



THE KAMNIŠKA BISTRICA RIVER: *Visions for Establishment and Utilisation of a Green Buffer Zone Along the River*

Municipalities: Domžale, Kamnik, and Dol pri Ljubljani
SLOVENIA

THE KAMNIŠKA BISTRICA RIVER:

Visions for Establishment and Utilisation of a Green Buffer Zone Along the River

Summary

Over the last two centuries, the area along the Kamniška Bistrica river and its numerous mill streams has become highly urbanised. This substantial past economic development of the region resulted from utilisation of the water power of the river. The urbanisation of the area along the river is still increasing. Consequently, the green buffer zone along the river channel is slowly disappearing, which causes numerous problems relating to floods, bad water quality, a very low self-purification capacity of the river as well as several problems relating to overall water management. The project “Kamniška Bistrica River: Recreational Axis of the Region” is one of the initiatives that tries to protect the green buffer zone along this 33 km long river and, in the long run, assure enough space for sustainable restoration of the river channel. Since the green buffer zone by itself cannot stop intensive urbanisation of the river flood plains, the central idea of the proposed vision is to establish a public park all along the river that would serve as a central axis for the development of ecological, cultural and recreational tourism in the whole region.



The mountain section of the Kamniška Bistrica River.

Introduction

The Kamniška Bistrica River basin is a part of the Sava River basin, which in turn is a part of the Danube River basin. It is the most artificially controlled river in Slovenia. Early in the history of urbanisation of the region, people built a complex network of mill streams to utilise the river's hydraulic power. Later on the river and its numerous mill streams became the nuclei for the industrialisation and urbanisation of the region. The urbanisation spread throughout the flooded areas, and pushed the river into a narrow channel. If the present trend of development continues, there will soon be no green space left along the river channel, and floods might become less and less controllable. Therefore, it is necessary to give up our false beliefs and to change our practices so that they become more in harmony with the natural laws of the river.

Background information on the project

In 1997, the Institute for Integral Development and Environment took the initiative to promote sustainable river restoration and the creation of a system of parks along the river. The initiative was finally supported in the Winter of 1998, through the PHARE Microprogramme for Partnership and through the Public Works Programme. Soon afterwards, the three municipalities which share the river signed a letter of intent to work together to solve the problem of floods and, at the same time, to create a river park all along the river which would be called the “Recreational axis of the region.” The Institute for Integral Development and Environment was named as the coordinator for the process of preparation of the vision at a regional level. A wide consultation process with experts from various governmental, professional, academic, public and local organisations as well as with the gen-



The town of Domžale.



Titan mill stream along the Kamniška Bistrica River.



Jub mill stream through the Jub industrial complex.



Old barriers on the Bistrica River.



eral public started in April 1999 and was completed in March 2000. The consultation process was carried out mainly using round tables and workshops which were well covered by the local press, as well as in the form of wide public campaigns with several public events which included children, their teachers, parents and the general public.

Description of the water system of the Kamniška Bistrica River

The Kamniška Bistrica River is a left tributary of the Sava River, which is a right tributary to Danube River. It is only 33 km long and has a torrential character from its spring in the Alps to its confluence with the Sava River. The ratio between the low and high flow is approximately 1 to 300. Therefore, there are severe problems with landslides in the mountain region and problems with floods in the plain region. The river catchment is spread over 535 km² of mountain

and plain area. The basic hydrological parameters for the upper part of the river at the town of Kamnik are $Q_{100}=282,00\text{m}^3/\text{s}$, $Q_{\text{average}}=8,57\text{m}^3/\text{s}$ and $Q_{\text{low}}=0,92\text{m}^3/\text{s}$, and for the confluence with the Sava River are $Q_{100}=427,00\text{m}^3/\text{s}$, $Q_{\text{average}}=20,90\text{m}^3/\text{s}$ and $Q_{\text{low}}=1,95\text{m}^3/\text{s}$.

The proportionally high gradient makes the river ideal for the use of water power with small drives. Early in the history of urbanisation of the area, people started to build mill stream on both sides of the river to utilise the water power. The oldest mill stream, called "Radomeljska Mlinščica", is at least 500 years old. In 1913 there were 84 water powered installations (mostly mills and saw-mills) on the Kamniška Bistrica mill stream. Since then, some mill-streams have been abandoned and buried, so that today there is almost no evidence of their past existence. It is impossible to be sure how many mill stream were built throughout history in this area. Some sources mention that there were

probably close to 200 km of canals excavated and buried again in different times in history. Today, there are over 40 km of active mill streams along the Kamniška Bistrica River and most of them are still in use. There are even several old rolling mills and old hydroelectric power stations in the area that are still in a good working condition.

Very low water flow in the summer, especially in combination with large water withdrawal for the mill streams, results in bad ecological conditions in the main course of the river itself. The problem becomes even worse in the lower part of the river because of high pollution ingress. Therefore, improvement of the management of the river basin is necessary to solve this problem.

Sustainable River Basin Management

There can be no sustainable river basin and river channel management if the

approach is not highly integrated, and if it does not involve all possible stakeholders in the whole river basin. These include all of the water users and water polluters, owners of mills and other installations which use water power, land owners and land users along the river, spatial planning authorities, tourist developmental agencies, nature protection agencies, heritage protection and development agencies, water management authorities and many others. Since water protection and sustainable water management policy is to a large degree implemented through spatial development plans, it is of great importance that a green buffer zone along the river is given a proper land use designated as a protected river park area. Legal protection is not enough to protect this highly valuable area against inappropriate land uses such as illegal urbanisation, dumping and similar activities.



Kamniška Bistrica is a slow and lazy river with almost no water, which can very quickly transform into a violent torrent with huge amounts of water that often threaten with floods like in those in 1992.

THE VISION: BETWEEN DREAMS AND REALITY

We can picture the future in at least two different ways:

- as a desirable long-term future situation based on established knowledge of future trends and above all, based on desires and expectations that often seem to be far from the present reality, as a dream,
- or as an agreed plan or programme of development which is based on the present preferences and short term desires of all the interested parties, and above all, is based on the process of negotiation and compromise.

