

1 - METHOD BACKGROUND			
NAME OR CODE		IHF - Índice de hábitat fluvial (IHF) - Index for the assessment of fluvial habitat in Mediterranean rivers	
COUNTRY		Spain	
KEY REFERENCE		Pardo et al. (2002)	
WEBPAGE			
CATEGORY		The method aims to characterize physical habitats (heterogeneity) and relate them to biological indicators	
2 - METHOD CHARACTERISTICS			
A - SOURCE OF INFORMATION / DATA COLLECTION		Maps/Remote sensing	Remote data could be used to identify survey reaches
		Field survey	7 components of river habitat are assessed in the field: Substrate embeddedness or sediments in pools, rapid frequency, substrate composition, velocity/depth conditions, % of shading, Heterogeneity components, in-channel vegetation cover
		Rapid field assessment	The method makes use of a rapid field assessment strategy
		Existing database	NOT APPLICABLE
		Modelling	NOT APPLICABLE
B - SPATIAL SCALE	HIERACHICAL SPATIAL SCALE	River catchment/Water body/ Reach/Cross Section	The method makes only the assessment of representative homogeneous reaches
	LONGITUDINAL SPATIAL SCALE	Fixed length	NOT APPLICABLE
		Scaled to channel width	NOT APPLICABLE
	LATERAL SPATIAL SCALE	Variable length	Homogenous reaches, long enough to allow for the assessment of the 7 components
		Channel	Assessment focuses on channel
		Banks/Riparian zones	NOT APPLICABLE
		Floodplain	NOT APPLICABLE
C - TEMPORAL SCALE		Physical and morphological assessment	The method considers only the present state
		Hydrological assessment	NOT APPLICABLE
D - TYPE OF METHOD		Characterization/classification	It could be used for characterizing river reaches attending to the 7 described components
		Assessment by index	The index is obtained by the sum of single scores for the 7 components. The index does not necessarily evaluate the quality of physical habitats, but rather is a characterization of complexity
		Deviation from reference	NOT APPLICABLE
		General assessment / Design framework	NOT APPLICABLE
		Modelling status / Scenario	NOT APPLICABLE
		Final expert judgment	NOT APPLICABLE
		Links with other systems	It is often used in combination to QBR; it can be successfully used in combination to biological indices to allow for the determination of ecological status especially in Mediterranean rivers. It has been included in the HIDRI protocol as tool for the physical characterization of Mediterranean rivers
E - REFERENCE CONDITIONS		Conditions before the impacts occurred, defined by expert judgment and field analysis verification	
F - GENERAL INFORMATION	RIVER TYPOLOGY		NOT AVAILABLE
	TYPOLOGY LIMITATIONS		The protocol applies only to Mediterranean rivers (temporary streams are included)
	TYPE-SPECIFIC (Protocol / Assessment method)		The protocol applies only to Mediterranean rivers
	BASIS FOR STANDARDS / THRESHOLDS		Thresholds for the score of reference sites have been calculated as the 25 percentile of IHF values of best reference sites (to divide reference and non-reference sites). Thresholds/scores for 7 components have been determined during the GUADALMED project (2000-2001), by 465 samples (reaches) collected at 156 locations (rivers)
	REACH SCALE SURVEY STRATEGY		The entire selected reach is assessed, but considering 7 component separately (and each component involves a specific spatial extent)
	TIMING AND FREQUENCY		NOT APPLICABLE
	DATA PRESENTATION (OUTPUT/LAYOUT)		Scores for 7 components and a final score
	METHOD SUPPORT / APPLICATION TOOLS		A paper which explain the development of the method and its relationship with biological indicators and indices; a field sheet (Munné et al., 2006 also describe the IHF protocol)
	SPATIAL COMPARISON		The method allows for spatial comparison of physical habitat heterogeneity between Mediterranean rivers, during the same hydrological conditions (it is sensible to hydrological temporal variation)
