



Review of Farm Incentive Schemes Benefiting Rivers

Compiled by the River Restoration Centre

Silsoe Campus, Silsoe
Bedfordshire, MK45 4DT
Tel: 01525 863341
www.theRRC.co.uk

**Neil Bannister
Jenny Mant
Martin Janes**

Final Report December 2005

Kindly sponsored by the Environment Agency

CONTENTS

1. Introduction	3
2. Policy and Mechanisms	3
2.1 European Policy Overview	3
2.2 UK Policy Overview	4
3. Description of Government Schemes	5
3.1 Environmental Stewardship	6
3.2 Woodland Schemes	14
3.3 Farm Waste Grant Scheme	20
3.4 Sheep Wildlife Enhancement Scheme	20
4. Non Statutory Funding Schemes	22
5. Ripon Multi-Objective Pilot Project	25
6. References	27
7. Other information	27

1. Introduction

Over the last few years there has been a growing realisation that there is a need to develop a coherent integrated catchment scale approach to managing Europe's rivers, floodplains and catchments. There is however, concern over how land use is affecting water quality, flood risk and biodiversity in our river systems. European and UK policy is starting to reflect this concern.

It is the view of the River Restoration Centre (RRC) that effective catchment scale river restoration requires a multi-disciplinary approach, including targeted strategic site based river restoration, effective land management, education and community involvement to name but a few. Appropriate land management is a key factor in delivering catchment scale restoration. This review will summarise the incentive schemes available to farmers and land managers that can encourage catchment sensitive farming throughout England and Wales. It will also outline how these mechanisms might help deliver catchment wide benefits especially with respect to river restoration projects. References for further information, especially relating to other projects which are evaluating similar issues will be included to provide a forum for focusing on how the various agricultural incentives might help to improve the UK watercourses.

2. Policy and Mechanisms

There is a number of European and UK policies that aim to assist or act as a catalyst to land use change. These are discussed below:

2.1 European Policy Overview

The EU Water Framework Directive (WFD) will establish a new integrated approach to the protection, improvement and sustainable use of Europe's rivers, lakes, estuaries, coastal waters and groundwater (Environment Agency Website 2004). The Directive is the most significant piece of water legislation to be released in 20 years.

In summary the major aims of the Directive are to:

- Prevent further deterioration, protect and enhance the status of aquatic ecosystems and associated wetlands;
- Promote sustainable water use based on a long-term protection of available water resources;
- Implement specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of the priority hazardous substances;
- Ensure the progressive reduction of pollution of groundwater and prevent further pollution; and
- Contribute to mitigating the effects of floods and droughts.

In order to deliver these aims the WFD states that the best management model is to consider riverine issues via river basins (i.e. the natural geographical and hydrological unit), instead of

according to administrative or political boundaries. To this end it recommends that each river basin ‘district’ must have a ‘river basin management plan’ that will need to be updated every six years. It is envisaged that these plans will provide the context for co-ordination between all relevant organisations interested in improving the status of water bodies within the context of each river basin. Over the past few years formulating these plans has become one of the main drivers for the increased interest in sustainable catchment scale projects.

Ecological protection is an essential element of the WFD. The directive expects that member states will have measures in place to achieve good ecological status (as defined in Annex V of the WFD), for all water bodies (or good ecological potential if classed as an artificial or heavily modified water body) by 2015. Without river restoration techniques being considered it is questionable how feasible this will be; a point now being recognised as programmes of measures are being compiled by the statutory authorities and as discussed at the CIWEM WFD Hydro-morphology Challenges and Implications Conference in November 2005

This theme is also an important element of the European Habitats Directive which has set-up a number of ‘Natura 2000’ sites across Europe, as Special Areas of Conservation (SACs). These sites have to be maintained or restored to bring them in line with the Directive’s ‘Favourable Conservation Status’¹. Within the United Kingdom there are 608 designated sites covering about 2,504,000 ha (more details can be found at <http://www.jncc.gov.uk/page-1458>). A good proportion of these sites include riparian and associated riverine habitats and hence appropriate restoration measures and management are required to fulfil the habitat directive criteria. Any farm incentives that can help to deliver restoration of these sites would be beneficial. It is therefore worth reflecting, at this point, that since the Ripon multi-objective project which is the driver behind this report, is situated on the Edge of North Pennine Moors SAC; the importance of this Natura site should not be overlooked.

2.2 UK Policy Overview

Policies promoting effective catchment management are moving to the forefront of water resource and land management in the UK. There are a number of policies in place including Catchment Flood Management Plans (CFMP’s), Catchment Abstraction Management Plans (CAMs) and Catchment Sensitive Farming.

The Department for Environment Food and Rural Affairs (Defra) and the Environment Agency (EA) have adopted a strategy for sustainable catchment scale flood defence to protect the estimated 5 million people at risk of flooding in England and Wales (Defra Website 2004). This policy has provided the impetus for the CFMP’s. These aim to provide “integrated, technically, environmentally and economically sound and sustainable flood risk management strategies” at catchment level for the next 50 years (Environment Agency, Defra and National Assembly for Wales 2002). The relationship between the CFMP’s and the

¹ The Habitat Directive defines Conservation Status as ‘the sum of influences acting on the habitat or its typical species that may affect its natural long term distribution, structure or functions as well as the long term survival of its typical species within the territory referred’. A habitat is favourable when ‘its natural range and area it covers within that range are stable or increasing; the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and the conservation status of its typical species is favourable’ (European Community 1992).

WFD, however, has not yet been firmly established. It is envisaged though, that CFMP's will run in parallel with the WFD (Environment Agency, Defra and National Assembly for Wales 2002). It is also uncertain how the CFMP's will impact on river restoration. The plans will identify areas where habitat restoration is required but it is unclear if this is for floodplain habitat watercourse habitat or both.

In 2001 CAMS were launched by the Environment Agency (EA), following a Government review of the system used to issue licenses for water abstraction in the UK. Here also it remains uncertain precisely how CAMS will be integrated with the WFD (ENDS Website 2004). The main aims of CAMS are:

- To make information on water resources and licensing practice available to the public;
- To provide a consistent approach to local water resources management recognising the reasonable needs of water users and the environment;
- To provide the opportunity for greater public involvement in managing the water resources of a catchment.