It is important to have both. The long-term vision helps us clearly to see and to keep a desired direction of development, while the short-term visions help us to move forward towards the desired future.

The vision presented in this publication is a desirable long-term future situation which

quite a large group of interested parties would like to see happen. However, it is still far from reality and far from an agreed common vision.

The Kamniška Bistrica River Park

The main focus of the vision is sustainable river channel restoration and the establishment of a river park along the entire river length. There are at least two main reasons for establishing the river park. The first reason is flood protection. Since the flood plains are mostly urbanised, and the river and its tributaries are regulated, the water regime of the river has changed considerably. Sustainable river restoration will improve the water regime, while the wider green zone alongside the river will serve as an inundation area for high waters (a flood plain). The second reason for establishing the river park is to improve

the ecological condition of the riverside environment. Consequently, there will be an increase in the self-purification capacity of the river and an increase in the diversity of habitats.

In order to protect the green buffer zone along the river against further urbanisation, legal protection of the area through establishing a park is not enough. Therefore, the main idea is to develop an appropriate programme for intensive land use. The park can serve as the main axis of regional development, connected to the ecological and cultural heritage of the region. The park itself connects the capitals of all three municipalities that share the river (Domžale, Kamnik and Dol pri Ljubljani). Also the other four municipalities in the river basin can be connected to the main axis, creating a single system of ecological, cultural and recreational tourism based on the river, its mill streams and the adjacent wetlands.



Radomeljnska mill stream is the oldest mill stream in the region.

The heritage path along the mill streams and old mills

The system of mill streams of Kamniška Bistrica River is an incredible technical heritage monument connected to the river and to the history of industrialization of the region, which needs to be protected from destruction. This system, over 500 years old, which some centuries ago hosted its first mills, and by utilising the water power of the river caused dramatic economic growth in the region - this system is definitely interesting enough to attract visitors if preserved and properly presented. A number of old mills, hydroelectric power stations and some other installations that use water as a driving force still exist in the area and they are still in a very good working condition. Those dwindling artifacts from the early times of industrialisation in the Kamniška Bistrica region should be able to give the river park a special historic character.

The old Jašovec Mill is the best preserved stone mill in the region that can be restored to conjure up some of its old beauty and richness. Next to the stone mill, there is an old sawmill that can also be preserved and restored.





An old lime-kiln is one of the very few examples of the old lime production that was in the past very important venue of earning and prosperity in the upper part of the region. The river is carrying huge amounts of bulky gravel, therefore, there was always enough raw material to produce high quality lime.



The old Titan hydroelectric power station was built in 1920, and it is still in a perfect working condition producing enough electricity to cover a great deal of the needs of the new Titan factory.



The old Felix Mill was built in the early 1920s and it is still in a perfect working condition. It is an old rolling mill that is mostly hand made of wood. The mill has only one turbine and many belts that transmit the driving power throughout the mill.





The Kamniška Bistrica River has very little water throughout the year also because of the large water withdrawal for the mill streams, which makes the river very sensitive to the pollution. Throughout the centuries, the wildlife of the river adapted to the conditions of the water shortage, but it did not adapt to the increased pollution, which is especially problematic in the lower part of the river.

THE KAMNIŠKA BISTRICA RIVER AS AN OUTDOOR CLASSROOM

Learning paths are increasingly important forms of protection of specific natural or cultural environments. They are self-guiding paths which usually do not focus on exceptional natural or cultural features. Instead, they try to include as many different natural phenomena and other elements that help to present a specific topic in the most complete and comprehensive way as possible, and in the shortest distance possible.

The Kamniška Bistrica catchment offers many possibilities to create various learning paths connected to the river and its history: In the upper valley of Kamniška Bistrica, it is possible to see the residues of the last glacier such as large boulders, moraines and the shape of the valley itself; Along the river, one can ob-

serve river terraces, erosion and other natural processes connected to the dynamic forces of the river, as well as various water habitats and their numerous inhabitants; The impressive system of mill stream and mills gives the opportunity to observe technical aspects of water management, and to get to know the history of the place and its industrial development through the history of the water use.




The system of various learning paths along the river, which supplements pedestrian and cycling paths, can change the whole Kamniška Bistrica River area into one giant outdoor classroom, and not only give the area a new educational function, but in the long run, also helps to change people's attitudes towards the river and its wetlands.






KAMNIŠKA BISTRICA RIVER AND ITS MILL STREAMS:

The ecological condition of stream channels and the identification of water powered installations





