

# Albis – White River: The Elbe as a Central European phenomenon

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The Romans called the Elbe Albis, White River, apparently for its extensive light-coloured sand beaches in which the river could freely change its flow at the time. Since then, a lot of

water has flowed through the Elbe river and it has significantly altered in many places. In the Central European context, however, the Elbe is still considered an exceptional river.



Elbe at Dolní Žleb, one of the most beautiful stretches of the river, combining high natural and scenic values: Kaňon Labe National Nature Reserve on the right bank and extensive gravel-sand alluvium on the left bank. Photo Petr Bauer

## Elbe: 6030 km without weirs

From the Czech perspective, we may not appreciate the importance of the Elbe-associated nature, which is yet amplified by the fact that our national emotions are much more linked to the Vltava (Moldau). The uniqueness of the Elbe river will however be recognised if we also know its much longer segment on German territory and see this river as one natural system,

regardless of the state border. It then becomes clear that it is wrong to look at the 40 km long part between the Střekov lock and the state border as the last, still insufficiently canalised section of the Czech Elbe. On the contrary, these 40 kilometres are part of an over 600 km long continuum of the Elbe between Střekov and Geesthacht, which is unique for it has remained completely free of navigation locks. Al-

though the Czech part of this most valuable Elbe section is short in comparison to the German part, it is important: the Elbe valleys in the Bohemian Highlands (České středohoří) and in the Elbe Sandstones (Bohemian-Saxon Switzerland) form a unique scenic coulisse, which is not seen further downstream after the landscape definitively opens up behind the Saxon town of Pirna. It is exactly this landscape that attracted romantic painters in the 19<sup>th</sup> century. Inspiration in the Elbe valley was found by world-class painters, such as Caspar David Friedrich (1774–1840), Johan Christian Dahl (1788–1857) and Adrian Ludwig Richter (1803–1884), whose *Überfahrt am Schreckenstein (Gemäldegalerie Dresden)* is probably the most famous painting from the Elbe valley.

It would be unjust to think that the mentioned 600-km long segment of the Elbe has fully kept its character known from ancient paintings and gravures. Anti-flood dams ('Deiche' in German) have been built since as early as the Middle Ages, first to protect the villages, later also the land. In this segment of the Elbe, also a range of islets were removed in the past, and regulatory measures in the form of stone fortifications or groynes ('Buhnen' in German) have been carried out with the aim of enlarging the navigation depth. A river adjusted this way becomes narrower, deeper, but also faster. This is not without consequences: a narrower and faster river works itself deeper and deeper into its bedrock, so that

the water level falls. In some places, such as between Torgau and Coswig (Anhalt), it has dropped two metres, and this deep erosion is observed further and further downstream. This poses a major threat to the floodplain forests and is also a problem for the agriculture in the German segment.

Despite these adjustments, the greatest natural value of this segment, consisting in the absence of cross barriers in the flow, has been preserved, retaining migration conditions and near-natural river dynamics. This situation is determined, just as in a range of similar cases (e.g. the unique nature of military grounds), by a historical paradox. As a result of the post-war division of Germany and thus also the Elbe river, the transport route saw no fundamental modernisations, so the river was, unlike part of the population, given freedom. Until this day, the Elbe has remained the only(!) large, freely flowing German river, whereas other watercourses, such as the Rhine and its tributaries the Main and Moselle with its tributary the Saar, just as tributaries of the Danube like the Iller, Lech, Isar, Inn, Altmühl, Naab and Regen, are today technically significantly transformed rivers with many weirs or dams, similarly to the Vltava in our country or most of the Czech Elbe river. After the political change in Germany ('Wende'), also here efforts were made to revive plans for building a range of navigation locks in the Elbe. These were however soon deferred ad acta, because it was already then obvious that the expenses would considerably exceed the profits and that realisation of these plans would cause unrepairable damage to the unique natural heritage, eventually protected under the European network of protected areas Natura 2000.

## Protected areas on the Elbe and their exceptional diversity

The entire section between Střekov and Geesthacht is nearly continuously lined with sites of European interest (in Germany also called 'FFH-Gebiete') together with a number of bird areas ('Vogelschutzgebiete'). In the Czech part, these are the České středohoří (Bohemian Highlands) and Lab-



Flusslandschaft Elbe Biosphere Reserve around Dessau. Photo Petr Bauer

ské pískovce (Elbe Sandstones) Protected Landscape Areas, while České Švýcarsko (Bohemian Switzerland) National Park marginally extends to the Elbe valley as well. The latter connects to the Sächsische Schweiz National Park and Sächsische Schweiz Protected Landscape Area ('Landschaftsschutzgebiet') on the Saxon side. Further downstream, the 'Flusslandschaft Elbe' is situated, a 2822 km<sup>2</sup> large German terrestrial UNESCO Biosphere Reserve (since 1997), extending over five Federal States (Saxony-Anhalt, Brandenburg, Lower Saxony, Mecklenburg – Western Pomerania and Schleswig-Holstein). This extensive Biosphere Reserve covers more than 400 kilometres of the river Elbe and includes many protected areas designated under legislation of the different Federal States, the most important of which is a Biosphere Reserve named 'Mittel-elbe' (since 1990). This reserve protects not only the actual river, but also a large complex of floodplain forests.

