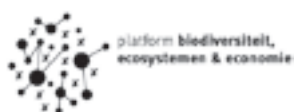


A GREEN RHINE CORRIDOR

FUTURE PROOFING WESTERN EUROPE'S LARGEST RIVER
FOR PEOPLE, NATURE AND THE ECONOMY





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June 2013

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Rhine Corridor

Rhine Corridor is an initiative of the following organizations:

Aqua Viva – Rheinaubund

BUND / Rhine Working Group

European Rivers Network

Institute for Geography and Geoecology

Natuurmonumenten

Platform Biodiversity Ecosystems and Economy

Staatsbosbeheer

WWF France

WWF Netherlands

WWF Switzerland

Rhine Corridor is supported by the European Anglers Alliance, Pro Silva Nederland, Sportvisserij Nederland, stichting Innovatie Recreatie & Ruimte and Wetlands International.

Rhine Corridor aims to strengthen and future-proof the significance of the Rhine as a hydrological, ecological, economic and social backbone of Europe.

Rhine Corridor wants to achieve this goal through the restoration of natural processes and by building new, strong and sustainable links between the river, people and economies. Activities of Rhine Corridor focus on the Rhine, including its tributaries, from source to sea.

This Vision describes the common vision of the organizations participating in Rhine Corridor.

In this Vision ideas for future work are presented. These are marked by icons and found throughout the report:



Study: proposed study on an issue of great importance to a Green Rhine Corridor.



Business pilot: examples of Rhine Corridor solutions that are more profitable (economically) than business as usual.



Project idea: project ideas that Rhine Corridor partners would like to explore, individually, jointly or with outside partners from business, governments and other relevant stakeholders.

Chapter 3 includes a number of tables entitled 'Possibilities for Action'. These tables list benefits for different stakeholders of a Green Rhine Corridor. These tables are by no means complete, but should be seen as concrete proposals for discussions with business and other stakeholders.

1 TRAVELLING DOWN A LIVING RIVER

The Rhine: ecological corridor and economic backbone, connecting five European countries to each other and the sea. Host to salmon and beaver, important to industry, agriculture, recreation, housing and transport. Today already a living river in many ways, but much can be improved. Natural life can be more closely linked to economic life and vice versa – not by accident but as a deliberate choice.

Although a living Rhine is like today's Rhine in many aspects, it differs in crucial others. What would a truly living Rhine look like? Let's take a trip downstream.

Like today's Rhine, a living Rhine starts in the high-mountains, with glaciers slowly but steadily releasing milky-opaque water. But more so than today it also starts in the middle mountains, comprising of watersheds with optimized land use, restored wetlands and reactivated floodplains. Here water is stored, much more effectively than today, during heavy rainfall. And subsequently released, just like the glaciers do, drop by drop – tens, thousands, billions, gradually laying the foundation for an economy stretching 1300 kilometers through Northwest Europe.



Looking at the small streams at high altitudes, the Rhine's importance to men is not immediately obvious. No economy in sight in many areas – or is there? Tourism has for many decades been the largest - and in some areas the only - economic sector with continuous growth, with nature-based tourism as one of the most important pillars.

Moving down, streams find each other and become a large one. Too wide to cross. Salmon come here to spawn, fishermen to catch the salmon. Somewhere in the valley more and more streams merge and become a river. The occasional cabins that are occupied in summer only, make place for houses. People live near the river. Close enough to enjoy its usual tranquility, but high enough above it to be safe when the mellow flow of water changes its mood and becomes a powerful current. A Living Rhine has restored oxbows and side-channels – and even beaver dams – which help to prevent or break the force of floods, buffering peak levels and stream velocity.

As the stream becomes a river, hiking trails become roads. The first village consists of a few houses, some bridges, a hotel and a campsite. Tourists in rented canoes are picked up downstream, near the first city, after peddling for hours through a breathtaking mosaic of meadows, forests and villages. They bring revenues to the village, keeping it vibrant and alive as part of a truly living Rhine.

RHINE CORRIDOR - A VISION OF THE FUTURE

This vision is anchored in our common belief that a revitalised Rhine will offer new economic opportunities, better living conditions, increased safety against flooding, opportunities for society to adapt to climate change, improved quality of water and nature, and new inspiration for the people living there. It could harness new energy, new approaches, new projects, and new support and funding for the Rhine.



A restaurant with a terrace facing south, overlooks the river. It serves local pastry, bread and dairy products, and depending on the season berries, game, fowl and fish. Hunters, farmers, fishermen, bakeries, butchers and others all benefit from the business opportunities the Rhine provides.

Further down the river everything is larger. Canoes are joined by large and modern fuel efficient container vessels transporting goods up and down the river. On a living Rhine,

the continuity of transport has much improved by adapting the draught of these ships to lower water levels. An added advantage is that dredging efforts can be minimized, which not only saves tax-payers money but also halts the drop of groundwater levels in the wider surrounding area.



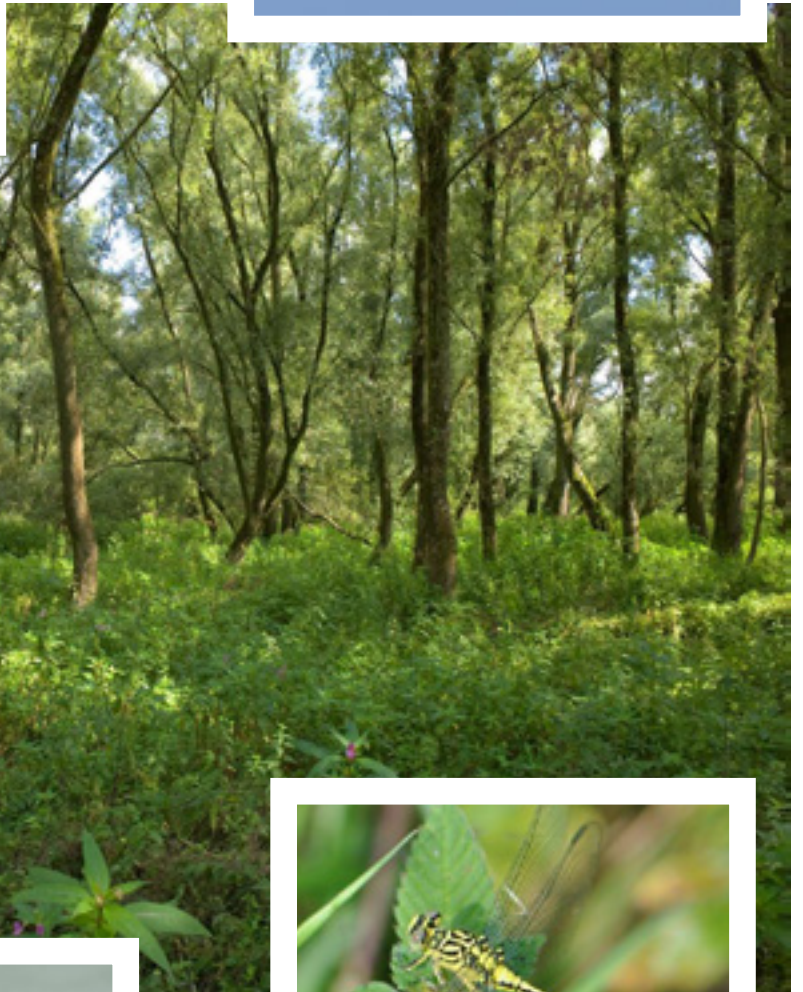
Remnant side channels of the former braided river system still exist and provide valuable floodplain habitat – and recreation opportunities.

Villages and small cities become urban areas stretching for many kilometers. Larger also are the number of people lying on beaches, enjoying the coolness near the water on hot summer days. Apartment buildings and hotels are located near the river, with the most sought-after rooms and apartments overlooking the breathtaking scenery. The living river with its green shores more effectively serves as a buffer for the effects of climate change such as heat, droughts and high-water peaks.

While continuing the journey, the river more and more becomes the visible blood vessel of the local and national economy. A reliable source for production of drinking water, cooling water for clean industries and for growing crops. Taken for granted by everyone living downstream, the continuity of supply especially in late summer very much depends on the water retaining capacity of rich, organic soils of forests and marshes upstream.



Extensive gravel banks have great potential for ecological restoration even along a heavily used waterway.



