Advisory Visit

River Rea, Shropshire

13th November, 2013

1.0 Introduction

This report is the output of a site visit undertaken by Tim Jacklin of the Wild Trout Trust to the River Rea on 13th November, 2013. Comments in this report are based on observations on the day of the site visit and discussions with Emma Buckingham of Severn Rivers Trust and the landowner, Mr. Blounts.

Normal convention is applied throughout the report with respect to bank identification, i.e. the banks are designated left hand bank (LHB) or right hand bank (RHB) whilst looking downstream.

2.0 Catchment / Fishery Overview

The River Rea is a tributary of the River Teme. The site visited was near the village of Neen Sollars between National Grid Reference SO66355 72345 and SO66396 71892. The visit was requested by Emma Buckingham of Severn Rivers Trust to assess the potential for river habitat improvement works and specifically the use of brushwood revetment to control rates of bank erosion.

This section of the Rea is classified as being "poor status" for ecological quality under the Water Framework Directive (see table below). The factor causing this classification is a failure of fish populations to meet expected levels, the suspected reason being diffuse source sediment pollution from agriculture.

Waterbody ID	GB109054044260
Waterbody Name	R Rea - conf Farlow Bk to conf R Teme
Management Catchment	Teme
River Basin District	Severn
Typology Description	Low, Medium, Calcareous
Hydromorphological Status	Not Designated A/HMWB

Current Ecological Quality	Poor Status
Current Chemical Quality	Does Not Require Assessment
2015 Predicted Ecological Quality	Moderate Status
2015 Predicted Chemical Quality	Does Not Require Assessment
Overall Risk	At Risk
Protected Area	Yes
Number of Measures Listed (waterbody level only)	-

There are no conservation designations on this part of the Rea. Land adjacent to the river is in Entry Level Stewardship and is used for grazing cattle.

3.0 Habitat Assessment

The Rea is a lowland river based on red sandstone and clay soils common to many middle Severn catchment rivers (cover photo). Unfortunately, it also shares the characteristic of being badly affected by *Phytophthora* disease in its alder trees. Numerous alder trees have been weakened or killed by the disease and lost from the river bank, reducing its resilience and accelerating rates of erosion. Severn Rivers Trust plan to carry out coppicing of alders here in the near future, which may help to prolong the life of trees and take the weight off the root structures, making them more likely to persist and retain bank resilience.

Two areas of erosion were inspected during this visit (Photos 1 and 2). Both areas appear to be affected by rotational failure rather than block failure (see Appendix). The presence of vegetation at the toe of the bank indicates that these areas would probably stabilise if grazing pressure was removed. Poaching of the banks by livestock is significant (Photo 3) and this is

Photo 1 Bank erosion by rotational failure

Photo 2 Bank erosion by rotational failure, exacerbated by livestock access.

Photo 3 Bank poaching by livestock

Photo 4 Where suitable trees are positioned next to eroding banks like this, they could be felled and fixed parallel to the bank to protect the bank and restrict livestock access (in the absence of fencing).

Photo 5 Smaller bankside trees like this hazel and willow could be partially cut and pleached into the river margins (like hedge laying) to create valuable cover for fish and help to protect banks.

contributing to accelerated erosion rates. Brushwood revetment is unnecessary here because the banks should become stable once they are fenced and livestock access is prevented; this contrasts with block failure where soft revetment is required to reduce erosion rates whilst fencing and vegetation regenerates. Figure 2 in the appendix shows rotational failure (type d) compared to block failure (types g and h).

Fencing is planned by Severn Rivers Trust and will be required to protect coppice re-growth and allow vegetation regeneration to support the banks. It will be necessary to provide alternative drinking sources for livestock and to have a plan to maintain vegetation between the fence and the river. The latter is particularly relevant given the presence of the invasive non-native Himalayan balsam which could dominate bankside vegetation in the absence of controlled grazing or manual/mechanical cutting.

In some areas it would be possible to create some features by creative use of bankside trees and bushes. These would improve in-stream habitat whilst protecting vulnerable areas of bank from erosion. Some examples are illustrated in photos 4 and 5. The coppicing contractors could carry out these measures and WTT could provide on-site ideas/training.

4.0 Recommendations

- Coppice alder trees as planned
- Create habitat features as described with pleached and felled trees. WTT may be able to assist with a practical visit in this respect.
- Fence the river banks to prevent livestock access, with suitable provision for drinkers and subsequent control of balsam.
- It is a legal requirement that all the works to the river require written Environment Agency (EA) consent prior to undertaking any works, either in-channel or within 8 metres of the bank.