TPOLOGY OF STREAMS

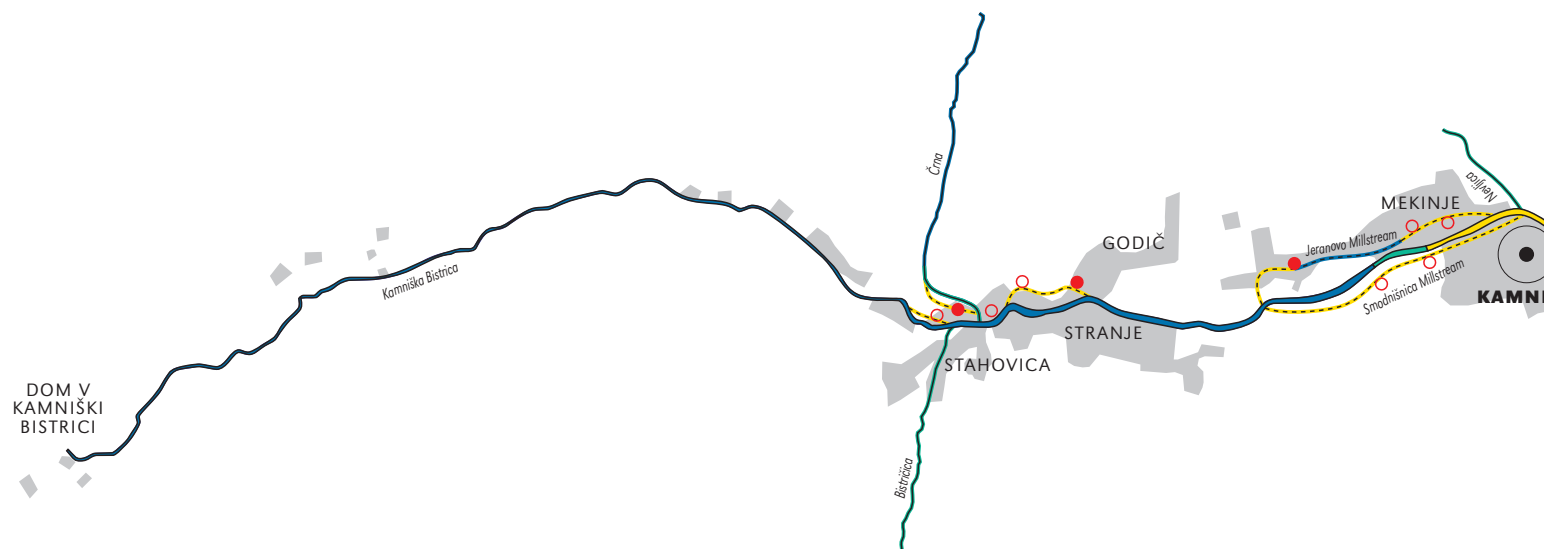
-  Kamniška Bistrica River
-  streams
-  mill streams

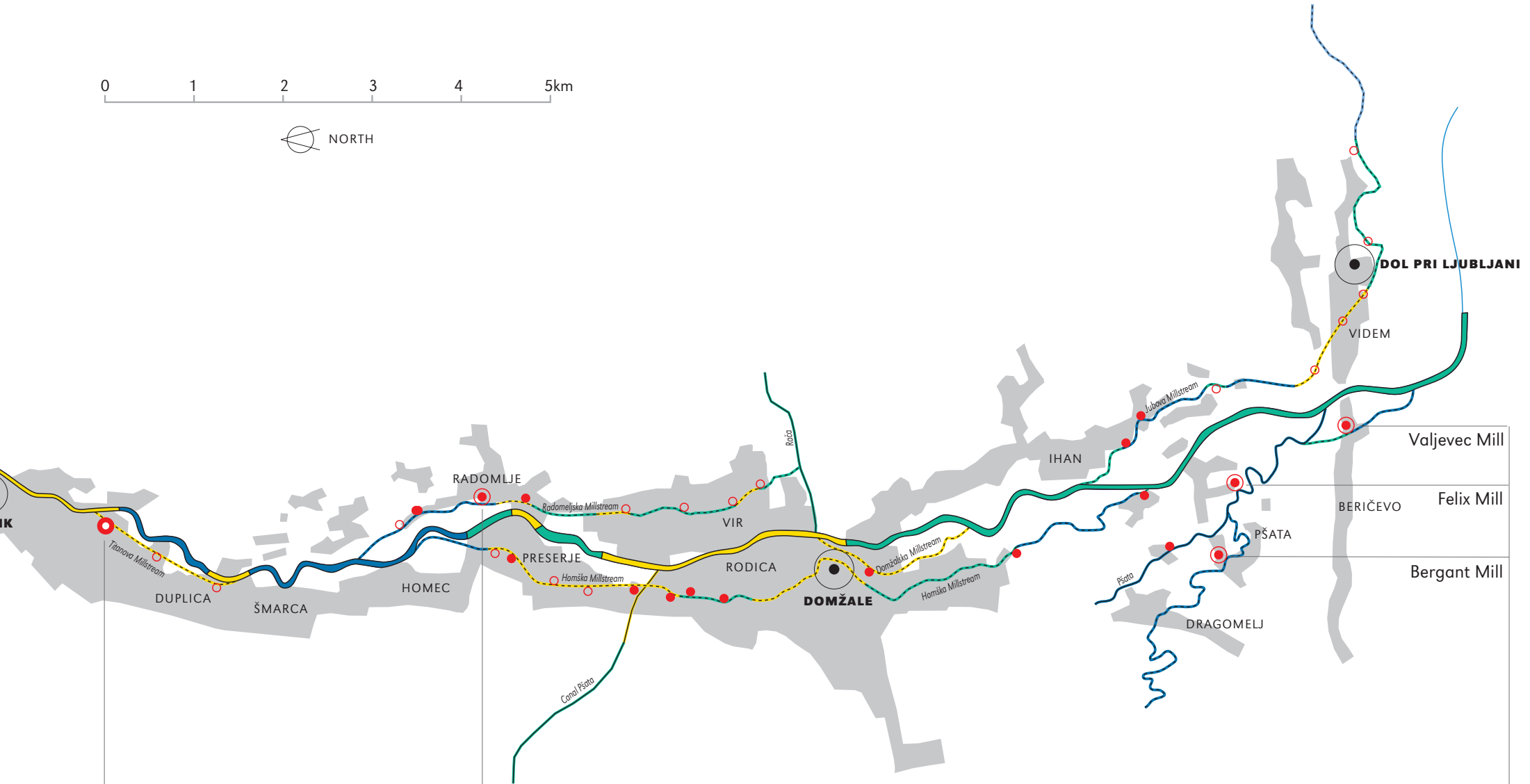
CONDITION OF STREAM CHANNELS

-  natural and co-natural
-  regulated
-  canalised

WATER POWERED INSTALLATIONS

-  locations of old mills (some artifacts still exist)
-  old mills in good condition
-  locations of other water powered installations (hydroelectric power stations, sawmills etc.)
-  old hydroelectric power stations in good condition





Old Titan hydroelectric power station
 OLD HYDROELECTRIC POWER STATION
 PROPOSED TO BE PRESERVED




Jašovec Mill
 OLD STONE MILL
 PROPOSED TO BE PRESERVED

OLD ROLLING MILLS STILL IN USE
 OR IN GOOD WORKING CONDITION






GREEN AREA ALONG THE KAMNIŠKA BISTRICA RIVER:

