Modular River Physical (MoRPh) Field Survey (ver 12)

Sheet 1 - GENERAL INFORMATION

RECORD WHAT YOU SEE NOT WHAT YOU KNOW

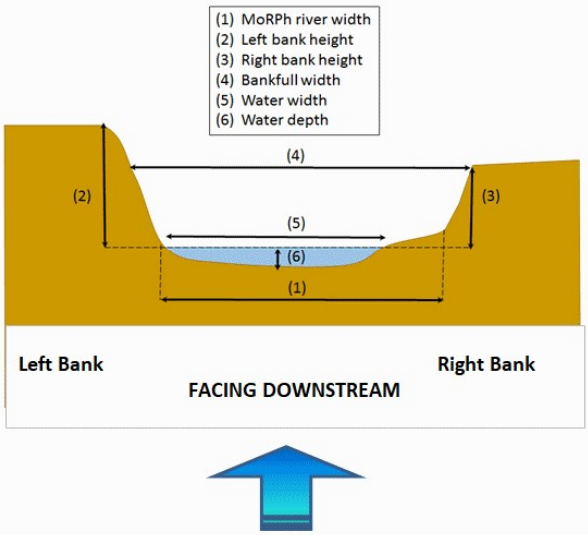
PROJECT DETAILS (Optional)	
Project name	
Project code	

1.1 SURVEYOR AND SURVEY CONDITIONS	
Surveyor	
Survey date and time	
Module surveyed from?	left / right / both banks
Bed visible?	Yes / No
Adverse conditions?	Yes / No
If yes, describe e.g. elevated flow, turbid water, etc	

1.3 CHANNEL DIMENSIONS (m)	
Cross section GPS	
1. MoRPh river width	
2. Left bank height	
3. Right bank height	
4. Bankfull width	
5. Water width	
6. Water depth	

Multi-MoRPh Channel Dimensions

If surveying multiple adjoining modules: a minimum of ONE (REPRESENTATIVE) SET OF CHANNEL DIMENSIONS should be measured for each group - up to 10 modules.
TIP!:- Bridges provide a good location for estimating dimensions of larger rivers.



PROJECT DETAILS (Optional)	
WFD Water Body ID	
Survey type (monitoring, pre-project post-project, post-recovery, scenario, training)	

1.2 MODULE NAME AND LOCATION	
River name	
Location/Reach name	
SubReach name (used to reference a sub-reach of contiguous modules)	
Module number (1, 2, 3… number from upstream to downstream within SubReach)	
Riverfly site reference (optional)	
Module length (m) **(i)**	
NGR / GPS - Midpoint	

(i) Determining your Module Length

River width (m) (ii)	Module length (m)
< 5 m	10 m
5 to < 10 m	20 m
10 to < 20 m	30 m
20 to < 30 m	40 m
Large & navigable rivers and canals	50 m

(ii) Predominant MoRPh river width is used to determine module length. It is estimated as the **typical water width plus any area of bare sediment or emergent aquatic plants at the water edge.**

If river ≥ 30 m wide it is usually too large for a full MoRPh Survey. For Large & navigable rivers and canals a reduced MoRPh survey is possible, focusing on the banktops and faces and those bed features that are visible

Identifying the LEFT AND RIGHT BANK

The **LEFT** and **RIGHT BANK** of a river are on the left and right sides of the channel **when facing in a downstream direction with the water flowing away from you**

1.4 PHOTOGRAPHS (max 4)	
Fixed point photograph taken with NGR / GPS? (Y/N)	
Photo ref 1 (iv)	
Photo ref 2	
Photo ref 3	
Photo ref 4	

We recommend 3 photos from the midpoint, one across, one looking upstream and one downstream to cover entire module. Photo 4 could be of special features or to support notes/queries.

NOTES

Use this box to enter details where you are unsure of any measurements / records you have made.

