

**1 - METHOD BACKGROUND**

NAME OR CODE	<b>RHS adaptation (in progress)</b>
COUNTRY	Portugal
KEY REFERENCE	Raven et al. (2009); Ferreira et al. (2011)
WEBPAGE	
CATEGORY	The method aims to assess the physical habitat quality of rivers in Portugal (modifications/adaptations of the UK-RHS to hydromorphological conditions in Portugal)

**2 - METHOD CHARACTERISTICS**

A - SOURCE OF INFORMATION / DATA COLLECTION	Maps/Remote sensing Field survey Rapid field assessment Existing database Modelling	The authors highlight the importance of aerial photographs to verify and interpret RHS survey data and to define riparian habitat distribution and land uses The same protocol as for RHS NOT APPLICABLE Use of existing database to calibrate the method to Portugal NOT APPLICABLE
B - SPATIAL SCALE	HIERARCHICAL SPATIAL SCALE LONGITUDINAL SPATIAL SCALE LATERAL SPATIAL SCALE	River catchment/Water body/Reach/Cross Section Fixed length Scaled to channel width Variable length Channel Banks/Riparian zones Floodplain
C - TEMPORAL SCALE	Physical and morphological assessment Hydrological assessment	Same as RHS NOT APPLICABLE
D - TYPE OF METHOD	Characterization/classification Assessment by index Deviation from reference General assessment / Design framework Modelling status / Scenario Final expert judgment Links with other systems	Same as RHS Modification/adaptation of HQI and HMS to rivers in Portugal Consistent with RHS but specific description of type-specific reference conditions in Portugal are needed NOT APPLICABLE NOT APPLICABLE NOT APPLICABLE Possible link and parallel use to QBR and other hydrological assessment methods (because RHS lacks them)
E - REFERENCE CONDITIONS		Authors need to describe type-specific reference conditions for Portugal, but rare examples seem to exist in Portugal
F - GENERAL INFORMATION	RIVER TYPOLOGY TYPOLOGY LIMITATIONS TYPE-SPECIFIC (Protocol / Assessment method) BASIS FOR STANDARDS / THRESHOLDS REACH SCALE SURVEY STRATEGY TIMING AND FREQUENCY DATA PRESENTATION (OUTPUT/LAYOUT) METHOD SUPPORT / APPLICATION TOOLS SPATIAL COMPARISON CONNECTION TO ECOLOGY USERS SCALE INFORMATION NUMBER OF END PARAMETERS	Authors will provide the development and validation of a national river typology (but nationally it is used the system B, (INAG, I.P., 2008)) The method would accomplish lacks of RHS in terms of assessment of Mediterranean rivers; it is specifically adopted to be applied to river types in Portugal NOT APPLICABLE Under development Same as RHS Particular attention should be given to the period of survey, because of the high variability in hydrological regimes in Portugal (Seasonal and inter-annual flow variability, both for natural and human-induced causes) Same as RHS A Portuguese support protocol version (manual, field sheets, database etc.) is under development Modifications to the original RHS protocol will be limited, allowing comparison of data between different EU Member States that use RHS Same as RHS Same as RHS Same as RHS NOT AVAILABLE

### 3. RECORDED FEATURES

	LARGE SCALE CHARACTERISTICS	Same as RHS
A - CATCHMENT / VALLEY	HYDROLOGICAL CONDITIONS	Consistent with RHS; surveyors are always required to record the conditions of the survey to allow for comparison
	L REGIME	NOT APPLICABLE
	VALLEY FORM / FEATURES	NOT APPLICABLE
	VALLEY FORM / FEATURES	Consistent with RHS; problems to determine banktop in V-shaped valleys
	CHANNEL PATTERN / PLANFORM	Same as RHS
	CHANNEL FORMS	The Portuguese version records some additional features of channel forms (total number of side bars; the presence and number of wet and dry sub-channels; distinguish mid-channel bars and mature islands surrounded by dry/ wetted sub-channels)
	BED CONFIGURATION	Adding "presence of vernal pools" (dry channels) amongst features of special interest
	CHANNEL DIMENSIONS	Re-definition of criteria to determine and define banktop
B - CHANNEL	FLOW-TYPE	It better defines/explains naturally-ponded flow-type and provides keys to identify modifications causing ponded water
	PHYSICAL / HYDRAULIC VARIABLES	NOT APPLICABLE
	SUBSTRATE	Consistent with RHS but it records either the dominant and sub-dominant channel substrate (because annual flow variability leads to a high number of substrate types in a site)
	IN-CHANNEL VEGETATION	Channel vegetation types description adapted to rivers in Portugal
	WOODY DEBRIS	Same as RHS
	ARTIFICIAL FEATURES AND STRUCTURES	Improved description of artificial features and their actual impact (i.e. minor fords and weirs), difficult to describe during low flows
	BANK PROFILE / SHAPE	It needs to define discrete sit/sand/gravel deposit as bankside depositional features
C - RIVER BANKS/ RIPARIAN ZONE	BANK MATERIAL	Same as RHS
	RIPARIAN VEGETATION STRUCTURE	Same as RHS
	LONGITUDINAL CONTINUITY OF RIPARIAN VEGETATION	Same as RHS
	RIPARIAN VEGETATION WIDTH	Differently from the RHS protocol, the Portuguese version directly assesses the width of the riparian zone (both banks)
	VEGETATION COMPOSITION, COVERAGE AND OTHER RIPARIAN VEGETATION CHARACTERISTICS	Presence/Absence/Extension of typical fluvial woody species and "nuisance" plant species
	ARTIFICIAL FEATURES AND STRUCTURES	Same as RHS
	LAND USE	Definition of land uses adapted for Portugal
	FLUVIAL FORMS	Same as RHS
D - FLOODPLAIN	INFO ON FLOODPLAIN FEATURES	NOT APPLICABLE
	LAND USE	Definition of land uses adapted for Portugal; add "Riparian (wet) woodland" amongst floodplain land uses

### 4. RIVER PROCESSES

A - LONGITUDINAL CONTINUITY	Sediment and wood	Same as RHS
	Water flow	Same as RHS
B - LATERAL CONTINUITY	Lateral hydraulic continuity	Same as RHS
	Sediment (and wood) lateral continuity	Same as RHS
C - BANK EROSION / STABILITY		Same as RHS
E - CHANNEL ADJUSTMENTS	Planimetric (pattern & width)	NOT APPLICABLE
	Vertical	NOT APPLICABLE
F - VERTICAL CONTINUITY	Groundwater connection	Same as RHS

### 5. APPLICATION TO WFD

OFFICIAL METHOD (WFD implementation) / COMMONLY USED METHOD (not compulsory)	The method is an implementation of the RHS methodology for fluvial hydromorphological characterization and quality assessment in Portugal in accordance with the WFD and with a work plan defined by Portuguese Water Authorities to achieve this objective
APPLICATION TO ALL WATER BODIES	It is applied to all water bodies in Portugal
USED IN THE CLASSIFICATION OF HIGH-STATUS / OTHER STATUS CLASSES	NOT AVAILABLE
USED TO PREDICT RISK OF DETERIORATION	NOT AVAILABLE
USED TO IDENTIFY IMPROVEMENT TARGETS	NOT AVAILABLE
USED TO HELP IDENTIFY CAUSE OF ECOLOGICAL IMPACTS	NOT AVAILABLE
KEY STRENGTHS FOR RIVER MANAGEMENT	Possibility to compare results at the European scale