Watch your Danube

Joint Danube Survey

icpdr iksd
International Commission for the Protection of the Danube River
Internationale Kommission zum Schutz der Donau

Fact Sheet 7

Biodiversity

About the Joint Danube Survey 3: The Joint Danube Survey 3, also known as 'JDS3', is the world's biggest river research expedition in 2013. Its main goal is to produce highly comparable and reliable information on water quality and pollution for the entire Danube River and many of its tributaries and to raise awareness about the importance of the Danube and sustainable water management. The International Commission for the Protection of the Danube River (ICPDR) coordinates the implementation of JDS3. Launched on August 14, 2013 from Regensburg, Germany, the boats of the JDS3 will travel 2,375km downstream the Danube River, through 10 countries, to the Danube Delta in Romania and Ukraine until late September.

The Danube River Basin is home to a rich variety of biodiversity. The EU Water Framework Directive (WFD) requires waters to achieve good ecological status by 2015, meaning they must provide good conditions for natural species to live healthily. The JDS2 findings confirmed that cooperation among Danube countries is bringing positive results for Danube biodiversity. However, some situations in the basin remain unsatisfactory while most migratory fish species have particularly suffered due to habitat loss, habitat degradation and over-exploitation.

According to the European Environment Agency, *biodiversity* consists of ecosystems, species and genes, and is essential to human well-being and for delivering services that sustain our economies and societies.

The Danube River Basin hosts a variety of fascinating, diverse and dynamic ecological territories with many unique plant and animal species. Examples of habitats include fast flowing mountain streams, wide and slowly flowing lowland rivers, large sand and gravel banks, wetlands and floodplains, wet meadows, oxbows, small and large lakes, and the dynamic Danube Delta. The habitats host some 2,000 vascular plants and more than 5,000 animal species, including over 40 mammals, about 180 breeding birds and 100 fish species, 12 reptiles and amphibians.

The Danube's remaining large floodplain forests and the Danube Delta are the last refuges in continental Europe for the white-tailed eagle and white pelicans. Beavers have been successfully reintroduced in the upper and middle Danube despite being driven to near extinction. The Beluga Sturgeon, one of the oldest species of bony fish in existence and one of six sturgeon species once native to the Danube, is an important icon for the ICPDR.

Changes to the river profile and width, water depth and flow velocity following the construction of dams, dikes, weirs and canals can significantly disturb the aquatic environment by disconnecting animals from their spawning grounds or otherwise degrading their habitats.
The EU Water Framework Directive (WFD) requires all EU surface inland waters, transitional and coastal waters, and groundwaters to achieve good chemical and ecological status or potential by 2015. `Good ecological (or biological) status´ means that waters must provide good conditions, such as

migration routes and suitable habitats, for natural species to live healthily. For example, many fish need natural sand bank habitats for spawning, but this may not be available along an engineered stretch of river even though that stretch might have `clean water´.

Joint Danube Survey 2 (JDS2) results for biodiversity

The JDS2 findings confirm that cooperation among Danube countries is bringing positive results for Danube biodiversity. The Danube in general still contains significant natural populations of flora and fauna which are typical for such a large river. A number of important biological parameters show improvement in comparison to the JDS1 of 2001. Large areas remain in good natural condition. Positive efforts have been made to restore damaged natural areas such as floodplains (e.g. in Munich, east of Vienna, on the Belene Islands and in the Danube Delta).

The analysis of *macro-invertebrates* (aquatic insects, worms, clams, snails and other animals without backbones that can be determined without the aid of a microscope and that live in or on sediments) indicated good biological water quality for almost 80% of the Danube sites. Such animals serve as *bio-indicators*, meaning that they allow for conclusions about the quality of the water that they live in (similar to how a litmus test allows for conclusions about water acidity).

In the regulated, non-impounded stretches of the Danube, macrophytes (plants, either free-floating or attached to a surface, that can be determined without the need for a microscope) often meet the conditions for good ecological status. However, the situation is unsatisfactory in the impounded stretches upstream from hydro-electric power plants.

The analysis of phytoplankton (free-floating plants, mainly microscopic, existing in water bodies) found most of the Danube with acceptable conditions. The indication of ecological status based on the analysis of phytobenthos (microscopic plants such as algae that live in the bottom layers of the river attached to a surface) suggested an increase of nutrients in the longitudinal profile of the Danube.

The fish survey, the first ever for the entire length of the Danube, revealed that only about one-third of the investigated sites on the Danube indicated good status. Hydromorphological alterations (i.e. to the physical characteristics of a water body's shape, boundaries and content) are the main pressure on fish populations in the Upper Danube, while poor water quality is the main pressure in the Middle and Lower Danube.

Fish on the edge

Before 1921, over 30 fish species were able to maintain their stocks by natural reproduction – today, the number has been reduced to only two fish species. Most migratory fish including sturgeons and the Danube Salmon are endangered or close to extinction in the Danube Basin due to habitat loss, habitat degradation and over-exploitation.

River and habitat continuity interruptions constitute a major pressure and are defined as part of hydromorphological alterations – one of the Significant Water Management Issues in the Danube River

Basin. Over 900 migration barriers are located in the basin (for rivers with catchment areas larger than 4,000 km^2), of which 56 are located in the Danube River itself. Barriers stem from infrastructure projects such as for flood protection, hydropower generation and navigation. Barriers influence the natural migration patterns of migratory fish species by preventing access to habitats and suitable spawning grounds. The integrity of fish populations relies to a high degree on the availability of required but spatially separated habitat patches within the river network.

The Iron Gate dams I & II at the border between Romania and Serbia are a specific challenge. They represent the first impassable obstacles for fish migration along the Danube River from the Black Sea. Restoration here would re-open a reach of more than 800 km, providing access to habitats and spawning grounds along the Danube and its tributaries for sturgeons and other migratory fish species.

Interruptions to river and habitat continuity, as well as their effect on water quality, are currently being investigated and addressed in the frame of the Danube River Basin Management Plan, in order to meet the requirements of the WFD.

The Plan's vision is that anthropogenic barriers and habitat deficits do not hinder fish migration and spawning anymore – sturgeon species and specified other migratory species are able to access the Danube River and relevant tributaries. The vision further adds that sturgeon species and specified other migratory species are represented with self-sustaining populations in the Danube River Basin District according to their historical distribution.

The plan calls for river and habitat continuity to be restored through the construction of fish migration aids -- by 2015, 108 fish migration aids will be constructed.

Consideration should also be made for new infrastructure projects. Different guidance documents were recently developed or are currently under elaboration, providing support in the planning, construction and operation of fish passes. These guidance documents are seen as a useful tool for government administrations, consulting engineers and the operators of infrastructure facilities.

Download from: **www.icpdr.org/main/publications/guidance-documents**