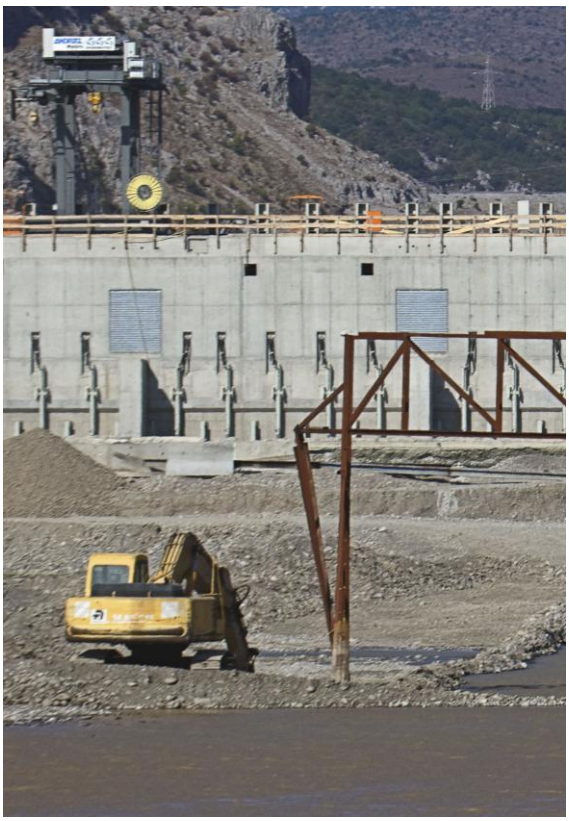
Balkan Rivers - The Blue Heart of Europe



Hydromorphological Status and Dam Projects

Executive Summary

Supported by:

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Executive Summary

Among the biggest current threats to the natural heritage of the Balkan region is a wave of planned hydropower stations. Hydropower dams have a significant impact on the river ecosystem and the longitudinal continuum for living organisms and sediments. They can also negatively impact wild terrestrial animals including large carnivores living in mountain fringes within the Dinaric Arc. This leads to a loss of ecological integrity, river degradation, and consequently a decrease in biodiversity. The study aims at providing a reliable information base to exclude ecologically valuable river stretches from harmful developments. In particular, it wants to support the identification of such "no-go areas" as demanded by European Water Directors and serve as a first step towards a "masterplan" as in preparation e.g. for Austria and Slovenia.

Methodology and range

This study is the first comprehensive attempt to provide a large-scale overview of Balkan rivers assessed by a harmonized methodology according to European standards. It analyses and ranks the hydromorphological intactness of rivers with the help of remote sensing and integrates the results with data on protected areas and major floodplains as well as information on ecology, hydropower dams, and river regulation activities. Intactness as analysed with this methodology is a good indicator for the ecological integrity and status of river systems.

The geographical area covered by the study has a length of approximately 1,300 km and a width of some 250 km and includes all countries of former Yugoslavia, Albania, and the trans-boundary catchment areas in the trilateral-region of Bulgaria, Greece and Turkey. All rivers with catchments larger than about 500 km² as well as karst poljes/floodplain areas larger than about 100 ha/500 ha respectively were included.

The following classification was applied:

	Hydro-morphological assessment class	**Conservation value** (assessment as result of overlay of hydromorphological assessment + protected areas + floodplains)
Class 1	Near-natural	**Very high**
Class 2-3	Slightly to moderately modified	**High** (river stretches crossing important floodplains/poljes/estuaries/deltas **or** overlapping with protected areas **or** both belonging to the "Very high" conservation value stretches)
Class 4	Extensively modified	**Low, but important for longitudinal continuum** (river stretches crossing important floodplains/poljes/estuaries/deltas **or** overlapping with protected areas **or** both belonging to the "High" conservation value stretches)
Class 5 Impoundments	Severely modified	**Not assessed**

Figure ES 1: Assessment and colour scheme for hydromorphology and conservation value

Hydropower dams larger than 1 MW were collected and categorised as "existing", "under implementation" and "planned" as well as divided into three size classes (1-10 MW, 10-50 MW and > 50 MW).

Results

In total 34,468 rkm in 224 sub-catchments were assessed covering an area of 449.480 km² (larger than the size of Germany with 357.112 km²).

