



**DRAVA  
LIFE**  
integrated river management

# Natura 2000 - Drava Management Strategy

LIFE14 NAT/HR/000115 – DRAVA LIFE

Natura 2000- Drava Management Strategy



Ministarstvo okoliša, prostora i energije  
**ZELENI OSIJEK**



 **Federal Ministry  
Sustainability and Tourism**



## **LIFE14 NAT/HR/000115 - DRAVA LIFE**

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### **Impressum**

#### **Partners:**

- Croatian Waters
- WWF Austria
- Green Osijek - Association for Nature and Environment protection
- Public Institution for Management of Protected Areas and Ecological Network of Virovitica - Podravina County
- Public Institution for Management of Protected Natural Values in Varaždin County
- Public Institution for Management of Protected Natural Areas in the Koprivnica-Križevci County

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# 1. Introduction

## Initial position and aim of the Management Strategy

There is currently no overall strategy or management plan for the Natura 2000 protected areas along the Drava in Croatia. The present Management Strategy elaborated within action A.5 of the Drava LIFE project aims to address this gap. Elaborated with the involvement of various stakeholders in Croatia, it aims to help start integrative cooperation in the project area. It serves as a baseline for further detailed planning along the Drava, for e.g. restoration actions, visitor guidance plans, an action plan for river birds, public awareness campaigns, and the Natura 2000 management plans. The strategy was elaborated by taking into consideration the EU Habitats Directive, the EU Birds Directive and EU Water Framework Directive, as well as potential synergies among them.

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 the 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. It serves as a baseline study and input for the public institutions and stakeholders involved in the creation process of the management plans for Natura 2000 sites along the Drava River. It details the guidelines of the Transboundary Cooperation Programme (TCP) in Croatia and thus supports the implementation of the Transboundary Biosphere Reserve Mura-Drava-Danube (TBR MDD). Croatia, Slovenia, Hungary, Serbia and Austria have agreed to establish a 5-country biosphere reserve according to the Man and Biosphere (MAB) programme of the UNESCO within the next years. As the name indicates, the Biosphere Reserve will stretch along the rivers Mura, Drava and Danube across these five countries and focus on protection of large-scale ecosystems and landscapes with their biological diversity.

The information given in this brochure is a summary of the Management Strategy and focuses on the aims and strategies developed within the related stakeholder process. It is based on a variety of sources including studies, mappings, question and answer sessions and workshops. It is a snapshot of the current situation, strategy and common opinion of the participants of this action, as it results from the working process of the involved partners and stakeholders. For this reasons, the present brochure and the related report do not claim to be exhaustive or final. Rather, they offer a starting point for future planning and need to be re-evaluated and adapted after a certain period.

### **Project partners:**

- Croatian Waters
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- Public Institution for the Management of Protected Natural Areas in the Koprivnica-Križevci County

### **Further stakeholders:**

- Balaton National Park Directorate
- Baobab - Association for Research and the Popularisation of Science
- 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
- Protective-ecological Association Senjar - ZEUS

## 2. Project area

The project area that stretches between Dubrava Krz. (rkm 322.80) and Osijek (rkm 15) covers four Natura 2000 areas along the Croatian Drava, additionally including a side buffer of 100m. The joint surface amounts to a total area of approximately 756 km<sup>2</sup>:

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

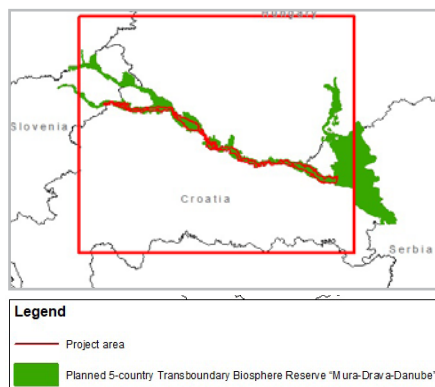


Fig. Location of the project area within the Transboundary Region (TBR) of the planned Biosphere Reserve „Mura-Drava-Danube“



Overview of the Natura 2000 areas within the project area

### 3. Overall management strategies and aims

Following strategies result from two workshops held with project partners and further stakeholders and are based on the analysis of the current situation as well as of strengths and weaknesses in terms of biodiversity within the project area. Proposed objectives (in this document: „aims“) and sub-objectives of the TCP that were found suitable for the Croatian context have been included as strategies in the present Strategy. The alignment process has shown that there is a need for continued exchange of ideas and stakeholder consultation regarding several aspects of Natura 2000 management. Such aspects are recognizable by the fact that two positions have been formulated regarding strategies considered suitable for their handling.

For details regarding methodology, development process and current situation, please consult the full document, available at [info@drava-life.hr](mailto:info@drava-life.hr).