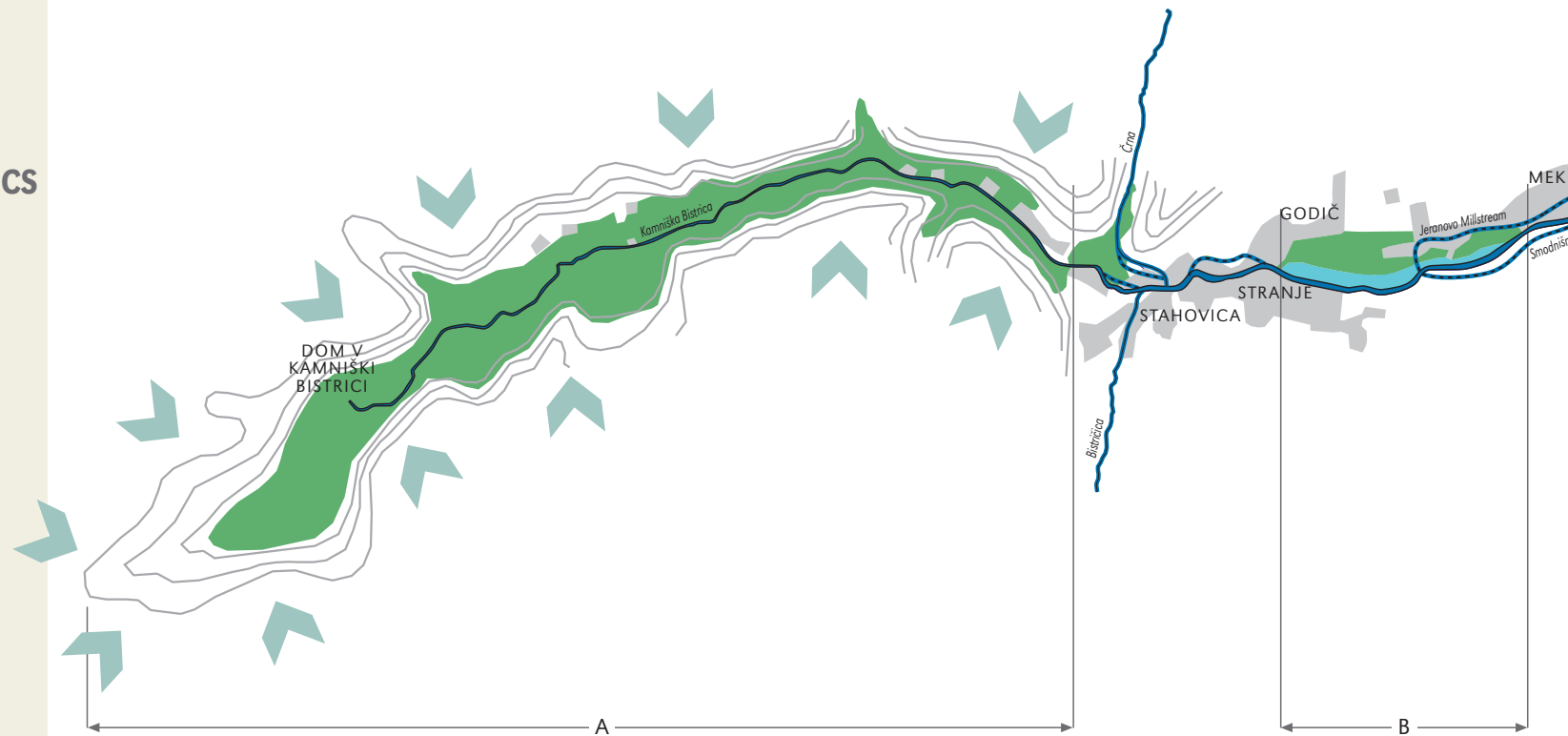
Possibilities for sustainable river channel restoration

TYPOLOGY OF STREAMS

-  Kamniška Bistrica River
-  streams
-  mill streams

SURFACE COVER CHARACTERISTICS

-  actively flooding area
-  non-urbanised (woods, meadows etc.)
-  urbanised
-  steep slopes
-  direct contact with large complexes of woods