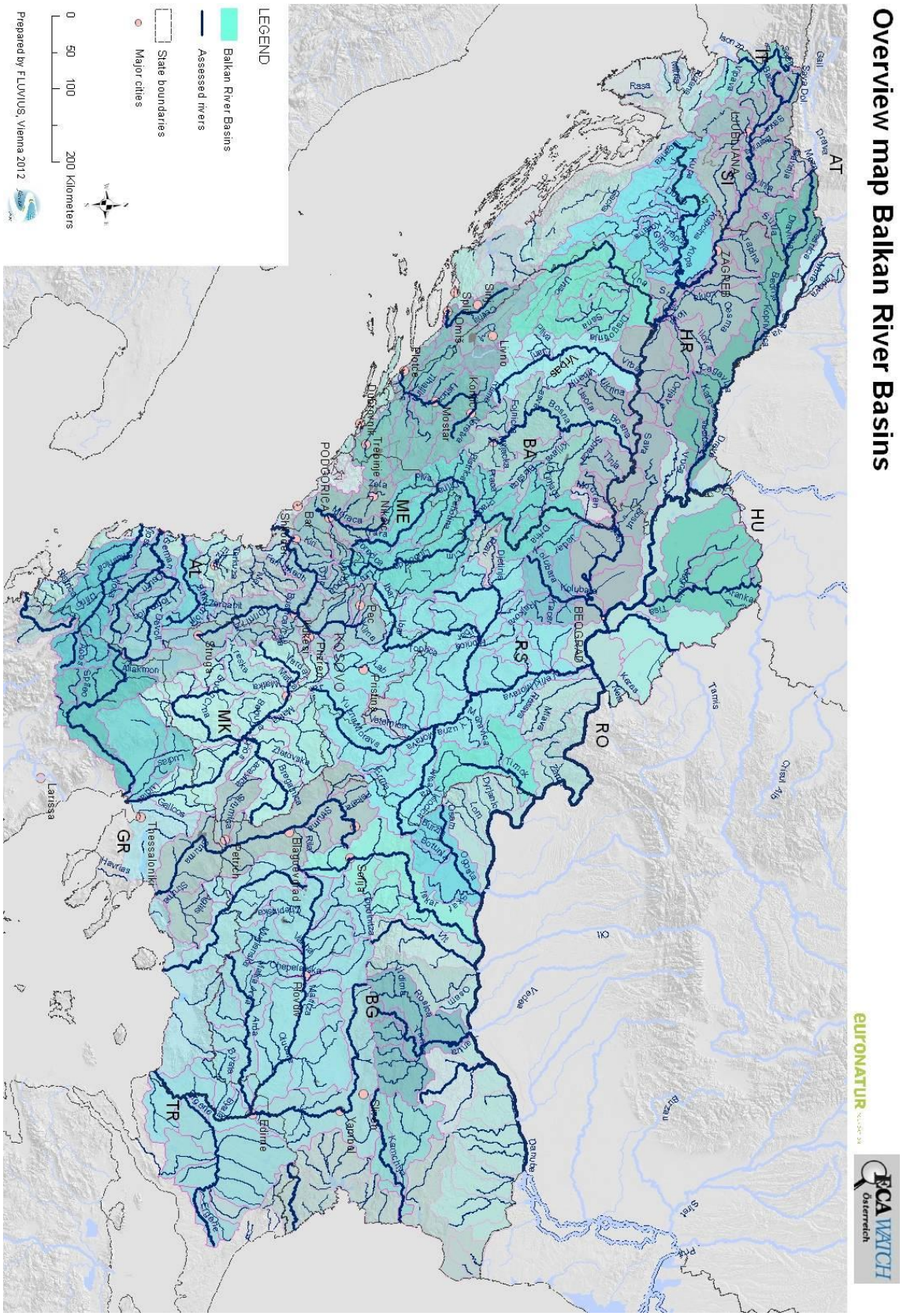

Figure ES 2: Project area (major rivers and different basins in blue colours).

Hydromorphological intactness

Overall, regions and catchments of the Balkans have retained many more largely intact river landscapes than western and central European river basins. Up to 30% of large rivers are still near-natural some even pristine and of very high conservation value, in Albania and Montenegro over 60%, while in Germany only 10%, in Switzerland 7% and in Austria 6% of the rivers are in such high state. Almost 50% of Balkan rivers are only slightly or moderately altered – in Germany, for comparison, this is the case for only 30%.

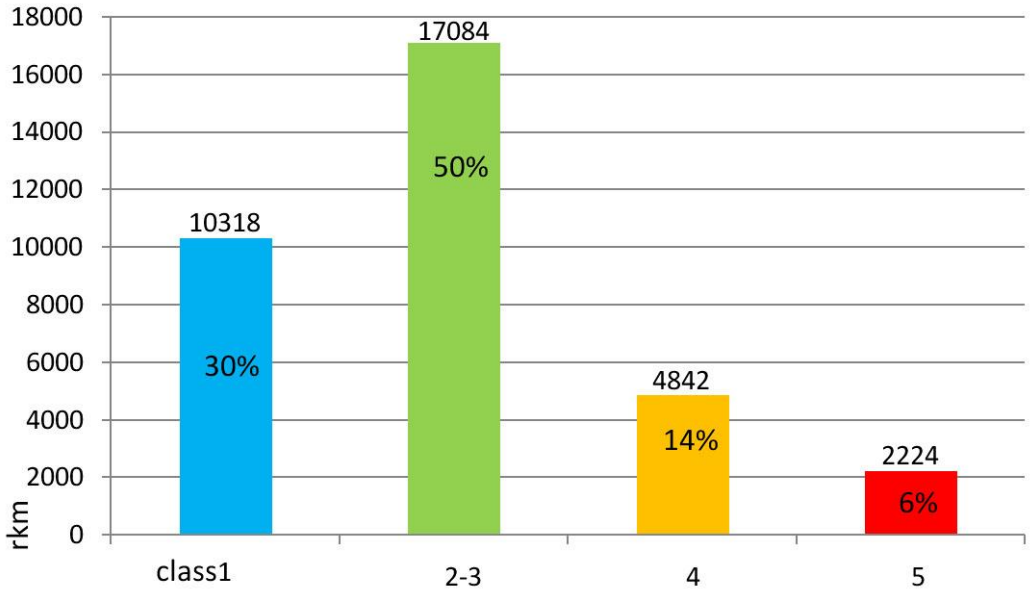

Figure ES 3: Hydromorphological assessment in rkm and percentage.

