	<p>Background</p> <ul style="list-style-type: none"> • To ensure that monitoring is a necessary aspect concerning Natura 2000 management it is important to include and inform several stakeholders and to raise their knowledge about the sense of monitoring. <p>Addressees</p> <ul style="list-style-type: none"> • Ministry of Environment and Energy County • Public Institutions for management of protected areas along Drava (Varaždin, Međimurje,

<ul style="list-style-type: none"> Develop and implement a Natura 2000 management plan including monitoring that is harmonised across Counties. 	<ul style="list-style-type: none"> Having a management plan for the project area promotes the development and implementation of a related monitoring. Administrative department for spatial planning, construction, environmental protection and nature conservation in Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County Communities 						
4.8 Aim: A monitoring of human activities is done regularly.							
<p>Related objectives of the TCP:</p> <p>-</p>	<table border="1" style="width: 100%;"> <thead> <tr> <th data-bbox="944 177 992 2088">Strategies</th> <th data-bbox="992 177 1040 2088">Background</th> <th data-bbox="1040 177 1087 2088">Addressees</th> </tr> </thead> <tbody> <tr> <td data-bbox="944 177 992 2088"> <ul style="list-style-type: none"> Implementing a process for definition of key activities, methodologies and operational questions. </td><td data-bbox="992 177 1040 2088"> <ul style="list-style-type: none"> The process is important to define costs and methods for splitting the work of monitoring, etc. E.g. meetings between ministry, public institutions, county offices, NGOs, etc. </td><td data-bbox="1040 177 1087 2088"> <ul style="list-style-type: none"> Ministry of Environment and Energy County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja </td></tr> </tbody> </table>	Strategies	Background	Addressees	<ul style="list-style-type: none"> Implementing a process for definition of key activities, methodologies and operational questions. 	<ul style="list-style-type: none"> The process is important to define costs and methods for splitting the work of monitoring, etc. E.g. meetings between ministry, public institutions, county offices, NGOs, etc. 	<ul style="list-style-type: none"> Ministry of Environment and Energy County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja
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	<ul style="list-style-type: none"> Providing education for all people who do or could do monitoring. 	<ul style="list-style-type: none"> This helps realise a proper monitoring of species, habitats and human actions (e.g. training, for example, hunters to for monitoring).

4.9 Aim: Establishment of a 5-country transboundary action plan.

Related objectives of the TCP:

- Experts and scientists of all relevant fields work together intensively across borders and exchange research data, results and field experience openly.

Related sub-objectives of the TCP:

- Protected Area Management and Coordination Institutions are coordinating their monitoring and research activities across borders.
- Research and monitoring results are actively made available across borders.
- There is a functioning transboundary harmonised monitoring system for indicator species of the rivers and their floodplains, based on the common monitoring methodological approaches.

Strategies	Background	Addressees
<ul style="list-style-type: none"> • Develop standardised monitoring methodologies and protocols for most important indicator species on a transboundary level. • Set up a transboundary GIS platform. 	<ul style="list-style-type: none"> • This helps to compare data at the same level and to have a uniform data set or information for a wider area. • By doing so monitoring can be stored and managed centrally and be available for everybody's use. 	<ul style="list-style-type: none"> • Ministry of Environment and Energy • Responsible authorities for protected area's management • County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County)
<ul style="list-style-type: none"> • Create transboundary networks for specific areas of nature protection and working groups of the protected areas including joint regular publications for review of research. 	<ul style="list-style-type: none"> • This helps to communicate, research, compare and share specific data on a trans-boundary level and among all PA managers. 	

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