(EA Website 2004)

Defra are currently developing measures to promote Catchment Sensitive Farming following consultation on the proposals. The aim of the policy is to reduce diffuse pollution from agricultural land. Agriculture practice is being targeted as 70% of the land area of England is agricultural, and research suggests that agriculture is responsible for 40-50% of phosphate pollution in our water systems (Defra website 2005).

The Catchment-Sensitive Farming programme is seeking to reduce diffuse water pollution from agriculture in England in order to help agriculture play its part in ensuring that water in England is as clean and healthy as practicable. This will contribute to several of Defra's wider aims including encouraging sustainable farming, raising water quality and improving the conditions of wildlife.

The above policies can act as a catalyst to drive land use change at the catchment scale in the UK. This following section discusses the specific mechanisms and incentives that can be used to bring about such environmentally driven improvements to land management.

3. Description of Government Schemes

Defra now provides, and has historically provided a number of grant schemes for farmers and land managers. Following the reform of Community Agricultural Policy (CAP), the Single Payment Scheme has now replaced 10 major payment schemes. The aim is that farmers will have greater freedom to farm to the demands of the market since subsidies will be decoupled from production. Environmentally friendly farming practices will be further rewarded through schemes such as Environmental Stewardship. One of the primary objectives of this scheme is to protect the natural environment which includes riparian and soil resources. A secondary objective is sustainable flood risk management. This suggests that Environmental Stewardship is a key mechanism for delivering catchment land use change that can deliver ecological benefit.

3.1 Environmental Stewardship

In essence Environmental Stewardship is the new agri-environment scheme which aims to secure widespread environmental benefit.

There are three elements in the scheme:

- Entry Level Stewardship
- Organic Entry Level Stewardship
- Higher Level Stewardship

The following provides a summary of the Environmental Stewardship Scheme. It does not cover all incentives but instead concentrates mainly on those that are more directly related to reducing run-off rates and associated soil erosion since these issues are most directly applicable to river restoration. Incentives that can help to improve water quality are also discussed since this is directly related to the delivery of the water framework directive and is a key element in the success of any habitat enhancement measures.

3.1.1 Entry Level Stewardship (ELS)

Entry Level Stewardship is essentially a whole farm scheme open to all farmers and land managers with land on the Rural Payment Agency's Rural Land Register (RLR) and is administered by the Rural Development Service (more details can be found online within the associated handbook: <http://www.defra.gov.uk/erdp/pdfs/es/els-handbook.pdf>)

If ELS is taken throughout a catchment it should help to:

- Improve water quality and reduce soil erosion (soil erosion on farms has been estimated to cost in the region of £8million/per year;
- Improve conditions for farmland wildlife;
- Maintain and enhance landscape character;
- Protect the historic environment.

For this report the ELS scheme will be reviewed to demonstrate how it can contribute to reducing soil erosion, improving river water quality, and perhaps help to mitigate against flood issues.

To apply for the scheme the land manager must complete a whole farm plan called a farm environment record. In the application process the farmer will be able to choose from a wide range of management options covering all farming types. Each option will earn points which contribute towards a points total. The land manager will have to achieve a total of 30 points per hectare for all eligible land. The only exception to this is for land in Less Favourable Areas (LFAs) where, for parcels of 15 ha or more, a score of 8 points per hectare is acceptable for scheme eligibility.

The farmer will be paid a flat rate payment of £30 per hectare, per year, for all eligible land, with the exception of land in LFAs where, for land parcels of 15 ha or more, a payment of £8 per ha, per year will be made.

This scheme was initially launched in March 2005 and the first agreements had a start date of 1st August 2005. Thereafter monthly agreement start dates will be instigated to help enable early entry into the scheme. The aim is that new agreements will be set up within three months of the receipt of a valid application and these will commence on the first day of each month (e.g. a valid application received during November 2005 will have a start date of 1st February 2006). The schemes are non-competitive and agreement will run for five years from the start date.

As stated previously one of the aims of the ELS is to reduce soil erosion. This is evident in the application process as part of the Farm Environment Record is to identify, on maps, fields that are considered 'at risk' from soil erosion and runoff at present and in the future. Table 1 lists the main management options that can contribute to reducing soil erosion and improving water quality.

Table 1. ELS management options that will contribute towards a reduction in runoff and improving water quality

Reference Number	Management Option	Number of units	Points per unit
EB1	EB1 Hedgerow management (on both sides of hedge)	100 m	22 points
EB2	EB2 Hedgerow management (on one side of hedge)	100 m	11 points
EB3	EB3 Enhanced hedgerow management	100 m	42 points
EB4	Stone-faced hedgebank management on both sides	100 m	16 points
EB5	Stone-faced hedgebank management on one side	100 m	8 points
EB6	Ditch management	100 m	24 points
EB7	Half ditch management (Cutting is restricted to half the length of the ditches on the farm)	100 m	8 points
EB8	Combined Hedge and Ditch Management (inc EB1)	100 m	38 points
EB9	Combined Hedge and Ditch Management (inc EB2)	100 m	26 points
EB10	Combined Hedge and Ditch Management (inc EB3)	100 m	56 points
EE1	2m buffer strip on cultivated land	1 ha	300 points
EE2	4m buffer strip on cultivated land	1 ha	400 points
EE3	6m buffer strip on cultivated land	1 ha	400 points
EE4	2 m buffer strips on intensive grassland	1 ha	300 points
EE5	4 m buffer strips on intensive grassland	1 ha	400 points
EE6	6 m buffer strips on intensive grassland	1 ha	400 points
EE7	Buffering in-field ponds in improved grassland	1 ha	400 points
EE8	Buffering in-field ponds in arable land	1 ha	400 points
EF7	Beetle Banks	1 ha	580 points
EF11	6m uncropped, cultivated margins on arable fields	1 ha	400 points
EJ1	Management of high erosion risk cultivated land	1 ha	18 points
EJ2	Management of maize crops to reduce soil erosion	1 ha	18 points
EM1	Soil management plan	1 ha	3 points
EM2	Nutrient management plan	1 ha	2 points
EM3	Manure management plan	1 ha	2 points
EM4	Crop protection management plan	1 ha	2 points
EK2	Permanent grassland with low inputs	1 ha	85 points
EK3	Permanent grassland with very low inputs	1 ha	150 points
EK4	Management of rush pasture	1ha	150 points
EL2	Manage permanent in-bye grassland with low inputs	1 ha	35 points
EL3	Manage permanent in-bye grassland with very low inputs	1 ha	60 points
EL4	Management of rush pasture (LFA land)	1 ha	60 points
EL5	Enclosed rough grazing	1 ha	5 points
EL6	Moorland and rough grazing *	15ha	5 points

*Less favourable areas only eligible

3.1.1.1 Summary of relevant ELS options which could help directly contribute to the improvements of aquatic and riparian environments by managing run-off more effectively

Hedgerow and hedgerow management options (EB1-5)

These options are designed to maintain hedges using a management regime that protects nesting birds. Cultivation must also be stopped within 2m of the hedge. The maintenance and creation of hedges can act as vegetation breaks on longer slopes and therefore potentially reduce erosion and runoff.

