River Habitat Survey Technical Update April 2016

IMPORTANT KEY NOTES FOR RECORDING RHS DATA

PLEASE KEEP THIS UPDATE WITH YOUR FIELD SURVEY GUIDANCE MANUAL

Bank and Channel Resectioning

Correct identification of resectioned banks and channels is important to accurately judge how natural or how modified a reach is. However, resectioning is difficult to establish in many cases, so this technical update offers further guidance on when surveyors should record resectioning, and what clues to look for.

Indicators

The RHS manual gives five indicators of resectioning, but does not make explicit which are describing bank resectioning and which are describing channel resectioning. Although bank and channel resectioning often occur in tandem, each should be considered separately using the available evidence.

Bank Resectioning

- Uniform angled bank profile – this is the key indicator for bank resectioning

The following indicators give clues as to whether bank resectioning is likely, but their presence or absence does not necessarily mean that banks are modified:

- No trees/uniform aged trees/young saplings along banktop
- High value/intensive land-use
- Channel resectioning (bank resectioning will usually be carried out in tandem with channel resectioning)
- Channel realignment/straightening

Old Bank Resectioning

Some reaches have had their banks resectioned a long time ago but are now beginning to naturalise and display a heterogeneous (diverse) bank profile. Where this is the case, and uniform banks no longer remain, do not record RS in bank modifications. If you suspect the banks have been resectioned in the past, or have local knowledge and know that they have, note your observations in the comments box but record NO for bank modifications – we only want RS to be recorded based on the evidence available in the field. Record NK for bank modifications if you feel there is conflicting evidence and you are unsure of what to record – but note that recording NK should be a last resort, as it means that your survey will be left with incomplete information. Take photographs of the banks in all cases to illustrate any observations. Check old maps, if available, for evidence of channel realignment/straightening (e.g. www.old-maps.co.uk).

Each spot-check should be considered independently on its own merits, so a naturalising reach may have a mixture of records of bank resectioning.

Channel Resectioning

There are two ways in which channels (i.e. the bed of the river) may be resectioned: through over-deepening or dredging (width:height ratio <4:1); and/or through over-widening the channel. The presence of over-deepening or over-widening provides direct evidence for channel resectioning. However, note that some reaches may be naturally wider and deeper than the norm (for example, reaches are likely to widen naturally if bankside trees are removed) – so you will need to use your judgement as to whether the surveyed reach has been artificially resectioned or has a natural profile.

The following give additional clues as to whether channel resectioning may have occurred:

- Uniform/low energy flow types
- No trees/uniform aged trees/young saplings along banktop
- High value/intensive land-use (TL, SU, IG, PG)
- Bank resectioning
- Uniform width
- Channel realignment/straightening
- Presence of spoil/dredging material on the banktop

How to record Channel Resectioning

Record channel resectioning at spot-checks **and in section D**, where you will provide information on the presence and extent of over-deepening.

There is currently no section to record the extent of over-widening, so make a note in the major impact or comments box in section P.

Old Channel Resectioning

Where river processes have re-instated more natural channel dimensions, cross-sections and planform, do not record RS for channel modifications or realignment/over-deepening in section D. If you suspect or know about past channel resectioning, make a note of your observations in the comments box (section P) but do not record resectioning (only record resectioning which is obvious at the time of the survey).

If you feel that you are unable to assess whether the channel has been resectioned, then record NK for channel modification in the spot-checks – but again, only use this as a last resort. One way of asserting channel resectioning is to consult old maps, when available (e.g. www.old-maps.co.uk) and look for artificial changes to the planform as straightening is generally done in conjunction with channel resectioning.

Some examples of the different types of channel resectioning are given below, with guidance on how to record each type. For these examples, we are assuming that the photograph is representative of the whole reach.