The shores and forelands of a living Rhine are a true, green corridor – providing space for flood control, wildlife and tourism but also for extraction of clay, gravel and sand. Extraction is allowed as long as it contributes to an ecologically functional secondary floodplain landscape. Houses in the lower forelands of a living Rhine have innovative designs, comfortable and with the ability to float. Built near restored side channels big enough to cope with high-water levels and ensure safety for a big city a few kilometers upstream. White-tailed eagles soar in the sky, lazily. Young otters make their way down the river. At night they use a green corridor in a large city to continue their journey. That same corridor is the favorite lunch spot of the people working in office buildings nearby. Also, here city children build tree houses and dams; in the process they are gaining strength, balance and coordination.

Near the end of the trip the living Rhine widens and splits into a number of branches. No longer in a hurry, water levels and stream velocity are increasingly influenced by the sea. Spreading over a wide area it deposits sand and clay, building up the land, helping to cope with raising sea levels. Fresh water becomes brackish, brackish water becomes salt. Oysters grow locally. Sturgeon, salmon and even an occasional harbor porpoise find their way upriver. The latter only for a few kilometers, the salmon still facing more than 1000 kilometers to reach its spawning grounds in the crystal clear water of the hills and mountains. The same area this trip started. It is just one of many cycles in a truly living river.

2 THE RHINE'S HEALTH PROGRAM

2.1 How the Rhine got ill

For thousands of years, people have lived near the Rhine, feeding on fish and wildlife and using the river for navigation. In the beginning, they certainly had temporary and local effects on the ecosystem, but did not upset the balance.



3000 years ago people started clearing land for agriculture. This resulted in increased sediment loads in the Rhine, followed by surface deposition over much of the floodplains, speeding up growth of the delta, increasing floods and ending peat formation.



1000 years ago the first minor tributaries were dammed and streams embanked, cutting off the river from its forelands, affecting both the river and the outer dike ecosystem.



In the past centuries, at an ever accelerating pace, more and more activities fundamentally changed the Rhine's natural processes.

Some of these changes were seen as progress and ambitions for further 'progress' were strong. According to 'Tamer of the Wild Rhine', engineer Tulla (1812): *"no stream or river, the Rhine included, needs more than one bed; as a rule, multiple branches are redundant"*. In 1817 he put his words into action and started a massive effort to straighten the Rhine in order to increase flood protection, ground water control,

establish a fixed boundary line with France and foster trade. Other interests, even at the time commercially important resources such as timber and salmon, had to yield. In the words of Cioc (2002), the idea of Tulla and his engineering colleagues *“of a well-behaved river was not a river at all: it was a canal, utterly and completely harnessed to the needs of transport”*.

After the rapid industrialization and growing populations of the 2nd half of the 19th and 1st half of the 20th century, the Rhine was in effect an open sewer, ‘seasoned’ with a deadly brew of toxics set free by the chemical production of acids, alkalis, fertilizers, explosives and dyes.



Overfishing of salmon became a problem in the same period, although further canalization and blocking of sea arms soon after surfaced as an even greater threat to salmon populations. Sturgeon and allis shad populations – two other commercial fish species – and a whole range of economically less valuable migratory fish took a nose dive as well.

Canalization and pollution had major impacts on natural processes. The river landscape was completely remodeled, natural structures were lost, fish had fewer places to spawn, side-erosion and sedimentation were hindered, oxygen levels decreased and the self-cleansing capacity of the river and its once connected marshes and riverine forests was severely reduced. The water quality deteriorated after the Second World War caused by large amounts of wastewater containing quantities of organic matter, pesticides, heavy metals, chlorine, salt and other chemicals. The Delta Works, constructed between 1954 and 1986 in the Rhine delta in order to provide safety, led to local problems with water quality and formed a major obstacle for migratory fish.

2.2 A turning point

In 1971 water quality hit an all time low (Frijters and Leentvaar, 2003). The river lacked oxygen in its downstream section, and this (finally) shocked the public and governments. At the same time it became clear that the decrease in water retaining capacity of the floodplains throughout the upper Rhine catchment area increased the risk of flooding in Hesse, Rhineland-Palatinate, North Rhine-Westphalia and the Netherlands. Something needed to be done, and it needed to be done quickly. Within a few years, a number of Rhine organizations were set up, and conventions were signed. But no significant action was taken.

Sometimes a disaster is needed to move from paper to action. This was certainly the case for the Rhine. A disaster on 1 November 1986 and a near-disaster in January 1995 turned out to be blessings in disguise. On the first date the Sandoz chemical plant near Basel caught fire and an incredible amount of chemicals ended up in the Rhine. This mix was so deadly, that 40 water works had to stop their intake of water. Nearly all aquatic life was killed between Basel and Koblenz. Finally governments of the Rhine states took action, agreeing on ambitious targets to reduce pollution and to restore impacted species such as the salmon.

This time words did lead to action. Between 1970 and 1985 governments spent over 30 billion on purification plants. Furthermore measures were taken to limit pollutants from entering the Rhine. In the following 10 years pollution from point source discharges was reduced by over 80%.

The second event that boosted action took place in January 1995. Water levels in the Rhine in the Netherlands rose so high that 250.000 people had to be evacuated within one week because major dikes were in danger of breaking. This near-disaster too proved to be an effective wake-up call. Shortly thereafter the Netherlands government decided to increase the safety by strengthening dikes, and by giving more space to the river. Dikes were set back, side channels, riverine forests and marshlands were restored and as a direct result many species of plants and animals reclaimed the territory they had lost over the years.

*Flooding at Weertershof,
the Netherlands*



Other positive measures taken in the past decades include removing hindrances between North Sea and the river, building fish passages, habitat improvement in tributaries and restocking the river with eggs and alevins to enable salmon and sea trout to re-establish themselves. Some salmon have indeed returned to the river, but numbers are still low and natural reproduction is happening only at a few sites. Other fish species however, including sea trout, are faring better, with stocks now increasing.

Many organisations have helped to ensure action. The International Commission for the Protection of the Rhine (ICPR), having played a central role, deserves a special mention. Milestones include decisions on the implementation of the Rhine Action Programme (1987-2000) and Rhine 2020. Ministers conferences have been instrumental in taking the necessary steps and the conference planned late 2013 could become a new milestone.

2.3 Land use, climate change, floods and droughts

But not all news is positive. Today the combined effect of land use change, increased drainage and climate change threaten people and economies all along the Rhine. This issue is complex and needs some explaining.

Simply put, the Rhine is fed by two sources: 1) precipitation and 2) glaciers.

Precipitation

Climate change is leading to a change in precipitation patterns, with more snow and rain in winter and less in summer. Precipitation in winter may rise 5-20% in 2100 (ICPR, 2100). Precipitation, once in the river, flows to sea within a few days, or a week at most. Most precipitation however takes days, months or even years before it reaches the river. In a natural situation it first travels through the soil, very slowly. Subsequently, when it surfaces, it is slowed down by 'spongy nature' such as marshes, deciduous forests and natural meadows. Man has however replaced deciduous trees by coniferous forests with less 'spongy', often artificially drained soils. In addition marshes and natural grasslands have been drained and cultivated, and streams canalized. The net effect being that precipitation reaches the Rhine faster than ever before.

Glaciers

The long-term reliability of glaciers – important in late summer when water is most needed – may be in jeopardy as a result of climate change (Haskoning, 2010). Volume wise, the contribution of glaciers to the Rhine is relatively minor. In late summer however, when precipitation is scarce and crops are still growing, this source is quite important. As a result of climate change glaciers may disappear. Even if this would happen, there would still be snow in winter and this would still feed the Rhine in summer. This snow however, unlike glaciers, would not last all summer.

The above changes in land-use (with more drainage) and climate contribute to two major problems faced by people and economies all along the Rhine: 1) floods and 2) droughts.

Floods

Floods are in part caused by water that is no longer buffered by spongy nature but instead makes its way to the Rhine in large quantities in a short period. A recent study of scenarios for the discharge regimes of the Rhine (ICPR, 2011) states that "if

predictions prove to be true, they would require the Rhine system to show a high adaptive capacity". Climate change is affecting precipitation patterns, with more rain concentrating in short periods. The combined effects of climate change (larger quantities of rain in certain periods) and of drainage and land-use change (the larger quantity makes its way to the river in a shorter period) greatly increase the risk for, and severity of, floods.