Ditch management (EB6-7)

The aim of these options is to establish varied bankside and aquatic vegetation and to provide undisturbed wildlife habitat adjacent to the ditch. For this option there are a number of management requirements including no cultivation or fertiliser, manure or pesticide application to land within 2 m of the centre of the ditch and within 1m of top of ditch bank, thereby reducing water contaminants, trap silt and hence increase water quality.

Combined hedge and ditch management (EB8-10)

The aim is to establish a diverse hedgerow, bankside and aquatic vegetation, which will provide a barrier to runoff, reduce soil erosion and enhance water quality.

Buffer Strips and Field Margins (EE1-8)

Buffer strips have a wide range of potential benefits, such as: creating new habitat for small mammals, invertebrates and birds; protecting habitats from sprays, fertiliser and cultivation; protecting archaeological or historic features from damage by mechanical operations; stabilising banks, protecting water courses and reducing diffuse pollution.

Beetle banks (EF7)

Beetle banks are tussocky grass ridges, generally about 2 m wide, that run from one side of a field to the other whilst still allowing the field to be farmed. They provide habitat for ground nesting birds, small mammals and insects (including those which feed on crop pests). When carefully placed across the slope such banks can help reduce run-off and erosion but you must ensure they do not channel water and make any existing problems worse.

6m uncropped, cultivated margins on arable land (EF11)

The use of buffer strips is widely acknowledged as a way of reducing the transfer of nutrients and other farm chemicals to watercourses. Strategic use of this option can help not only to create a range of on-farm habitats but should also help improve water quality of rivers and ditches.

Management of high erosion risk cultivated land (EJ1)

This option is only available on fields at risk of soil erosion or run-off, on farms where root crops such as potatoes and sugar beet, and/or where maize or brassica fodder crops are included in the current rotation. Guidelines are included in the ELS manual that promote cultivation along contours for example.

Management of maize crops to reduce soil erosion (EJ2)

This option may not be located on fields at high risk of soil erosion or run-off. It is only available on land where maize is being grown. The management includes harvest by 1st October and ploughing or cultivating to leave a rough surface, ideally within 2 weeks of

harvest, to reduce subsequent soil erosion. Alternately crops should be harvested by 1st October and an autumn sown crop established. Under sowing the maize crop with a grass or clover-based mixture is another option. By leaving a rough surface and reducing the period in which the soil is left uncultivated can have a major impact in reducing the amount of topsoil which is lost and hence may routed into the nearby watercourses.

Moorland and rough grazing (EL6)

Whilst only available in LFAs it should help to protect areas such as wetlands, including peat bogs and other mires, and hillside flushes since the aim is to prevent further installation of any new land drainage or modification of any existing drainage that would result in increased run-off.

Management plan options (EM1-4)

These plans require the farmer to take a broader view of the way that their farm is managed to reduce soil loss and negate nutrient and pesticides entering the watercourses. Such a plan must be prepared during the first year of an ELS agreement. In terms of river restoration their key advantage is that they can serve as an opportunity to raise awareness of how best practice management can be beneficial for both the farming community and wildlife habitats.

Reduction of nutrients inputs in pasture and grassland areas (EK2-4 and EL2-5)

In particular permanent grasslands, rush pasture and meadows rely on low nutrient inputs to maintain their habitat qualities. These options are aimed at encouraging farmers to keep fertilised application low. In turn this will reduce the risk of nutrient rich run-off entering adjacent watercourses.

3.1.2 Organic Entry Level Stewardship (OELS)

This scheme is also a 'whole farm' scheme and is very similar to ELS. It is open to farmers who manage all or part of their land organically and who are not receiving aid under the Organic Aid Scheme (OAS) or the Organic Farming Scheme (OFS). Payments differ slightly to those outlined in the ELS but essentially serve the same purpose. Further specific details can be found at: <http://www.defra.gov.uk/erdp/schemes/oels/default.htm>

3.1.3 Higher Level Stewardship (HLS)

This competitive scheme provides a resource protection option list, in addition to other relevant options. Due to its more complex nature initial agreements dates have been delayed. The 2005 and 2006 agreement start dates for applications are now be as follows:

HLS application deadline	HLS agreement start date
31 August 2005	early in 2006
31 October 2005	early in 2006
31 December 2005	1 May 2006
31 March 2006	1 August 2006
30 June 2006	1 November 2006

HLS agreements run for 10 years and land must be either agricultural land or part of a farmed environment. HLS is dependent on the development of a Farm Environmental Plan (FEP). This is paid by DEFRA at a rate of between £395 - £3,350 depending of landholding size.

In contrast to ELS, HLS funds capital work although it is not possible to apply for these grants without also delivering one or more HLS land management options. Those items which are relevant to watercourse protection are shown in the list below.

Capital Work	Cost/unit
Sheep fencing	£1.80 per m
Post and wire fencing	£1.20 per m
Permanent electric fencing	£1.20 per m
Fencing supplement (difficult sites)	£2.50 per m
High tensile fencing	£1.25 per m
Coppicing bankside trees	£29.00 each
Grip blocking drainage channels	£3.30 per sq/m
Silt trap provision	£60% of costs

Overall the land management options outlined in Table 2 in conjunction with the capital works programme above should help to protect watercourses by reducing diffuse pollution. They buffer sensitive habitats and protect areas that replenish groundwater, by reducing the risk of soil erosion, nitrate leaching and phosphorus transport whilst helping to restore valuable habitats.