#### Waterbody / Flood protection / Hydropower / Fishery

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

#### Forestry / Agriculture / Hunting

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

#### 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.

#### 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.

## 3.1 Waterbody / Flood protection / Hydropower / Fishery

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

### 3.1.a

**Aim:** River development and risk management concept including river restorations.

**Strategy:** 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.

**Background:** This helps to include stakeholders and their interests and to coordinate measures of nature protection with human activities and uses (e.g. forestry, agriculture, recreation, etc.). Concrete measures are needed in order to reach goals concerning Natura 2000 and to preserve or restore an intact ecosystem and wildlife.

**Strategy:** Encourage and implement cooperation between sectors (integrative planning) on a regional and transboundary level.

**Background:** This helps to increase the understanding of all stakeholders' needs, build mutual respect and trust and reach efficiency of joint actions. Relevant sectors include nature conservation, agriculture, forestry, water management, etc.



Overview of the catchment area of the Drava



### 3.1.b

**Aim:** Natural, free-flowing Drava within a well-connected, active floodplain.

#### Related sub-objectives of the TCP

In consultation with all relevant stakeholders and institutions, the river can move freely between the dykes or within 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.

**Strategy:** Implement EU Water Framework Directive and EU Habitats Directive.

**Background:** The directives propose aims and regulations concerning surface and groundwater and species and habitats, which help to reach a natural and free-flowing river dynamic.

**Strategy:** Continue and extend the already successful transboundary cooperation in comprehensive river basin management.

**Background:** Cooperation between stakeholders and authorities of different sectors on national and transboundary level enhances understanding of everybody's needs, builds mutual respect, trust and efficiency. E.g. cooperation between nature conservation, agriculture, forestry, water management, etc.

#### Strategy for building of new HPPs

**Position Nature Conservation Stakeholders:** No new hydropower dams in the free-flowing section of the Drava.

**Position Hrvatske vode:** Building/not building new HP dams to comply with the Croatian Government's decision and laws in force (in particular the National Strategy for Energy Development).

**Background:** Hydropower plants have a big impact on the river dynamics and ecosystem (e.g. change of runoff, sediment transport, etc.).



**Strategy:** Construction of any new river training structure within the river and its active floodplain is in line with the Drava River Restoration Concept and restricted to the purpose of protection of main infrastructure such as dykes, bridges, roads, railways, power lines or settlements.

**Background:** A floodplain with no or only few constructions can develop and function in a more natural way.

**Strategy:** For any new project involving building new river training structures, a nature and environment impact assessment is made.

**Background:** This prevents or minimises nature impacts, especially where longer river sections are affected (e.g. sediment transport, waterflow, etc.).

**Strategy:** No further net loss of active floodplains.

**Background:** A wider floodplain gives back the Drava its former course and dynamics. Habitats, for example floodplain forests, are dependent on floods and therefore could be connected to the river again.

**Strategy:** Purchase privately owned land, or implement compensation measures for restoration on private land.

**Background:** Implementation of projects or measures in the context of nature protection would be easier to realise on state owned land compared to privately owned land. E.g. find (research) and buy or trade (private or state owned) land to compensate for areas directly affected by the river. Find “Buy and Trade Agency” for agricultural land on local level (PIs, NGOs).

**Strategy:** Take the potential of river revitalisation into consideration. Evaluate and implement revitalisations if possible.

**Background:** Revitalisations of the Drava will increase naturalness and therefore contribute to the preservation and development of a natural ecosystem along the Drava. The evaluation of revitalisation measures is important to guarantee their functionality.



**Strategy:** 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).

**Background:** 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 back the Drava its former course and dynamics, it offers more retention area and therefore has flood protection effects on downstream areas, including villages. Habitats, such as floodplain forests, are dependent on floods and therefore could be connected to the river again.

**Strategy:** Initiate channels and connect side arms to restore the former natural course of the Drava including its floodplains and extend the floodplains in areas within the dykes.

**Background:** 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.

**Strategy:** Waterbody maintenance is minimised as much as possible.

**Background:** 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.



### 3.1.c

**Aim:** People living along the river Drava and their assets are protected from floods. (TCP)

Related sub objectives of the TCP

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.

**Strategy:** 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 EU Floods Directive, EU Water Framework Directive and EU Habitats Directive).

**Background:** 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 of the floodplain area, bank protection with biological structures, etc. The goals of the EU Water Framework Directive (achieving good qualitative and quantitative status of all water bodies) would be followed.

**Strategy:** Assure people that their safety is respected and will not decrease with river restoration and other measures that are proposed.

