

# **The Integrated River Engineering Project on the Danube East of Vienna Requirements from the ecology site**

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The part of the Danube east of Vienna covered by the Integrated River Engineering Project (IREP) is almost identical with the area of the Nationalpark Donau-Auen (Danube Floodplain National Park). By invitation of the Austrian Waterways Authority, the National Park Company was involved in project development since early 2003 and took an active role in the project steering committee. In April 2004 the steering committee reached consent on the planning principles for the project. There was a common understanding that the implementation of these principles should bring about a substantial improvement both for navigation and of basic ecological parameters for the National Park.

The consent reached in 2004 is in fact the result of a much longer process of technical discussions and political struggles concerning this part of the Austrian Danube. Since the 1940ies there was a general social and political consensus, that the whole of the Austrian Danube should be converted into a chain of hydropower dams, accompanied by an axis of industrial development. Besides producing substantial amounts of electricity, the dams would guarantee improved and stable conditions for navigation.

Yet in the early 1980ies, when the chain of dams was almost complete, the construction of the dam of Hainburg, covering more than 40 river kilometres east of Vienna, met fierce resistance of an emerging ecological movement, culminating in a spectacular occupation of the construction site in December 1984. The project had to be stopped and was never realised. Instead Nationalpark Donau-Auen was established in autumn 1996.

In the “Hainburg” debate, biologists developed a concise understanding of the basic ecological parameters of the floodplain, putting the focus on hydromorphology. The concept of lateral connectivity defines the good ecological condition of the floodplain:

- Hydrological conditions of the floodplain are determined by the rhythms of changing water discharge of the river. Regular flooding, alternating with droughts and the continuous rise and fall of the ground water table guarantee the specific biodiversity of the floodplain.
- River beds, river banks and adjacent floodplain should be exposed to the shaping force of the flowing water, thus creating and maintaining the specific variety of habitats.

It could be easily shown, that the hydropower dam would definitely put an end to river-floodplain-connectivity. Therefore no way was seen to bring the dam in accord with the demands of conservation and in harmony with national and international nature protection regulations (e.g. Ramsar Convention).

But even the dam project warded off and the whole area ennobled to a National Park, preserving the status quo can not be the final solution. River and floodplain are affected and modified by the 19<sup>th</sup> century river regulation. As early as 1985, a commission established by the Austrian chancellor to seek alternative solutions and to develop first concepts of a National Park stated that within a period of twenty years new engineering solutions are to be developed to solve the problem of continuous sole degradation. In consequence, the National

Park planning group developed first ideas of bed stabilisation by adding “gross” gravel as well as concepts of reconnecting side arms cut off from the main bed by river regulation.

Along with the establishment of the National Park three pilot projects of reconnecting side arms were realised (1996 – 2004). A pilot project of natural river bank restoration followed in 2005/2006. All these were common projects of the Austrian Waterway Authority and the National Park, co-financed by the EU LIFE-Programme. Due to the consecutive gain of experience, each new project has been more “radical” and “daring” than the previous one. Once a project is realised, it is so much easier to convince stakeholders and authorities to take the risk to give greater “freedom” to the river.

These projects demonstrated in a very concrete and practical way the high potential of river restoration even along a major international waterway. But they did not solve the problems of bed erosion and navigation. In 1997 the Austrian Waterway Authority presented the first integrated river engineering project based on a low water depth of 3,20 m and the so called “granulometric sole improvement”.

Since the 3,20 m project would have substantially increased the amount of “hard” stone structure in the river bed (low water bed regulation) it was not acceptable for the National Park. In the following discussion and planning process, the National Park and its Scientific Board defined standards and preconditions for an integrated navigation project in the National Park:

- ***Improvements for navigation should not (as in the past) worsen the problem of sole erosion, but provide a lasting and sustainable solution to the problem. Water levels should be raised as far as possible, the dynamics of gravel transport –though substantially reduced – should not be stopped completely. The concept of granulometric sole improvement complies with these demands.***
- ***To speak of a truly integrated project, improvement of navigation has to be combined with all possible measures of river restoration. The potentials of reconnecting side-arms (previously defined by the National Park) and of river bank restoration (about 50% of the “shoreline”) have to be fully realised.***
- ***Low water regulation must not increase hard stone structures more than 10% of the actual length. New shapes of groins are to be applied to minimize the negative impact on river bed diversity and shallow water habitats.***

Navigation standards of low water depth as such were not taken as an ecological criterion. However, this view was not shared by some NGOs like WWF. Since any increase in the requirements for navigation undoubtedly narrow the margin for “hydromorphological freedom” of the river, increased navigation standards would lead to detrimental projects in other parts of the Danube, where compensating measures reached for the National Park would not be applied.

This argument underlines the importance of reaching a Danube-wide common understanding of an “ecologically sound inland waterway transport”. Taking the Austrian experience as a positive example one should not forget, that the consensus reached is based on

- a 20 years-old “culture” of confrontation and cooperation, in which both sides have learned to define the essence of their “interests” and the requirements to meet them;
- the legal status of the National Parks that allows a discourse between conservation and navigation at the same eye level;
- new and innovative technical concepts, provided by creative water engineers which made a win-win-solution possible.