Table 2. HLS Management options that will assist in the reduction of run-off

Management Option	Reference Number	Payment
Arable reversion to unfertilised grassland to prevent erosion or run-off	HJ3	£280 ha
Arable reversion to grassland with low fertiliser input to prevent erosion or run-off	HJ4	£210 ha
Infield grass areas to prevent erosion or run-off	HJ5	£350 ha
Preventing erosion or run-off from intensively managed improved grassland	HJ6	£280 ha
Seasonal livestock removal on grassland with no input restriction	HJ7	£40 ha
Nil fertiliser supplement	HJ8	£55 ha
Creation of woodland in the LFA	HC9	£200 ha
Creation of woodland outside LFA	HC10	£315 ha
Maintenance of successional area and scrub	HC15	£100 ha
Restoration of successional area and scrub	HC16	£100 ha
Creation of successional area and scrub £100/ha	HC17	£100 ha
Maintenance of traditional water meadows	HD10	£350 ha

Restoration of traditional water meadows	HD11	£350 ha
Maintenance of species rich semi-natural grassland	HK6	£200 ha
Maintenance of rough grazing for birds	HK7	£200 ha
Restoration of rough grazing for birds	HK8	£200 ha
Maintenance of wet grassland for breeding waders	HK9	£255 – 335 ha
Maintenance of wet grassland for wintering waders and wildfowl	HK10	£255 – 335 ha
Restoration of wet grassland for breeding waders	HK11	£255 – 335 ha
Restoration of wet grassland for wintering waders and wildfowl	HK12	£255 – 335 ha
Creation of wet grassland for breeding waders	HK13	£255 – 335 ha
Creation of wet grassland for wintering waders and wildfowl	HK14	£255 – 335 ha
Maintenance of reedbeds	HQ3	£60 ha
Restoration of reedbeds	HQ4	£60 ha
Creation of reedbeds	HQ5	£380 ha
Inundation grassland supplement	HQ13	£85 ha
Maintenance of rough grazing for birds	HL7	£80 ha
Restoration of rough grazing for birds	HL8	£80 ha
Maintenance of moorland	HL9	£40 ha
Restoration of moorland	HL10	£40 ha
Moorland rewetting supplement	HL13	£10 ha
Seasonal livestock exclusion supplement	HL15	£10 ha

3.1.3.1 Summary of relevant HLS options which could help directly contribute to the improvements of aquatic and riparian environments

The options outlined in Table 2 can be divided into 4 main groups in terms of the types of objectives they seek to achieve.

Water management (HK6 -14, HL 9, 10 and 13, HQ3-5 and 13, HD 10 -11)

Some of the HLS options specifically help to consider water management issues through restoring, maintaining or creating moorlands, wet grasslands for winter waders, water meadows and reedbeds. These options potentially provide opportunities for re-connecting watercourses to floodplains and creating areas for attenuation of water during high flows, which may help to reduce flood risk in vulnerable locations downstream.

Woodland creation and management (HC9 and HC10)

There is currently much discussion about the value of wet woodland (Hughes 2003, Forest and Water guidelines 2003; The value of tress in our changing region 2005). It can provide a buffer effect by reducing nutrients entering the watercourses and will also have an impact

upon the discharge curve and hence a valuable opportunity to restore the function of a river by improving water quality and reducing the peak of large flows.

Manage/restore uncultivated land (HC15-17, HL7-8 and 15)

Whilst these options do not have a direct on watercourses nevertheless the management of uncultivated land to create rough grazing and scrubland can, if located near to water bodies, provide a buffer zone and hence reduce the nutrient rate transfer to them. Seasonal exclusion of livestock in particular and have a direct impact on river rehabilitation in restoring poached river banks.

Diffuse pollution (HJ3 – HJ8)

Mitigating against diffuse pollution is critical to improving water courses. The measures outlined in Table 2 not only help reduce the input of nutrients but also focus on soil protection and runoff management and hence potentially reduce silt input into the watercourses.

3.1.4 River Restoration Benefits from ELS, OELS and HLS

Whilst these stewardship schemes are not directly aimed at river restoration nevertheless, within the context of catchment processes they can ultimately play an important part in helping to improve the river habitat quality and potentially be instrumental in reducing flooding by slowing down the runoff rate. The schemes provide options for better land management and resource protection with the aim of reducing soil erosion and surface runoff from agricultural land. Since river systems are essentially carriers of water and sediment from the surrounding hillslopes a high uptake of these stewardship schemes within a catchment should have a direct benefit for the watercourses by increasing water quality and reducing the introduction of fine silty sediments thus providing better conditions for riparian habitats and associated species. There has already been some research relating to the benefits of shelter breaks (lines of trees on the floodplains initially planted for animal shelter), one option to consider for flood management. Whilst most research, to date, has been based on studies from North America and sub-tropical zones, an early assessment of the Pontbren catchment, North Wales, has indicated that water infiltration rates were up to 60 times higher in areas planted with young trees than areas comprising solely of grassland. This demonstration site indicated that small farm tree coppices could represent a key feature in reducing run-off even where only present as a small proportion of the land cover (Carroll et al 2004, RRC News 22 (Nov 2005). Whilst this research is still in its infancy, it does indicate that vegetation buffers as well as being a positive asset to the farming community, can have a direct benefit for the watercourses. Furthermore, if carefully placed and managed they may potentially reduce flood risk at the local scale.

In order to maximise the benefits of these schemes for river systems, farms throughout the entire catchment should be encouraged to apply for the schemes. A piecemeal approach would greatly reduce the benefit that ELS, EOLS, and HLS provide to catchment scale river rehabilitation and instead developing systematic FEPs and management plans for a number of adjacent farms would be far more effective at combating current water management issues

Table 3 below provides a summary of the degree to which each of the ELS options could add benefit to the water course for each of the incentives which indicates that in many cases the various options could have an additional role to play in reducing run-off rates and water quality in addition to those options outlined in the HLS payments. Table 3 re-iterates the point that although these farming initiatives have little impact on restoring in-channel habitats

directly, they can be very beneficial in terms of reducing nutrients, silt and runoff rates all of which can potentially destroy existing in-channel habitats and reduce the success of river restoration initiatives.