Droughts

The risk for droughts is greatest in late summer. As with floods, the risk for and severity of droughts is greatly increased by changes in climate, drainage and land-use. First of all, climate change is not only predicted to result in more rain in some periods, but also in longer periods without any rain in others. Furthermore glaciers, today a significant source of water in dry periods, may be disappearing. Lastly, spongy nature has been drained and cleared in large parts of the catchment of the Rhine and is thus no longer able to continue to supply water in long dry spells.

Hence, low discharges we already experience today, will occur much more frequent in the future. Transport, agriculture, energy supply (through lack of cooling water for power plants), production of drinking water, process water for industry, nature and recreation along the Rhine will all suffer.

Study – the effectiveness of the sponge

While the theory of how water can be stored in the middle mountains is clear, serious doubt is often expressed about the effectiveness of taking measures to restore storage capacity. This doubt is fueled by the current models used to predict floods. For this report these models have been studied in detail (Deursen et al, 2012). The conclusion is clear; the models in their current form cannot be used to predict the effectiveness of storing water in middle mountains. They have a number of fundamental flaws, most notably:

- *Models are designed either to simulate the flow of water in rivers or to simulate transport in the soil. None of them covers the whole picture.*
- *Models look at changes in land-use, without taking into account the (more important) changes in drainage.*
- *Most models are based on a (modified version of) of a Curve Number Approach for changes in land-use. The foot of a slope - which is of critical importance for water storage – typically lies outside the boundaries of this model.*

Adaptations to models may somewhat improve their usefulness, but the only way to get a better grasp of what will happen in reality is to measure in the field – data should cover and precipitation, and land-use, and drainage and and river discharge.

2.4 Reconnecting

As shown in practice (see 2.2), a combination of ambitious targets and international cooperation can make a world of difference. Unfortunately much of that ambition resulted from negative incentives; a dying river and catastrophic accidents. This vision proposes to take the next step, not as a response to a catastrophe, but to prevent future problems and at the same time out of an understanding that a revitalized truly living Rhine will improve the lives of millions of Europeans and strengthen as well as broaden the base for local and regional economies.



3 SAFETY AND ECONOMIC BENEFITS

People may take action out of fear, or - preferably - because they are inspired. Rhine Corridor aims to inspire by painting a picture of a Rhine that is safer, performs more functions and does so better, and is more beautiful and more accessible than today. This is not just a dream. The change is possible if we want it to happen. An appealing precedent is the Lower Danube Green Corridor; an initiative of the WWF Danube-Carpathian Program. In April 2000 the Ministers of the Environment of all Danube states signed a declaration committing to improving the conservation of over 1 million hectares. This dream came true. Ten years later, in 2010, an amazing 1.4 million hectares were better conserved.

Unlike the Lower Danube Green Corridor, Rhine Corridor is not merely about conservation. It is also about people benefitting in many ways from a better Rhine, with more jobs, a better place to live and recreation in the immediate vicinity. Hence Rhine Corridor makes a lot of sense not only from an ecological but just as much from a socio-economic perspective.



Eurasian beaver

3.1 Innovation, not melancholy

This vision does not promote that the Rhine returns to the river it once was. Instead it proposes a leap forward and to create together the best new Rhine imaginable. For this to happen a couple of steps need to be taken:

1. *The river must be revitalized.* By restoring natural processes (erosion and sedimentation, flooding, natural grazing) and habitats (riverine forests, marshes, side channels) and re-introducing species who can't Return home on their own (beaver, otter, sturgeon, see 3.7). And by reconnecting the river with its tributaries, oxbow lakes and flood plains. In other words, by enlarging and connecting today's ecologically healthy dots and build a true and strong corridor.

2. *People and river must be reconnected.* Simply by making the Rhine much better accessible for living, working and recreation. Currently, in most areas it is very difficult or even illegal to get to the banks of the Rhine and enjoy its beauty from nearby. Nor is it possible for many people to connect to the river in one of the most attractive ways one can think of: by living in a House with a river view (see 3.5). Another way to reconnect is by bringing the river in the city to create a perfect mix of Cool, green and blue (see 3.4). Naturally not all things can be done everywhere and some vulnerable areas will require strict protection: connecting people to the river requires tailor made solutions: Think river-scale, act locally (see 3.3).
3. *The Rhine must be made 'future proof'.* As one of the Rhine's sources (glaciers) and precipitation patterns are affected by climate change it makes sense to restore the natural water buffering capacity of marshes and floodplains in the middle mountains. See The source of the Rhine (see 3.2). Restoring the natural water buffering capacity must not be done simply out of a love for marshes, but because Natural innovations (see 3.6) can help to fight droughts that have an impact on farmers, factories, shipping and drinking water companies in late summer. And to help decrease flood peaks and bring safety to those living on the Rhine's banks, and in its floodplains.

Innovation is crucial in order to realize this vision. Men is incredibly innovative. We've been on the moon, eradicated smallpox, invented the internet, re-use sewage effluent for drinking water and capture the energy of sun and wind. All major achievements that result from an appealing vision and a decision to 'go for it'. These same elements already helped to combat pollution in the Rhine. In the 1970's governments made it clear that enough was enough, and within a few decades the situation was largely turned around. Over 96% of the wastewater generated by industry, trade and households along the Rhine now goes through treatment plants (ICPR, 2008). As mentioned before, and this message cannot be repeated enough, change is possible if we really want it to happen. The following paragraphs describe which steps must be taken next, in order to allow the Rhine to further improve its health. We will all benefit.

3.2 The source of the Rhine

The Rhine is fed by two main sources: glaciers and 'spongy' nature in the higher parts of its catchment (see 2.3). Climate change is affecting glaciers and precipitation patterns, whereas land change (e.g. draining and straightening) has greatly reduced the effectiveness of the water storage capacity of marshes, meadows and forests (especially in the middle mountains). Combined, these factors can result in increased problems in late summer (longer droughts) and in winter (more extreme floods) all along the Rhine.

Patchwork solution

It will be difficult to change precipitation patterns, or to stop glaciers from melting away – even if the discharge of greenhouse gases would stop right now – because climate change is already underway. It is only common sense therefore to focus on what can be achieved; restoring 'spongy nature' in higher parts of the Rhine catchment. This will take some time, but a patchwork of smaller sponges in well chosen places can make a real difference and the approach has a great number of advantages for people all along the river.

How it works in the meadows

In a natural situation, precipitation falling in the middle mountains first travels through a fairly thin layer of top soil and then hits rock bottom. Gravity then pulls the water downhill over the rock. This is a very slow process. Eventually, at the bottom of

the slope and in particular at the “head” of a valley, the water surfaces (“seepage”) and a marsh develops. The water slowly travels through the vegetation and it takes time before a first small stream develops.

Many of these relatively small natural marshes have been drained for agriculture (grazing, hay), but to modern farmers these are marginal fields as they are far away from farms and often difficult to work with heavy machinery. In fact, many have already been abandoned; the only thing that didn’t happen is closing the drainage canals.

Because marshes at the head of a valley collect precipitation of a large surrounding area, their potential for water storage is high. And because the best (potential) sponges are the worst agricultural grounds, and a haphazard distribution of smaller sponges works better (i.e. collects more water) than one large sponge, it is possible to start restoration immediately. Naturally the land-owners must agree and where necessary be compensated for their contribution. This only needs redirecting a small part of the billions we are spending on flood control and a reliable water supply.

How it works in the forests

Deciduous forests with their thick layers of humus efficiently store (rain)water as well. Two centuries ago, deciduous forests still covered over 10% of the low mountain ranges. Today nearly all have been converted to needle coniferous production forests of which many in the valleys are being drained (Stroming, 2004). Draining makes the management of production forests easier, but increases the risk of major flood damage in villages, cities and agricultural areas elsewhere. In other words, this may not be a good trade-off economically and socially when looking at the effects regionally instead of just locally. In fact, research has shown that converting and draining forests may not even be sensible from an economic perspective for the foresters themselves.



Business pilot – nature-based forestry

The assumption that forestry benefits from draining is being questioned in recent years. It may be more profitable to switch from traditional forestry with its intensive management (including drainage) to low-management nature-based forestry.

Profitability: Profitability, simply put, is profits from timber sales minus costs. In nature-based forestry costs are low. In traditional forestry management costs (such as draining) are high. High costs are particularly negative in a sector dependent on a slow growing crop (such as a tree), because of interest rates. But it is not just that costs are higher. Traditional forestry has even-aged stands, which are harvested when trees are still small. Economic reality however is that satisfactory prices are only paid for large trees. In nature-based forestry annually very few large and valuable trees are harvested. In that way there is a continuous income which is high compared to harvested yield (Wobst and Piussi, both in Diaci, 2006; Froehlich, 2011). An added benefit of nature-based forestry is its compatibility with good carbon management (Schutz, 2011).