	CONNECTION TO ECOLOGY		The index relates well to biological indicators and indices (e.g. number of families of macrobenthos, macrobenthos quality index, etc.) and is sensible to the temporal variation of habitat heterogeneity; it characterizes the % of shading
	USERS		The method is widely used by Water Agencies
	SCALE INFORMATION		Only local scale information is provided
	NUMBER OF END PARAMETERS		7 components and 16 distinct parameters

3. RECORDED FEATURES		
A - CATCHMENT / VALLEY	LARGE SCALE CHARACTERISTICS	NOT APPLICABLE
	HYDROLOGICAL REGIME	Estimation of River velocity/depth conditions
	Metrics of hydrological regime	NOT APPLICABLE
	Hydro-peaking	NOT APPLICABLE
B - CHANNEL	VALLEY FORM / FEATURES	NOT APPLICABLE
	CHANNEL PATTERN / PLANFORM	NOT APPLICABLE
	CHANNEL FORMS	NOT APPLICABLE
	BED CONFIGURATION	Frequency of rapids; heterogeneity components (Natural dams)
	CHANNEL DIMENSIONS	NOT APPLICABLE
	FLOW-TYPE	Velocity/depth conditions (4 categories)
	PHYSICAL / HYDRAULIC VARIABLES	Estimation of river velocity/depth
	SUBSTRATE	Substrate embeddedness or sediments in pools; Substrate composition; Heterogeneity components (leaf litter)
	IN-CHANNEL VEGETATION	In-channel vegetation cover (3 categories)
	WOODY DEBRIS	Heterogeneity components (presence of branches and wood in the stream)
C - RIVER BANKS/ RIPARIAN ZONE	ARTIFICIAL FEATURES AND STRUCTURES	NOT APPLICABLE
	BANK PROFILE / SHAPE	NOT APPLICABLE
	BANK MATERIAL	NOT APPLICABLE
	RIPARIAN VEGETATION STRUCTURE	NOT APPLICABLE
	LONGITUDINAL CONTINUITY OF RIPARIAN VEGETATION	NOT APPLICABLE
	RIPARIAN VEGETATION WIDTH	NOT APPLICABLE
	VEGETATION COMPOSITION, COVERAGE AND OTHER RIPARIAN VEGETATION CHARACTERISTICS	Heterogeneity components (Tree roots in the banks); % of shading
	ARTIFICIAL FEATURES AND STRUCTURES	NOT APPLICABLE
	LAND USE	NOT APPLICABLE
	FLUVIAL FORMS	NOT APPLICABLE
D - FLOODPLAIN	INFO ON FLOODPLAIN FEATURES	NOT APPLICABLE
	LAND USE	NOT APPLICABLE
		NOT APPLICABLE
4. RIVER PROCESSES		
A - LONGITUDINAL CONTINUITY	Sediment and wood	NOT APPLICABLE
	Water flow	NOT APPLICABLE
B - LATERAL CONTINUITY	Lateral hydraulic continuity	NOT APPLICABLE
	Sediment (and wood) lateral continuity	NOT APPLICABLE
C - BANK EROSION / STABILITY		NOT APPLICABLE
E - CHANNEL ADJUSTMENTS	Planimetric (pattern & width)	NOT APPLICABLE
	Vertical	NOT APPLICABLE
F - VERTICAL CONTINUITY	Groundwater connection	NOT APPLICABLE
5. APPLICATION TO WFD		
OFFICIAL METHOD (WFD implementation) / COMMONLY USED METHOD (not compulsory)		The method is widely used by Water Agencies in Spain
APPLICATION TO ALL WATER BODIES		It applies to all Mediterranean rivers (Mediterranean regime)
USED IN THE CLASSIFICATION OF HIGH-STATUS / OTHER STATUS CLASSES		The method is considered as complementary to establish reference conditions of high ecological status for biota (because it relates well to biological indices and indicators of ecological quality)
USED TO PREDICT RISK OF DETERIORATION		Flow-related components of the index are sensible to water level temporal (seasonal) fluctuations, therefore it could be used to predict the risk of regime flow alteration, as well as consequence of water pollution (especially during low flow)
USED TO IDENTIFY IMPROVEMENT TARGETS		It could be potentially used for this purpose
USED TO HELP IDENTIFY CAUSE OF ECOLOGICAL IMPACTS		It relates well to biological indicators and indices, and it is sensible to the temporal variation of habitat heterogeneity, therefore it can be used to identify causes of ecological impacts
KEY STRENGTHS FOR RIVER MANAGEMENT		Meaningful and wide protocol; it collects information from all the river areas and several points of view (hydrological, physical habitat, morphological, etc.)