Table 3. Example of potential benefit of stewardship incentives to watercourses

	Water Quality N & P	Reduction of fines into water course	Slow down runoff rates during storm events	Riparian habitats	In-channel habitats
ELS options					
Hedgerow and hedge bank management	Limited	High	High - low (depends on proximity to watercourse)	None	None
Ditch Management	High	High	Medium (since confined to ditch areas)	High	Low
Buffer strips	High	High	High/medium	High	None
Beetle banks	Low	Medium	High	Low	None
Management of high erosion risk cultivated land	Medium	High	Medium	None	None
Management of maize crops to reduce soil erosion	Low	Medium	Medium	None	None
Moorland and rough grazing	Low	Low	High	High	Low
Reduction of nutrient inputs in pasture and grassland	High	Low	Low	Medium	Low
HLS main areas					
Water level management	Low	Low	Medium	High	Low
Woodland creation and management	Medium	Medium	High	Medium	Low
Manage uncultivated land	High	High	Medium	High	Medium – Low (esp. seasonal exclusion of livestock)
Diffuse pollution	High	High	Medium	Low	Low

In addition to those options outlined in Table 3 the opportunity to block grips through the additional capital payments within the HLS schemes may be highly beneficial in reducing peat erosion in many moor lands, especially within the Ripon area.

3.2 Woodland Schemes

3.2.1 The English Woodland Grant Scheme (EWGS)

Note: Wales is transferring to ‘Better woodlands for Wales’

The Woodland Grant Scheme (WGS) and the Farm Woodland Premium Scheme have been reviewed through the ministerial Agricultural Review. This process has shaped the new English Woodland Grant Scheme. The WGS is largely closed since 28th June 2004. The transition strategy aims to create space for introducing the new grants and to allow woodland owners time to consider their options and adjust to the new grants. All existing agreements will be honoured provided the work is completed and maintained as agreed. Most types of

grants are now closed to new applications. Grant claims and amendments to current contracts can still be made in the usual way.

The objectives of the superseding EWGS are:

- To sustain and increase the public benefits derived from existing woodlands in England
- To invest in the creation of woodlands in England of a size, type and location that most effectively delivers public benefits

EWGS will be the main mechanism for delivering woodland grants, and where ever possible will be compatible with the new agri-environment schemes. The scheme will be opened in July 2005 and in summary will contain six grant components but further details can be found at <http://www.forestry.gov.uk/forestry/infd-6dccen>

- **Woodland Management** - Available from October 2005 and aimed at improving the woodland capacity to deliver increased public benefits and woodland sustainability – Will replace WGS annual management scheme and available across all regions at a single rate of £30.00 per hectare while funds allow.
- **Regeneration** - Available from 18th July 2005 to support restocking and regeneration work that creates specific changes in the composition of the woodland –will operate in the similar way to the previous transitional restocking grant - grant payments not yet published.

Table 4. Grant Rates for woodland regeneration

Change from	Change to	Grant rate per hectare	Conifer nurse allowed
Conifer plantation	Native species	£1100	N
	Broadleaved plantation	£950	Y
	Conifer plantation	£360	Y
Broadleaved plantation	Native species	£1100	N
	Broadleaved plantation	£950	Y
	Wide-spaced broadleaved restocking	£350	Y
Conifer plantation on Ancient Woodland Sites	Native species	£1760	N
	Broadleaved species	£950	N
	Conifer species	£0	Y
Broadleaved plantation on Ancient Woodland Sites	Native species	£1760	N
	Broadleaved species	£950	N
Ancient and other semi-natural woodland	Native species	£1100	N

- **Woodland Creation** - Available from 18th July 2005, closes 30th September but reopens April 2006. Application is competitive. Aimed at supporting the creation of new woodlands that are properly designed and well located to deliver public benefit. It will encourage the creation of new woodlands near to where people live, particularly within the urban fringe that can act as protective buffers and link important woodland habitats and other associated natural areas. Restoring former industrial land is high on the objective list of this grant

Table 5. Grant Rates woodland creation

Woodland creation grant categories	Rate per hectare Broadleaves	Rate per hectare conifers
Standard, Small Standard, Native, Community Woodland	£1800	£1200
Special Broadleaved Woodland	£700	n/a

- **Woodland Improvement** - Available from October 2005 to provide capital funds, over an agreed period, to create and sustain an increase in the quantity and quality of public benefits delivered. Intended to be aligned with the Defra HLS scheme and is discretionary and paid as one or more payments over 5 years.
- **Woodland Management Planning** – Available from 18th July 2005 to support the preparation of plans (over 3ha) that meet the UK Woodland Assurance Standard for sustainable management - grant payments not yet published.

Table 6. Grant rates of woodland management planning

Area of woodland on the property	Total grant
3 to 30 ha	£300 total
Over 30 ha and under 100ha	£10 per ha
Any additional area over 100ha	£5 per ha

- **Woodland Assessment** - Available from 18th July 2005 to support the gathering of specific information to improve management decisions and to focus other support where it is most needed to achieve sustainability - will assist in costs to support this.

3.2.2 The Farm Woodland Premium Scheme (now closed)

The Farm Woodland Premium Scheme is also now closed to new applications which must wait until the introduction of the English Woodland Grant Scheme (EWGS) – see 3.2.1 above.

The aim of this Defra funded scheme, was to enhance the environment through encouraging the planting of farm woodlands. Where woodland was being established on productive agricultural land WGS participants could apply to join the FWPS. FWPS was primarily designed to compensate for loss of farm income as a result of converting agricultural land to woodland. FWPS payments were additional payments to the WGS grants.

Payments

Payments were made for 10 years for woodland which is mainly conifers or for 15 years for woodland which is mainly broad-leaved trees. To be eligible for the scheme, farmers had to run an agricultural business that included the land to be converted to woodland; however participants were not required to continue to maintain an agricultural business after entry into the scheme.

Table 7. FWPS payment rate (applicable from 1 April 1997)

TYPE OF LAND ²	PAYMENT RATE
Arable land	
Outside Less Favoured Areas	£300/hectare/year
Disadvantaged Areas of Less Favoured Areas	£230/hectare/year
Severely Disadvantaged Areas of Less Favoured Areas	£160/hectare/year
Other Improved land	
Outside Less Favoured Areas	£260/hectare/year
Disadvantaged Areas of Less Favoured Areas	£200/hectare/year
Severely Disadvantaged Areas of Less Favoured Areas	£140/hectare/year
Unimproved Land	
Less Favoured Areas (whether Severely Disadvantaged or Disadvantaged Areas)	£60/hectare

3. 2. 3 Energy Crop Scheme

This is a Defra funded scheme with the objective of providing grants for energy crops, crops that are used to produce heat and/or electricity. Crops that can be funded are short rotation coppice (willow or poplar) and Miscanthus (a tall woody grass). The scheme provides an establishment grant, which is a one off payment designed to cover 40-50% of the cost of establishing approved energy crops the amount of grant depends on the area of land under agreement, the crop grown and the previous landuse. The energy crop must be established within an area of at least 3 hectares.