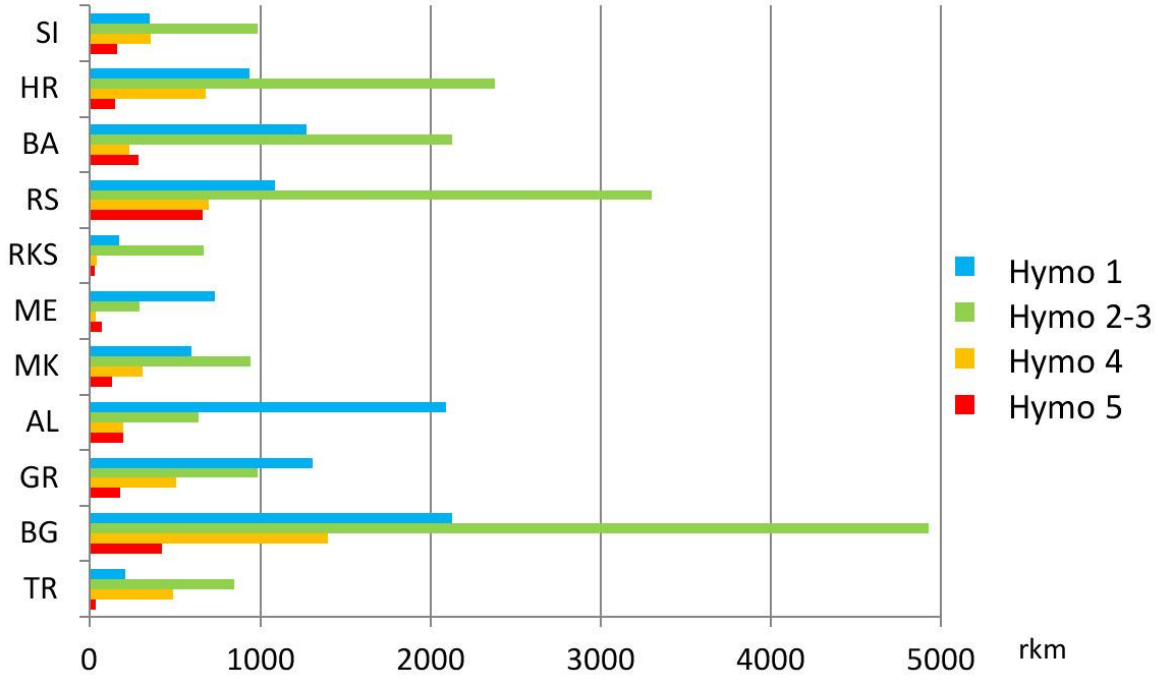

Figure ES 4: Country distribution of hydromorphological classes (for GR only the northern country part and for TR only the European part of the country, compare ES 2).