So, in conclusion, forestry may win or lose as a result of draining. But everyone else loses. Clearly, draining therefore makes no sense at all: not economically, not socially and not ecologically.

Storing water near the source, in meadows and forests in the low mountain ranges, does make a lot of sense. For four reasons:

1. These areas have heavy rainfall and are largely responsible for extreme discharge peaks (Stroming, 2004).
2. Everyone in the entire catchment benefits from storing water upstream, from

- local inhabitants to people living and working downstream.
3. This is where most affordable space for restored spongy climate buffers is available.
 4. No “large schemes” are required: a patchwork of sponges works best. So, the approach can be “opportunity driven”.

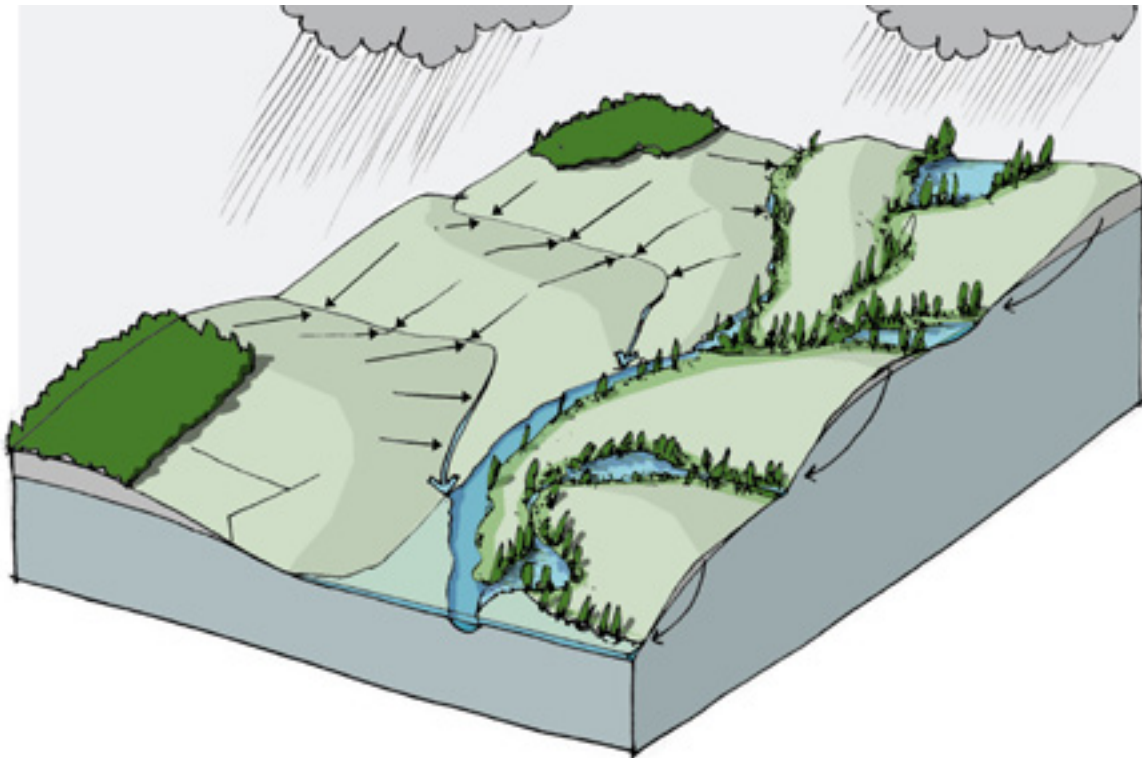
Project idea - Storage and purification of brook discharges in the river mound

What: in those parts of the Rhine basin where the river is flanked by dikes, discharge of water from tributaries becomes difficult when levels in the main river are high. A technical solution is to place a pump, which empties the tributary into the river. A more natural solution would be to develop a marsh where the tributary meets the river.

Why: water stored there can be discharged during droughts; the marsh will act as a natural purification plant and benefit biodiversity.

Status: project idea included as a principle in the Dutch National Water Plan.

Possible funding source: European Regional Development Fund; Operational Program North-West Europe.



The area on the left is drained. Rainwater is quickly led via ditches into the stream. The area on the right has no ditches. First the water seeps into the ground and, in a slowly moving underground current, makes it to the stream. At the foot of the hill the water surfaces but transport is still slow because of the natural vegetation in marshes and around brooks. This area will store water for a longer period thereby not only leveling off flood peaks but also continuing to feed water into the stream much longer during dry periods.

Possibilities for Action:

Who	Issue	The Challenge	The Reason
Farmers	Diversify farm incomes	Broaden the income base by becoming “water managers” or by selling land for waterfarming to third parties	Additional income from selling land and/or selling services (provision of water, decreasing flood peaks). Additional/securing income from farmers downstream by supplying them with water for irrigation. Apply PWS schemes (payment for watershed services)
Local forestry	Forest management costs and benefits	Switch from traditional forestry to nature-based forestry and combine this with filling up ditches	Costs go down (both for management and harvesting). Lower yield (in volume)
			Higher value per m3. Higher carbon storage in natural forests (and soils) compared to drained traditionally managed forests
Local entrepreneurs	Business	Identify business opportunities.	Make use of more diverse landscape, which is more attractive for activities such as walking and fishing.
Government	Biodiversity	Diversify the economy to act as a catalyst to - and benefit from - this type of change.	More connected and diverse habitats and as a result cheaper to achieve biodiversity targets.
Cities, villages and agriculture downstream	Floods and drought	Discuss these types of solutions with municipalities upstream.	Less extreme floods and more water in dry periods for drinking, agriculture, cooling, hydropower, etc.
Insurance companies Governments	Floods and drought	Initiate and support these developments if they make economic sense by preventing damage.	Less damage and thus lower costs.

3.3 Think river-scale, act locally

Agriculture (crop- plus grassland) covers more than 40% of Europe's land surface (Eurostats, 2011). In suitable areas agriculture is intensifying. Elsewhere economic growth can only be achieved through diversification of rural economies. The EU is aware of this and has actually freed funds for this purpose. Diversification of a local economy can be a process happening by chance, with entrepreneurs and municipalities responding to changes in EU-policy, demography or any other outside forces. There is nothing wrong with this, but it often pays off if there is someone with a vision and the capacity to steer. The benefit of a more deliberate process is that local policies and spatial planning can go hand in hand and enhance one another.

Business pilot – Floods and drought control

One issue that may well be less expensive to solve when thinking on a river-scale instead of locally is the control of floods and droughts. The river Rhine is shorter and narrower than it was before: meanders were cut off and dikes narrow down the winter bed. ICPR states that the Rhine lost 85% of its original flood plain. As a consequence water travels faster downstream than ever before, causing higher flood peaks and longer periods of drought. Not all developments should be turned back, but some of them can. Rivers can be granted more access to floodplains, thus increasing the rivers capacity and lowering flood peaks. The target should be to at the same time also restore the marshes in the middle mountains which feed the tributaries to the Rhine. Almost all of them were drained and developed as agricultural lands. Modern farming however is not economically feasible in these remote and sloping areas and many lands have been abandoned in recent years. Restoring the marshes would help store water during times of plenty rainfall, thus reducing flood peaks and securing a prolonged supply of water during droughts.

Profitability: The potential is high. In the Netherlands alone € 1,9 billion was spent to prepare the Rhine to accommodate an expected extra 1000 m³/s: a financial injection of € 6 million per km. Channelling part of this money to integrated solutions (incl. further upstream), i.e. linking flood control to habitat restoration, is a major opportunity for restoration of riverine habitats. A similar partnership is feasible with drought control – important for shipping, energy production and agriculture (irrigation).