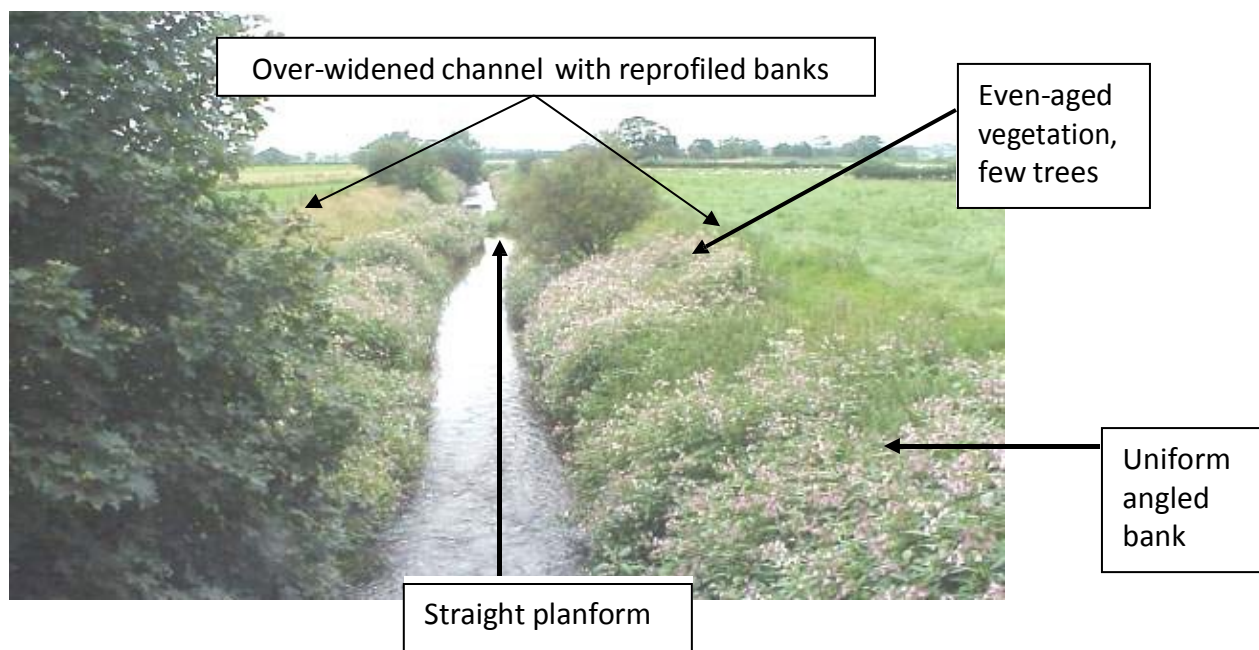## Resectioned channel - over-deepened, with resectioned banks

Example:

The above channel is obviously over-deepened and over-widened with uniform steep resectioned banks. Record RS in the spot-checks for channel and bank modifications

LEFT BANK	Ring EC or SC if composed of sandy substrate									
Material NV, BE, BO, CO, GS, EA, PE, CL, CC, SP, WP, GA, BR, RR, TD, FA, BI										
Bank modification(s) NK, NO, RS, RI, PC(B), BM, EM	RS	RS	RS	RS	RS	RS	RS	RS	RS	RS
Marginal & bank feature(s) NV, NO, EC, SC, PB, VP, SB, VS, NB										
CHANNEL	GP- ring either G or P if predominant									
Channel substrate NV, BE, BO, CO, GP, SA, SI, CL, PE, EA, AR										
Flow-type NV, FF, CH, BW, UW, CF, RP, UP, SM, NP, DR										
Channel modification(s) NK, NO, CV, RS, RI, DA, FO	RS	RS	RS	RS	RS	RS	RS	RS	RS	RS
Channel feature(s) NV, NO, EB, RO, VR, MB, VB, MI, TR										
For braided rivers only: number of sub-channels										
RIGHT BANK	Ring EC or SC if composed of sandy substrate									
Material NV, BE, BO, CO, GS, EA, PE, CL, CC, SP, WP, GA, BR, RR, TD, FA, BI										
Bank modification(s) NK, NO, RS, RI, PC(B), BM, EM	RS	RS	RS	RS	RS	RS	RS	RS	RS	RS
Marginal & bank feature(s) NV, NO, EC, SC, PB, VP, SB, VS, NB										

As the channel is over-deepened, tick the relevant box in section D.

