Environment and Rural Affairs Monitoring & Modelling Programme (ERAMMP)

ERAMMP Document-90: Field-Survey Handbook (Procedures) Stream Erosion 2022

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UK Centre for Ecology & Hydrology

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Abbreviations Used in this Report

ERAMMP	Environment and Rural Affairs Monitoring & Modelling Programme
RHS	River Habitat Survey
UKCEH	UK Centre for Ecology & Hydrology

Contents

1 General Principle of The Stream Erosion Survey

The aim of the survey is to record actual or potential sources of erosion and sediment input along the selected survey reach of each square in more detail than that recorded in the RHS survey.

Although there is duplication with some of the RHS data collected, the soil erosion survey provides more detail than RHS on the type and location of erosion and, most importantly, quantifies the extent of the processes recorded.

As the streams to be surveyed in the ERAMMP project are small headwater streams, the survey is an amended version of a conventional erosion survey. Certain features such as artificial substrate extraction and erosion caused by navigation have been omitted. Should they be encountered, types of erosion that do not appear in the dropdown lists of the software can still be recorded in the “others” section.

2 THE STREAM EROSION SURVEY PROCESS

The survey covers the same 500m reach as the River Habitat Survey (RHS) and can be conducted in tandem with the RHS survey or separately. For more geomorphologically diverse sites or for surveyors who are less experienced in this type of survey, it is advisable to carry out the Soil erosion survey separately to the RHS.

As the location of each separate erosion feature is recorded, together with photographs, the survey must be completed as the surveyor moves along the stream, it should not be collected as a sweep-up survey.

Photographs are also taken of the processes recorded.
Surveyors should ensure they are familiar with identifying the different types of erosion and the type and sub-type they are recorded under before going into the field. These are described in Section 5 (Appendix 2).

If required, data such as the survey date and the location of the centre of the survey can be derived from the RHS data.

3 RECORDING DATA

3.1 Recording data using ERAMMP22_Soil_erosion_River_v1

- Double click the ArcGISSurvey123 icon
- Select “ERAMMP22_Soil_erosion_River_v1”

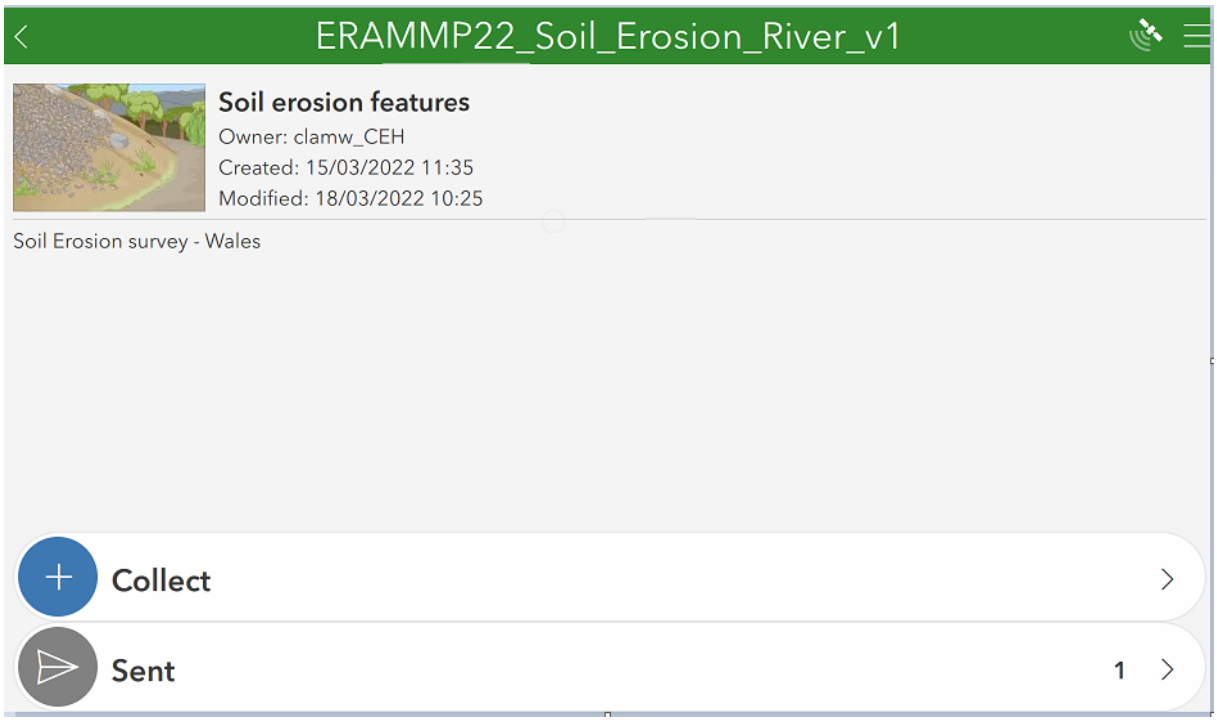

Figure 3.1 Screen shot of the opening menu of the ERAMMP22_Soil_erosion_River_v1 application

- Click on the “Collect” icon (see figure 3.1)
- Input the square number and recorder initials.
- Then the collection of data can begin.