**Background:** Essential flood protection infrastructure such as dykes should therefore regularly be maintained and if necessary upgraded to ensure better safety. Upgrades should be done in a more nature-friendly way (e.g. using groynes against erosion or shifting constructions out of the floodplain). If an upgrade for better safety is necessary, synergies with biodiversity and river dynamics should be taken into consideration.



### 3.1.d

**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 sub-objectives of the TCP

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.

**Strategy:** Ensure natural self-purification and recharge capacity of groundwater through river restoration.

**Background:** 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 to identify whether further measures are needed.

**Strategy:** Improve and promote the quality of surface and groundwater through elimination of point and non-point pollution sources.

**Background:** A better water quality contributes to a healthier life for humans and wildlife and follows the intentions of the EU Water Framework Directive.

**Strategy:** Stop water use or extraction for other uses than providing drinking water in case of significant decreases in the water level.

**Background:** This helps to keep important water quantities within the river ecosystem

**Strategy:** Education for local people on the issues concerning water quality.

**Background:** This helps to raise the understanding of the river ecosystem and its closely related surroundings and therefore reduce negative impacts.

### 3.1.e

**Aim:** Existing hydropower plants are operating in a way that their negative impacts on a dynamic river corridor are mitigated as much as possible. (TCP)

### Related sub objectives of the TCP

The operation of existing hydropower plants, including the dotation of the residual flow stretch, is adjusted to the regulations specified in the EU Water Framework Directive.

**Strategy:** Control whether the regulations specified in the EU Water Framework Directive are followed.

**Background:** The directive contains aims and regulations which help to reach a natural and free-flowing river dynamic.

**Strategy:** 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.

**Background:** 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.

#### **Strategy for ensuring natural flow dynamic in the free-flowing section of the Drava**

**Position Nature Conservation:** Adapt the operation of the last Drava dam D. Dubrava to allow natural flow dynamic downstream. Stop hydropeaking.

**Position Hrvatske vode:** Adapt the operation of last existing / last planned downstream Drava dam according to the adopted National Strategies, to allow dynamic flow downstream.

**Background:** Hydropeaking 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 hydropeaking is sediment deposition on gravel banks (clogging), which affects the habitats of different animals, especially rheophilic fish species. Minimizing hydropeaking effects would lead to a more natural development and conditions of the ecosystem of the Drava (see above).

#### **Strategy for managing flow levels in residual flow stretches**

**Position Nature Conservation:** The minimum flow should be increased in residual flow stretches („Stara Drava“) and a flow mimicking natural hydrological cycle enabled („e-flow“).

**Position Hrvatske vode:** Flow levels described in work permits and conditions according to Croatian Law must be complied with.

**Background:** 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.

**Strategy:** Adapt sediment management in reservoirs along the Drava to avoid negative ecological impact in free-flowing downstream sections, including floodplains.

**Background:** The clouding of water as a result of reservoir flushing 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 incision.

**Strategy:** Develop and implement sediment management plan for the river Drava (including extraction of sediments upstream of existing dams and their transfer to areas downstream of HPPs, especially sediment deficit areas in Croatia downstream of HPPs).

**Background:** A management plan helps regulate and maintain a natural sediment amount and transport within the river system.



### 3.1.f

**Aim:** Sediments are kept within the river ecosystem and their transport takes place in a natural way.

#### Related objectives of the TCP

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

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.

**Strategy:** Improve enforcement of laws (in particular inspection and execution) against illegal exploitation of gravel and sand from the river system.

**Background:** The extraction of sediments (gravel and sand) from the river system leads to a deficit within the ecosystem. This can result in riverbed incision, which in turn leads to disconnection of the river 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 not be removed from the Drava river system.

**Strategy:** Extraction of sediments from the river system should not be allowed and the prohibition incorporated into national water and nature protection legislation.

**Background:** For example the removal of sediments from one side of a hydropower plant's dam to the other is acceptable, but not the removal out of the river system. Extracting sediments from the river system can influence the river and its ecosystem downstream as described above. Keep sediments extracted for restoration measures within the river system (upstream).

**Strategy:** Remobilisation of lateral erosion by river restoration where possible (removal of embankments, outward shifting / reallocation of dykes, reconnecting sidearms, etc.).

**Background:** This contributes to a natural sediment amount and transport within the river system.

**Strategy:** Implement a system of gravel transport from upstream sections to downstream (after HPPs).

**Background:** HPPs block the natural sediment transportation within the river system. This obstacle can be overcome if missing sediments are relocated from upstream to downstream sections.

### 3.1.g

**Aim: The impacts of currently existing international navigation routes on nature are decreased and mitigated as much as possible. (TCP)**

#### Related sub objectives of the TCP

The classification of the navigation routes on the Drava River is adjusted to the actual navigation conditions and use.

