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Applications of hydromorphological monitoring in the assessment of channel network in the urban and suburban environment - an example from the City of Brno, Czech Republic

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Hydromorphological monitoring and assessment is an important tool of present day river management, which is closely related to priorities given by EU Water Framework Directive. There may be found a lot of national hydromorphological monitoring procedures (manuals) in Europe, however, those in use are not very well applicable for urban rivers. Conditions of river surveys in the urban areas markedly differ from those in rural areas. Further, available river geomorphological classification systems either ignore or undervalue the urban rivers. Forms and processes of urban and sub-urban streams and rivers remain much unstudied until the present day. There are still only a few studies on urban rivers using surveying procedures developed specifically for this purpose. This is unfavourable for the practice of urban rivers management, especially river restoration and rehabilitation, because scientific background for evaluating ecological status of urban rivers is generally lacking. We present results of a pilot study focusing on hydromorphological monitoring, assessment, and classification of the channel network of the Brno city. Pilot study was targeted to main watercourse of the agglomeration – the Svratka River. We utilised modified urban river survey (URS) procedure (Davenport et al. 2004) for basic description and classification of the river physical and ecological features. The URS procedure was further extended by mapping the extent of public access to the river banks and evaluation of the potential of the river corridor for recreation of urban citizens. We also discuss the administrative procedures which are involved in the urban river management, restoration, planning, and constructing the river design. The results of hydromorphological monitoring and assessment may used for decisions about feasible restoration measures (technical solutions, allocation of financial resources), during public involvement and discussions, and for planning rivers as functional city structures. The channel network of the Brno city offers a great opportunity for testing methods of the hydromorphological monitoring in the urban environment. Watercourses of various orders, habitat diversity and quality, and degree of urbanisation of surrounding floodplain may be found within the study area. There are two large rivers (the Svratka River and the Svitava River) forming a basic skeleton of the channel network; they differ markedly by their ecological status and development of surrounding floodplain (residential versus brown-field areas). Two large rivers are accompanied by numerous smaller streams, some of them having their whole watershed within the Brno city agglomeration. Thus, the entire continuum from heavily modified to semi-natural streams may be found in the study area. Recently new general drainage network plan of the Brno city is being incorporated into a new municipal plan. This gives an opportunity to make progress in river restoration of degraded city watercourses and enhance the knowledge of urban river morphologies, habitats and processes that are shaping them.