Is channel obviously realigned?	No ☐	Yes, <33% of site ☐	⩾33% of site ☐
Is channel obviously over-deepened?	No ☐	Yes, <33% of site ☐	⩾33% of site ⬭
Is water impounded by weir/dam?	No ☐	Yes, <33% of site ☐	⩾33% of site ☐

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Resectioned channel – realigned and over-deepened with resectioned banks

Over-widened channel with reprofiled banks

Even-aged vegetation, few trees

Uniform angled bank
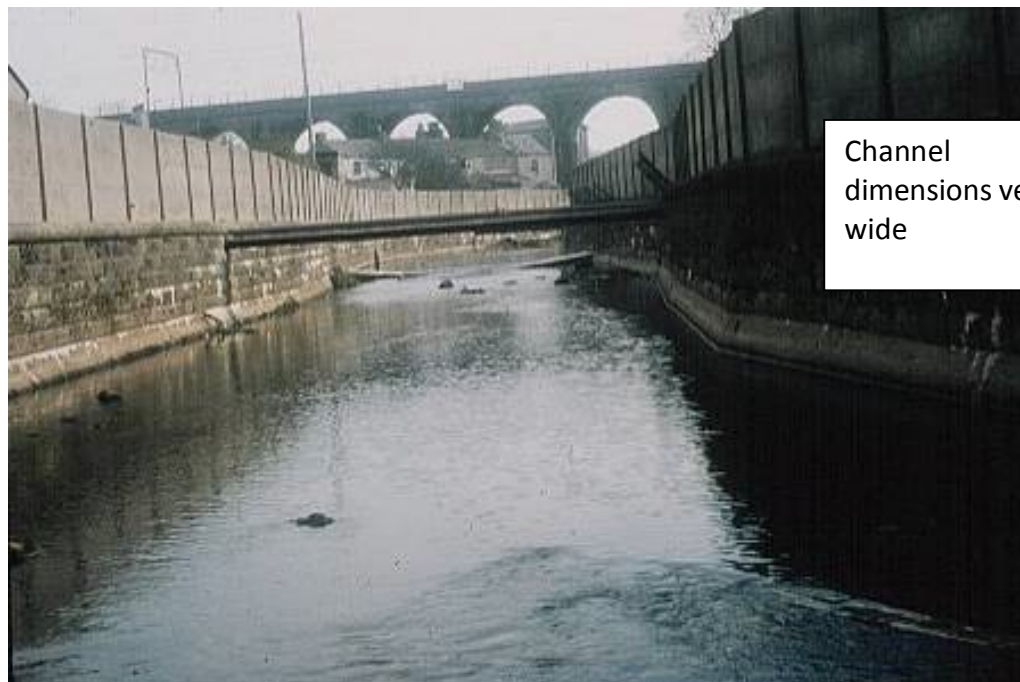
Straight planform

Example:

The channel is obviously over-deepened and over-widened with uniform steep resectioned banks. Record RS in the spot-checks for channel and bank modifications:

As the channel is obviously realigned and over-deepened, tick the relevant boxes in section D and add over-deepening, over-widening and realignment as major impacts in section P.

Resectioned channel – over-widened

Channel dimensions very wide

Record channel resectioning under channel modification in the spot-checks:

CHANNEL	GP- ring either G or P if predominant										
Channel substrate NV, BE, BO, CO, GP, SA, SI, CL, PE, EA, AR											
Flow-type NV, FF, CH, BW, UW, CF, RP, UP, SM, NP, DR											
Channel modification(s) NK, NO, CV, RS, RI, DA, FO	RS	RS	RS	RS	RS	RS	RS	RS	RS	RS	
Channel feature(s) NV, NO, EB, RO, VR, MB, VB, MI, TR											
For braided rivers only: number of sub-channels											

Record over-widening in section P as a note or major impact:

P   OVERALL CHARACTERISTICS   (Circle appropriate words, add others as necessary)
Major impacts: landfill - tipping - litter - sewage - pollution - drought - abstraction - mill - dam - road - rail - industry - housing mining - quarrying - overdeepening - afforestation - fisheries management - silting - waterlogging - hydroelectric power
Evidence of recent management: dredging - bank mowing - weed cutting - enhancement - river rehabilitation - gravel extraction - other (please specify)
Animals: otter - mink - water vole - kingfisher - dipper - grey wagtail - sand martin - heron - dragonflies/damselflies
Other significant observations: if necessary use separate sheet to describe overall characteristics and relevant observations
Channel over-widened for >33% of reach

Note that bank modifications would be recorded as RI for whole bank modification (**not** RS/RI which should only be used for part-bank reinforcement with resectioning).