Payments

£1600 per hectare for Short Rotation Coppice on ex-livestock land. The land must be either permanent grass or other grassland which is counted towards forage area.

£1000 per hectare for Short rotation coppice on other land

£920 per Hectare for miscanthus

It is important to note that payment rates are being reviewed because, following reform of the Common Agricultural Policy (CAP), arable and livestock schemes will be incorporated into a Single Farm Payment scheme. This could make the enhanced rate for short rotation coppice redundant. Energy Crops can be grown on set-aside land and the farmer will be able to continue to receive set-aside payments through the single payment scheme. Following CAP

² Note: Less favoured area land is land difficult to farm due to climate, where they are sited or features in the landscape. Less favoured areas are classified into disadvantaged and severely disadvantaged Areas.

reform, growing energy crops on non set-aside land may attract a new energy crops payment in addition to payments under the Single Farm Payment scheme.

The applicant must be able to demonstrate that the crops will have an energy end-use. This could be a biomass power station or community energy scheme using combined heat and power technology. The end-user must be within a reasonable distance of the crops. Guidelines state that the crops should be within 10 miles of small installations and 25 miles of larger installations. Also there must be suitable evidence of an end-user i.e. a contract or letter of intent.

Note: Despite effort to find the information, it is not known where precisely the biomass power stations are in relation to the Ripon area. One is located to the south at Ferry Bridge some 40 miles away but smaller stations have been difficult to locate. It is understood that Yorwoods maybe in the process of developing a new scheme. Contact details are: Will Richardson 01765609355; [www.website](http://www.yorwoods.org.uk): Yorwoods.org.uk.

3.2.4 Benefits of Woodland Schemes for River Restoration

The three woodland schemes reviewed are the Energy Crop Scheme, English Woodland Grant Scheme and the Farm Woodland Premium Scheme (now closed). These schemes do not provide direct benefits to River Restoration. However, they provide incentives to alter land management to reduce runoff and indirectly benefit the water quality of the river.

The EWGS and the FWPS have been designed to support the sustainable management and improvement of existing woodland, and the creation of well designed new woodlands. The new EWGS has the capacity to be developed in a flexible way to meet the emerging priorities in each English Region. In developing this scheme, the Forestry Commission have worked closely with Defra to ensure that the proposals can be effectively integrated with their Environmental Stewardship Scheme wherever feasible (Forestry Commission Website www.forestry.gov.uk 2004).

In terms of reducing flood risk in vulnerable urban areas the woodland regeneration can potentially contribute to flattening the peak of a hydrograph through a catchment if carefully positioned. Effectively, this means slowing down the rate at which the peak flows reach the most 'at risk' areas by the trees acting as interceptors and hence reducing the rate of overland flow into the watercourse. All components of the new grants can, potentially, add value to this cause, whilst also being of ecological value. Nevertheless, the most relevant component to this review would seem to be the woodland creation grant since it is directly targeting creating woodland areas for the benefit of both local communities and ecological diversity and therefore could possible also be relevant to flood risk areas.

The planting of trees on productive agricultural land initially promoted by the Farm Woodland Premium Scheme could also directly help to reduce the amount of bare soil and reduce soil erosion. If woodland now continues to be planted in conjunction with grass and hedges under the new EWGS in locations where soil is vulnerable to erosion (especially, for example, on long slopes), the benefit of these schemes could also additionally help benefit water quality and reduce diffuse pollution.

The new grants are yet to be launched and hence it would be well worth monitoring the uptake of these schemes and identify potential areas that may be eligible for woodland planting within the Laver and Skell catchments.

Detailed information about the new EWGS grant sizes have not yet been made available so it is impossible to report on these at present.

The main value of the energy crop scheme in terms of river rehabilitation differs somewhat. Willow and poplar, for example, grow well along river banks. The benefit of encouraging the growth of such crops for energy has been shown quite clearly in some cases. In the Pontbren catchment (<http://bangor.ceh.ac.uk/English/science/pontbren/pontbren.htm>) for example, such practices are carried out and, when carried out in conjunction with fencing off of parts of the watercourse, have resulted in a noticeable stability of the banks, together with some shady areas important for fish and other invertebrate habitat. However, as the payment stands at present there are 2 issues of concern with respect to river restoration initiatives in terms of both flood risk management and bio-diversity enhancement.

These are:

1. The end crop must be for energy and crops need to be close to the end-user. This determines where such crops might be grown.
2. Where the trees are close to the bank edge good management is critical over the longer term otherwise what may appear to be of positive benefit in the short term to the river, could potential turn to a deterioration to that same habitat quality. This is especially relevant if the crop is not coppiced regularly and rotationally.

If these schemes were to be extended to provide material needed for river restoration techniques (e.g. willow spilling) which are standard practices for some river restoration projects this would alleviate the need to be quite so predictive about where these crops are planted. With the requirements of the WFD to improve water quality and hydromorphological conditions of the UK's rivers, the need for such materials is likely to increase. At present there is only a finite amount of such material being cropped in the UK.

On example of such forward thinking is a local co-operative set up on the River Monnow. Previously, unwanted woodland was burnt on site but that same wood is providing income to the landowners as they supply speciality woods for wood turning activities.

Table 8. Example of potential benefit of woodland incentives to watercourses

	Water Quality N & P	Reduction of fines into water course	Slow down runoff rates during storm events	Riparian habitats	In-channel habitats
Energy Crops	Limited	Low	Low	High when forming part of the river bank	Medium (if placed along bank edge and managed correctly)
EGWS (especially creation)	High	High	High/medium	None	None

3.3 Farm Waste Grant Scheme (now closed)

The Farm Waste Grant Scheme provided help to farmers in Nitrate Vulnerable Zones who were installing or improving farm waste facilities. The aim of the scheme was to assist farmers to comply with the restrictions on spreading of livestock manures in Nitrate Vulnerable Zones.

