

Review of the River Enrick ICMF:

Version 1

Report to:

Glen Urquhart Land Use Partnership

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**Mountain
Environments**

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1 Introduction

Following a series of devastating floods during the 1990s in the catchments above Drumnadrochit Mountain Environments was commissioned in 2001 to develop the River Enrick Integrated Catchment Management Plan (ICMP). The plan focused on measures to restore the river system and to implement measures to prevent the damage happening again. Since the ICMP was prepared a number of the recommended actions have been implemented. However during that period a number of changes have also taken place including the development of legislation to introduce Sustainable Flood Management (SFM) into Scots Law. In 2008 the Glen Urquhart Land Use Partnership (GULUP) decided to review the ICMP and commissioned Mountain Environments to return to the Glen and undertake this work. This report reviews the progress that has been made and makes recommendations for the next steps especially in light of recent developments in SFM. The report is deliberately brief to avoid repetition of previous reports and to avoid telling GULUP what they already know.

2 Revisit to the River Enrick

In 2000 and 2001 Mountain Environments surveyed a large proportion of the catchment as part of the consultation phase to develop the ICMP. In this current review of the ICMP it was not considered necessary to re-survey the entire area but to revisit the main river to see how things had changed over the past eight years. Several visits were made to the river during the summer of 2008 and a series of photographs taken of the key features mentioned in this report. There are still some sites which need further visits, especially some of the tributary catchments.

The first impression of returning to the catchment was that there is still a significant problem with the river in terms of morphological instability, flood risk and habitat degradation. But a more detailed investigation showed that the river has recovered in many places and there are now only a small number of problem sites. These sites though are major problems resulting in continued risk to houses, roads, bridges and fields and causing significant degradation to aquatic and riparian habitats.

It was found that the river above Loch Meiklie is recovering but there are still a number of sites where there are localized erosion or sedimentation problems. These are particularly around Milton of Buntait and at the confluence of the Shenval Burn with the River Enrick. The area in the headwaters of the main catchment and also the catchment of the Shenval Burn were visited with Forestry Commission to see the work undertaken through the Safer Project. The sites in the upper catchment are of special interest to the development of Natural Flood Management (NFM), a component of SFM, and are clear demonstrations of what could be done in other parts of the catchment to retain storm waters and reduce runoff rates. The catchment of the Shenval Burn is also of interest and needs further visits to inspect the sources of the sediments and to see how the work done in the Safer project could be controlling these sources.



The River Enrick below Loch Meiklie shows no signs of the coarse sediments from the upper catchment being transmitted through the loch. The erosion and sediment transport below the loch is however still affecting the entire river down to Loch Ness. Therefore the proposed work upstream of the loch is for local improvements while below the loch it will be for both local and downstream improvements. Downstream of the loch the survey showed that, while attention is often focused on the large eroding bluffs, the majority of the river is in a very good condition. But the eroding bluffs are causing serious local problems, they are releasing large volumes of sediment into the river, the continuity of habitats is broken at each one and they could be forming barriers to migratory fish. The most seriously eroding bluffs are at Strathnacro and Polmaily while the most serious sedimentation problem is at Kilmichael.

While carrying out the survey a number of other issues were observed, these were mainly related to the quality of the aquatic and riparian habitats but also to developments in the catchment. In terms of the habitats there are several examples down the river where coarse sediment accumulations have been transported down from the eroding bluffs and partially blocked the river channel. These have often resulted in the river being squeezed over to one side causing erosion of the river bank and loss of the riparian ground. Also the river downstream of Drumnadrochit, known as the Cover, has numerous fallen trees partially blocking the channel. In some cases this blockage deflects the river water onto a bank causing erosion, in others it results in sediment accumulations which also deflect the flows and in other cases the fallen trees appear to be blocking the river probably preventing fish migrating up the river.

Some recent developments in the catchment cause concern to future flood risk. Housing developments down the Glen should recognize that the old buildings were constructed just above the low lying ground next to the river. This is particularly noticeable in Milton where the houses are clustered along the old road which is well above the flood zone. Also in the lower catchment the new houses built over the flat ground below Drumnadrochit appear to be vulnerable. It may be worth investigating the risk to these properties but if a risk is identified there is a question of what to do.

The survey therefore showed that the river has partially recovered but the problems in the catchment, which contributed to the rapid run-off rates and the devastating floods, still exist. Also the aquatic and riparian habitats are recovering but some reaches are still degraded. Of most significance to the local community, the survey showed that there are still houses, roads, bridges and fields close to the river which are at risk of flooding. This led to the conclusion from the survey that there should be a three way approach to implementing the ICMP over the next five years, these are:

- a. The problems which cause the houses, roads, bridges and fields to be at risk of flooding or flood damage should be addressed first;
- b. The problems with the aquatic and riparian habitats should be addressed next;
- c. The problems with run-off rates and flood generation in the catchment should be dealt with as a long term solution.



