

Executive Summary

D4.1 A classification system for methods, tools and devices for improvement measures

FIThydro carries out research on environmental impacts from hydropower projects and aims to find solutions to increase power production and to support development of self-sustainable fish populations. Hydropower currently supplies 18 per cent of the electricity generated across Europe, which is more than 50 per cent of all renewable energy. With a growing share of unregulated renewable energy from wind and solar power being integrated into the electricity grid, it is expected that the role of hydropower will be even more important in the future. Hydropower is a very site-specific technology developed where the topography and hydrology are favourable.

Hydropower may alter flow and morphology in downstream and bypassed rivers, causing direct mortality of fish, changes in fish habitat conditions and introducing barriers for fish migration. Freshwater fish are abundant in European rivers. They have different requirements for habitat at different life stages, and they have different needs and capability to move and migrate. The aquatic ecosystem is adapted to the local flow regime, and mitigation measures to improve conditions for fish must also be adapted to local conditions.

Even though mitigation measures must be adapted to local conditions, different types of measures can be categorized and described. This report aims to describe the main types of mitigation measures that can be used to solve challenges related to:

- Environmental flows
- Habitat
- Sediment management
- Downstream fish migration
- Upstream fish migration

For each type of mitigation measures, several solutions are described. Each solution is described in more detail in sub-chapter of this report.

The first step before implementing a mitigation measure, is to investigate whether there is a reduction or impact on the fish population. If so, the pressures and problems that cause harm to the fish population must be assessed. Finally, suitable mitigation measures must be planned, implemented and maintained.

A range of different methods, tools and devices can be used to plan, implement and monitor mitigation measures. FIThydro aims at developing new and improved solutions, methods, tools and devices (SMTDs) to improve the environmental performance of hydropower. For each mitigation measure (solution) described in this report, some currently available methods, tools and devices are described. More information about many solutions, methods, tools and devices are found in FIThydro Deliverable D2.1. Deliverables produced at later stages in the project will include a more comprehensive list of mitigation measures and linkages to new and further developed SMTDs.

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