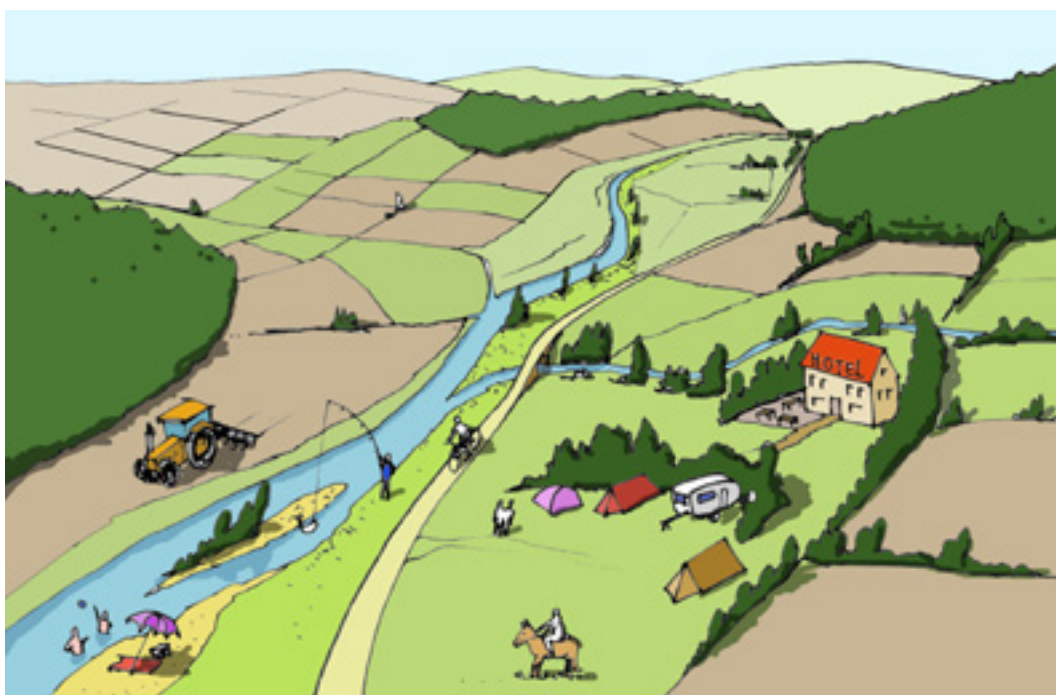
Reservoir empoundments raise the river level high above the former floodplain leaving very little restoration options.

An inspiring example of a new Green Rhine Corridor local economy can be found in the Gelderse Poort, the Netherlands (Bekhuis et al, 2005). In this 10.000 hectares area the Rhine enters the Netherlands and branches out into the rivers Waal, Lower Rhine and IJssel. The soil quality is good, but regular flooding prevents intensification of agricultural practices. This left agriculture increasingly less competitive. A deal was struck: agriculture would leave the (marginal) river forelands to provide space for nature restoration combined with “space for the river” and clay extraction. In return farmers would be given the opportunity to intensify – within environmental standards – on the high quality agricultural lands behind the dikes. Within a decade a new economy was built, with a number of organizations (incl. WWF Netherlands) steering the process.

Business pilot – Nature-based recreation

Conservation and recreation are often perceived as having different interests. Many conservationists are worried that access to nature reserves will lead to disturbance and eventually loss of species. The public at large is sometimes frustrated that they are not allowed to visit natural areas – although these often are created and managed in part with tax payers money. Along the rivers such animosity is generally unnecessary. In fact, tourism and recreation can help “legitimize” and broaden public support for nature conservation and restoration.

Profitability: A recent survey (Bureau voor Vrije Tijd en Toerisme, Office Leisure and Tourism 2012) compared 3 regions with river forelands. The area with the highest natural values and free access, generated twice as much revenue (170 jobs and € 6,3 million) from recreation and tourism as did a region with agricultural landscapes and a region with a riverine landscape that is largely closed for the public. Interestingly enough the area with the highest revenue also has the highest biodiversity, despite the fact that even during the development phase the area concerned was fully open to the public. In riverine landscapes, with their high degree of natural dynamics and resilience, tourism and habitat restoration can truly go hand in hand.



The area on the left is primarily used for agriculture. There are few jobs and the economy is totally dependent on commodity prices. On the right agricultural lands are mixed with space for other sectors (e.g. tourism with a campground, hotel, recreation areas and various activities).



Nowadays hundreds of thousands of people annually visit the Gelderse Poort. As a result the number of jobs grew substantially and the economy diversified. Central in the process was the choice to protect nature with instead of against the people. Accessibility is a key element in the vision for this area, and people are free to wander through most of the nature instead of having to stay on the tracks. Studies have shown that local biodiversity does not suffer, and support for nature has grown.

The Rhine also has a lot to offer from a cultural-historical perspective. Castles, fortresses and ruins at strategic locations demonstrate how the river acted as a border. Ship yards and harbours emphasise its significance as an important, international connecting zone. Dykes show how we resisted the water; Brickworks highlight the fact that while resisting the water we also made grateful use of the clay which arrived during times of elevated water levels. Signs that water was both our friend and our enemy throughout the centuries can be found everywhere along the course of the river. That visible, rich history also is a great attraction in terms of recreation and tourism. Pleasure boats, angling, walking or camping on the banks of the river, in-line skating or cycling along the dyke: the Rhine offers so many opportunities. And then there are possibilities for new initiatives such as the redevelopment of historic brick kilns into recreational meeting points and the use of water taxis and traditional ferries such as foot-passenger and cycle ferries increasing accessibility and chances for people to enjoy visiting this environment.

Another positive example is the “Kühkopf” in Hesse, Germany: an area of about 2.400 hectare with natural flood control and grasslands and floodplain forests. The area is very important for recreation, with thousands of visitors at the weekends. A number of other sites will be used for natural flood protection as well, including the “Hördter Rheinaue” and a restrine in the north of Worms (Eich-Gimbsheim) in Rhineland-Palatinate (Bund & Alsace Nature, 2012).



Project idea - Integrated development of floodplains: analysis of success/fail factors

What: analysis of good examples of integrated environmental projects (e.g. habitat restoration combined with flood control and mining) in Germany, France and the Netherlands. Explicitly including the economic and social spin off (e.g. flood protection in urban areas).

Why: the aim is to identify the main success and fail factors. With this knowledge, new projects can be launched.

Status: project idea.

Possible funding source: European Regional Development Fund; Operational Program North-West Europe.



Project idea - Biomass energy and management of river forelands

What: By optimizing vegetation management in floodplains (e.g. cyclic rejuvenation and up-scaling), conservation of biodiversity and natural processes can be combined with cost-effective energy production (harvesting of e.g. wood).

Why: Development of a concrete business case should clarify the conditions (scale, frequency etc.) under which harvesting can be done without harming – or even improving – the ecological qualities of river forelands.

Status: project idea.

Possible funding source: European Regional Development Fund; Operational Program North-West Europe.

Possibilities for Action:

Who	Issue	The Challenge	The Reason
Local entrepreneurs	Business and jobs	Come up with local business ideas.	Better opportunities for new businesses accommodation, activities, local products. There are typically more jobs in these new businesses than in agriculture
Government	Local economy	lay out a vision for diversification of the local (rural) economy and take steps (in policies and spatial planning) to support the change	A diverse economy is more robust and offers more jobs
Government	Biodiversity	Facilitate development of new economies and save tax payers' money	More connected and diverse habitats and as a result cheaper to achieve biodiversity targets
Conservationists	Biodiversity	Realize a paradigm shift and see how nature and people can better benefit from each other, instead of presenting nature as vulnerable and in need of constant protection.	Linking economy and nature builds more support for nature, which in return is good for nature
Cities, villages and agriculture downstream	Floods and drought	Link or integrate upstream – downstream in planning for safety	This type of developments is often better and/or more cost-effective at buffering against both floods and droughts.

3.4 Cool, green and blue

Cities can be depressing and unhealthy. Especially cities with lots of buildings and traffic, few trees and no surface water. The air in summer is hot and dirty and there is no attractive place to enjoy lunch, a cup of coffee or to read a newspaper. Nowhere for seniors to meet and play petanque in the shade of large trees. Nor for young lovers to sit down in the grass in a park. It is amazing how much difference trees and water make for the atmosphere in a city. And this is not just on the psyche. For skeptics and hard-boiled scientists; quite a few of the positive effects can actually be measured. For example the so-called urban heat island effect as well as a number of health effects.