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Sheet 2 - BANK TOP: FLOODPLAIN MEASUREMENTS

RECORD WHAT YOU SEE NOT WHAT YOU KNOW (within 10 m of bank edge)

MEASUREMENT CATEGORY	MEASUREMENT TYPE		CODE		ABUNDANCE		NOTES
2.1 BANK TOP - ARTIFICIAL / MANAGED GROUND COVER			**LB**	**RB**	**LB**	**RB**	**SUB-DOMINANT TYPE** ONLY RECORD if it occupies > 20% of area within 10m of bank edge
Artificial ground cover	Artificial ground cover (Fp, Tr, Ic, Re, Sy, Ld, Ar, Pv, Pr, Pw, Ow)	DOMINANT TYPE			*A / T / P / E*	*A / T / P / E*	
		SUB-DOMINANT TYPE (see **(i)**)			*A / P / E*	*A / P / E*	

2.2 BANK TOP - NATURAL / LIGHTLY MANAGED GROUND COVER			**LB**	**RB**	
Terrestrial vegetation	Unvegetated (bare soil / rock)		*A / T / P / E*	*A / T / P / E*	**ABUNDANCE CODES** A/T/P/E abundance codes on sheet 2 refer to proportion of area within 10 m of bank edge along the module length. Circle one of: A = absent, T = trace (< 5%), P = present (5% - <33%), E = extensive (> 33%)
	Mosses / lichens		*A / T / P / E*	*A / T / P / E*	
	Short/creeping herbs/grasses		*A / T / P / E*	*A / T / P / E*	
	Tall herbs/grasses		*A / T / P / E*	*A / T / P / E*	
	Scrub or shrubs		*A / T / P / E*	*A / T / P / E*	
	Saplings or trees		*A / T / P / E*	*A / T / P / E*	
	Fallen trees (ONLY those with a significant proportion on bank top)		*A / T / P / E*	*A / T / P / E*	
	Leaning trees		*A / T / P / E*	*A / T / P / E*	
	J-shaped trees		*A / T / P / E*	*A / T / P / E*	
	Tree/shrub branches trailing into channel		*A / T / P / E*	*A / T / P / E*	
	Large wood (wood pieces > 1m long, > 10 cm diameter)		*A / T / P / E*	*A / T / P / E*	
	Predominant tree type (Absent, Deciduous, Coniferous, Mixed)		*A / D / C / M*	*A / D / C / M*	
Non-native invasive plant species	Himalayan balsam		*A / T / P / E*	*A / T / P / E*	**PLANT IDENTIFICATION** See MoRPh field guide
	Japanese knotweed		*A / T / P / E*	*A / T / P / E*	
	Giant hogweed		*A / T / P / E*	*A / T / P / E*	
	Floating pennywort		*A / T / P / E*	*A / T / P / E*	
	Other: NAME SPECIES		*A / T / P / E*	*A / T / P / E*	
	Other: NAME SPECIES		*A / T / P / E*	*A / T / P / E*	

2.3 BANK TOP - WATER RELATED FEATURES			**LB**	**RB**
Water-related features	Pond	Disconnected from river at time of survey	*A / T / P / E*	*A / T / P / E*
		Connected to river by water-filled channel at time of survey	*A / T / P / E*	*A / T / P / E*
	Side channel - free flowing separate channel including tributaries and fish passes		*A / T / P / E*	*A / T / P / E*
	Wetland (recorded by dominant vegetation type)	Short non-woody vegetation (e.g. mosses, sedges)	*A / T / P / E*	*A / T / P / E*
		Tall, non-woody vegetation (e.g. reeds, rushes)	*A / T / P / E*	*A / T / P / E*
		Shrubs and trees (e.g. alder / willow carr)	*A / T / P / E*	*A / T / P / E*

NOTES (ctd.)