5.0 Acknowledgement

The Wild trout Trust would like to thank the Environment Agency for their continued support of the advisory visit service

6.0 Disclaimer

We have produced a 70 minute DVD called ‘Rivers: Working for Wild Trout’ which graphically illustrates the challenges of managing river habitat for wild trout, with examples of good and poor habitat and practical demonstrations of habitat improvement. Additional sections of film cover key topics in greater depth, such as woody debris, enhancing fish stocks and managing invasive species.

The DVD is available to buy for £10.00 from our website shop http://www.wildtrout.org/product/rivers-working-wild-trout-dvd-0 or by calling the WTT office on 02392 570985.

The WTT website library has a wide range of materials in video and PDF format on habitat management and improvement: http://www.wildtrout.org/content/index

Appendix

River bank erosion- mass failures.

The following information is taken from course material supplied by Professor Richard Hey.

Mass failures take several forms which include sliding along deep-seated failure surfaces, shallow slips and block failures. Banks are more susceptible to failure if:

- Basal scour increases the height and angle of the bank
- Rapid drawdown of river levels following flood recession or infiltration during rainfall increases pore water pressures, seepage forces and the effective weight of wet soil
- The bank top is loaded (e.g. with heavy livestock)
- Cohesion of bank material is reduced by wetting
- Vegetation, particularly if well-rooted, is destroyed as this reinforces bulk strength of the soil and its increases its tensile strength
- Tension cracks are well- developed and become filled with water.

These factors are illustrated in the Figure 1 below.

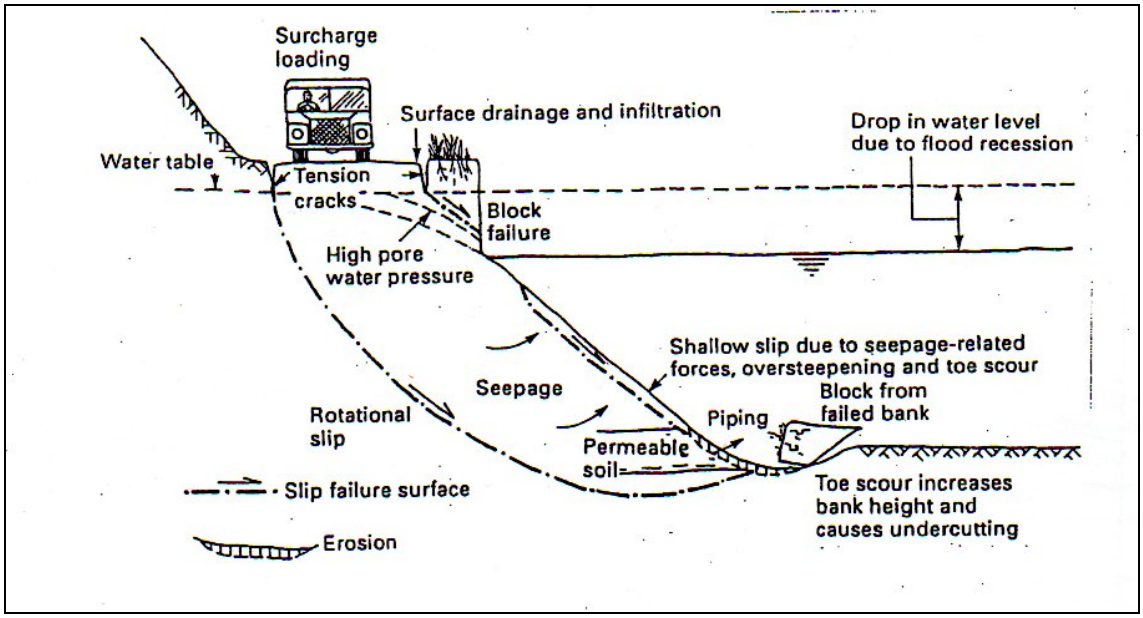

Figure 1 Processes responsible for mass failure of river banks (Hey and Tovey 1989)

For a given bank, failure is most likely during or immediately after sustained high flows. This encourages basal scour and associated heightening and steepening of the bank, and the saturated soil reduces any cohesion, increases seepage forces in non-cohesive material (e.g.gravels), and increases the unit weight in soil. Removal of any tree or shrub cover will not only expose the bank to higher shear stresses but also reduce the bulk unit strength of the soil by destroying the root system. The actual type of failure depends upon the bank composition and geometry – see Figure 2 below.