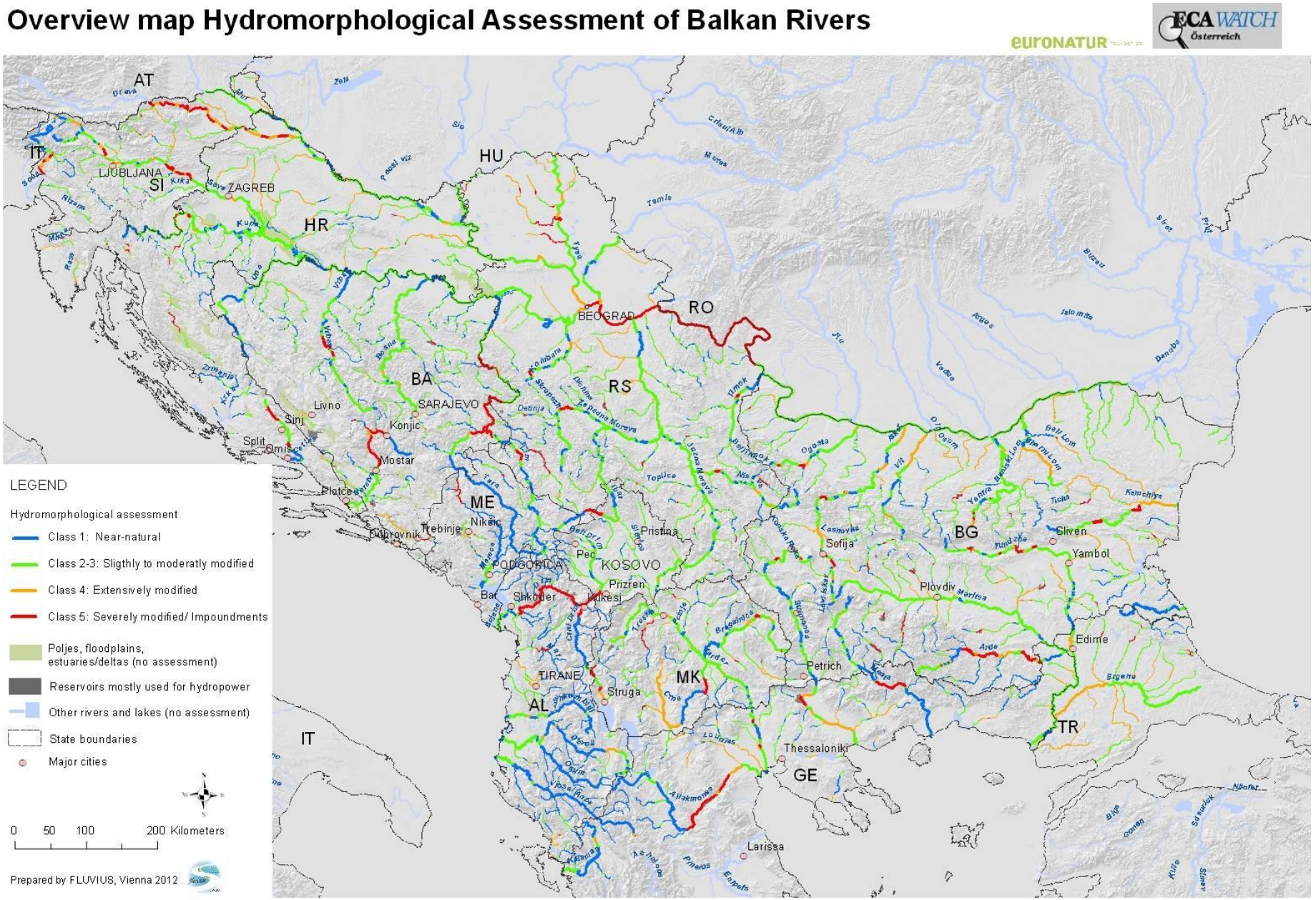

Figure ES 5: Overview map of hydromorphological assessment.

Conservation value

More than 50% of all rivers fall into the very high conservation value class. These are composed of 30% hydromorphologically intact rivers and 21% of the second class (Hydromorphology class 2-3) rivers within protected areas. 33% belong to the “high” class, 10% to the “low” class and the remaining stretches (6%) are impoundments without assessment.

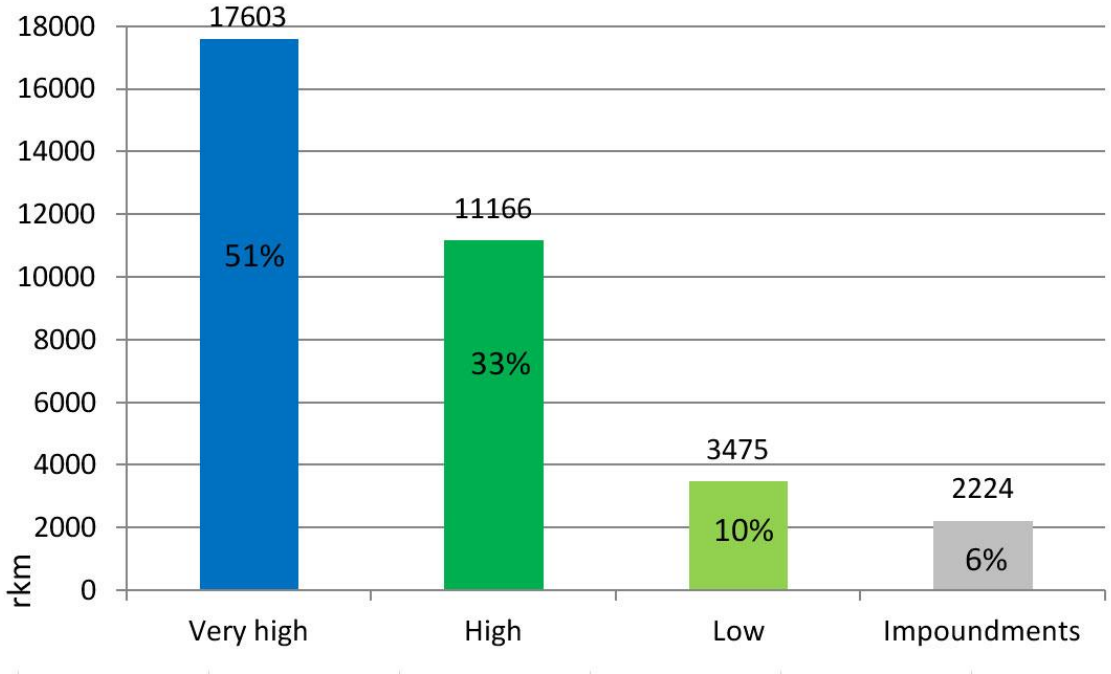

Figure ES 6: Percentage of rivers of very high, high, low conservation value and those with impoundments.