**Strategy:** Evaluate the actual use and classifications of navigation routes and their impact on the ecosystem at the Drava. Review and adjust the classification of the Drava navigation route to the actual navigation status and use.

**Background:** If navigation routes are not in use, not classified appropriately or contradict nature conservation's interests, actions to improve the current situation should be taken into consideration. This would help to decrease existing negative impacts .





### **Strategy for navigation on the Drava**

**Position Nature Conservation:** Adjust the navigation route's classification upstream of Osijek according to current needs.

**Position of Croatian Waters:** Maintain existing navigation route's classification defined in Croatian and Hungarian International Agreement and continue developing new routes for touristic purposes.

**Background:** As the river section between Osijek and the Dubrava HPP is natural or near-natural, the impact on the Drava can be reduced.

## **3.1.h**

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

### **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.

**Strategy:** Include nature conservation restrictions in a fishery management plan. All fishery management plans should pass a nature impact assessment procedure prior to adoption.

**Background:** 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 designated 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.

**Strategy:** Actively promote nature-friendly behaviour of fishermen and improve their education to let them act in a more nature- or species-oriented way.

**Background:** As the river section between Osijek and the Dubrava HPP is natural or near natural, the impact on the Drava can be reduced.

**Strategy:** Follow ethical standards to ensure the welfare of protected fish species.

**Background:** This means that fishermen do not use prohibited methods of fishing.

**Strategy:** Conduct annual fish monitoring in order to define proper fishing quotas.

**Background:** This helps to reduce negative impacts on fish populations. For example discussions, round tables or working groups can be organised.

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**Strategy:** Elaborate and implement measures for lowering the extent of illegal fishing.

**Background:** This helps to reduce negative impacts on fish populations and can improve the health of fish populations.

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**Strategy:** Promote catch and release fishing (sport fishing).

**Background:** This can improve the health of fish populations and should line up with considerations of animal welfare.

### 3.1.i

**Aim: Implement a zonation plan for sustainable fishery.**

Related sub objectives of the TCP

Non-intervention areas are an ideal undisturbed retreat for fish.

**Strategy:** Define sanctuaries or no-go areas at main fish spawning areas, where no disturbance is caused by people (no fishing, no driving, etc.).

**Background:** 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.

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**Strategy:** Define legal fishing spots including small shelters for each village.

**Background:** This helps to regulate fishery and to minimise illegal fishery and negative impacts on fish populations.



### 3.1.j

**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.

**Strategy:** Ensure that all abandoned or illegal fishing infrastructure is removed.

**Background:** This helps to regulate and control fishing activities, which would lead to a nature-friendly fishing behaviour.



**Strategy:** Establish and operate fishponds in a nature-friendly way.

**Background:** Ecological operation ensures the health of the ecosystem in the Natura 2000 area.

**Strategy:** Improve the education for fishermen in a more nature- or species-oriented way. No restocking of the fishing areas with non-native fish species.

**Background:** This increases fishermen's knowledge about species and nature-friendly methods for fishing as well as for building and operating fishponds etc.

**Strategy:** Promote buying native fish.

**Background:** 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.

**Strategy:** Promote sustainable fishing tourism.

**Background:** Tourists and locals alike are responsible for sustainable fishing.

**Strategy:** Stop the conversion of existing oxbows into sport angling sites.

**Background:** Usually the conversion of oxbows into sport angling sites is associated with the removal of bank vegetation, dredging, re-stocking with desirable species etc.





## ADRESSEES

- Bilateral water management commissions (Croatia-Hungary, Serbia-Croatia, etc.)
- Ministry of Environment and Energy
- Croatian Agency for Environment and Nature
- Croatian Waters
- Croatian Forests
- HEP group (Hrvatska Elektroprivreda)
- County Public Institutions for management of protected areas along Drava (Varaždin, Međimurje, Koprivnica-Križevci, Virovitica-Podravina and Osijek-Baranja County)
- Agency for Inland Waterways
- Fishing associations
- Local communities/municipal institutions
- Landowners
- Local farmers
- Local people
- Major local industry / plants
- Shipping companies
- Owners of fishing rights
- Fishermen



## 3.2 Forestry / Agriculture / Hunting

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

### 3.2.a

**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 Europewide for their nature-friendly forest use.

#### Related sub objectives of the TCP

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.

**Strategy:** 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).

**Background:** 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. The 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 seminatural mix of native trees. Especially for the conversion itself, EU funds can be used.



**Strategy:** Develop an agreement on priorities between forestry and nature protection concerning forest management.

**Background:** Such an agreement helps increase the understanding of nature conservation needs concerning forestry management and would contribute to achieve a more extensive forestry management. For instance, PA managers and conservations participate in the development of forest management plans.