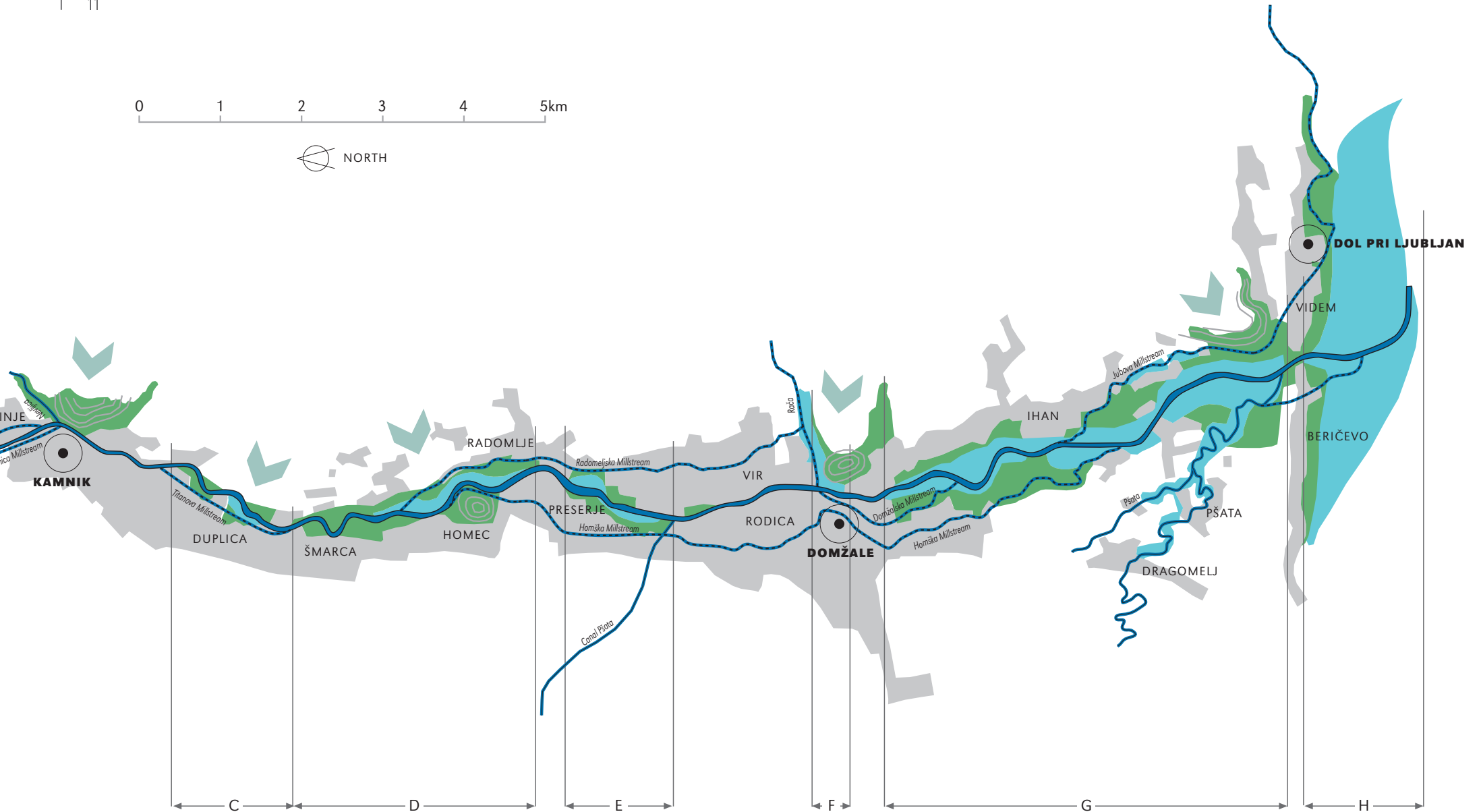


A
The Kamniška Bistrica River is a typical mountain torrent whose water course has a large carrying capacity (rocks, stones, sand). It has well preserved natural river-bed that needs to stay intact.

B
The river forms a typical mountain valley with several high terraces. Even though the river channel has been completely regulated in the past, it appears very natural. With the preservation of the first terrace as a flood plain and with proper river channel maintenance, it can reach a very high degree of renaturalisation and sustainability.

C
The river has been completely regulated; however, it appears almost natural. To preserve its near - natural qualities, the areas of green space along the river should be completely preserved.

D
Even though the river channel has been completely regulated, it appears quite natural. The main reasons are woods and quite broad vegetation zone along the left bank of the river. With the preservation of the flood plain and with a proper river channel restoration, the river can reach a very high degree of renaturalisation and sustainability.



E

The river channel has been completely regulated in the near past. With the preservation of the areas of green space along the river and with proper river channel restoration, it can reach a very high degree of renaturalisation and sustainability.

F

The area is highly urbanised and the river channel has been completely regulated. The only section that has not been canalised should be protected and regulated in a very sensitive way to keep the natural qualities of the river-bank. The hard-regulation of the river channel should be softened wherever it is possible.

G

This section of the river has been recently regulated because of frequent floods. On both sides of the river it is still possible to preserve the flood plain from urbanisation and, in the long run, renaturalise the river channel through sensitive restoration. In the whole area there are many dead river branches that need to be revitalised and hydraulically connected to the main stream.




H

The river has been recently regulated. Even though the whole riparian vegetative strip adjacent to the river banks has been destroyed, a high potential for sustainable river channel restoration still exists. Therefore, the flood plain should be preserved and a wider zone along the river should be devoted to the river.

KAMNIŠKA BISTRICA RIVER PARK:

The concept for establishment and utilisation of a green buffer zone




TYPOLOGY OF STREAMS

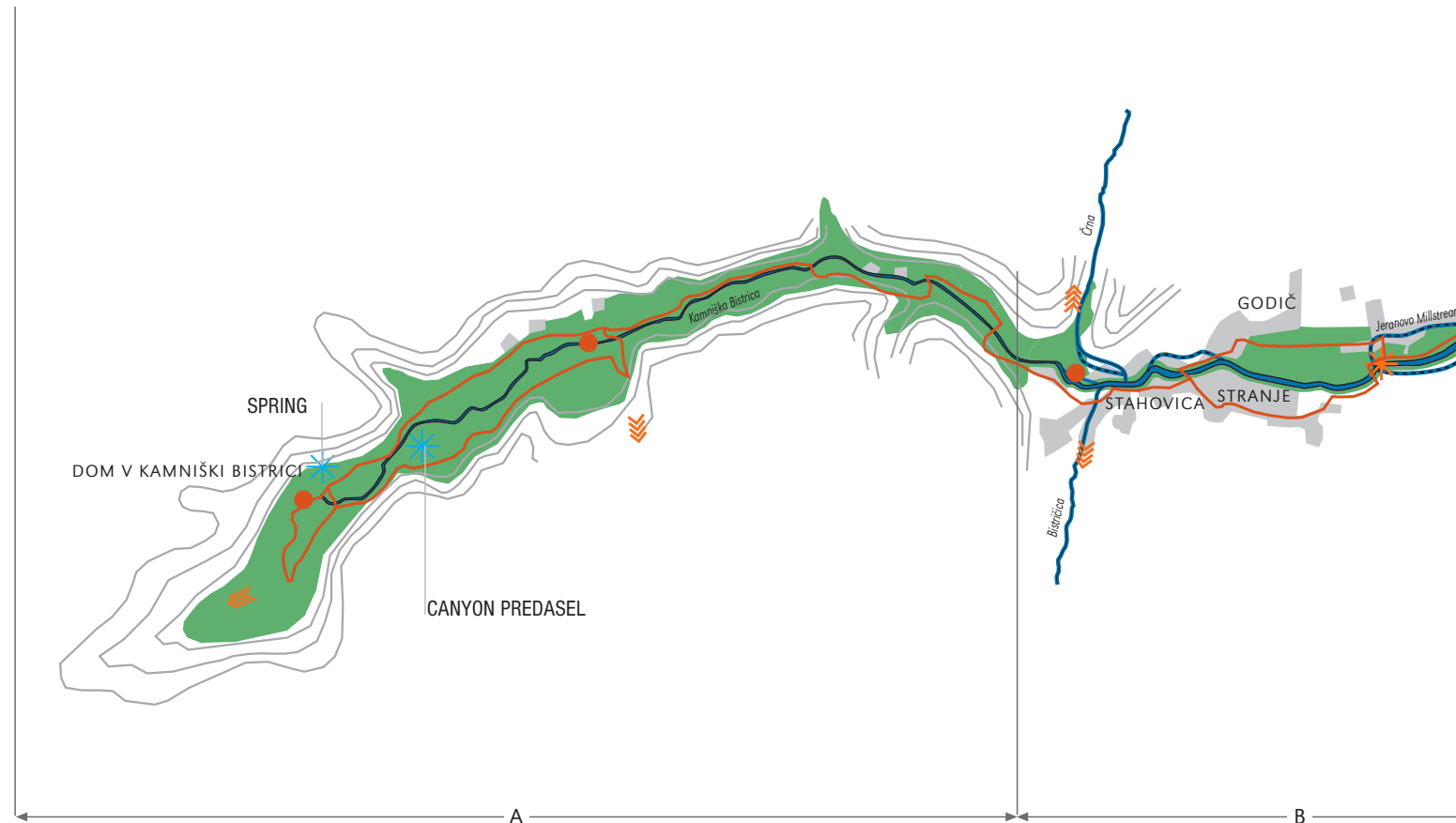
-  Kamniška Bistrica River
-  streams
-  mill streams