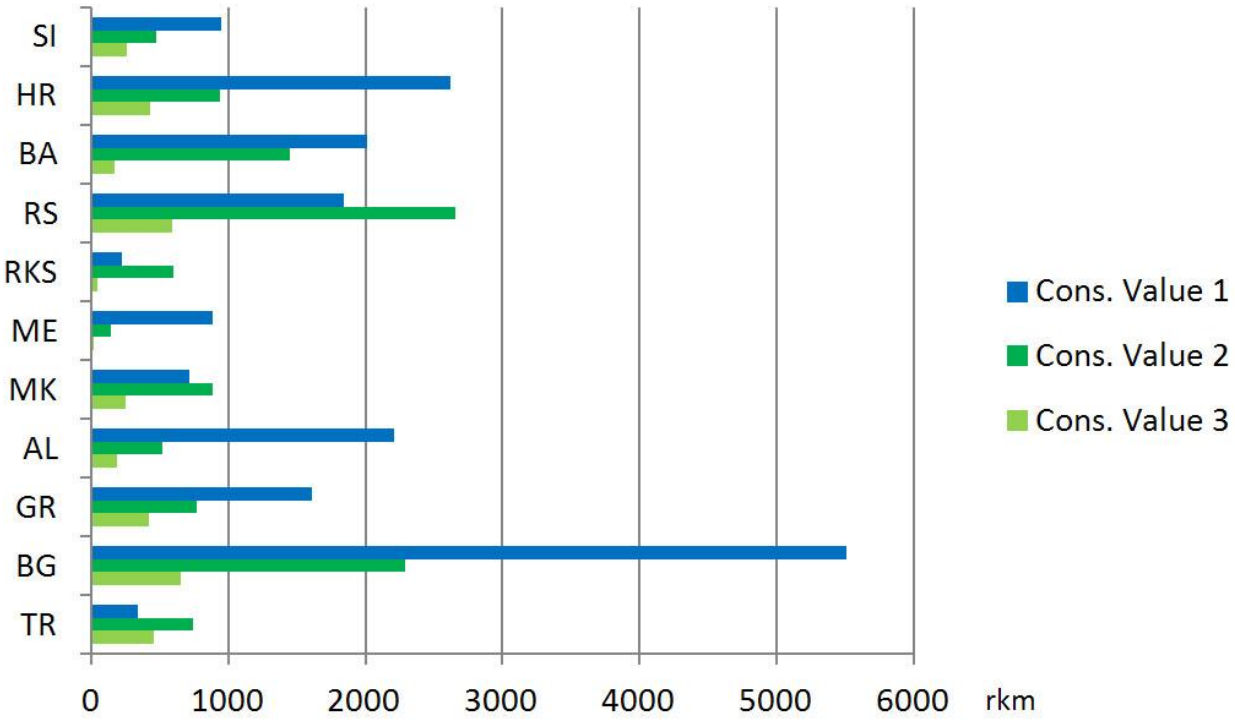

Figure ES 7: Country distribution of conservation value.

Hydropower plants

Of 861 hydropower plants with a capacity over 1 MW and sufficient information, 573 are currently planned and would impact many rivers. The remaining ones are under implementation or already in operation.

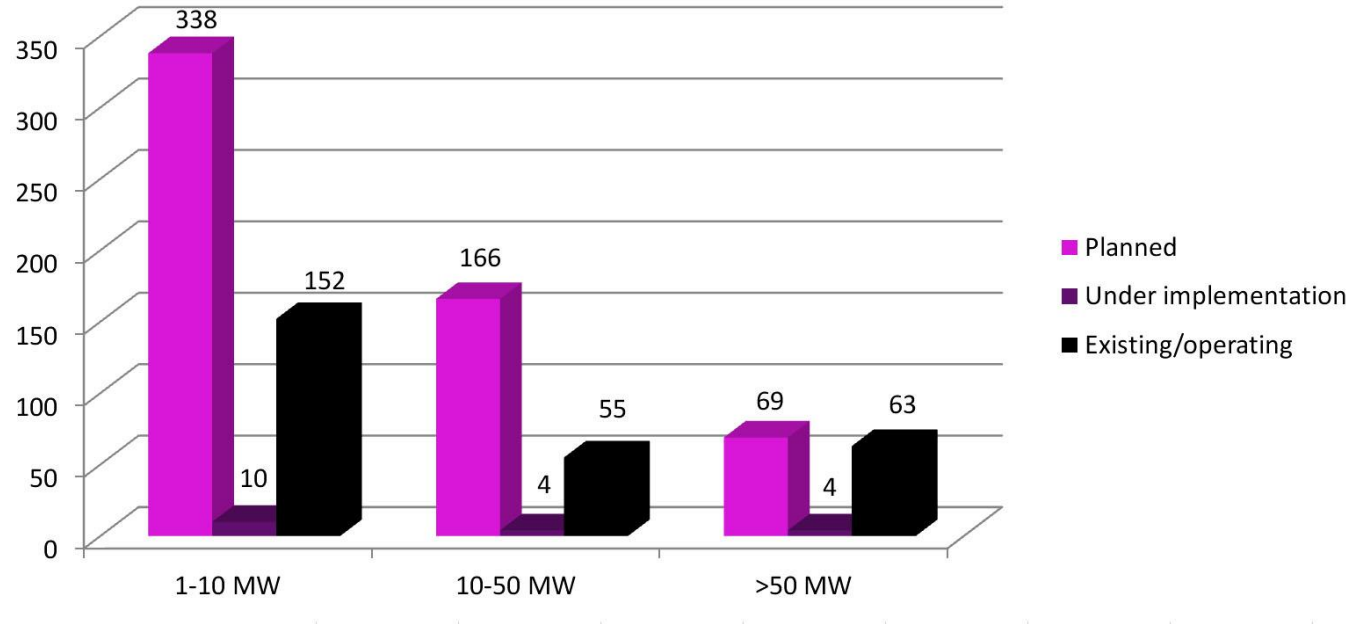

Figure ES 8: Distribution of hydropower plants.