3 ICMP review

A review of the original ICMP shows that many of the recommended actions have either been implemented or measures are being taken to implement them. Also, even though there have been significant developments in SFM, most of the recommended actions in the ICMP comply with recently developed best practices in flood management. A formal review or re-write of the ICMP was therefore considered un-necessary but plans should be made for further actions to be implemented over the next five years.

It is proposed that the actions should be implemented in the three way approach as suggested before: risk reduction, habitat restoration and catchment flood management.

3.1 Risk reduction

Reduction in the risk to houses, roads, bridges and fields most likely will involve an engineered solution to stabilize eroding bluffs and to ensure there is sufficient capacity in the channel to convey the flood waters. This type of work will require a Controlled Activities Regulations (CAR) license. There are three sites which fall into this category: Strathnacrow, Polmaily and Kilmichael.

Strathnacrow

The main river channel at Strathnacrow bends round to the left and is where a burn joins the main river. A large eroding bluff has developed on the right bank and shows little sign of stabilizing. The erosion causes undercutting of the bluff with the overhanging material regularly collapsing into the channel. The material has developed a large mass of coarse sediments in the channel preventing the river from migrating away from the bluff and so sustaining the erosion. If nothing is done at the site it is unlikely to stabilize and will continue to block the channel and causing damage at the site and also further downstream.

Work is needed to protect the foot of the bank and to give the river room to spread in flood events. The mass of sediment should be partially removed by scraping the top off the deposit to lower it to a level just above the water surface in low flows. A low bund could be formed around the left channel edge which would help to protect the gardens, road and houses. The excavation will not affect the river and the material will not need off-site disposal. The foot of the bluff needs protection by placing a line of large boulders along the edge of the water. The boulders should be some 1m³ in size and two boulders in height, allowing the material to collapse from above and build up on top of and behind the boulders. The burn which joins the main river at this point should be further investigated to ensure it is not contributing to the problem.



Polmaily

The channel at Polmaily also bends to the left with severe erosion of the bluff on the outside of the bend. A burn flows into the river immediately upstream of the erosion site. The erosion has resulted in the channel becoming infilled with coarse sediments and the river held against the foot of the bluff. The coarse sediments extend downstream causing further problems with a threat to the public road and the fields downstream.

The work needed is similar to that at Strathnacro with sediment scraped off the deposit and the foot of the bluff protected with boulders. The island immediately downstream has had the right channel infilled with coarse sediments however this material should not be excavated but left for the river to re-distribute. The existing rock rip-rap appears to be adequate at present to protect the road but it should be extended downstream to also protect the field on the outer bend. The burn immediately upstream should be checked to ensure it is not contributing to the problem.

Kilmichael

The river at Kilmichael has historically divided to flow around a densely vegetated island. Immediately upstream of the island the channel is in a reasonable condition with an apparently stable bed and stable banks. The problem starts at the island where the channel around the right side of the island has been blocked by large boulders. These boulders are high enough to deflect most flood flows around the left channel. The boulders protrude into the left channel and deflect the flows onto the left bank causing serious bank erosion. Along the left channel and also downstream of the island large amounts of sediment have been deposited reducing the capacity of the channels in flood flows and deflecting flows to cause further bank erosion.

The work needed should involve bank protection works and lowering the excessive sediment deposits. The blockage in the right channel should be lowered by some 1m to allow this channel to act as a flood relief channel. Also the boulders which protrude into the channel should be pulled back to create a more smooth bend and the left bank should be protected with large boulders. The sediment deposits in the left channel and downstream of the island should be lowered in height by scraping the top off the deposits down to the level of the water in low flows. The existing rip-rap on the right bank immediately downstream of the island should be reinforced and the fallen trees in the channel below the island should be removed. This type of work will need a CAR license and as part of that a detailed proposal for the work

3.2 Habitat restoration

The overall principle for habitat restoration in a river which has such a high ecological value must be to allow the river to recover itself as much as possible. Immediately upstream of Corrimony the river appears to be doing this and so no restoration work is anticipated. There are however problems between Corrimony and Loch Meiklie and also downstream of the loch.



Immediately downstream of Balnain the erosion was severe but the work carried out and natural recovery processes appear to be working so no further intervention work is anticipated, although regular surveys are recommended.

Downstream of the Strathnacro eroding bluff there are reaches where the sediment accumulations appear to be excessive. The sediments are likely to be from the Strathnacro, and possibly Balnain sources so if these are controlled the supply will be reduced, the river will disperse the sediments downstream and over the next 5-10 years the local problems will be re-solved. Some sites are clearly still a problem to the landowner with the river banks eroding and trees and fences collapsing into the river. The tree problem at the moment should be re-solved by removing all fallen trees as they are causing localized erosion problems and could easily be washed down in a flood and trapped under a bridge. In the future once the excessive erosion is controlled the number of trees falling into the channel should reduce and it may be possible to leave them in the channel to naturally break up and wash downstream. The eroding banks could be protected and there is evidence along the river of a long history of this type of work. The best solution for the river is to fence off the section of eroding bank, plant trees and allow natural regeneration, especially of alder which is prevalent through the Glen. Grants should be available for the landowners to do this.