TOURIST ATTRACTIONS

-  cycle path
-  focal points (starting points etc.)
-  cycling connection to other attractions
-  major natural river attraction (spring, canyon etc.)
-  major attraction connected to river use (old mill, old hydroelectric power station etc.)
-  other major attractions (botanical garden, historic centers etc.)

LAND USE

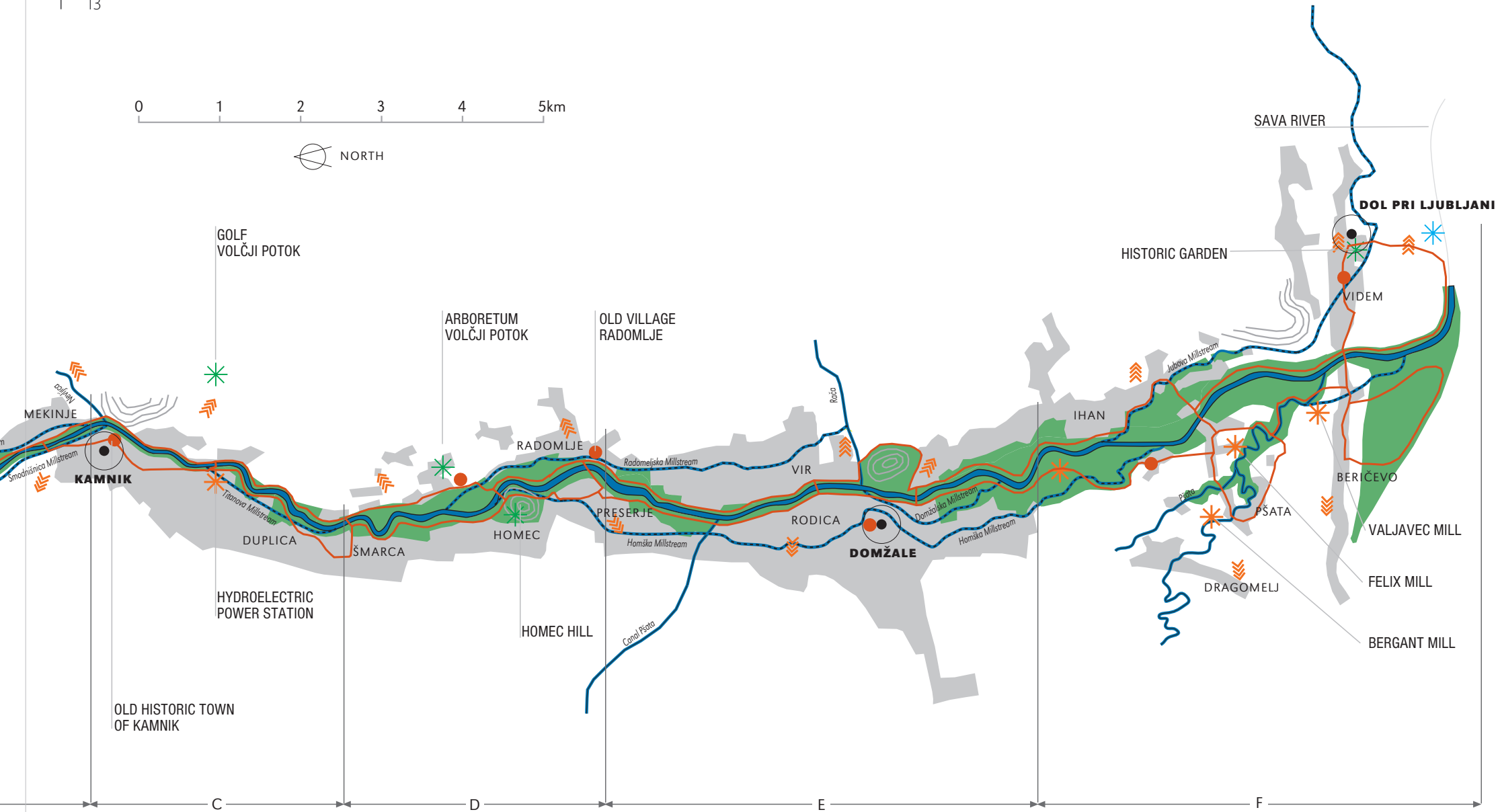
-  urbanised
-  proposed river park (recreation, agriculture etc.)
-  steep slopes



A
The mountain valley of the Kamniška Bistrica River offers a unique experience of the torrential mountain stream with its dry torrential tributaries, narrow canyons, deep still water pools, water-falls and emerald green water. The cycle path often crosses the river to give many different views of the river landscape. In addition, the river already represents a very popular picnic area and the point of departure into the mountains.