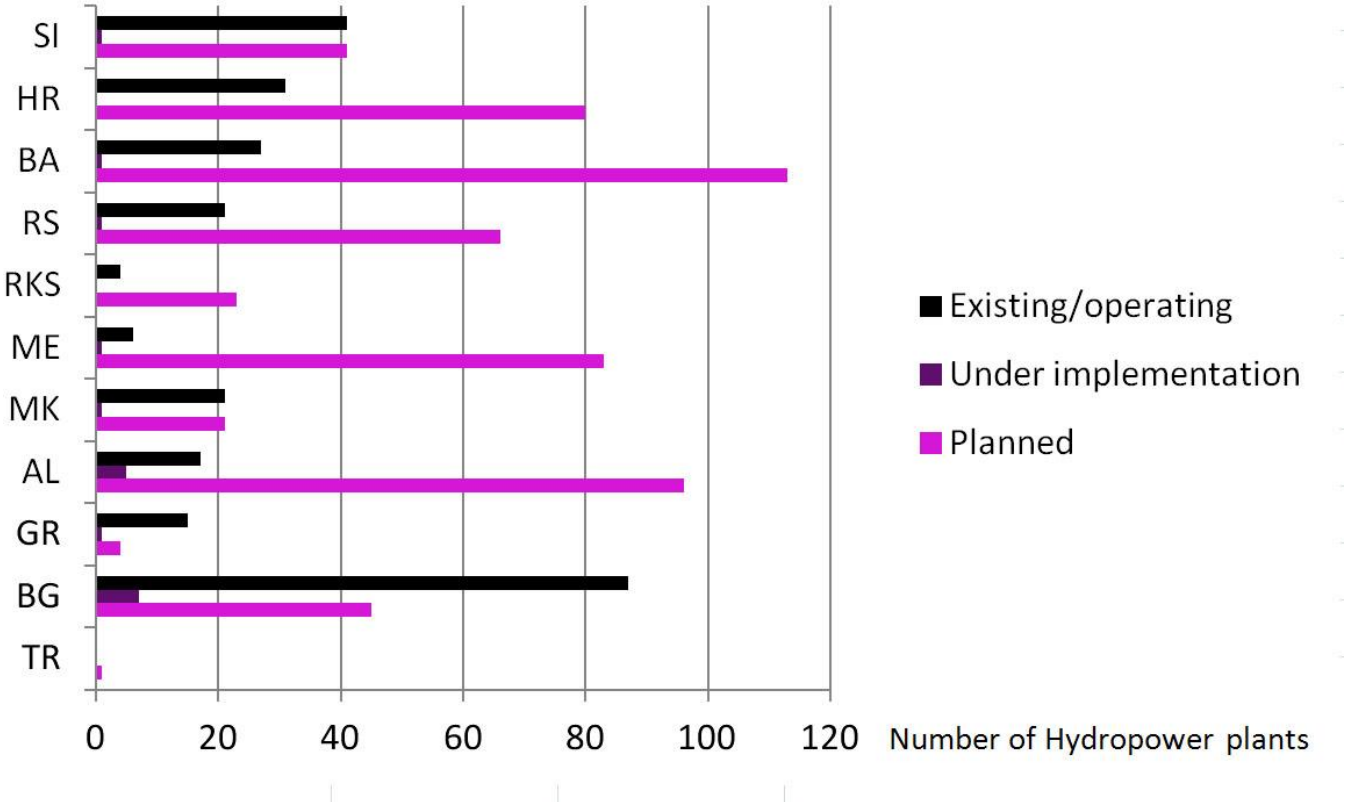

Figure ES 9: Country distribution of hydropower plants.

Planned hydropower plants and conservation value

The overlay of assessed rivers and hydropower developments show that many of the planned hydropower plants will be located in ecologically valuable areas: 70 % in river stretches of “very high” and 23% in “high” conservation value. The expected damage to river ecosystems is consequently particularly high. This threat appears to be highest in Albania and Montenegro, in particular regarding the fragmentation of currently still entirely free flowing rivers.

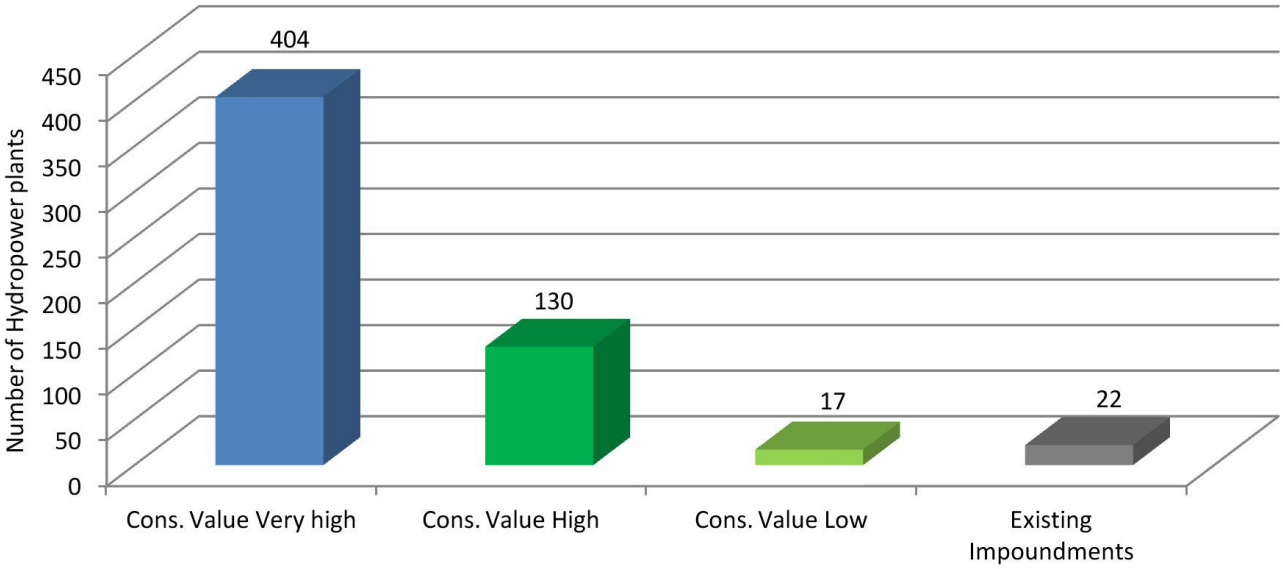

Figure ES 10: Number of planned hydropower plants that would affect very high, high and low conservation stretches.