Payments

Grants were available, at a rate of 40%, on eligible expenditure up to an investment ceiling of £85,000 for each agricultural business. The Scheme is now closed for new applicants but for applications submitted before 31st August 2004 works will be carried up until 30 September 2005.

3.3.1 Benefits of Farm Waste Grant Scheme for River Restoration

Note: this scheme may provide one-off opportunities but are not core to providing what the Ripon project is aiming to deliver

This scheme has now been closed, however it has been listed here because it demonstrates the type of schemes that could be made available to benefit water quality. The Farm Waste Grant decreased nutrient input into the river system through enhancing farm waste facilities. If this was taken up over a catchment then the scheme could have a positive affect on the river quality, flows and storage of floodwater. It is understood that the scheme was closed as a result of the EU Nitrates Directive (91/676/EEC) which required an assessment of all member states vulnerable zones. This culminated in 55% of the UK being designated as such in 2002. Farmers in nitrate vulnerable zones (NVZs) must now adhere to an action programme of measures to reduce the amount of nitrate lost from their land that could subsequently pollute the watercourses. Much of the Ripon catchment especially near the town of Ripon is designated as such (see map at <http://nvz.adasis.co.uk/maps/index.html> for details. Depending on how stringently these NVZ action programmes are adhered to this should be providing a potentially benefit to the surrounding watercourse in that particular area.

3.4 Sheep Wildlife Enhancement Schemes (scheme now closed)

This was funded by Defra but administered by English Nature. The scheme's aim was to encourage sustainable grazing on Sites of Scientific Interest (SSSI's). Over-grazing on many upland sites is a massive obstacle to sustainable management (English Nature). The scheme funded stock reductions and supported shepherding on SSSI's, currently in poor condition through historic heavy grazing. However, if the SSSI was under grazed then the scheme could contribute to restoring adequate stock numbers.

Payment

In 2004 the SWES budget was £3 million with roughly two thirds going to upland sites and one third to lowland sites with variable payments depending on stocking density. Priority farms were approached by English Nature, however due to limited funds not all applicants were successful. The scheme closed to new applicants in 2005. Successful applicants undertook a five year agreement however, so some of these will still be in force until 2010.

3.4.1 Benefits of Sheep Wildlife Enhancement Schemes for River Restoration

Erosion by overgrazing on hill sides and river\stream banks is a cause of diffuse pollution in the form of fine sediments contaminating the water course. Sustainable grazing promoted by SWES will allow a more suitable denser vegetation cover which will intercept more surface runoff and lessen compaction of the soil by the sheep's feet. Since the single payment scheme now promotes sustainable farming and environment improvements rather than specifically production rates it is hoped that where these schemes have been developed the practices of reducing over-grazing will continue.

4. Non Statutory funding schemes

There are a number of alternative funding streams which could be used to implement land use change. These are listed in the tables below.

Table 9. UK National Funding Bodies

Name	Website	Summary
Big Lottery	www.biglotteryfund.org.uk	Amalgamation of the New Opportunities Fund and the Community Fund.
Heritage Lottery	www.hlf.org.uk	Deigned to fund improvements to cultural and natural heritage.
Landfill Credit Tax	www.ltcs.org.uk	Designed to help mitigate the effects of landfill upon local communities
Aggregates Levy Sustainability Fund	www.english-nature.org.uk/about/alsf.htm	Address the environmental and social costs of aggregate extraction by delivering environmental improvements
Natural Environment Research Council	www.nerc.ac.uk/funding/grants/	Environmental research grants schemes
Waterways Trust	www.thewaterwaystrust.org.uk/grants/	Funding for waterways related schemes

Table 10. European Funding

Name	Website	Summary
INTERREG III	www.interregnorthsea.org	Trans-European co-operation for spatial planning
Objective 1	www.esf.gov.uk/about/objectives/objectives/objective1.asp	To develop regions where the economy is lagging behind most of Europe.
Objective 2	www.esf.gov.uk/about/objectives/objectives/objective2.asp	To renew industrial, urban, rural and fisheries areas that are in decline.
Objective 3	www.esf.gov.uk/about/objectives/objectives/objective3.asp	To tackle labour issues
URBAN	www.europa.eu.int/comm/regional_policy/urban2/index_en.htm	For urban regeneration
Leader +	www.ukleader.org.uk/	For Rural Development
LIFE	www.Defra.gov.uk/environment/life/index.htm	Only EC fund to be dedicated solely to environment.

Synopsis of most suitable funding streams.

Heritage Lottery

This funding body has four priorities, these are:

- care for and protect our heritage; or
- increase understanding and enjoyment of our heritage
- give people a better opportunity to experience heritage by improving access; and
- help to improve people's quality of life by benefiting the community and wider public

HLF have a number of grants which vary in size and objectives. These are listed below:

Your Heritage between £5,000 and £50,000

- care for heritage or increase people's understanding of it
- 3 month turnaround time

Heritage Grants £50,000 - £ 1,000,000+

- <£1m, 10% match funding and regional grants panels decision
- To enhance heritage, increase participation in heritage activities and improve public access
- >£1m, 25 % match funding and national grants panel decision

Landscape Partnership Schemes: £1m+

- areas with strong landscape identity linked to rural regeneration

Townscape Heritage Initiative: £250,000 to £2 million

Young Roots: £5,000 to £25,000 for between 13 and 20 year old

Public Parks: £50,000+

The most useful of the above grants for implementing landuse change would be the Landscape Partnership Scheme, as it will allow the project to cover a wide area of the catchment.

Aggregates Levy Sustainability Fund

The aim of the ALSF is to address the environmental and social costs of aggregate extraction by delivering environmental improvements, minimising the demand for primary aggregates and reducing the local effects of aggregate extraction. English Nature and The Countryside Agency have developed the ALSF Partnership Grant Scheme. They will jointly administer an allocation of around £5.7 million in 2005/2006 and £4 million in 2006/2007, to fund Land and Community-based work.

Leader +

This European funding stream seeks to encourage the implementation of integrated, high-quality, original strategies for sustainable development designed to encourage experimenting with new ways of:

- Enhancing the natural and cultural heritage
- Reinforcing the economic environment, in order to contribute to job creation

-
- Improving the organization abilities of their community

The beneficiaries will be Local Action Groups made up of more than 50% socio-economic partners and associations, less than 50% government officials

5. Ripon Multi-Objective Pilot Project

The Ripon catchment encompasses the rivers Kex Beck, Laver and Skell. The landuse around the headwaters of the catchment is moorland. Below the moorland the landuse is mostly improved grassland with patches of woodland, both deciduous and coniferous, and arable land. Some sections of the catchments fall under the old Countryside Stewardship Scheme.

