

Activity Report EG Fish Biology/Fishery 2016

Projects

Projects related to anadromous fish species, sturgeons and shads.

1. **Fish behaviour preparatory study at Iron Gate Hydropower dams and reservoirs.** financed by European Investment Bank, 2014-2015

The global objectives of project were to restore fish migration on the Danube river, focusing on the main migration barrier - the Iron Gates hydropower dams between Romania and Serbia – as part of the legal requirements under the Water Framework Directive.

The specific objectives were to test and adapt different telemetry techniques (radio – and acoustic) on sturgeon, in order to achieve the detection resolution required to precisely determine the preferred location of the fishpass entrances at the Iron Gate hydropower and navigation systems as well as to prepare and train sturgeon tagging and tracking teams from Bulgaria and Serbia, in order for them to become partner in the future larger telemetry study on sturgeon behaviour in relation to the Iron Gate hydropower and navigation systems.

2. **Ex-situ survey to preserve sturgeon genetic diversity in the Middle and Lower Danube,** financed by EU and the City of Vienna, 2015-2016

The objectives were to obtain an overview of existing ex-situ facilities in Middle and Lower Danube area, acquire support of local stakeholders and fishery authorities for sturgeon conservation and to develop a roadmap for future actions in ex-situ conservation

3. **Pontic shad (*Alosa immaculata*) during migration,** Short Term Scientific Mission (STSM) project by COST Action FA1304: FITFISH - *Swimming of fish and implications for migration and aquaculture*, 2016

Work involved collection of material for DNA analysis of shad specimens caught in Danube Delta as well as in Serbian part of the Danube River at rkm 862. Material collected also for geometric morphometrics and otolith analysis.

Conference

Suciu, R., Lenhardt, M., Okland, F., Nichersu, I., Onara, D., Hont, S., Paraschiv, M., Holostenco, D., Trifanov, C., Iani, M. 2015. Monitoring strategy of sturgeon behaviour to ensure functionality of future pass: the Iron Gate 2 case International conference on river connectivity best practices and innovations "Fish Passage 2015", June 20-25, Groningen, The Netherlands, p. 130.

Lenhardt, M., Jaric, I., Skoric, S., Smederevac-Lalic, M., Cvijanovic, G., Djikanovic, V., Visnjic-Jeftic, Z., Hegedis, A., Mickovic, B., Nikcevic, M., Jovicic, K., Jacimovic, M. and Gacic, Z. (2015). Restoration of longitudinal connectivity of the Danube River by the construction of free passages for migratory fish species at the Iron Gates dams. International conference on river connectivity best practices and innovations "Fish Passage 2015", June 20-25, Groningen, The Netherlands, p. 137-138.

Smederevac-Lalic, M., Riha, M., Kubecka, J., Drastik, V., Peterka, J., Muska, M., Tuser, M., Hegedis, A., Skoric, S., Nikcevic, M., Mickovic, B., Lenhardt, M. 2016. Application of high tech sonar techniques for the monitoring of fish migrations in the Danube River (Serbia). FITFISH Annual Conference, Functional mechanisms behind the beneficial effects of swimming, Fish migration and Exercise in aquaculture, 22 April, Belgrade, Serbia, 38.

Lenhardt, M., Suci, R., Finn, O., Hont, S., Paraschiv, M., Iani, M., Smederevac-Lalic, M., Skoric, S., Cvijanovic, G., Mickovic, B., Nikcevic, M. Restoration of fish migration on the Danube focusing on the main migration barrier - the Iron Gates hydropower dams between Romania and Serbia. FITFISH Annual Conference, Functional mechanisms behind the beneficial effects of swimming, Fish migration and Exercise in aquaculture, 22 April, Belgrade, Serbia, 48.

Cvijanovic, G., Adnadjevic, T., Jaric, I., Jovic, V., Maric, S., Lenhardt, M. 2016. Danube sterlet morphometrics and genetic - guidelines for restocking programs. FITFISH Annual Conference, Functional mechanisms behind the beneficial effects of swimming, Fish migration and Exercise in aquaculture, 22 April, Belgrade, Serbia, 50.

Tosic, K., Lenhardt, M., Sabatino, S. 2016. The story of Eurasian shads (*Alosa sp.*): genomics, morphometrics, life history and adaptation. FITFISH Annual Conference, Functional mechanisms behind the beneficial effects of swimming, Fish migration and Exercise in aquaculture, 22 April, Belgrade, Serbia, 58.

Papers

Aborgiba, M., Kostic, J., Kolarevic, S., Kracun-Kolarevic, M., Elbahi, S., Knezevic-Vukcevic, J., Lenhardt, M., Paunovic, M., Gacic, Z., Vukovic-Gacic, B. 2016. Flooding modifies the genotoxic effects of pollution on a worm, a mussel and two fish species from the Sava River. Science of the Total Environment 540, 358-367.

Banaduc, D., Rey, S., Trickova, T., Lenhardt, M., Curtean-Banaduc, A. 2016. The Lower Danube River–Danube Delta–North West Black Sea: A pivotal area of major interest for the past, present and future of its fish fauna — A short review. Science of the Total Environment 545-546, 137-151.

Jarić, I., Gessner, J., Lenhardt, M. 2015. A life-table metamodel to support the management of data deficient species, exemplified in sturgeons and shads. *Environmental Biology of Fishes* 98 (12), 2337-2352.

Ljubobratović, U., Kucska, B., Feledi, T., Poleksić, V., Marković, Z., Lenhardt, M., Peteri, A., Kumar, S., Ronyai, A. 2015. Effect of weaning strategies on growth and survival of pikeperch, *Sander lucioperca*, larvae. *Turkish Journal of Fisheries and Aquatic Sciences* 15, 327-333.

Morina, A., Morina, F., Djikanović, V., Spasić, S., Krpo-Ćetković, J., Kostić, B., Lenhardt, M. 2016. Common barbel (*Barbus barbus*) as a bioindicator of surface river sediment pollution with Cu and Zn in three rivers of the Danube River Basin in Serbia. *Environmental Science and Pollution Research* 23 (7), 6723-6734.