Naturalising banks with over-deepened channel

In this example, the river has had both banks and channel resectioned in the past. The channel is still clearly over-deepened and realigned, but the banks are beginning to naturalise in places (note the presence of erosion and slumping on the left). Where resectioning is no longer visible, record NO obvious modification in the spot-checks.

LEFT BANK	Ring EC or SC if composed of sandy substrate									
Material NV, BE, BO, CO, GS, EA, PE, CL, CC, SP, WP, GA, BR, RR, TD, FA, BI										
Bank modification(s) NK, NO, RS, RI, PC(B), BM, EM	RS	NO	RS	RS	NO	NO	RS	RS	RS	NO
Marginal & bank feature(s) NV, NO, EC, SC, PB, VP, SB, VS, NB										
CHANNEL	GP- ring either G or P if predominant									
Channel substrate NV, BE, BO, CO, GP, SA, SI, CL, PE, EA, AR										
Flow-type NV, FF, CH, BW, UW, CF, RP, UP, SM, NP, DR										
Channel modification(s) NK, NO, CV, RS, RI, DA, FO	RS	RS	RS	RS	RS	RS	RS	RS	RS	RS
Channel feature(s) NV, NO, EB, RO, VR, MB, VB, MI, TR										
For braided rivers only: number of sub-channels										
RIGHT BANK	Ring EC or SC if composed of sandy substrate									
Material NV, BE, BO, CO, GS, EA, PE, CL, CC, SP, WP, GA, BR, RR, TD, FA, BI										
Bank modification(s) NK, NO, RS, RI, PC(B), BM, EM	RS	RS	NO	RS	NO	NO	RS	RS	NO	RS
Marginal & bank feature(s) NV, NO, EC, SC, PB, VP, SB, VS, NB										

Record realignment and over-deepening in section D:

	No	Yes, <33% of site	≥33% of site
Is channel obviously realigned?	☐	☐	**⊗**
Is channel obviously over-deepened?	☐	☐	**⊗**
Is water impounded by weir/dam?	☐	☐	☐

Embankments

Where embankments are present at spot-checks, record EM in bank modification. If the bank profile has been reprofiled, record RS as well as any other observable bank modifications.

Example.
On this urban river section, the left bank has been raised (look at the level of the car) and reprofiled. Record both EM and RS in the spot-checks. As bank reinforcement is also visible at the toe of the banks, you should also record RI.
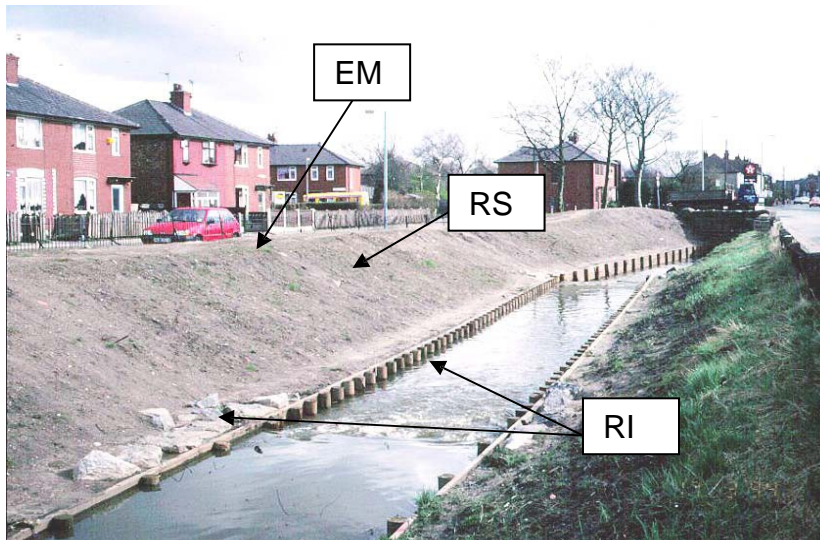
You will find that not all embankments have resectioned banks. Some will have natural-looking bank profiles as earth has been dumped on the banktops to create an embankment. In these situations, do not record RS. If you are uncertain about recording bank and/or channel modifications at a given site, record NK and check with local experts, e.g. EA flood risk management teams, to find out if the river is modified.

DO NOT INCLUDE SET-BACK EMBANKMENTS IN YOUR SPOT-CHECKS. YOU RECORD SET-BACK EMBANKMENTS IN THE SWEEP-UP BANK PROFILES SECTION OF THE SURVEY FORM.