The biodiversity of the habitats on the Elbe river is of extraordinary importance. If we had to select some so-called flag species for the Elbe, they would be particularly Eurasian beaver and Atlantic salmon, and as for plants e.g. strapwort (*Corrigiola littoralis*). The beavers on the Elbe have played a key role in the natural return of this rodent in Central Europe. Whereas beavers were exterminated on e.g. the

Rhine and Danube already in the mid-19<sup>th</sup> century, and then also in large parts of Central Europe during the 20<sup>th</sup> century, nearly 200 beavers survived on the Elbe between the towns of Lutherstadt Wittenberg and Magdeburg. As early as 1929, a beaver reserve was established here and many conservationists were involved in the rescue of the beaver. From this area, sometimes referred to as a 'beaver ark', beavers could also spread to other sections of the Elbe catchment basin (incl. the Czech Republic since the end of the 20<sup>th</sup> century) and was introduced to other rivers, such as the Oder and, after the change in regime, also to Western European countries (Saarland, Netherlands, Belgium, Denmark).

The story of the return of the salmon to the Elbe river is just as remarkable. In this case, however, no indigenous population was available. The extinction of the salmon on the Elbe is well documented. Until the 19<sup>th</sup> century, it was the most important fish in the fishery business. With the transformation of the Elbe to a waterway, salmon, just like the sturgeon, started to decline. In 1896, a salmon hatchery was established in Porschdorf, aimed at halting salmon decline in the river. However, its operation was stopped after just a few years. As of 1932, salmon was not recorded in the Elbe with the exception of an isolated capture near Pirna in 1947. In the





In Flusslandschaft Elbe BR on the middle Elbe in Germany, historic dikes were intentionally interrupted after the 2013 floods in order to enable overflowing of the river into the landscape. This should increase flood prevention in lower lying river sections and prevent floodplain forests from drying. Photo Handrij Hartel



Old oxbows of the Elbe river are highly valuable habitats in Flusslandschaft Elbe Biosphere Reserve. Photo Petr Bauer

year 1995, under the Losos 2000 project, salmon from northern Europe were planted in the Lachsbach (‘Salmon Stream’ in translation), Saxon Switzerland. In the autumn of 1998, the first returning salmon were discovered here.

Not only certain rare and endangered species inhabit the Elbe in abundance, also

a rich mosaic of habitats is found here. Besides the mentioned floodplain forests, also river sediments, otherwise known as gravel sand or mud deposits, deserve protection. This type of habitat has seen a strong decline in Central Europe during the 20<sup>th</sup> century, particularly as a result of river canalisation. It is namely dependent on natural or at least near-natural river dy-

namics, i.e. on a periodic alternation of flooding and falling dry, which enables competitively weak species, such as strapwort, to survive. This is a critically threatened species in the Czech Republic, occurring only in the segment from Střekov downstream, and reliably indicates river parts of extraordinary value, i.e. without transverse structures (navigation locks).

### Potential for further renaturalisation of the Elbe

Long periods of low river water levels in the summer months are natural in the Elbe, although we can recently observe a tendency to an even sharper polarisation during the year. In addition, the history and course of floods, including the latest ones in 2002 and 2013, are very instructive. It is quite evident that the basic principle is to provide the river space. In the German segment of the Elbe river, during a large flood in 1845, dikes (‘Deiche’) broke in more than 100 places. It was shown that the dikes had often been built too close to the river. The old dikes were therefore interrupted in some places and new dikes built at a larger distance from the river. This measure was also meant to help rescue the floodplain forest. In contrast to other large rivers, the German Elbe has large areas of former floodplain, which serve as farmland and are not built up. Thanks to this, a return to natural flooding is principally possible. It namely turns out that many so-called flood control measures, which must prevent the river from overflowing, actually accelerate its flow, worsening the situation in lower lying river sections, i.e. efforts to raise dikes against extreme floods often increase flood risk downstream. The 2013 flood on the German Elbe was, compared to the Czech Republic, worse than the 2002 flood.

Concluding we can state that the collaboration between Czech and German conservationists is important for the protection of the Elbe nature, particularly its 600km long segments without navigation locks. It is certainly appropriate to intensify cooperation between the different protected areas. For example, the international association of protected areas on the Danube named ‘Danube



During low water levels in the summer months, extensive sand beaches significant for biodiversity are created in the Elbe around Dessau in Flusslandschaft Elbe Biosphere Reserve. Photo Petr Bauer



Using historically created groynes (‘Buhnen’) to improve navigation, banks on the German middle Elbe were corrected to their present form, here covered with willows and oaks, with a sand bottom and pools. Photo Petr Bauer

Parks (<http://www.danubeparks.org/>) may be inspiring, just as the German Integrated Elbe Conception (‘Gesamtkonzept Elbe’) is. On the one hand, this text (2017) rejects further building up of the Elbe river but also notes that “measures on the Elbe will be accepted if they serve environmental, water management and transport objectives at the same time, connecting these goals in a meaningful manner”. I think that the protection of the Elbe in the section downstream of Střekov and the state border should be conceptually based on

similar principles, moreover because the approaches applied on the German part of the Elbe will always limit the transport connection of the Czech Republic with the North Sea. These theses are of essential importance for the further protection of the Elbe, especially in light of the conditions that recently prevail on the Elbe during the summer months. For example in 2018, according to official data of the Federal Ministry of Transport and Digital Infrastructure, a fairway depth of 140 cm was not reached on the German Elbe for



Old oak trees on Elbe dikes are a characteristic feature in Flusslandschaft Elbe Biosphere Reserve. Photo Petr Bauer

240 days, i.e. for two thirds of the year (at least in one of the sections between de state border with the Czech Republic and Geesthacht).

As stressed in the introduction, the fact that in comparison to the German Elbe only a relatively short near-natural river section has remained in the Czech Republic, does not reduce its value in any way. Rather the opposite is the case, and the greater is our responsibility for its protection, ideally in close Czech-German cooperation.