

Habitat and Ecology

The research activities for TKI 2020 - JPower Habitat & Ecology are split in three: tool improvement, more in-depth analysis of smart use of statistics and Ayu habitat suitability, and an exploration towards possible benefits of the use of fish guild approaches instead of single species approach for getting insight in the ecological functioning of the Tenryuu river. The detailed research activities for TKI 2020 -JPower Ecology can be found [here](#)

Tool

The tool that has been improved, is the delwaq2raster tool. This tool used to be limited in selecting a part of the grid, selecting a time period and what kind of statistics available for data manipulation. In its present form the tool can be used to select just a part of the flow or delwaq grid, time periods can be selected on the resolution of the flow or water quality simulations and several statistics (e.g. mean, median, percentiles, standard deviation) are available to the user. How the tool works, is explained in [this](#) short movie. The tool is freely available, and can be obtained by sending an e-mail to habitat@deltares.nl.

Statistics and Ayu

The goal of this project is to investigate how an environmentally friendly dam operation scenario can be designed using a bottom up approach. The common method to test the ecological effect of dam operations is to use a top-down approach where dam operations are designed to optimize power generation or to improve sediment flushing and reduce downstream erosion. These scenarios are fed into a morphodynamic model to calculate the effect on flow and sediment and subsequently the effects of hydro-morphodynamic changes are calculated on water quality and ecology (Figure 1a). But if the goal is to balance power generation, sediment flushing AND ecological values, a bottom-up approach is necessary to investigate how dam operation can be optimized to increase environmental values (see Figure 1). The full report can be downloaded [here](#).

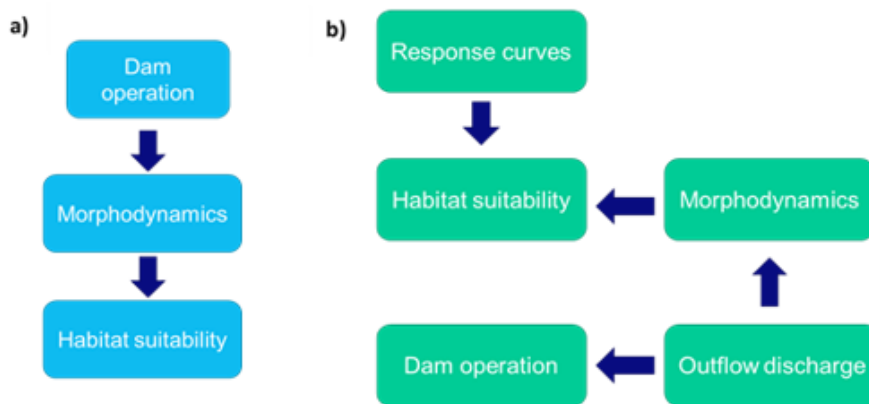


Figure 1. flow diagrams of dam operation methods. a) commonly used top-down approach, b) proposed bottom-up approach.

Fish guild approach

The approach of using fish guilds can reveal more information about the state of the ecological functioning of a river than a single species approach. This study uses the data available for the Tenryuu river in Van Oorschot et al. (2019) and a simplified fish guild approach of Aarts et al. (2004) to research whether the guild approach is indeed signalling more information about the ecological functioning of a riverine system than a single species approach. The results reveal that this is indeed the case, even though the use of a simplified guild approach. The full report can be downloaded [here](#).