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Sheet 3 - BANK FACE AND CHANNEL MARGIN MEASUREMENTS

RECORD WHAT YOU SEE NOT WHAT YOU KNOW

MEASUREMENT CATEGORY	MEASUREMENT TYPE		CODE			ABUNDANCE		NOTES
3.1 BANK FACE - PROFILE				LB	RB	LB	RB	
Bank face - Profile	Natural / artificial bank profile	DOMINANT TYPE *(V, Vo, Vu, Vt, St, Gt, Cm, Rs, Ts, Em, Sm, Pc)*	*Bank profile type*			*A / T / P / E*	*A / T / P / E*	**SUB-DOMINANT TYPE** ONLY RECORD if it occupies > 20% of the bank length
		SUB-DOMINANT TYPE (see **(i)**)	*Bank profile type*			*A / P / E*	*A / P / E*	
3.2 BANK FACE - MATERIALS				LB	RB			**WHICH PART OF THE BANK IS REINFORCED?** A = absent T = mainly the top B = mainly the bottom W = Whole bank face
Bank face - Natural materials	Bank face sediment *(AR, BE, BO, CO, GP, SA, SI, CL, OR, PE, EA, NV)*		*Sediment size (top 2/3)*			LB	RB	
			Sediment size (bottom 1/3)					
Bank face - Reinforcement	Which part of the bank is reinforced? (**NOTE SPECIFIC CODES IN BOX (ii)**)					*A / T / B / W*	*A / T / B / W*	
	How extensive is the reinforcement horizontally along the module?					*A / T / P / E*	*A / T / P / E*	
	Bank reinforce-ment	DOMINANT TYPE *(CC, CB, BR, SP, WP, BW, RR, GA, WS, RE, BC, WO)*	*Reinforcement type*					**SUB-DOMINANT TYPE** ONLY RECORD if it occupies > 20% reinforced area
		SUB-DOMINANT TYPE (see **(iii)**)	*Reinforcement type*					
3.3 BANK FACE / CHANNEL MARGIN - FEATURES				LB	RB	LB	RB	**ABUNDANCE CODES** A/T/P/E abundance codes on sheet 3 refer to **proportion of bank length** occupied by feature, APART FROM '*Terrestrial vegetation on bank face*' and '*Non-native invasive plant species*' in section 3.4, which refer to **proportion of bank face area**: A = 0%, T = < 5%, P = 5% - <33%, E = > 33%
Natural physical features	Bare / unvegetated side bar (< 50% vegetation cover)		*Sediment size*			*A / T / P / E*	*A / T / P / E*	
	Vegetated side bar (>50% vegetation cover)		*Sediment size*			*A / T / P / E*	*A / T / P / E*	
	Berm (if unsure whether berm/bench record as berm)					*A / T / P / E*	*A / T / P / E*	
	Bench (if unsure whether berm/bench record as berm)					*A / T / P / E*	*A / T / P / E*	
	Stable cliff (> 0.5 m)					*A / T / P / E*	*A / T / P / E*	
	Eroding cliff (> 0.5m)					*A / T / P / E*	*A / T / P / E*	
	Toe					*A / T / P / E*	*A / T / P / E*	
	Nest holes or animal burrows					*A / T / P / E*	*A / T / P / E*	
	Marginal backwater					*A / T / P / E*	*A / T / P / E*	
	Tributary junction / confluence: RECORD AS COUNT							
Artificial physical features	Pipes / outfalls (if appear potentially functional): RECORD AS COUNT							**Maj** (Major) = >20% channel width; **Int** (Intermediate) = 10-20% width; **Min** (Minor) = <10% width
	Jetty					*Maj / Int / Min*	*Maj / Int / Min*	
	Deflector					*Maj / Int / Min*	*Maj / Int / Min*	
	Other: INSERT FEATURE NAME					*Maj / Int / Min*	*Maj / Int / Min*	

