

PHAM Seminar Summary (Day 1 – 19th November 2009)

This summary aims to compile the most important ideas that have been delivered to the PHAM seminar during the 19th of November 2009. However, we have to warn that not all the aspects that have been commented during the seminar are included. We first review the definition of river habitats according to the different contributions and then we have compiled the most relevant ideas and comments within each session.

River Habitats

River habitats are usually defined depending on the objective considered, which is commonly a plant, an animal or even a biological community. A habitat is, thus, described according to the key characteristics that allow a specie or community to thrive or perish. Therefore, the characteristics and the spatial scale are different, depending on the subject considered. For example, the habitat of a diatom could be described from substrate, water velocity and depth at a micro-scale, while a trout population will need to incorporate characteristics at higher scales, such as the presence and distribution of pools. However, we should be aware of the differences between studies that characterise river habitats focusing on certain species or communities and those ones directed to assess river habitat condition for environmental management purposes. Having said this, an effort must be made in order to establish the set of key habitat characteristics in rivers that might be important at each spatial scale in order to carry out suitable river habitat assessments for an adequate ecosystem management and the reporting of the state of river habitat conservation.

Session 1. The need to describe river habitats

Physical habitat features within the Water Framework Directive (WFD) are not as important as biological communities in classifying the ecological quality of Water Bodies (WB). Hydromorphological impacts and pressures are only considered important when they produce a deviation in biological communities, but not because of the effect they cause on physical habitat attributes per se. However, methodologies to classify a water body as high or good status based on hydromorphological impacts and pressures are yet far from clear. Moreover, the effect that hydromorphological impacts and pressures have on river hydrology, continuity and morphological conditions or in biological communities is also poorly understood.

The main role of hydromorphological elements in the WFD is to:

- 1.- Identify WB as natural, heavily modified or artificial
- 2.- Determine water bodies in reference condition.
- 3.- Design programs of measures (restoration & mitigation)

There is a strong need to investigate the relationships between hydromorphological and biological quality elements within the WFD. Moreover, hydromorphological quality elements are not properly assessed by almost any of the existing indices and methods, and they are extremely important for the designing and monitoring of active measures for river restoration.

Regarding the Habitats Directive (HD), physical habitat attributes have to be considered for establishing the habitat carrying capacity for each vegetation community and species and also to evaluate the status of conservation of the different species and habitats included in the annex II of the Directive. Physical habitat attributes and geomorphological processes should be considered as key elements and evaluated accordingly. This assessment should include the actual value and the one we want to achieve in order to reach a good conservation status. In this way, we will be able to assess the efficiency of the different active and passive management activities.

Session 2. River Habitat from Basin to Cobbles

River habitats are created and maintained by catchment and local characteristics and processes. River channel forms and channel characteristics (i.e. geodiversity) are extremely important for ecological processes, however they should also be considered as valuable elements in themselves. At a large scale, river habitat characteristics are mainly controlled by climate, tectonics, base level and historic events while discharge, sediment yield and valley characteristics play an important role at medium spatial scales. Human activities can also influence through land-use changes, water regulation and other local modifications.

At a local level, water temperature, velocity and depth, substrate composition and shade are all important physical attributes from river habitats. At this scale, large woody debris and riparian structure and composition play important roles in the determination of the local variability of these physical attributes. Moreover, dead wood is really important in structuring river habitats, creating spatial heterogeneity, providing refuges, sorting of sediments and retention of organic matter.

Session 3. Assessment of River Habitats: A Spanish approach

In Spain there are a wide variety of methods that aim to assess different attributes of the fluvial habitat for river management purposes. Riparian Quality Index (RQI) and “Qualitat del Bosc de Ribera” (QBR) are two techniques extensively used to assess riparian vegetation quality with similar performances. Instream habitat integrity is also assessed in Spanish rivers using the “Índice del Hábitat Fluvial” (IHF), which is mainly based on river habitat heterogeneity. The degree of modification on river functioning and river processes is also assessed using the “Índice Hidrogeomorfológico” (IHG), which evaluates anthropogenic alterations to different attributes of river ecosystems. Moreover, different protocols have been established for assessing the hydrogeomorphology of Spanish rivers, such as the HIDRI and CEDEX Protocols, which consider hydrology, river continuity, riparian quality and instream channel characteristics. Finally, river habitat assessments have also been carried out using IFIM methodologies in order to determine habitat suitability for fish, invertebrate communities and riparian vegetation according to flow requirements.

Session 4. Assessment of River Habitats: An International perspective

Different methods are used in Europe for the assessment of river habitats for river management purposes. Between the most used methods is the River Habitat Survey

(RHS), which has been successfully applied to several European countries. Given its high functionality as a characterisation protocol, it is an easy method to be reviewed and extended, incorporating different characteristics to the rivers from where it was first developed. The RHS has been modified to include large and braided rivers in Italy (CARAVAGGIO) and has also been modified for Portuguese rivers, and it is now the official method used in these Mediterranean countries for reporting WFD related issues. RHS survey datasets have also been exploited to develop different indices such as the lentic-lotic river descriptor. RHS has also been applied to Spanish northern rivers and compared to national methods. Although HQA (RHS derived index) performed slightly better than IHF index, habitat heterogeneity did not seem to be a good indicator of habitat integrity by itself. The advantage of characterisation protocols against indices is that other river characteristics recorded and stored in the database than the ones used in a specific index can be used for exploratory purposes. Finally, a CEN standard has been published in 2004 for the assessment of hydromorphological features in European rivers, which include ten assessment categories in three sections: 'Channel', 'River Banks/ Riparian Zone' and 'Floodplain'. This standard does not compromise national methods but sets the minimum characteristics to be considered and, thus, helps countries who have no methods for assessing river hydromorphology. A second standard on hydromorphological modification is being prepared with the aim of complementing the first standard, enabling consistent, broad-based characterization across a wide spectrum of hydromorphological modification and to allow high-level reporting of river hydromorphology throughout Europe.