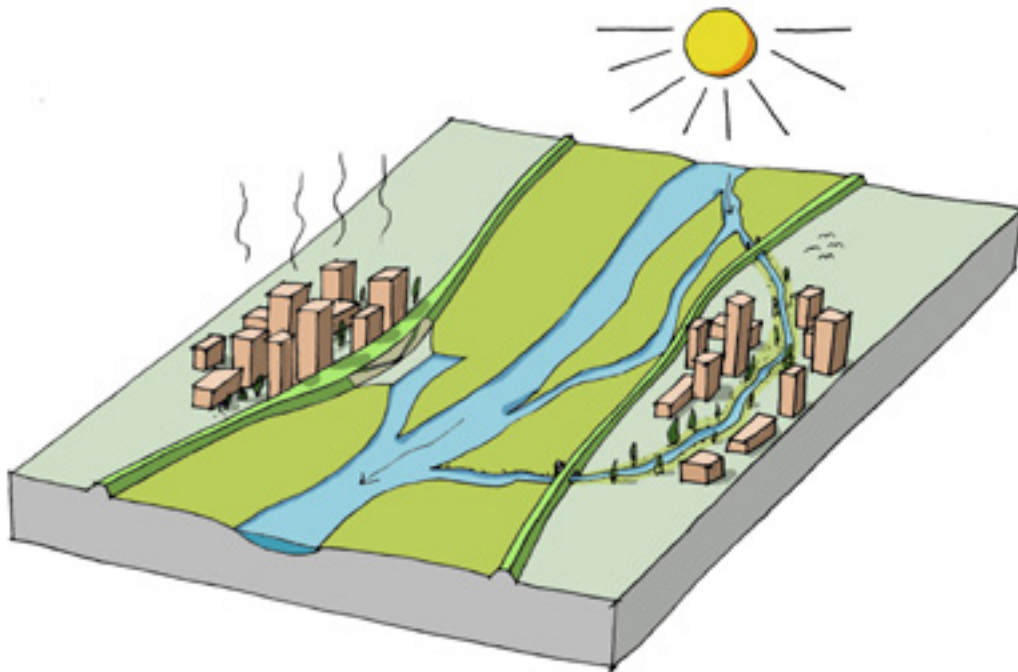
Business pilot – natural air-conditioning and air-purification

Nowak and Greenfield (2009) list a wide ray of economic, social and ecological benefits from urban trees: carbon storage and sequestration, air pollution removal, surface air temperature reduction, reduced building energy use, absorption of ultraviolet radiation, improved water quality, reduced noise pollution, improved human comfort, increased property value, improved human physiological and psychological well-being, improved aesthetics and improved community cohesion.

Vegetation is quite effective at lowering temperatures. Studies have recorded reductions of 11-25°C for shaded walls and roofs, of 20°C for vines on a wall and of 25°C inside parked cars (US EPA Climate Protection Partnership Division, 2008). Growing trees remove carbon and pollutants (e.g. ground level ozone) from the air, primarily by uptake via leaves.

Profitability: In 1994 trees in New York City removed an estimated 1,821 tons of air pollution at an estimated value for society of \$ 9,5 million.

In Rotterdam, extensive measurements (satellite imagery and various measurement campaigns) have shown that in hot, windless periods there may be a temperature difference of 8°C between urban and rural areas. The most urbanized parts are the hottest, whereas areas with lower buildings and a lot of green are significantly cooler (Gemeentewerken Rotterdam, 2011). Heat is not just inconvenient; in the Netherlands mortality was shown to increase with 12% during heat waves. Especially elderly people are vulnerable to high temperatures. The study concludes that both simulations and field observations confirm that greening the environment lowers air temperatures. The same can be said for surface water, as long as this is cooler than the air. Deeper, flowing water will thus be more effective than shallow lakes and ponds.



Green Rhine Corridor cities are cool, green and blue. Trees are abundant. The atmosphere is pleasant and the air clean. The river - or at least a side channel - runs through a Rhine Corridor city. That this is possible for some sites shows the winner-concept of an architect combat in Speyer, Rhineland-Palatinate, Germany for an old factory site: buildings with integrated protection against flood, a lot of trees and a wide green corridor at the riverbank for recreation.

Possibilities for Action:

Who	Issue	The Challenge	The Reason
Insurance companies and governments	Floods	Initiate and support green and blue measures that reduce costs	Parks, trees and green roofs buffer rainfall and side channels reduce flood peaks. Thus less damage claimed.
Inhabitants, companies and developers	Cooling in buildings	Plant trees, use vegetation on walls and roofs	Less cooling necessary, so costs and CO2-emissions go down.
Inhabitants	Quality of living	Initiate and promote planting of trees, building ponds and restoration of side channels.	Make the city a nicer place to live and work.
Government	Biodiversity	Restore or construct a side-channel through the city or village	More connected and diverse habitats, and as a result cheaper to achieve biodiversity targets.
Government	Health	Make your city blue and green.	Heat stress reduction, especially for the elderly and sick. Cleaner air. Stress reduction. Improve well being of all inhabitants.

3.5 House with a river view

Rivers attract. Every day a different view and always something happening. High waters, ice, sunsets and rainbows. A ship from a neighboring country sailing by. A fisherman trying to catch that big fish he's been after for years now, side by side with a heron waiting patiently for the smaller ones. The liveliness of a river makes people feel alive. The promise of opportunities and the lure of other worlds hang in the air. The world near a river is always bigger than in a meadow, city of forest. Rivers are special, and the Rhine is no exception.

But too often it the Rhine tucked away behind fences and prohibition signs. Inaccessible to everyone. Fishing not allowed and even hiking forbidden. Just being near the river has been made impossible. Either for safety of because someone doesn't want people on his property. Sometimes for understandable reasons, but all too often out of habit or unrealistic fears.



Even hiking, walking your dog or fishing along the Rhine is often forbidden or impossible.

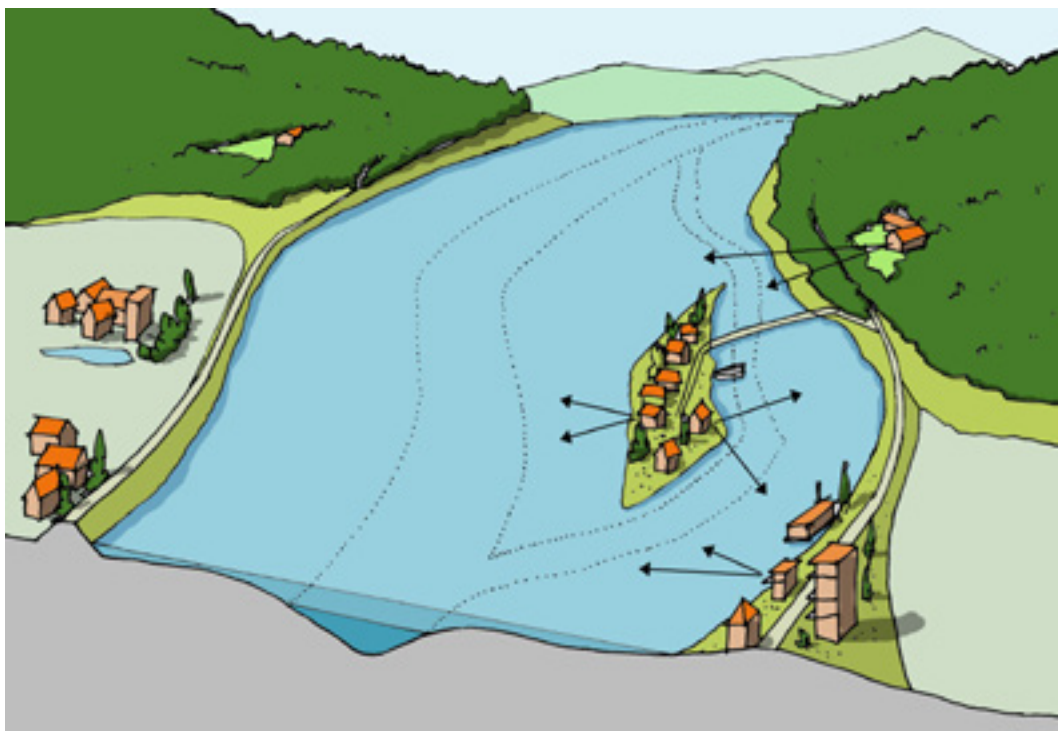
Wouldn't it be great to make much better use of Northwest Europe's dominant natural feature, most visible ecological corridor and most tranquil transportation route? To do so is certainly part of the Green Rhine Corridor vision.

What is needed first and foremost is new thinking. Followed by technical innovations and more intelligent spatial adaptations. The new thinking may be rather straightforward: for parts of Germany and the Netherlands it could for example be "let's build houses on dikes and natural heights instead of behind them". Or more visionary: "let's develop houses that float or that stand on poles".



innovative buildings in and on water are inspiring to live and work in

The main advantage of this approach is that it may no longer be necessary to build and maintain strong dikes that provide "full safety". At least not everywhere and under all imaginable conditions. Instead, a dike that keeps out the water in almost all circumstances could be sufficient if the damage caused by a flood is limited (e.g. only damage to crops).