3.2 Collection of Data

When a distinct area of erosion is identified, its length is recorded by selecting first the relevant process and then the erosion/sediment input type. A full list of these is presented in Section 4 (Appendix 1) and a description in Section 5 (Appendix 2). As with RHS, banks are defined as left or right looking downstream.

The length (in metres) is recorded in the “Extent left” or “Extent right” boxes and can be measured through pacing, as the surveyor should know how many of their paces are equal to

one metre through calibration as part of the RHS training. A ranging pole may be used for small units of measurement. The smallest length measured is 25cm.

As an example, figure 3.2 shows basal bank scour has been added to a record a length of 5 metres on the left bank.

When the length of a distinct process has been recorded, the centre of the feature is stamped by selecting the symbol. This should store the coordinates of the location using the tablets GPS. The working of the GPS may be impacted by tree cover or topography.

Due to the resolution of the GPS unit (usually <>5m) and the small size of streams recorded in the ERAMMP survey, it is not necessary to differentiate between left and right bank locations of erosion types where they occur adjacently.

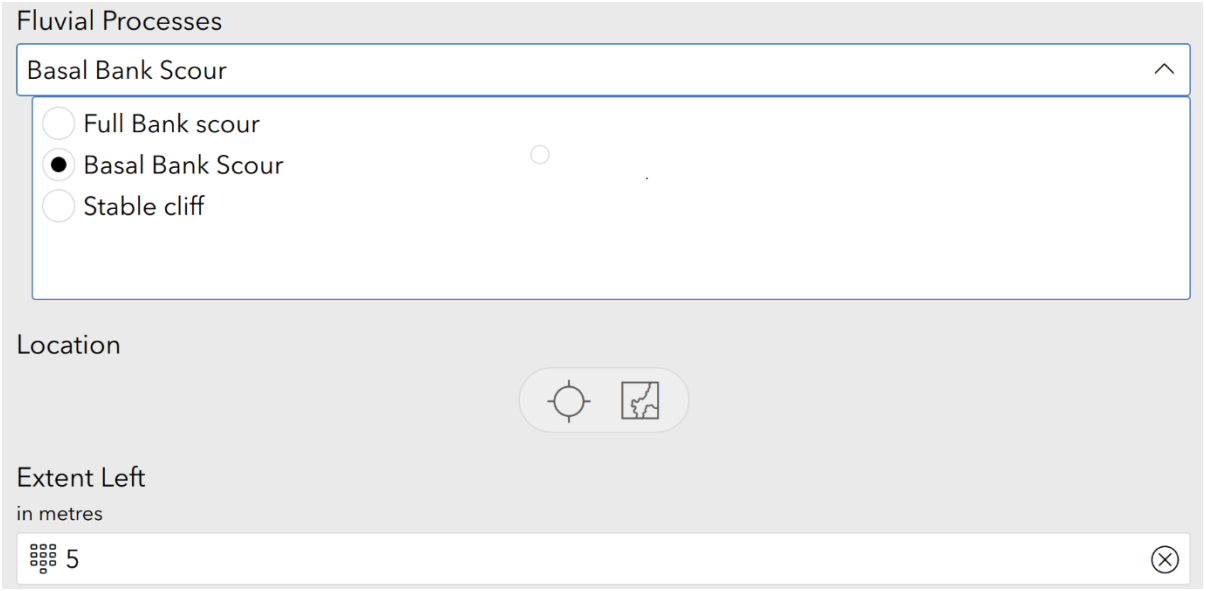

Figure 3.2 Example of a record showing 5m of basal bank scour on the left bank

When the measurements have been taken, a photo of the erosion is taken by selecting the camera icon. When the area of erosion being recorded is large it may not be possible to capture the whole length in detail, in which case it is sufficient for the photo to show an example of the process.

Additional occurrences of each erosional type can be added by selecting the + icon at the foot of each section.