**Strategy:** All forest management plans must pass a nature impact assessment.

**Background:** 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.

**Strategy:** Encourage communication between forestry sector and nature protection sector (e.g. PA managers) and involve the forestry sector in nature protection projects.

**Background:** This helps increase the knowledge and understanding of nature conservation's needs and build mutual respect and trust between both sectors. Possible measures are e.g. annual or semi-annual meetings or workshops for alignment on changes in forestry infrastructure.



**Strategy:** Find ecological yet profitable forms of forestry to stop dependence on forest clearcutting.

**Background:** This would help decrease the demand for clearcutting, which has serious impacts on the ecosystem of woods and the need of resources.

E.g. develop new techniques to replace the usage of pesticides (business as usual), which harm the ecosystem. The state could help forestry companies to produce their products in a nature-friendly way.

**Strategy:** Define a maximum percentage of a forest as clear-cutting area and continually reduce the allowed size of clear-cuts.

**Background:** Large scale clearcuts have a strong impact on the ecosystem of a forest, such as loss of habitats for a long period, extraction of nutrients, faster mineralisation of humus, etc. Such a definition should be done based on negotiations and contracts between forest management and nature protection authorities in a continuous process.

**Strategy:** Adopt Natura 2000 protection status on the same level of importance as that of national parks, nature parks, etc. by law and in practice.

**Background:** This would help accomplish aims of Natura 2000 more easily and to conserve and develop natural and near-natural forests.

**Strategy:** Increase the number of inspection activities to ensure respect for the existing laws.

**Background:** This would ensure that existing laws and regulations are followed.

### 3.2.b

**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)





## Related sub-objectives of the 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. 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.

**Strategy:** Elaborate compensation measures for forest owners willing to change their way of operation.

**Background:** 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.

**Strategy:** Define indicator species and introduce monitoring to harmonise measures related to them.

**Background:** Indicator species are species which are very useful to describe and identify various aspects of an ecosystem such as 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.

**Strategy:** Support the natural growth and spread of indigenous riparian vegetation by concrete measures.

**Background:** 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).





**Strategy:** Increase the habitat quality.

**Background:** 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.

**Strategy:** Increase the number and size of natural habitats.

**Background:** This supports the development of a natural or near natural ecosystem along the Drava and decreases non-natural or intensively used areas.

**Strategy:** No active management and economic use of gallery forests in the active floodplain.

**Background:** Gallery forests are indicators of a natural river system. They are already priority Natura habitats (91E0). Therefore they should be left to develop naturally (including their possible destruction due to meandering) and they should not be further managed and harvested.

**Strategy:** Create areas where no human intervention takes place.

**Background:** 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.

**Strategy:** Enhance natural rejuvenation by river restoration, bringing back natural pioneer habitats.

**Background:** With this a former and more near-natural state of the ecosystem along the river Drava can be reached.



### 3.2.c

**Aim:** The maintenance and use of road infrastructure respects sensitive habitats and seasons and is reduced to the minimum necessary. (TCP)

#### Related sub objectives of the TCP

Large areas of floodplain forest in the non-intervention area are undisturbed due to few access possibilities.

**Strategy:** Reduce the number and use of existing forestry roads within natural or near-natural forests.

**Background:** This reduces the blockings of the natural river flow and its runoff 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.

**Strategy:** Find an agreement on limiting forestry work to periods / seasons when the soil is either dry or frozen.

**Background:** 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 March to July) for biodiversity protection reasons.

### 3.2.d

**Aim:** Agricultural land use is in line with nature protection.

#### Related objectives of the TCP

Agriculture in the TBR MDD supports the protection of natural resources, biodiversity and mosaic habitats.

#### Related sub objectives of the TCP

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.

**Strategy:** Purchase privately owned land or implement compensation measures for restoration on private land.

**Background:** Projects or measures in context of nature protection 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. Find “Buy and Trade Agency” for agricultural land on local level (PIs, NGOs).

**Strategy:** Promote and encourage ecological / extensive farming in Natura 2000 areas.

**Background:** 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 nature-friendly agricultural measures by nature protection institutions; involving 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.

**Strategy:** Develop a proper zonation concerning Natura 2000 areas and arable land to avoid negative impacts on Natura 2000 areas.

**Background:** In case existing problems or negative impacts on Natura 2000 areas can be solved by a proper zonation.

**Strategy:** Encourage and promote branding of products coming from Natura 2000 areas.

**Background:** This helps to raise awareness and knowledge concerning Natura 2000 and nature conservation and local people may also benefit in an economic way.