On the left a high dike protects low lying houses and agricultural land. The houses are not connected with the river. The houses on the right are safely built on the dike, in the hills, floating on the water and on the high part of an island and have beautiful views. The lower lying land is less valuable and does not need protection under all circumstances. Hence, costs (for the dike) are much lower.

Possibilities for Action:

Who	Issue	The Challenge	The Reason
Land owners	Recreation	Make lands accessible to people so they can enjoy the river.	To make the community more attractive or to combine with business opportunities (e.g. selling local products).
Builders	Business	Build high, floating or in other intelligent ways to run no risks from flooding and benefit from great views.	The best and most innovative builders will benefit if municipalities allow safe houses and buildings in/near the river.
Municipalities,	Local economy	Include all risks, costs and opportunities in spatial planning.	More attractive place of residence and business.

3.6 Natural innovations

Innovation is important, and this is frequently verbally acknowledged by governments and companies. But in practice innovation may not be stimulated enough. The Netherlands for example takes pride in being a global leader on water management. The Deltaworks and the Afsluitdijk are showpieces of Dutch ingenuity. Tourists and media from all over the world visit to marvel at what has been achieved. But these showpieces are decades old and problems are beginning to surface (e.g. with water quality). A good company continuously improves its products or services. It has to. A business is much like ecology: eat or be eaten. Here lies a major challenge for the water management sector. It's all about innovation. Instead of big and impressive, the trend is towards more intelligent, tailor-made solutions. The better the toolbox is filled, the better equipped a company is to come up with the best local solution. Natural processes have been neglected, whereas they are indeed an important tool in many circumstances.

Some Dutch polders lie 6 meters or more below sea level, chock-full with houses, offices and other valuable properties. In these areas water must be kept out under all imaginable circumstances. The traditional response is building ever higher and stronger dikes. This may not be the most cost-effective measure. Nor may it be the safest.

Business pilot

Some scientists, companies, water boards and governments are beginning to realize that a lot can be gained by coming up with innovative designs in which natural processes can play a role. Forelands for example - especially with trees - are capable of breaking waves effectively. This is particularly important under circumstances where waves are high (e.g. in lakes and along broad, open parts of the river). Creating new forelands or allowing vegetation on existing forelands may avert the need for a stronger dike. Thus potentially combining lower costs with extra societal benefits (e.g. recreation and species conservation). An added advantage is that this may prevent houses and cultural monuments built on old dikes from having to be torn down.

Calculations: Costs of creating a new foreland with trees in front of an existing dike at Fort Steurgat (in the west of the Netherlands) may be as much as 3 to an amazing 60 times lower than building a stronger dike; 25-55 €/m compared to 150-1500 €/m (Building with Nature - Ecoshape, 2011). And just as effective. In fact, Building with Nature concludes that natural solutions are typically more flexible and robust.



Of course in many areas traditional, technical solutions will remain necessary. Natural solutions must always be considered however when the need arises to increase the safety of a dike, as the traditional, technical solution may not always be the best solution. Not socially, not financially and not ecologically.



Project idea – Develop a vision for the Oberrhein-Staufstufen chain of dams on the upper Rhine

What: Develop the remnants of the old Rhine furcations, which are to some extent still present, into a restored bypass system. The water management should be as natural as possible to support floodplain dynamics. This can probably be explored best on the German side of the river, covering the stretch from Iffezheim up to the Breisach. Concerning the longitudinal connectivity this would be a real alternative to the mostly non-existent or limitedly functional fish migration devices on the dams. The lateral connectivity might be supported by a number of cross connections below the dams, connecting the main river with the bypass system. The vision should also look into the possibilities of flexible/floating turbines which are currently already established in smaller rivers.

Why: To reduce flood hazard downstream, improve conditions for migratory fish and restore floodplain habitat.

Status: project idea.

Possible funding source: EU.



Project idea - International Network of river engineers and nature conservationists

What: Set up an International Network of river engineers and nature conservationists.

Why: In search of excellence, in order to learn from positive experiences and in order to exchange (scientific) results an international network of river engineers and nature conservationists (and policymakers) is necessary. It can start with a internet forum and can be enlarged with combined monitoring programs and field visits.

Status: this idea can echo a highly successful international forum of nature conservationists of dunes and raised bogs within the EU.

Possible funding source: EU.

Possibilities for Action:

Who	Issue	The Challenge	The Reason
Local people	Quality of living	Stimulate governments and water managers to come up with better solutions.	If through a foreland a higher, broader dike is not necessary houses and cultural monuments can be spared and living conditions improve instead of deteriorate.
Water managers	Economic opportunities	Think out of the box.	The best and most innovative water management companies will benefit (also internationally).
Governments	Government spending	Stimulate innovation in water management, for its potential to reduce costs and the business opportunities it may create.	Natural solutions may cost less and/or create more opportunities.
Scientist	Safety and costs	Help develop different solutions, calculate safety and costs and clarify what the optimal solution is under different circumstances.	By proving that new solutions work just as well or better enhance innovation and the economic competitiveness of water management companies.

3.7 Returning home

There is no denying that biodiversity is declining all over the world. And the outlook for the survival of numerous species is grim. But contrary to popular believe there is no law that says that economic growth automatically leads to ecological damage. Many examples all over the world have shown that species can and do recover, even in areas with growing human populations and economies. Even large mammals and birds of prey can bounce back. Wolves are returning to many areas in Germany and white-tailed eagles and ospreys are doing well too. Some species need strict protection and areas made inaccessible to men, but many other do not.

The story of the Rhine offers more hope. Now that the water is much cleaner and nature has been given the opportunity to restore itself in restoration projects, species are returning to their previous homes. Some with a little, or a lot, of help from governments, nature organizations and countless dedicated volunteers. Most species however do so on their own, not noticed by anyone except for the odd biologist. Insects for example, as well as plants, snails and other small crawling things may not attract much attention, but these too are an indicator of a richer, living river.

*restored sidechannels
and riverbanks are
wonderful habitats for
many species*



Business pilot – species protection through clay mining

For centuries clay mining as an economic activity has been linked to river forelands along the Lower Rhine. Clay deposited by the river during floods is “scraped” from the sandy subsoil of the forelands and used for the production of bricks and tiles. After the clay layer has been removed, the surface usually is levelled and recultivated as agricultural land. In Western Europe, where riverine nature is scarce, an alternative has been brought into practise. It is as simple as it is rewarding: after clay mining the area is not levelled but the underlying relief – in fact old river beds hidden in the subsoil - is used as a basis for the development of riverine nature. In this way clay mining, an economic activity often regarded as a “destroyer” of riverine landscapes, becomes a powerful ally in restoring one of Europe’s most important habitat types, with characteristic species which had been lost for decades, returning.

Calculations: In this example there are no costs to tax payers while species benefit. In fact, it may save costs as these new areas can be very cost-effective in achieving conservation targets. It is a typical win-win.

In 2001 the Conference of Rhine Ministers agreed on a Program on the sustainable development of the Rhine (Rhine 2020). It aims at restoring the habitat patch connectivity and the ecological continuity (up- and downstream migration) of the Rhine from Lake Constance to the North Sea, including the tributaries figuring in the migratory fish program. A number of ambitious targets were agreed upon, including increasing the structural diversity of at least 400 km suitable river banks in 2005 (and 800 km in 2020), revitalization of suitable fish habitats, improving connectivity for migratory fish, etc.

An inspiring example is the ‘Danube Restoration Project’ (DRP), which aimed to re-establish the connectivity between the Danube and its floodplains along a free flowing section downstream of Vienna. Restoration measures were implemented on a large scale, which is particularly remarkable as this stretch is one of Europe’s most busy shipping lanes. The removal of 3 km of riprap vastly improved the river dynamics and ecological situation of the floodplains habitats and species within the project area.



Along the Rhine, for some species the challenges are enormous. This is especially the case for migratory fish, spending part of their life in salt water, and part in the Rhine catchments (as far up as in the Swiss mountain streams). Salmon being the best known of this group. Salmon has been reintroduced to the Rhine and circumstances improved (e.g. through building fish passages). This is certainly a step in the right direction, but is it a major success? Calling something a success often depends on perception. About ICPR-program Salmon2000 and 2020 the following statements were made:

"The return of salmon from the ocean and, above all, their natural reproduction prove the success of this program. Since 1990, evidence has been given of more than 2400 adult salmon returning and migrating upstream the Rhine system. More than 300 of them used the new fish passage at Iffezheim, 700 km upstream the estuary." (ICPR, 2004).