3.3 Notes

In this section, further detail on the survey reach, the type and extents of erosion and any observations relevant to the survey can be recorded.

3.4 Completed Survey

When the survey is complete, the ü at the bottom of the screen is selected. This will give two options, either to continue the survey or save the survey in the outbox, in which case it can be returned to at a later date.

When the survey is saved in the outbox, it can be submitted with the other freshwater data from the square when online.

3.5 Potential future refinements to the survey application

The survey could be amended to record the area instead of the length of erosion and deposition and also the substrate type entering the channel.

The survey could also record the extent of fencing and other structures, artificial or natural, which prevent livestock from damaging the banks and channel. This is currently recorded in the RAPID (RHS) software.

It may also be useful to record whether the site is regarded as being a source or sink of sediment.

4 APPENDIX-1: PROCESSES AND TYPES OF EROSION & SEDIMENT SOURCE

Process	Type
Fluvial processes	Full bank scour
	Basal bank scour
	Stable cliff
Biological processes	Tree fall
	Burrowing
	Bed scour
Artificial processes	Footpaths
	Access
	Poaching
	Below structure
Other	Runoff (field) actual
	Runoff (field) potential)
	Runoff (other) actual
	Runoff (other) potential
	Tributary
	Other

5 APPENDIX-2. DESCRIPTION OF FLUVIAL PROCESSES AND TYPES

5.1 Fluvial processes

- Full bank scour. This is broadly equivalent to the “Eroding cliff” recorded in the River habitat Survey. It captures active (not stabilised) erosion of the bank face due to river action, extending for **more than 50% of the bank face**. It must have **less than 50% vegetation cover** (to indicate a lack of stability). It is most likely to act as a source of sediment input in higher flows and is often found on the outside of bends in the river, associated with higher flow velocities. It may also be associated with undercut banks.

- Basal bank scour. This type of erosion has the same definition as full bank scour, the crucial difference being it extends for **less than 50% of the bank face.**

- Stable cliff. This feature is indicative of erosion that is now stabilising, as indicated by a vegetation cover of more than 50%.

5.2 Biological processes

- Tree fall. Areas were tree fall leads to silt entering the channel through the disturbance of bank substrate. This is more evident when the tree fall is recent but even older events may still have an impact in time of flood or high flow. Judgement is needed by the surveyor as to whether the base of the fallen tree is sufficiently close to the channel to be submerged in high flow. Indicators can be derived from the height of trashlines. Once the area surrounding tree fall has stabilised to the extent that it will be stable even in high flow then tree fall should not be recorded.

- Burrowing. Record the length of areas where sediment may be deposited in the channel due to burrowing activity by mammals.

- Bed scour. This records **natural** down cutting of the channel due to waterfalls. It does not record areas where the stream bed is eroded by the action of natural features such as weirs and culverts (see blow structure).

5.3 Artificial processes

- Poaching Where damage to the banks by livestock leads to sediment erosion. This does not include sediment input due to footpaths (see below). When poached areas have significantly recovered and stabilised due to the (re)growth of vegetation, in such a way that sediment will not be transferred to the channel, then poaching should not be recorded.

- Footpaths This records both actual and potential sediment input (via bank instability) usually as a result of footpaths on the banktop.

- Access (ford). Fords (artificial river crossings) may lead to silt inclusion via trampling (if the bank material is natural) or the washing in of substrate (if the bank material is artificial).

- Below structure. This records any erosion of the banks or the channel that occurs due to artificial structures such as fencing (bank erosion) and weirs (channel erosion), especially by the impact on flows in times of high flow. Over time these may stabilise, often indicated by vegetation cover, in which case they should not be recorded.

5.4 Other processes

- Runoff (field) actual This is used to record observed ingress of silt to the channel from fields, often via bare or lightly covered tilled land or under tree cover where bare, steep banks make the surface layer unstable.

- Runoff (field) potential. As above but when the runoff is likely to occur in the future, often as a result of heavy rain. It is also more likely in areas where tilled fields are currently well vegetated but may become less so when harvested or left bare.

- Runoff (other) actual. This is usually associated with areas of hard standing or artificial bank substrates (not including fords which are recorded separately) where it is clear that substrate has recently entered the channel via runoff.

- Runoff (other) potential. As above but the runoff is likely to occur in time of high flow and is not occurring at the time of survey.

- Tributaries. This records tributaries which are considered likely to wash sediment into the channel, especially in times of high flow. The stability of both the substrate and the banks of the tributary will indicate the likelihood of this occurring.

- Other. This includes any form of silt input not included in the standard survey. Further details or descriptions can be included in the notes section.

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