Reference

Hey, R.D. and Tovey, N.K. (1989) Processes of bank failure. In Hemphill, R.W. and Bramley, M.E. (eds) *Protection of River and Canal Banks*, CIRIA/Butterworths, London, 7-39.

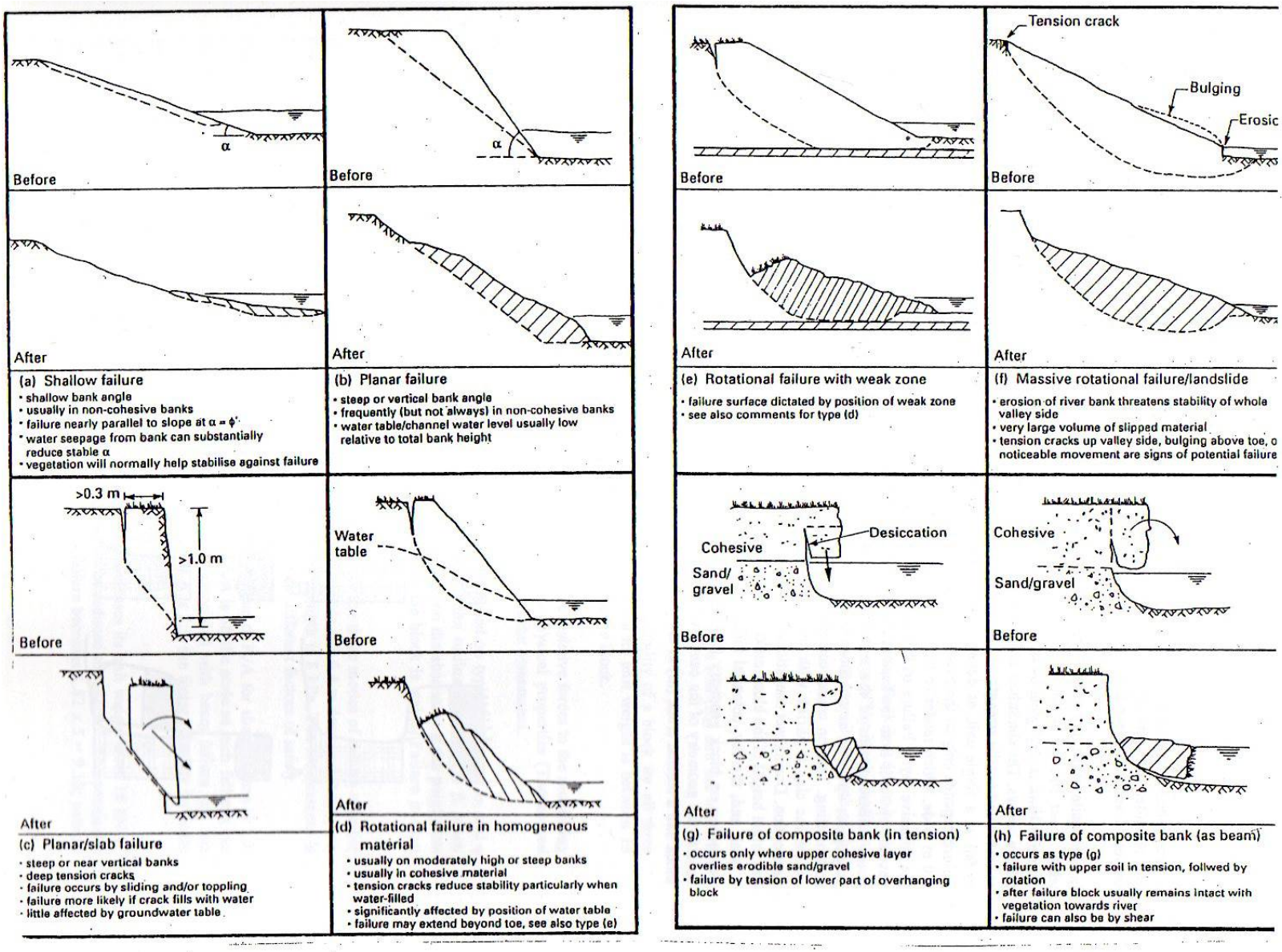

Figure 2 Types of mass failure of river banks (Hey and Tovey 1989)