B
The valley from Stahovica to Kamnik is interesting because of several well established river terraces that form the basic morphology of the valley. In addition, Stahovica represents the start of the Kamniška Bistrica mill stream system with some impressive old river dams and gates.

C
The town of Kamnik and the area south of Kamnik is highly urbanized and needs new recreational areas. Through the old historic town the river is completely canalised, while its natural appearance has been preserved all along the industrial zone that has been formed on both sides of the Titan mill-stream south of Kamnik. One of the first water powered installations on this mill stream is an impressive old Titan hydroelectric power station.



D

The area of Volčji potok and Radomlje is known for the oldest mill stream along the Kamniška Bistrica River, which is at least 500 years old. There used to be a lot of old stone mills in this area, but now only the Jašovec stone mill is left. The mill stream has all the qualities of a natural stream. The river itself has preserved its natural appearance. These facts, together with many other cultural and natural attractions, give the area a high potential to attract visitors and to develop into a popular river park.

E

The highly industrialised and urbanised area north and south of the town of Domžale has been developed along the two main mill streams. The river and the mill streams are to a large extent canalised and there is almost no possibilities for their renaturalisation. Along the river there is a strip of greenery with paths that could form a future park along the river. South of Domžale, however, there is more space that can be devoted to the river, which makes that part of the river very interesting for the development of the river park.

F

The area of Pšata and Dol has a very high natural potential for development of the river park. Unfortunately, there is no real tourist attraction in the area yet. Besides that, highly polluted water of the Kamniška Bistrica River gives a very bad image to the river. With the revitalisation of abandoned river branches and the restoration of the river self-purification capacity, the river park can acquire better image in the long run. By the river, there are three old rolling mills that are still in a good working condition and that could already serve as an important tourist attraction.



The old Koželj Path leads along the Kamniška Bistrica River from its spring in the mountains all the way to the historic town of Kamnik.

Cycling is an important recreational activity interesting for tourists as well as for the afternoon visitors. It leads visitors along the river and through wonderful countryside.



THE KAMNIŠKA BISTRICA RIVER AS A RECREATIONAL AXIS OF THE REGION

The vision of the river as a recreational axis of the region is to create a system of bicycle and pedestrian paths along the Kamniška Bistrica River that would feature a rich recreational programme and connect not only all the major towns along the river, but also interesting tourist destinations in its hinterland, into one massive system of cycle paths.

The fact is, that cycling has become one of the most popular recreational activities in the last decade. Cycling links recreation with afternoon or Sunday trips to places interesting for their cultural and natural heritage which are close to big cities. The concept for the Kamniška Bistrica system

of cycle and pedestrian paths, therefore, distinguishes two systems of paths. The first system is the path which connects all major attractions along the river. It mainly follows the Kamniška Bistrica River or one of its mill streams, and finally leads to Ljubljana, which will be the expected source of most visitors. The main axis connects several places which serve as points of departure for shorter or longer circular cycling or pedestrian trips into the hinterland of the Kamniška Bistrica region. Besides that, the Kamniška Bistrica River offers also other recreational attractions which have become very popular, such as picnicking and horse riding along the river.

The upper part of the river has very good potential for fishing tourism. The water is clean, fast and great for trout.



THE CONCEPT OF A TOURIST DEVELOPMENT PROGRAMME

The Kamniška Bistrica River, as the focal axis of the region, can connect many different programmes along the river. The cultural, natural and technical heritage, and rich recreational, cultural, ecological and educational programmes, all can be included into one comprehensive tourist package. Some of its programmes, such as The Heritage Path or The Cycle Path, connect the whole region together. Other tourist programmes and attractions give the sub-regions along the river their specific identity:

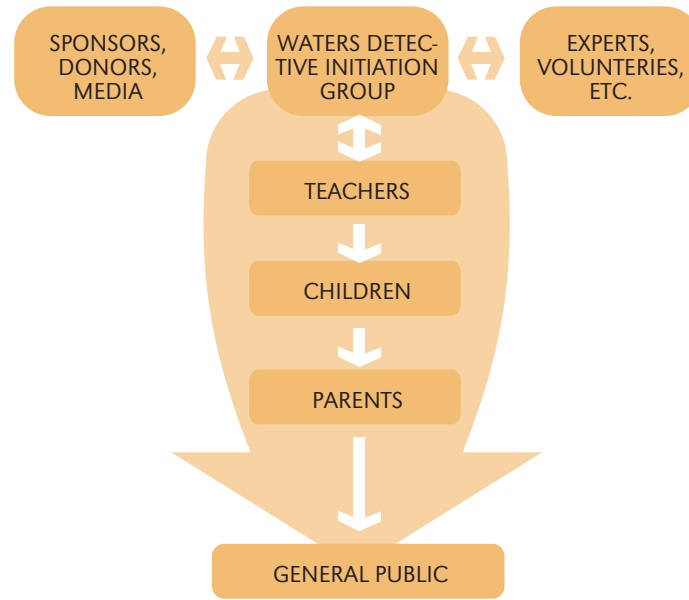
- The upper valley of the Kamniška Bistrica is a very popular point of departure into the mountains for hiking in wild nature, climbing or skiing;
- The old town of Kamnik is interesting for its mediaeval architectural heritage;
- The area of Volčji Potok, Radomlje and Homec is interesting for the historic garden, arboretum, and golf course, as well as for numerous inns and pubs with good traditional food;
- The town of Domžale is known as a young industrial area that hosts international competitions in tennis;
- The area of Dol pri Ljubljani, Pšata and Bišče is known for its industry and old mills.