**Strategy:** Promote and implement ecological flow and develop „e-flow“ assessment (with its implementation at water stages).

**Background:** The concept of the flow regime is necessary for achieving the environmental objectives of an ecosystem.

**Strategy:** Implement regulations for using chemicals in Natura 2000 areas and support the change towards nature-friendly agriculture.

**Background:** 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 for the usage of pesticides and fertilisers that have negative impacts on the ecosystem or ban the use of fertilisers, pesticides and herbicides.

**Strategy:** The area of intensively managed agricultural land is decreasing and being converted to extensive agricultural land.

**Background:** Extensively used agricultural land usually has a higher species variety compared to intensively used agricultural land and therefore has more value for nature protection.



### 3.2.e

**Aim:** Meadows are managed nature-friendly and extensively (TCP)

#### Related sub-objectives of the TCP

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.

**Strategy:** Use or set up finance programs to enable farmers to do extensive farming (subsidies, EU projects, Natura 2000 etc.).

**Background:** This helps farmers 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.).

**Strategy:** Raise awareness and knowledge about extensive management practices.

**Background:** This helps promote and implement extensive farming. E.g. local farmers can be informed through training, workshops, information sharing etc.

**Strategy:** Establish management measures in cooperation between farmers and PA managers.

**Background:** This helps to increase the knowledge and understanding of nature conservation's needs as well as mutual respect and trust between both sectors.

**Strategy:** Manage meadows in an extensive way.

**Background:** 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.

**Strategy:** 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).

**Background:** 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.

**Strategy:** Prevent the conversion of meadows or forests into arable land.

**Background:** 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 Natura 2000 regulations, etc.

## 3.2.f

**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.



**Strategy:** Harmonise hunting law with nature protection law.

**Background:** This helps to regulate or reduce overlaps between both laws and to avoid conflicts between hunting and nature protection.

**Strategy:** Contents of the Natura 2000 framework and aims are part of lectures which must be attended to receive hunting permits.

**Background:** This helps to increase the knowledge and understanding of nature conservation needs and Natura 2000 strategy.

**Strategy:** Harmonise hunting law with nature protection law, hunting associations and TBR conservation goals.

**Background:** This helps to regulate or reduce contradictory overlaps between both sectors.

**Strategy:** Hunting management plans must pass a nature impact assessment and harmonise management principles in hunting grounds with the aims of nature conservation.

**Background:** 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.

**Strategy:** 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).

**Background:** 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.

**Strategy:** Ban lead ammunition in the project area.

**Background:** Lead ammunition can harm animals eating it.

**Strategy:** Define no-hunting areas.

**Background:** 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 no-hunting area.

**Strategy:** Promote the use of animal friendly fences where the construction of fences cannot be avoided.

**Background:** E.g. smooth wire, woven wire, post and pole or buck and rail etc. help to avoid harming animals.

**Strategy:** Establish a legal network of rangers to control the compliance with current regulations and the controlling of measures and provide enough staff for it.

**Background:** 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. E.g. offer training for policemen, fish and game wardens, prosecutors, judges, etc. to improve control and punish illegal actions.

**Strategy:** Active suppression of illegal hunting in place within the project area.

**Background:** Illegal hunting can cause serious impacts on wildlife and works against nature protection's aims.

### 3.2.g

**Aim:** Hunters are active supporters of the protection of the ecosystem and its species (TCP)

#### Related sub objectives of the TCP

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.

**Strategy:** Provide education to hunters for a proper monitoring of species, habitats and human actions.

**Background:** 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.

**Strategy:** Increased intensity of active measures against illegal killing.

**Background:** 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.

## ADRESSEES

- Ministry of Agriculture
- Ministry of Environment and Energy
- Croatian Agency for Environment and Nature
- Croatian Forests
- Croatian Waters
- County Public Institutions for Management of Protected Areas along Drava
- Responsible authorities for Protected Areas' management
- Forestry inspection
- Hunting associations
- Fishing associations
- Communities
- Network of ecological farmers / best practice ecological farmers involvement from abroad (e.g Slovenia, Austria)
- HEP Group (Hrvatska elektroprivreda)
- Landowners
- Local farmers
- Hunters
- Private owners of forests
- Owners of fishing rights



### 3.3 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.

#### 3.3.a

**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.

**Strategy:** Develop and implement a visitor guidance / action plan (within management plans of PIs (Public institutions) considering the existing uses within the area.

**Background:** 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 themselves with the free-flowing and natural river. A visitor / action plan can include: 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 wildlife. Marketing and coordination of touristic and recreational activities across bilateral borders along the Drava.

#### 3.3.b

**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

RIVER`SCHOOLS are the main hubs in a well-visited environmental education network spanning across the whole TBR.