"The Rhine could thus potentially support an annual run of 6000 to 12,000 adult individuals – barely enough to ensure a self-sustaining population. So far, Salmon 2000 has failed to attain anything close to those levels... coaxing a few salmon back to its channel is not the same as turning the Rhine into a true "salmon river" once again. The old river possessed enough fish habitat to support annual salmon runs of half a million or more." (Cioc, 2005).

Both observations are true. The good thing is that the ICPR does not believe its work is done, now that some salmon are reproducing naturally. In its master plan migratory fish Rhine (2009) targets are set for the return of viable populations of salmon, sea trout and a range of other fish. In fact, in the last decades all fish species have returned or been brought back to the Rhine with the exception of the sturgeon, albeit not all with self-sustaining populations yet. And about sturgeon, the Netherlands conservation organization ARK is now working with the French research institute IRSTEA and Sportvisserij Nederland (the Dutch Sport Fishing Association), supported by WWF Netherlands, to prepare a reintroduction of this highly threatened species to the Rhine in 2012 (ARK press release 23 June 2011).



Salmon

These examples give hope. And we need hope, especially if it is firmly set in reality. This paragraph started by stating the obvious; biodiversity is in serious decline all over the world. But species like beaver, river clubtail, river lamprey, mayfly (ICPR, 2003) and countless others have shown us that hope for a richer Rhine is absolutely based in reality. In fact, the upsurge of biodiversity is happening now (Kurstjens and Peters, 2012).



Project idea – International coordination for fish migration

What: setting up a campaign to improve fish migration in the Rhine and its tributaries (upstream and downstream) by finding solutions for key hindrances.

Why: The Rhine basin has been the home for salmon, sturgeon and other migratory fish for long time. Salmon and sturgeon are ideal flagship species to consider ecological aspects of a river system. ICPR has a program for migratory fish, called Salmon 2020. Connectivity has been improved, but there is international pressure needed to open the Haringvliet sluices and to reconnect the upper Rhine between Strasbourg and Basel to get the migratory fish back in their original habitats. At the same time there is pressure needed to protect or restore the original habitats and to prevent new dams in the salmon rivers.

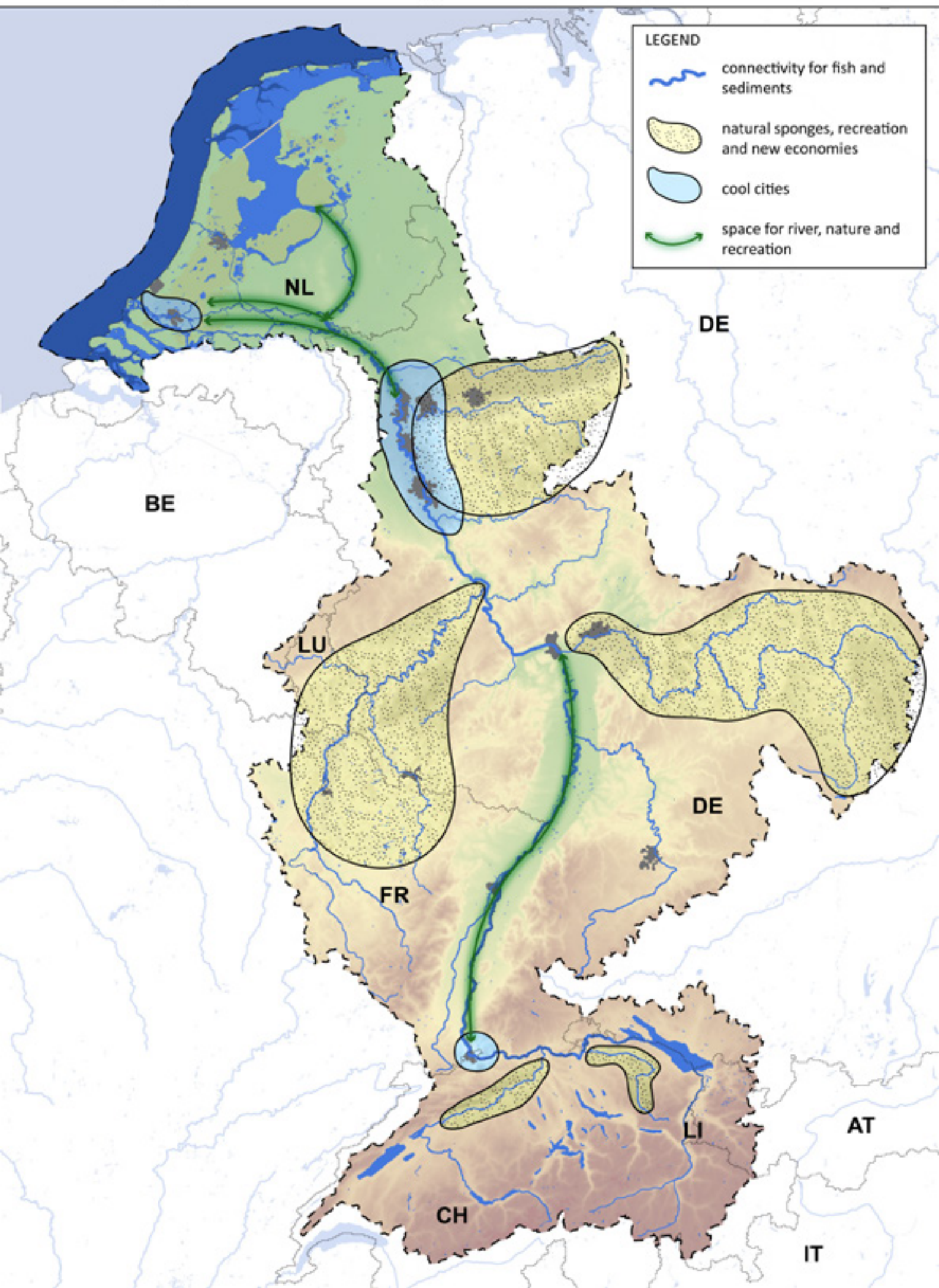
Status: A campaign is being designed. WWF Switzerland in cooperation with the European River Network (ERN) and WWF France have taken the lead to design a proposal for the coming 2-3 years. Interested stakeholders are going to be involved.

Possible funding source: foundations, NGO's.

Possibilities for Action:

Who	Issue	The Challenge	The Reason
Local entrepreneurs	Business	Support the work of the other interest	Accommodations and restaurants will benefit from sport fishermen.
Sport fishermen	Recreation	Support reintroductions and research, initiate and help to finance local projects for habitat improvement	More places to go and species to catch, including much sought-after species like salmon.
Governments	Government spending	Build fish passages (as natural as possible, e.g. side channels) and restore habitat for spawning.	Natural solutions better combine functions and thus may cost less and/or create more opportunities.
Conservationists	Biodiversity	Support reintroductions and research, initiate and help to finance local projects for habitat improvement	More corridors and better habitat for spawning. Get broader support for restoration of habitats and species

Indicative geographic location of some opportunities for action.



4 Our offer

Green Rhine Corridor aims to strengthen and future-proof the significance of the Rhine as a hydrological, ecological, economic and social backbone of Europe. Green Rhine Corridor wants to achieve this goal through the restoration of natural processes and by building new, strong and sustainable links between the river, people and economies.

Implementation of this vision requires action in all fields mentioned in the previous chapter. The challenge now is to step into reality as soon as possible, to nail down the first opportunities for partial implementation. During the implementation of these first steps, experience will grow, partnerships will develop and new ideas will emerge. Just like small drops eventually form a large river, a number of relatively small initiatives combined will create great and lasting benefits.

We - Viva – Rheinaubund, BUND / Rhine Working Group, European Rivers Network, Institute for Geography and Geoecology, Natuurmonumenten, Platform Biodiversity Ecosystems and Economy, Staatsbosbeheer, WWF France, WWF Netherlands and WWF Switzerland, supported by the European Anglers Alliance, Pro Silva Nederland, Sportvisserij Nederland, stichting Innovatie Recreatie & Ruimte and Wetlands International - hereby invite the ministers and all others mentioned in (or inspired by) this vision to join us and make a better Rhine.

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