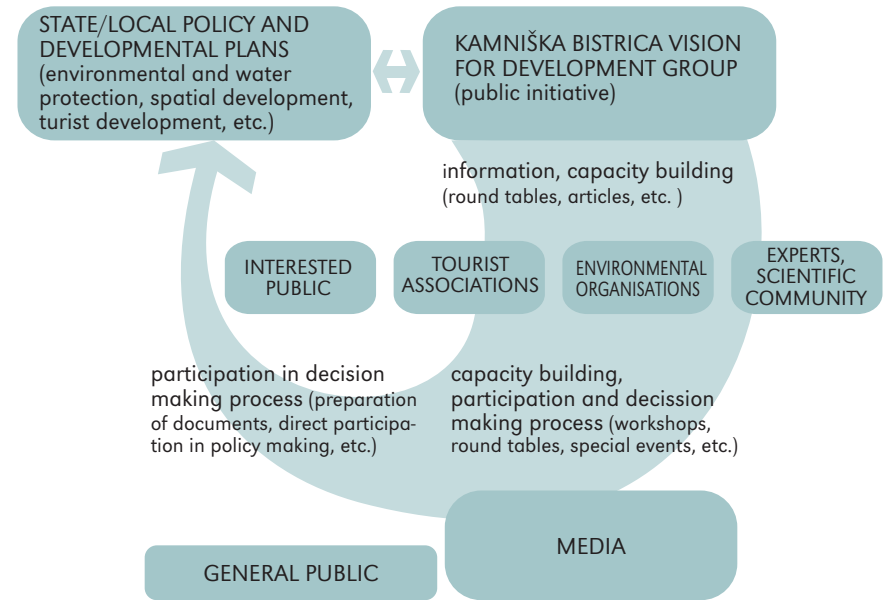


In the mountains, the river goes through several canyons and narrows, such as the narrow at Iverje.

The chart represents the linear pattern of capacity building through education.



The chart represents circular pattern of capacity building that is characteristic of capacity building through participation in decision making processes.



FROM VISION TO REALISATION

One of the main tasks, at the moment, is to raise the general level of understanding of natural processes, and consequently, to change peoples' attitude towards the river and its heritage. This is needed in order to create a strong political will in the region, which will be able to make a change towards a more sustainable regional development and more sustainable river basin management, and finally, it is needed to gain a strong public support.

Making room for the river through physical planning

A water system is a dynamic system, which needs room to function, to change

and to evolve. Therefore, man should respect the natural processes and work with them, not against them. We must change our twentieth century attitude towards nature and recognise that technology cannot solve every problem for us. Nature will sooner or later demonstrate that the river is a living part of it, and that we cannot govern it. If we consider the likely effects of climate change, we have to recognise that one hundred-year or one thousand-year events could happen tomorrow. This is an important recognition we have to follow and therefore start to use those systems which are relatively safe even if they should fail. This means that we

have to make room for the river and its natural processes through wise physical planning and proper land use.

Public participation in implementation of the vision

Public consultation and public participation in decision making in water management, spatial planning and regional development are vital to the success of environmental protection, as well as to the implementation of sustainable regional development. Public participation increases the quality of decisions and the possibility of their implementation. However, a poorly informed public can-

The old regional tradesmen's tradition of celebrating the first day of spring by "throwing the light into the waters" and more general Slovenian celebration of the birds marriage were merged with the new ecological topics of wetlands into a very successful project "Where the birds are getting married?", which is conducted in several kindergartens throughout the Kamniška Bistrica catchment.

One of the public round tables where we talked about the possibilities for development of a river park to make room for the river.



Also very young children learn about the Kamniška Bistrica River and its mill streams.

not be constructively included into the decision making processes. Building the capacity of the public to enable its full involvement into the decision making process is therefore of vital importance.

As a part of its strategy to build this capacity, the project "Kamniška Bistrica: Recreational Axis of the Region" uses two main methods. The first method is the involvement of the public into a decision making process starting with capacity building through round tables, workshops and media involvement, continuing with the preparation of special documents, and finally, through direct involvement in the preparation of local,

regional or state policies and development programmes.

The second method is focused mainly on raising awareness about water and water environments through various public awareness projects and campaigns. The umbrella project for these activities is the Water Detective project, which runs in collaboration with teachers in primary schools and kindergartens. The projects are designed in such a way that not only are children and their parents included, but also their local communities and local media become involved in some general public events connected to the Water Detective and the Kamniška Bistrica River projects.





Epilogue

The project “The Kamniška Bistrica River: the Recreational Axis of the Region” has started a long process of public awareness and capacity building, and is geared towards public participation in decision making processes. In the past two years, many decisions have been already made and implemented, and many more choices still need to be made to achieve the vision. Even though the process is slow, the vision has started to live its own life in the hearts of many people. This makes it even more real.

Acknowledgements

This publication is the result of the initiative which was taken by Institute for Integral Development and Environment together with the Municipality of Domžale and the Tourist Association of Radomlje in the autumn of 1998 and resulted in a PHARE micro project: "Kamniška Bistrica: Recreational Axis of the Region". The Municipality of Dol pri Ljubljani and Municipality of Kamnik soon joined the initiative. There were also many other organisations and individuals who joined the initiative through participation at the round tables, which were essential for preparation of this publication. For their support and participation we gratefully thank them all.

Round tables and workshops:

30. September 1999: River as Recreational Axis

14. October 1999: Water Management Aspects of the River Channel Restoration

28. October 1999: Educational Programs and Learning Paths

18. November 1999: Mills and Mill Streams along the Kamniška Bistrica River

25. November 1999: The Concept of Tourism and Recreational Program Along the Kamniška Bistrica River

Experts and representatives of municipalities, who helped to form the vision through participation at round tables and workshops, and other consultants that were invited to participate at the project:

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- Kamniška Bistrica River basin
- Danube River basin

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Savska 5, 1230 Domžale, Slovenia
 icro@siol.net

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