## Related sub-objectives of the TCP

The eight RIVER`SCHOOLS 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.

**Strategy:** Raise awareness and knowledge of local people and visitors concerning Natura 2000.

**Background:** 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.

**Strategy:** Adapt the education of school children.

**Background:** 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.

**Strategy:** Create new ways of informing people and promote public participation in the conservation and management of the flood-plains of the river Drava.

**Background:** Develop specific info material for specific groups. E.g. Create / print info materials such as brochures, leaflets etc. Use social media / website. Create educational corners / info centres / study paths. Develop / implement volunteer programs (e.g. through NGO / PI cooperation) for concrete actions such as cleaning river banks, removing invasive species, supporting amphibian migration (e.g. PI in Međimurje 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. Regular information of media and journalists about Natura 2000 issues. Capacity building and cooperation between public institutions and various stakeholders.



**Strategy:** Properly train existing or new guides or rangers.

**Background:** Rangers can help to spread knowledge about nature, Natura 2000 and nature protection. E.g. offer constant training of the guides and rangers (communication tools, keeping up with trends, new know-how, models in tourism / visitor management, English language).

**Strategy:** Sensitise local people and tourists on the reasons for temporary or permanent restrictions.

**Background:** This will help people to understand restrictions as a responsibility for protection of wildlife.

**Strategy:** Encourage and promote branding of products coming from Natura 2000 areas.

**Background:** This will contribute to raise awareness and knowledge of local people and visitors concerning wildlife, Natura 2000 and nature conservation.



### 3.3.c

**Aim:** Natura 2000 areas are free of illegally built infrastructure and existing uses are subject to clear rules.

**Strategy:** Existing infrastructure for recreational use is subject to clear rules and regular check-ups.

**Background:** 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 caused by recreational uses at a minimum.

**Strategy:** 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.

**Background:** 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.

**Strategy:** New infrastructure for recreational usage is subject to a clear authorisation process aligned with Natura 2000 management plans.

**Background:** 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 roads, camping sites, swimming areas or further sites related to touristic use). This helps avoid negative impacts on wildlife caused by recreational uses or reduce them to a minimum (through forward-looking planning).

**Strategy:** Elaborate concept for handling illegally built infrastructure such as weekend houses or huts.

**Background:** Illegally built infrastructure might be located within sensitive areas or habitats and therefore 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 setting up a ranger service (using the example of the PI in Međimurje county): 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 appropriate, legalised through cooperation with spatial planning.

**Strategy:** Raise awareness among local population requiring new infrastructure within Natura 2000 areas.

**Background:** This would help raise the understanding and knowledge concerning the Natura 2000 area and might avoid illegal buildings in the future.

### 3.3.c

**Aim:** Stimulation of green tourism activities in Natura 2000 areas.

**Strategy:** 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.

**Background:** Green tourism activities and ecotourism have a smaller impact on the wildlife compared to conventional tourism. Ecotourism 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.



#### ADRESSEES

- County Public Institutions for Management of Protected Areas along Drava
- Responsible authorities for Protected Areas management
- Tourism information centres and tourism boards of counties along Drava
- NGOs for nature conservation
- Communities
- Schools
- Farmers
- Media
- Private companies

## 4.4 Natural space / Nature conservation / Natura 2000 / Monitoring

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

### 4.1.a

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

**Strategy:** Develop a management plan by an integrative process with all stakeholders.

**Background:** 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.

**Strategy:** Harmonise and adapt existing different management plans within the project area and on a transboundary level.

**Background:** 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 adopted and referenced into Natura 2000 management plans.

**Strategy:** 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.

**Background:** 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.b

**Aim:** Within the TBR MDD natural dynamic processes are improved and preserved. (TCP)

### Related sub-objectives of the TCP

River and riverine habitats like flood plain forests or floodplains 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.

**Strategy:** Ensure that in no-intervention zones no agriculture, forestry or other human intervention takes place.

**Background:** 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.

**Strategy:** Develop, implement and monitor measures for revitalisation and conservation.

**Background:** 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.





### 4.3.c

**Aim:** Natural conditions for indicator and flagship species of dynamic river and floodplain habitats are sustained or created. (TCP)

#### Related sub-objectives of the TCP

The number of individuals and indicator species and flagship species are increased. There is a functioning transboundary harmonised monitoring system for indicator species of the rivers and their floodplains, based on common monitoring methodological approaches.

**Strategy:** Define indicator species and set specific actions for dynamic habitats and species.

**Background:** 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.

**Strategy:** Ensure that the population of typical species can grow.

**Background:** Typical species are for example the white-tailed sea-eagle (*Haliaeetus albicilla*), black stork (*Ciconia nigra*), great capricorn beetle (*Cerambyx cerdo*), red flat bark beetle (*Cucujus cinnaberinus*), stag beetle (*Lucanus cervus*) or the black coloured ground beetle (*Carabus variolosus*).



