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The river Waal is the main branch of the river Rhine in the delta in the Netherlands. It has been trained with groynes in the 19th century to reduce flooding risk due to ice jams and to improve navigability. The resulting narrower main channel, however, has triggered bed erosion and lowered low-flow water levels at a rate of meters per century with increasing adverse effects. For instance, hydraulic structures become unstable, pipeline and cable crossings are exposed, obstacles appear for navigation, and inundation depths and frequencies of floodplain and wetland habitats are reduced. To mitigate the adverse effects while maintaining the benefits of river training, Rijkswaterstaat launched the idea of a new system of river training. It replaces the existing system of a single main channel between groynes by two parallel channels, separated by a longitudinal training wall. To test this new system, Rijkswaterstaat implemented a 10-km long pilot with three longitudinal training walls in the river Waal in the years 2014-16. Before, during and after implementation, an extensive monitoring and research program was executed by the Waal Samen partnership consisting of Rijkswaterstaat, Koninklijke BLN-Schuttevaer, Sportvisserij Nederland, Hengelsportfederatie Midden-Nederland, Deltares, and the universities of Nijmegen, Wageningen, Delft and Twente. The new system was found to improve navigability at low flows if applied in reaches of least available depth. Moreover, it was found to sustain long-term navigability by countering the ongoing overall incision of the river bed. After implementation of the pilot, the waterway continued satisfying the international navigability standards. The pilot substantially improved the quality of nature in the reach of the training walls. The walls lowered design flood water levels at least as much as the groyne lowering previously planned in this reach. A modestly positive effect was found on freshwater supply during droughts. Participation of stakeholders in the monitoring and research program was found to have increased support and appreciation for the pilot. We conclude that the system tested in the pilot opens perspectives for integral solution of several river problems. It performs better than the old system with groynes thanks to spatial diversification through separation of functions. No unforeseen negative impacts have surfaced. A longer pilot reach monitored over a longer period would be required for solid conclusions about the extent to which the new system solves all river problems, but at any rate it offers more space for further improvements in the future than the old system. Rijkswaterstaat and Deltares jointly identified three points of further attention: (i) regulation of flow and sediment transport by modifying inlet sills; (ii) operation and maintenance; (iii) the inland waterway. We recommend addressing these points by continued monitoring and close consultation of the inland waterway transport sector.