The catchment contains two SSSI's, these are Cow Myers designated for its fen, alder carr and broadleaved woodland and East Nidderdale Moors, designated also as SAC and SPA. To the north west of Ripon there is an Area of Outstanding Natural Beauty (Nidderdale AONB). Much of the study area lies within the AONB. The Ure, Skell and Laver Valleys are designated under Special Landscape Areas by the local authority. The catchment also contains a number of BAP habitats, among these are; lowland mixed deciduous woodland, fen, wet woodland, and upland heathland.

This synopsis has aimed to show how grant schemes may also help in the role of catchment scale flood management (even if the results of the individual schemes are only relevant at the local scale), together with their potential input in improving the watercourses for habitat interests. None, of the schemes are directed specifically at watercourse improvements, however, there is both growing interest and some proof that catchment farming practices can help deliver water framework directive and flood management objectives.

It must be recognised though, that unravelling direct cause and effect may be difficult, especially since there has been such a radical change in the way that grants are being administered. That said recent discussions with members of the farming community suggest that the uptake of single payment schemes may be extremely high and include both large estates and new small holdings.

It must be recognised that benefit to farms is always the primary objective of these schemes. However, if uptake is high and individual landowners can be encouraged to work together there is real potential to demonstrate how good farm management at a catchment scale might have a direct impact on improving water courses.

To make the most of the incentives specifically in terms of the Ripon project, it would seem essential to establish the current uptake of old schemes and identify where specific parts of the new ES and EWGS are being applied for. If related to the key objectives of the Ripon project it may be feasible to identify which specific parts of these incentives would be beneficial to different parts of the catchment.

Due to the recent updates and changes however, it is difficult to propose the best solution for Ripon landowners as the schemes and the success in implementation is not yet well enough understood. Thus Ripon should be a test bed for these schemes seeking to maximise uptake and provide future projects with information about success, uptake rates etc. Such an assessment could form part 2 of this report in 18 – 24 months time when more is know and can be reported/disseminated.

An alternative to maximum uptake (if this proves difficult and time consuming) could be to target vulnerable areas and concentrate effort in those places. Such an approach may

encourage others to then follow and therefore enable longer term gains. Encouraging those farmers in the NVZ to apply for HLS funds could be one option for example.

The time scale of the effects that these schemes could help to mitigate against, needs also to be seriously considered. Climate change is predicted to increase flood risk through flash flooding. This risk might be mitigated by 10 years or so of uptake of ELS and EWGS by landowners. Thus ideally grants should be monitored by the local rivers group (e.g. the rivers trust) so that they can stay in touch with what is available and keep a record of what is being implemented within the catchment.

It would also be very valuable if the Ripon Project team were to develop a more detailed document that identifies the kind of environmental measures that would be most relevant in different parts of the catchment. This could effectively provide an on going management document for the catchment long after the core team has gone. Such a detailed document, however, would need to be based on thorough scientific understanding of the catchment and modelling of the impacts of implementing these schemes for different sizes of flow events and sub catchments. It must be recognised that changing the hydrological patterns might conceivably increase flood risk in some areas. For example, if the changes resulted in the peak hydrographs of different limbs of the river network changing such that all peaks reached one place at the same time where previously they had been staggered, this could be cause for concern and should be borne in mind.

Whilst on the one hand the farm payment schemes have undoubtedly become more stream lined and related to environmental factors nevertheless, a strong relationship needs to be built up with the landowners to ensure that the measures that relate to the EWGS, ELS, and HLS, in particular, can be implemented in a way that is of benefit to the wide issues pertaining to this catchment. The task of ensuring that landowners are aware of the Ripon pilot project and encouraging them to appreciate the significance of the project would seem to be the most urgent factor to consider. As a pilot, the Ripon project is well placed to assess the impact of these new schemes at the catchment scale. The results of such a study would be highly relevant and provide valuable information to help inform good management of other UK catchments.

6. References

Bannister, N, Mant, J., Janes, M. and De Smith, L (2004) *A Review of Catchment Scale River Restoration Projects in the UK*, River Restoration Centre

Carrol, Z.L. Bird, S.B., Emmett, B.A., Reynolds, B. and Sinclair, F.L. Can tree shelterbelts on agricultural land reduce flood risk? *Soil Use and Management* 20 357-359

Defra FWPS website: www.Defra.gov.uk/erdp/schemes/fwps/default.htm

Forestry Commission Website: www.forestry.gov.uk/forestry/INFD-5YGFUX

Farm based Grant Scheme England Pamphlet, Nitrate Vulnerable Zones, DEFRA

Energy Crop Scheme Establishment Grants Pamphlet, England Rural Development Programme, DEFRA

Environment Agency Website

Environment Agency, Department for Environment, Food and Rural Affairs and National Assembly for Wales (2002) *Catchment Flood Management Plans: Guidelines Volume I – Procedures (Third Draft)*.

Forestry Commission (2003) *Forest and water guidelines (4th editions)* Forestry Commission

Hughes, F (2003) *The Flooded Forest :Guidance for policy makers and river managers in Europe on the restoration of floodplain forests*. University of Cambridge

Henshaw, A (2005) *Restoration of the Pontbren Catchment River Restoration New*, 22

SEPA 2004, *Pressures and Impacts on Scotland's Water Environment: Report and Consultation*

The Value of trees in our changing region York and Humber Region (2005) Forestry Commission.

7. Other information

1. The need to address the impacts of farming is accepted. Chris Kaighin EA in conjunction with RDS is looking at how Good Farming Practice and the environmental stewardship scheme can help improve our water and how the areas most at risk from diffuse pollution can be targeted with respect to the Ribble pilot catchment.

-
2. On the 19th December 2005 Defra announced the 40 priority catchments that will be targeted to reduce pollution from farming and this includes the Peak District Dales area.
<http://www.defra.gov.uk/news/2005/051219a.htm>
<http://www.defra.gov.uk/news/2005/051219a.htm#map>

 3. West Country Rivers Trust have completed a document entitled 'Making the most out of cross compliance and environmental stewardship' (2005) which would be beneficial to read in conjunction with this report.