## 4.4.d

**Aim:** Favourable conservation status for Natura 2000 species and habitats is reached and ensured on the long term. (TCP)

### Related sub-objectives of the TCP

No deterioration and improvement of species and habitats of the EU 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.

**Strategy:** Natura 2000 management plans to be included in other management plans.

**Background:** 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.

**Strategy:** 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.

**Background:** This would help improve the health of key animal and plant populations.



**Strategy:** PA managers and conservationists participate in the development of forest management plans.

**Background:** This helps to increase the understanding of nature conservation needs and therefore to avoid negative impacts on nature.

**Strategy:** 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.

**Background:** 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 conservations perspective.

**Strategy:** Enforce the no-net-loss principle of characteristic and key Natura 2000 habitats and as a fundamental principle of all management plans.

**Background:** The connection of habitats is important for migration, exchange and distribution of species.



## 4.5.e

**Aim:** An extensive use by humans of habitats of the cultural landscape is maintained and established to ensure a good conservation status. (TCP)

### Related sub-objectives of the TCP

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.

**Strategy:** Promote and encourage ecological (= extensive) farming in Natura 2000 areas.

**Background:** 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.



**Strategy:** 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).

**Background:** 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. 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.

**Strategy:** Define indicator species and monitoring to harmonise measures related to them.


**Background:** 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.

## 4.6.f

**Aim:** Regular and comprehensive method for monitoring target species and habitats named in Natura 2000 data forms exists.

**Strategy:** Define key species and ensure their proper monitoring (including staffing and funding).

**Background:** 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.



**Strategy:** Implementing a process for the definition of key species, methodologies and operational questions.

**Background:** The process is important to define key species, method, costs, how to split the work of monitoring, etc. E.g. meetings between ministry, public institutions, county offices, NGOs, etc.

**Strategy:** Implementing the monitoring for the whole project area.

**Background:** 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.

## 4.7.g

**Aim:** Monitoring is seen as an important aspect concerning Natura 2000 management.

**Strategy:** Raise awareness of all stakeholders (Ministries, Counties, local people, visitors, etc.) on the national and county level.

**Background:** 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.

**Strategy:** Develop and implement a Natura 2000 management plan including monitoring that is harmonised across Counties.

**Background:** Having a management plan for the project area promotes the development and implementation of a related monitoring.

## 4.8.h

**Aim:** A monitoring of human activities is done regularly.

**Strategy:** Implementing a process for definition of key activities, methodologies and operational questions.

**Background:** 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.

**Strategy:** Implementing the monitoring for the whole project area.

**Background:** By doing so, database of species, understanding and knowledge can be achieved. National monitoring programs can be used and developed to get better knowledge and data on species and also to develop more appropriate measures.

**Strategy:** Providing education for all people who do or could do monitoring.

**Background:** This helps realise a proper monitoring of species, habitats and human actions (e.g. training hunters to do monitoring of certain species).



## 4.9.i

**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.



**Strategy:** Develop standardised monitoring methodologies and protocols for most important indicator species on a transboundary level.

**Background:** This helps to compare data at the same level and to have a uniform data set or information for a wider area.

**Strategy:** Set up a transboundary GIS platform.

**Background:** By doing so, monitoring can be stored and managed centrally and made available for everybody to use.

**Strategy:** Create transboundary networks for specific areas of nature protection and working groups of the protected areas including joint regular publications for review of research.

**Background:** This helps to communicate, research, compare and share specific data on a transboundary level and among all PA managers.

## ADRESSEES

- Ministry of Environment and Energy
- Croatian Forests
- County Public Institutions for Management of Protected Areas along Drava
- Administrative department for spatial planning, construction, environmental protection and nature conservation in Varaždin, Međimurje, Koprivnica Križevci, Virovitica Podravina and Osijek-Baranja counties
- Responsible authorities for Protected Areas' management
- Communities
- Hunters
- NGOs



## **Glossary**

CAEN – Croatian Agency for Environment and Nature

DTP coop MDD - Danube Transnational Programme cooperation Mura-Drava-Danube

E.g. – Example given

Etc. - etcetera

HPP – Hydropower Plants

MAB – Man and Biosphere

NGO – Non Governmental Organisation

OP – Operational Programme

PA – Protected Area

PI – Public Institution

TBR – Transboundary Biosphere Reserve

TBR MDD – Transboundary Biosphere Reserve “Mura – Drava – Danube”

TCP – Transboundary Cooperation Programm