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Channel Vegetation

Many surveyors are having difficulty in understanding how to complete section G of the form – channel vegetation.

Please re-read this section in your manual (pages 3.28-3.29). We have provided examples on how to complete this section.

If there is no, or less than 1%, channel vegetation at spot-checks, enter a tick in the 'None/Not visible' row and leave the rest of the column blank.

G CHANNEL VEGETATION TYPES (to be assessed over a 10m wide transect: use E (⩾ 33% area), ✓(present) or NV (not visible)											
None (✓) or Not Visible (NV)	✓										
Liverworts/mosses/lichens											
Emergent broad-leaved herbs											
Emergent reeds/sedges/rushes/grasses/horsetails											
Floating-leaved (rooted)											
Free-floating											
Amphibious											
Submerged broad-leaved											
Submerged linear-leaved											
Submerged fine-leaved											
Filamentous algae											
Use end column for overall assessment over 500m, including types not occurring in spot-checks (use ✓, E or NV)											↑

If you cannot see the bed of the channel (for example, if the water is turbid or murky), enter 'NV' in the 'None/Not visible' row. Then you enter 'NV' against all of the submerged vegetation types in section G. If there are emergent plants present, record their extent, as appropriate.

G CHANNEL VEGETATION TYPES (to be assessed over a 10m wide transect: use E (⩾ 33% area), ✓(present) or NV (not visible)											
None (✓) or Not Visible (NV)	NV										
Liverworts/mosses/lichens											
Emergent broad-leaved herbs	✓										
Emergent reeds/sedges/rushes/grasses/horsetails											
Floating-leaved (rooted)	E										
Free-floating											
Amphibious											
Submerged broad-leaved	NV										
Submerged linear-leaved	NV										
Submerged fine-leaved	NV										
Filamentous algae											
Use end column for overall assessment over 500m, including types not occurring in spot-checks (use ✓, E or NV)											↑

If you cannot see the channel at all (for example, if it is in a culvert or due to dense terrestrial vegetation or limited access), then you enter 'NV' in the 'None/Not visible' row and 'NV' for the whole column.

G CHANNEL VEGETATION TYPES (to be assessed over a 10m wide transect: use E (≥ 33% area), ✓(present) or NV (not visible)											
None (✓) or Not Visible (NV)	NV										
Liverworts/mosses/lichens											
Emergent broad-leaved herbs											
Emergent reeds/sedges/rushes/grasses/horsetails											
Floating-leaved (rooted)											
Free-floating											
Amphibious											
Submerged broad-leaved											
Submerged linear-leaved											
Submerged fine-leaved											
Filamentous algae											
Use end column for overall assessment over 500m, including types not occurring in spot-checks (use ✓, E or NV)											

If you can see the channel and the bed and vegetation is present, then place a tick for present and 'E' for extensive for the vegetation types occurring. Leave the rest of the column in section G blank.

G CHANNEL VEGETATION TYPES (to be assessed over a 10m wide transect: use E (≥ 33% area), ✓(present) or NV (not visible)											
None (✓) or Not Visible (NV)											
Liverworts/mosses/lichens											
Emergent broad-leaved herbs	✓										
Emergent reeds/sedges/rushes/grasses/horsetails											
Floating-leaved (rooted)											
Free-floating											
Amphibious	✓										
Submerged broad-leaved											
Submerged linear-leaved	E										
Submerged fine-leaved											
Filamentous algae											
Use end column for overall assessment over 500m, including types not occurring in spot-checks (use ✓, E or NV)											

Remember to complete the 'catch-all' column, the last column after spot-check 10. This column is an assessment of vegetation type extent **over 500m**. Record vegetation types as present (✓) or extensive (E) if their coverage is less than 1% or greater than 33% **of the 500m section**.

Your completed section G may look something like this:

G CHANNEL VEGETATION TYPES (to be assessed over a 10m wide transect: use E (⩾ 33% area), ✓(present) or NV (not visible)											
None (✓) or Not Visible (NV)	✓	✓	NV					✓			
Liverworts/mosses/lichens				✓							
Emergent broad-leaved herbs											
Emergent reeds/sedges/rushes/grasses/horsetails			✓		✓	✓	E		✓	✓	✓
Floating-leaved (rooted)											✓
Free-floating						✓					
Amphibious											
Submerged broad-leaved			NV								
Submerged linear-leaved			NV								✓
Submerged fine-leaved			NV								
Filamentous algae											
Use end column for overall assessment over 500m, including types not occurring in spot-checks (use ✓, E or NV) ———————→											

Please note that some vegetation types (e.g. liverworts/mosses/lichens and free-floating vegetation) may be recorded as present at individual spot-checks and absent overall. This is due to the scale at which vegetation cover is recorded: 10m for individual spot-checks and 500m for the overall assessment.