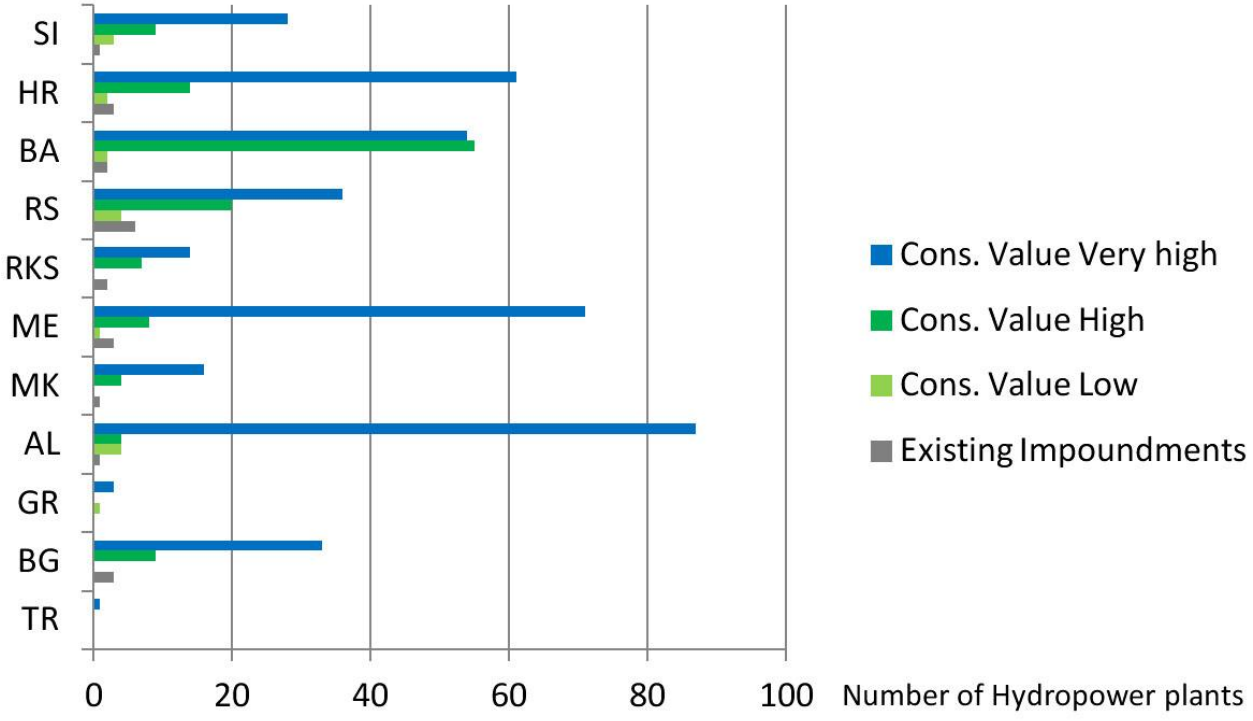

Figure ES 11: Country comparison highlights the high number of hydropower plants affecting pristine rivers in ME and AL.