MEASUREMENT CATEGORY	MEASUREMENT TYPE	ABUNDANCE		MEASUREMENT TYPE	ABUNDANCE	
3.4 BANK FACE / CHANNEL MARGIN - VEGETATION		LB	RB		LB	RB
Terrestrial vegetation on bank face	Unvegetated (bare earth or rock)	*A / T / P / E*	*A / T / P / E*	Fallen trees (ONLY those with a significant proportion on bank face)	*A / T / P / E*	*A / T / P / E*
	Mosses / lichens	*A / T / P / E*	*A / T / P / E*			
	Short/creeping herbs/grasses	*A / T / P / E*	*A / T / P / E*	Leaning trees	*A / T / P / E*	*A / T / P / E*
	Tall herbs/grasses	*A / T / P / E*	*A / T / P / E*	J-shaped trees	*A / T / P / E*	*A / T / P / E*
	Scrub or shrubs	*A / T / P / E*	*A / T / P / E*	Tree/shrub branches trailing into channel	*A / T / P / E*	*A / T / P / E*
	Saplings or trees	*A / T / P / E*	*A / T / P / E*			
	Large wood (pieces > 1m long, > 10 cm diameter)	*A / T / P / E*	*A / T / P / E*	Exposed tree roots	*A / T / P / E*	*A / T / P / E*
				Discrete organic accumulation (e.g. leaves, twigs)	*A / T / P / E*	*A / T / P / E*
Aquatic vegetation at bank-water margin	Liverworts, mosses, lichens	*A / T / P / E*	*A / T / P / E*	Amphibious	*A / T / P / E*	*A / T / P / E*
	Emergent broad-leaved	*A / T / P / E*	*A / T / P / E*	Filamentous algae	*A / T / P / E*	*A / T / P / E*
	Emergent linear-leaved (incl horsetails)	*A / T / P / E*	*A / T / P / E*			
Non-native invasive plant species	Himalayan balsam	*A / T / P / E*	*A / T / P / E*	Other: RECORD SPECIES NAME	*A / T / P / E*	*A / T / P / E*
	Japanese knotweed	*A / T / P / E*	*A / T / P / E*			
	Giant hogweed	*A / T / P / E*	*A / T / P / E*	Other: RECORD SPECIES NAME	*A / T / P / E*	*A / T / P / E*
	Floating pennywort	*A / T / P / E*	*A / T / P / E*			

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Sheet 4 - CHANNEL BED MEASUREMENTS

RECORD WHAT YOU SEE NOT WHAT YOU KNOW

MEASUREMENT CATEGORY	MEASUREMENT TYPE		ABUNDANCE	MEASUREMENT TYPE	ABUNDANCE
4.1 CHANNEL BED - MATERIALS					
Channel bed - Natural materials	Bed sediment size	Bedrock (BE)	*A / T / P / E*	Silt (and finer non-sticky particles, SI)	*A / T / P / E*
		Boulder (BO)	*A / T / P / E*	Clay (CL)	*A / T / P / E*
		Cobble (CO)	*A / T / P / E*	Organic (leaves, twigs etc. not fully decomposed) (OR)	*A / T / P / E*
		Gravel-Pebble (GP)	*A / T / P / E*		
		Sand (SA)	*A / T / P / E*	Peat (PE)	*A / T / P / E*
	Silt overlying coarser sediments	Continuous silt layer (the form of underlying coarser sediments is visible)	*A / T / P / E*	Patchy thin layer (some coarser particles protrude through the silt layer)	*A / T / P / E*
Channel bed - Reinforcement	Bed reinforcement extent		*A / T / P / E*		
			CODE / DESCRIPTION		
	Bed reinforcement materials	DOMINANT TYPE *(CC, CB, BR, SP, WP, BW, RR, GA, WS, RE, BC, WO)*	*reinforcement type*		
		SUB-DOMINANT TYPE (see **(i)**)	*reinforcement type*		

(i) SUB-DOMINANT REINFORCEMENT TYPE: ONLY RECORD if it occupies > 20% reinforced area

4.2 WATER SURFACE					
Water surface flow patterns	Flow types	Free fall (FF)	*A / T / P / E*	Rippled (RP)	*A / T / P / E*
		Chute (CH)	*A / T / P / E*	Smooth (SM)	*A / T / P / E*
		Broken standing waves (BW)	*A / T / P / E*	No perceptible flow (NP)	*A / T / P / E*
		Unbroken standing waves (UW)	*A / T / P / E*		
		Upwelling (UP)	*A / T / P / E*	Dry (DR)	*A / T / P / E*