Conversely, vegetation types not recorded at spot-checks (e.g. floating-leaved and submerged linear-leaved) may be recorded as present in the last column if they cover more than 1% of the 500m reach.

Silt deposits

Currently the manual states:
"Point or side bars composed of silt are extremely unlikely to occur in UK rivers. *'Silt is not considered to be a substrate of distinct 'bars'; if silt is the predominant substrate in spot-checks, record SI; if discrete silt deposits are present record these as 'present' in Section K, and if large expanses of silt occur record as 'extensive' in Section K'.* If the silt forms distinct deposits resembling bars, note this in Section P, as these deposits are often signs of channels recovering from over-widening as a result of engineering works"

How silt should be recorded

- Where silt is the main channel substrate and silt deposition occurs in the shape of distinct bars, these features should be recorded as such.

- Where silt is not the main channel substrate but occurs at more than 1% of the RHS site, it should be recorded as an additional channel substrate on page 2.

- Discrete unvegetated silt deposits are to be recorded in section K if they fit the description – (contrasting with predominant bed substrate(s), >5m²).

- In over-widened rivers, silt may accumulate on the margins and create features resembling bars, generally with emergent vegetation, and a clear step indicating vertical accretion (see Natural Berms, RHS manual, page 17). These features should be recorded as 'Natural Berms' in the spot-checks and sweep-up sections (section I).

- Silting should be recorded as a 'major impact' where appropriate.

Natural silt berm

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Risk assessment form

The risk assessment form must be filled in before doing the survey **and amended afterwards** if hazards were discovered during the survey. It is very important that the form includes all potential threats as the data will be inputted into the RHS database and will be available for future reference. Please do not hesitate to change the status of existing threats and add recommendations such as double-manning, specific protective equipment (e.g. gloves) etc.

Bankfull width

The guidance in the RHS manual states to only record bankfull width where the bankfull is visible and to record nothing otherwise. We recommend to record banktop width when there is no observable bankfull and to annotate as indicated below to indicate that the banktop was measured instead of the bankfull.

L CHANNEL DIMENSIONS (to be measured at one location on a straight uniform section, preferably across a riffle)					
LEFT BANK		**CHANNEL**		**RIGHT BANK**	
Banktop height (m)	2.5	Bankfull~top~ width (m)	5	Banktop height (m)	2.5
Is banktop height also bankfull height? (Y or N)	N	Water width (m)	3	Is banktop height also bankfull height? (Y or N)	N
Embanked height (m)		Water depth (m)	0.3	Embanked height (m)	
If trashline lower than banktop, indicate: height above water (m) = width from bank to bank (m) =					
Bed material at site is: consolidated ❏ unconsolidated (loose) ❏ unknown ❏					
Location of measurements is: riffle ❏ other ❏ (state)					

Photos:

To be valuable, site photographs should be taken from a high point (e.g. a bridge) facing downstream or upstream so as to present an overall view of the site.

Avoid taking pictures across the river such as spot-checks as these provide very little information on overall site condition. Beware of lighting conditions and obscuring leaves and objects, especially when using a flash.

Examples of good and bad photographs are shown on the next page.

Take as many pictures as necessary with geotagging on if possible (https://en.wikipedia.org/wiki/Geotagged_photograph). Most mobile phones with GPS now offer geotagging as an option. Please consult your camera/mobile phone help file. Photographs provide extremely valuable information and are now easily produced and stored, so be trigger happy!

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Example of good and poor photographs: the top two photographs provide a general view of the stream and its features. The top right photograph was probably taken from a bridge. The bottom two photographs provide very little information. The bottom left photo view is obscured by vegetation and the bottom right shot only displays a cross-section of the river.

Erratum:

Section B - Predominant Valley form - Distinct flat valley bottom?

Always tick 'Yes' if 'no obvious valley sides' is ticked.

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