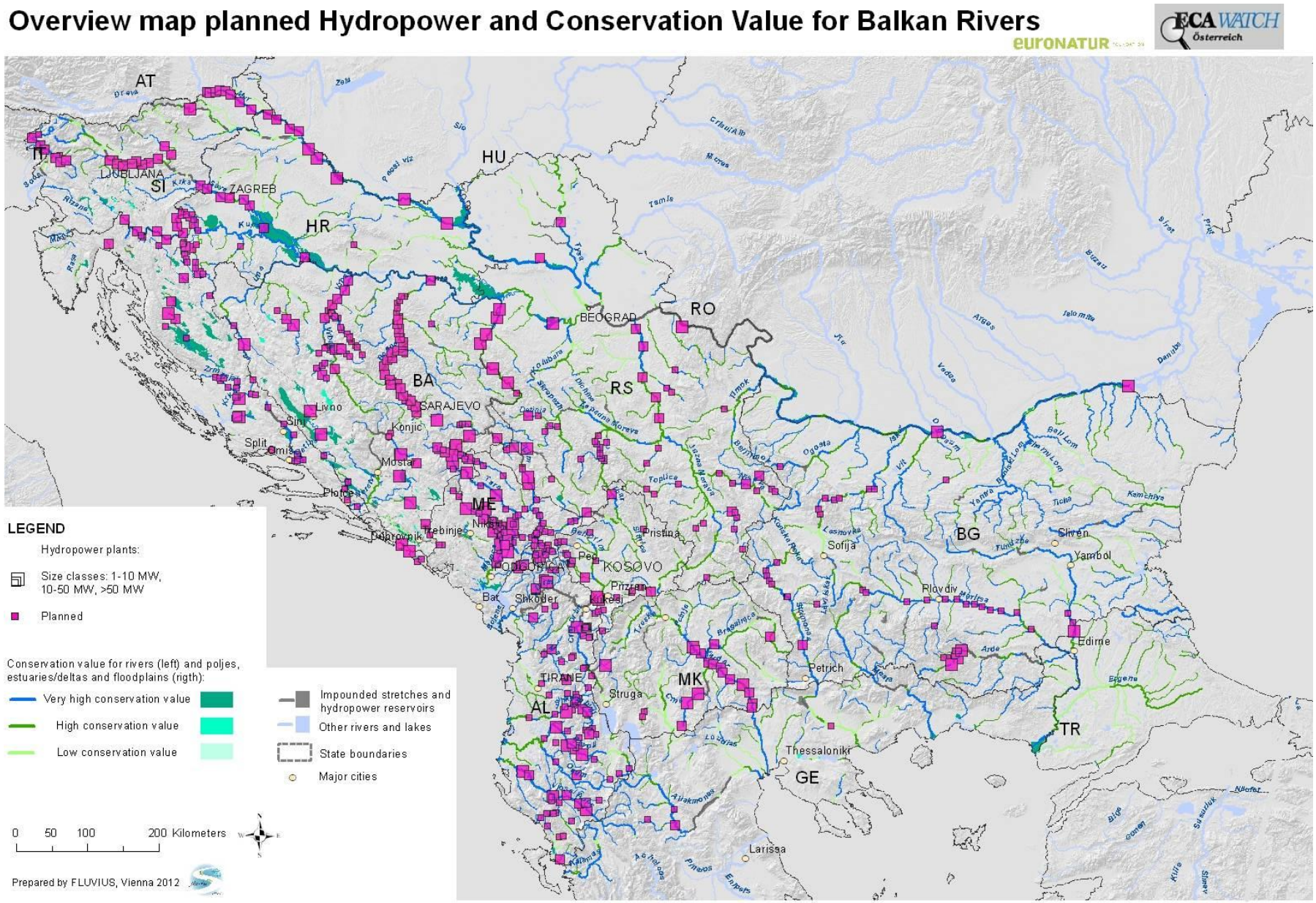

Figure ES 12: Affected very high and high conservation stretches by planned hydropower plants for the entire project area.

The enormous richness of karst waters and river systems provide home to a unique and globally endangered endemic fish and molluscs fauna (e.g. Softmouth trout, Marble Trout, Dalmatian barbel gudgeon, Greek brook lamprey). In some river basins more than 50 % of the fish species are endemic. This makes the region one of the densest areas of fish endemism in overall Europe and therefore one of the priority ecoregions for biodiversity conservation globally.
The numerous planned hydropower plants would severely impact these rivers. So far number and locations of new dams are concentrated on maximum energy exploitation not following ecological planning principles. Intact river landscapes are not “renewable” and ecological compensation measures can never fully balance the loss of biodiversity. Therefore priority should not be given to building new hydropower dams, but upgrading existing ones and lowering increasing energy demand by raising energy efficiency, for which the potential in the Balkan region is huge. Developing and using ecologically sustainable alternative sources such as solar power is particularly high in this part of Europe. Existing dams should mitigate impacts, e.g. by being made passable at least for fish, better also for sediment. While river landscapes of highest conservation value should not be developed at all, those of lesser value are not necessarily recommendable for development.

Most threatened major rivers
In Slovenia and Croatia on the lower Mura and Drava Rivers, in total 17 new dams are planned and would be in contradiction to a planned trans-boundary biosphere reserve. Furthermore, Slovenia wants to develop many more power stations on the upper Sava and together with Croatia along the upper Kolpa/Kupa. For the lower Sava in Croatia several new large dams are planned partially in conjunction with navigation. In Bosnia the Vrbas and Bosna rivers, are expected to be turned into canalized chains of hydropower plants. The lower Drina in Serbia - a unique remnant of a meandering large gravel dominated river - might be developed for hydropower exploitation. Many narrow river valleys such as along Ibar in Serbia would be turned into chains of hydropower plants. The nearly untouched upper courses of Moraca and Tara in Montenegro are subject of ambitious plans which would disconnect the upper river systems of Moraca towards Scutari Lake and Adriatic Sea. Two large braided rivers in Albania, the Vijosa and Devoll Rivers, will be interrupted by major dams. The still free-flowing Vardar River in Macedonia would be turned into a hydropower cascade. In Bulgaria the Struma could be disconnected systematically by new dams. Lower Danube is threatened by two mega projects impounding some 500 rkm. Dams on lower Veliki Morava in Serbia and one on lower Tundzha River on the Bulgarian-Turkish border will interrupt large river systems.

Conclusions
Balkan rivers can be rightly called as “Blue Heart of Europe” still offering a tremendous ecological value with its specific endemic biodiversity unique for Europe, grown over millenniums. Now in 2012, these river lifelines are faced with a rapid development of hydropower plants, interrupting the river continuum, impounding free-flowing rivers and impacting nearly all remaining free-flowing stretches and karst underground waters within only one decade of construction. If all construction plans will be realised the Balkan rivers will definitely lose its prominent position among Europe Rivers.
This study can only provide the basis for complex political decisions that need to be reached with stakeholder involvement. It hopes to give momentum to the important identification of “no-go” areas.