MEASUREMENT CATEGORY	MEASUREMENT TYPE	CODE / DESCRIPTION	ABUNDANCE
4.3 CHANNEL BED - FEATURES			
Channel bed - Natural physical features	Exposed bedrock		*A / T / P / E*
	Exposed unvegetated boulders / rocks (< 50% vegetation cover)		*A / T / P / E*
	Exposed vegetated boulders / rocks (> 50% vegetation cover)		*A / T / P / E*
	Bare / unvegetated mid channel bar (< 50% vegetation cover)	*sediment size*	*A / T / P / E*
	Vegetated mid channel bar (>50% vegetation cover)	*sediment size*	*A / T / P / E*
	Island		*A / T / P / E*
	Cascade		*A / T / P / E*
	Pool: RECORD AS COUNT		
	Riffle: RECORD AS COUNT		
	Step (steep boulder/bedrock feature <2m high, mainly chute and free fall): RECORD AS COUNT		
	Waterfall (steep boulder/bedrock feature >2m high, mainly free fall): RECORD AS COUNT		
Channel bed - Artificial features	Large trash (car parts, trolleys, traffic cones etc)		*A / T / P / E*
	Major weir (see **(ii)**): RECORD AS COUNT		
	Intermediate weir (see **(ii)**): RECORD AS COUNT		
	Minor weir (see **(ii)**): RECORD AS COUNT		
	Bridge piers in river bed: RECORD AS COUNT		
	Bridge shadow (see **(iii)**)		*Wide / Int / Narr*
	Culvert: RECORD AS COUNT		

NOTES

ABUNDANCE CODES

A/T/P/E abundance codes on sheet 4 refer to proportion of the area of the river bed within the module length. Circle one of:
A = absent,
T = trace (< 5%),
P = present (5% - <33%),
E = extensive (> 33%)

WEIR TYPES / SIZES

Major: permanent, impermeable, impounding structure across entire channel width **Intermediate:** semi-permeable, loose stone / wood structure across entire channel width **Minor:** highly permeable, transient feature across entire channel width

BRIDGE SHADOW

Wide = > 25 m channel length, **Int** (Intermediate) = 10-25 m, **Narr** (Narrow) = < 10m

MEASUREMENT CATEGORY	MEASUREMENT TYPE	ABUNDANCE	MEASUREMENT TYPE	ABUNDANCE
4.4 CHANNEL BED - VEGETATION				
Vegetation within wetted channel (aquatic vegetation)	Unvegetated (bare river bed)	*A / T / P / E*	Amphibious	*A / T / P / E*
	Liverworts, mosses, lichens	*A / T / P / E*	Submerged broad-leaved	*A / T / P / E*
	Emergent broad-leaved	*A / T / P / E*	Submerged linear-leaved	*A / T / P / E*
	Emergent linear-leaved (incl horsetails)	*A / T / P / E*	Submerged fine-leaved	*A / T / P / E*
	Floating leaved (rooted)	*A / T / P / E*	Filamentous algae	*A / T / P / E*
	Free floating	*A / T / P / E*	Channel choked with plants?	*YES/NO*
Vegetation interacting with wetted channel (terrestrial vegetation)	Vegetation shading channel	*A / T / P / E*	Large wood dam (in channel and crosses entire channel): RECORD AS COUNT	
	Submerged tree roots	*A / T / P / E*		
	Trees/shrubs/saplings growing on river bed	*A / T / P / E*	Fallen trees (ONLY those with a significant proportion in channel): RECORD AS COUNT	
	Large wood in channel (pieces > 1m long, >10 cm wide)	*A / T / P / E*		
	Discrete accumulations of organic material in channel (e.g. twigs, leaves)	*A / T / P / E*		
Non-native invasive plant species	Himalayan balsam	*A / T / P / E*	Other: RECORD SPECIES NAME	*A / T / P / E*
	Japanese knotweed	*A / T / P / E*		
	Giant hogweed	*A / T / P / E*	Other: RECORD SPECIES NAME	*A / T / P / E*
	Floating pennywort	*A / T / P / E*		