Downstream of Polmaily the problem is more severe with the river bank erosion cutting into the field and another eroding bluff just before the bridge. The bluff appears to be stabilizing and the channel is not blocked with coarse sediments, unlike the other two eroding bluff sites. These types of eroding bluffs occur naturally in other Highland rivers and so it could be wrong to control them all. The one downstream of Polmaily does not appear to be causing a problem and so could be left alone. The river bank immediately upstream of the bluff does need protection. In this situation rock protection or willow spiling are the two options. Willow spiling would be more sympathetic to the natural environment but expensive while rock protection would be less expensive but be un-natural in this situation. With both techniques there is a need to restore the riparian woodland by fencing, planting and encouraging natural re-generation. Gaps should be left in the fence upstream and downstream of the site to allow cattle to access the river for drinking.

Downstream of Drumadrochit, especially in the Cover area, the problem is that coarse sediment from the upstream sites is getting washed down, banks are eroding and trees collapsing into the channel. Over time, as the upstream restoration takes effect, the sediments could get washed out into Loch Ness but there equally may not be enough energy in the river at this point to move the larger material. If there are specific problem sites where sediment deposits are clearly causing a local problem (e.g. in the channel behind the houses on the Green) there may be a case for digging the material out but in general it will be best to leave the sediments alone. The problem in the Cover area is particularly noticeable at the confluence with the Coiltie where many fallen trees have become trapped and large sediment accumulations have built up. It appears that some fallen trees are hindering, or maybe blocking, fish migration which would appear to be a good case for selective tree removal. This should also help to move the sediments downstream and into Loch Ness. Finally for



this area, the new housing in the area is still of concern. The flood risk assessments carried out as part of the developments need reviewing to check whether they are still valid, whether the mobile sediment accumulations were taken into account and whether the variable level of Loch Ness was taken into account. These reports are available in Highland Council for inspection.

With the implementation of the river restoration works there will be a progressive recovery of the whole river. Most of the river is currently in a very good condition however the impacted sections could be causing problems to fish migration and possibly to the continuity of habitat for other flora and fauna. The fish population surveys should be continued as indicators of recovery and there is also a need to start other surveys such as the River Habitat Survey (RHS) and the Geomorphological equivalent (GeoRHS). These surveys will identify any sites where recovery is not happening and why it is not happening.

3.3 Catchment flood management

Restoration works in the catchment for flood management should be considered as a long term action. GULUP needs to remain aware of progress in the subject of SFM and should keep in contact with similar community groups. The major problem in the development of NFM is the role of communities, NFM will not work without strong community involvement. The Scottish Government, through SNIFFER, will soon be looking for NFM demonstration sites. They are aware of the River Enrick and may want to include the FC/SAFER sites in a national network. There would be significant advantages if the SAFER sites in the upper catchment were instrumented to measure the effectiveness of the work and there could be significant interest in using the Glen as a test case of how to involve a community. GULUP could however initiate a process of identifying potential NFM sites in the catchment and engaging with the landowners to see if they would be willing to take part in farm scale restoration projects.

The SAFER project has generated a large amount of information and data which GULUP should use in the future. The reports are useful documents and the data, such as the Lidar survey data, are valuable and over time will show how much has been achieved. GULUP should be testing options for NFM within these resources. As an example it was recently suggested that the channel downstream of Lochletter bridge should be widened to reduce flood peaks. This has been tested in a simple model of the site and it was shown that by increasing the channel width by 20% the peak downstream of the bridge is reduced by around 1m in the 50-200 year events. This could be investigated in a more detailed way and other locations similarly studied.



4 Recommended actions

The review of the River Enrick ICMP has therefore shown that progress has been made with the implementation of the plan. The ICMP is still a valid baseline document for GULUP to work with and it is possible to plan the actions needed over the next five years. The following lists the recommended actions:

1. Work at Strathcathro, Polmaily and Kilmichel needs to be progressed with Kilmichael being the priority site. Each site will need a detailed design and a CAR license application;
2. A series of river restoration projects need to be undertaken, particularly downstream of Polmaily, but most of the work should be left to the river to recover;
3. Riparian woodlands need restoring particularly at sites where there has been river bank erosion, much of this can be achieved by natural regeneration;
4. An management agreement is needed with SNH about tree removal in the Cover area;
5. Several local flooding issues could be addressed by a simple modeling exercise and relatively small changes to the channel;
6. The catchment needs further assessment for NFM. Specific sites need identifying, discussions are needed with landowners and funds sought;
7. There is a need to regularly repeat surveys of fish populations and to start river habitat surveys and GeoRHS;
8. The catchment, community and Safer site need proposing as a Scottish Government demonstration site.

