

Final Report

Project FRM21

**Understanding the opportunities and constraints for
implementation of natural flood management features by farmers**

March 2011



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EXECUTIVE SUMMARY

Understanding the opportunities and constraints for implementation of natural flood management features by farmers (January 2011)

Project funders/partners: Scottish Government

Background to research

In the past much flooding has been dealt with through heavily engineered defence solutions. The 2009 Flood Risk Management (Scotland) Act introduces a new approach to dealing with floods. The Act recognises that there is a need for a more sustainable approach to management which is risk based and will need co-ordination and the involvement of a number of parties. Central to the concept of sustainable flood management is natural flood management (NFM). NFM considers both the source and impacts of floods. It promotes a catchment approach that deals with flow generation, floodplain and within river channel management. Within each of these three elements land managers play a key role. For example undertaking drainage practices that 'slow the flow' through increasing sub surface storage and restoration of wetlands and wet woods on flood plains. Whilst there has been discussion about NFM within the policy community for many years, land managers in Scotland have rarely been involved. For many land managers this is a new role society is asking them to get involved with, and involves balancing food production whilst providing other ecosystem services. Government and Agency staff need to understand these issues from a practitioners view point and see how and where NFM approaches can be incorporated and how best to achieve this.

From this background the Scottish Government sponsored two workshops to initiate increasing understanding and dialogue between the flood policy community and land managers. This report outlines the approach taken, the findings and proposes the next steps.

Objectives of research

The overall objective of the work is to improve the understanding between land managers and flood authorities of the ways in which existing processes and incentives work to promote or hinder how the farming landscape can be managed to help reduce flood risk through implementation of NFM and how these could be improved.

Specific objectives

1. To raise awareness and share practical experience of NFM and wider river management features based on the Tarland Catchment, N.E. Scotland.
2. To listen to and discuss farmers' experiences in assessing, accessing funding and implementing best management practices in relation to river management.
3. to discuss options for compensating farmers for their role
4. To share and disseminate this information to a range of public agency organisations as a way of improving land and river management objectives across Scotland.

Key findings and recommendations

The headline message from both workshops was the urgent need for a programme of awareness raising and communication about NFM targeted specifically at farmers. Such a programme should clarify, inform and facilitate.

1. Clarification needs to address three key farmer concerns
 - Eligibility of land under NFM features for single farm payment

- The rules (and flexibility) on dredging ditches, burns and other water courses
 - Financial flows likely to be associated with NFM
2. Information is needed on the wider context associated with NFM, including:
- The multiple (environmental) benefits that can come from NFM
 - How NFM measures on particular farms fit within the whole catchment context
 - How NFM features have worked on other farms in practice
3. Facilitation: In just about every context the need for a “trusted intermediary” or a local catchment champion was highlighted. This would facilitate:
- Negotiation between farmers and agency on regulations to enable pragmatism
 - Access to a variety of funding streams
 - An integrated catchment approach to water, environmental and farm management

Finally, whilst the SRDP was not considered appropriate for NFM, NFUS representatives stressed the need to integrate discussion on the future funding of flood risk management with discussion on CAP reform, which are ongoing now.

Key words: Natural Flood Management, Flood Risk Management (Scotland) Act 2009, Farmers.

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1. INTRODUCTION

In the past much flooding has been dealt with through heavily engineered defence solutions. The 2009 Flood Risk Management (Scotland) Act introduces a new approach to dealing with floods. The Act recognises that there is a need for a more sustainable approach to management which is risk based and will need co-ordination and the involvement of a number of parties. Central to the concept of sustainable flood management is natural flood management (NFM). NFM considers both the source and impacts of floods. It promotes a catchment approach that deals with flow generation, floodplain and within river channel management. Within each of these three elements land managers play a key role. For example undertaking drainage practices that 'slow the flow' through increasing sub surface storage and restoration of wetlands and wet woods on flood plains. Whilst there has been discussion about NFM within the policy community for many years, land managers in Scotland have rarely been involved. Yet for many land managers this is a new role society is asking them to get involved with, and requires farmers to balance the need to run an economically viable business, the need to produce food, and at the same time provide other ecosystem services¹.

Government and Agency staff need to understand these issues from a practitioners view point and see how and where NFM approaches can be implemented to best achieve this. From this background the Scottish Government sponsored two workshops to initiate better understanding and dialogue between the flood policy community and land managers. This report outlines the approach taken, the findings and proposes the next steps.

2. OVERALL OBJECTIVE AND OUTCOMES

The overall objective of the work is to improve the understanding between land managers and flood authorities of the ways in which existing processes and incentives work to promote or hinder how the farming landscape can be managed to help reduce flood risk through implementation of NFM, and how these could be improved.

Specific objectives

1. To raise awareness and share practical experience of NFM and wider river management features based on the Tarland Catchment, N.E. Scotland.
2. To listen to and discuss farmers' experiences in assessing, accessing funding and implementing best management practices in relation to river management.
3. To discuss options for compensating farmers for their role.
4. To share and disseminate this information to a range of public agency organisations as a way of improving land and river management objectives across Scotland.

Outcomes

For Farmers:

- Raised awareness of what NFM is and how it integrates with other policy drivers and business requirements.
- To give their views on how current and future funding incentives help or hinder their business.
- To provide opportunities for future involvement in NFM policy implementation.

¹ Ecosystem services are natural services that we derive goods from: goods such as food, timber, energy; services such as the purification of water and the regulation of the climate; and less tangible benefits such as opportunities for recreation, exercise, inspiration and reflection.

For Policy and Agency staff:

- To understand NFM from the farmers perspective.
- Opportunity to see and discuss the catchment approach to NFM and the potential multiple benefits (and costs) of policies used to promote it.
- Contribute to inter agency discussion on how to promote more, improved river and riverside management, and to consider what mechanisms and processes can be improved or put into place

3. APPROACH

The approach used has been to run two workshops on consecutive days. Both days began with a short field visit to some NFM installations and potential sites for future NFM in the River Dee catchment, North East Scotland.

The first day was a workshop for farmers in which we took farmers and their representative to see and discuss NFM measures in situ. We facilitated a structured discussion on the opportunities and constraints offered by policy, finance and agency processes in promoting or restricting the uptake of NFM measures. In order to maximise farmer participation from a range of experiences the project leaders worked with local and national National Farmers Union Scotland (NFUS) leaders who promoted and supported attendance and participation at the workshops. The agenda for day 1 and day 2 of the meetings is included in annex 1.

The second day involved the flood policy community at both local and national scale. It began with a field trip to see NFM measures in situ and continued with a workshop, where the farmers' views synthesised from day 1 was fed back to representatives from the Scottish Government, Agencies, Local Authorities and other interested parties. There was facilitated discussion on how current mechanisms promoting enhanced flood plain and riparian management can be adapted to address farmers concerns.

Both workshops were held at Douneside House, Tarland, Aberdeenshire. The venue was selected as the authors have done a considerable amount of work with the farmers and the community in the Tarland catchment in relation to both water quality and flooding.

To provide a context for the farmers, a briefing paper was generated and circulated prior to the meeting, giving background to NFM, its role in policy and potential mechanisms for its promotion on farms. The paper is appended in appendix 3. At both workshops an introductory power point presentation was given. All presentations given at the workshops and details of the sites visited, attendees and other resources can be found at:

www.macaulay.ac.uk/flooding/nfm_workshop.

4. RESULTS

4.1 Farming Community

The farmers workshop (Day 1) was held on 18th January 2011. Attendance was disappointing. This was the second day of good weather after a 7 week period in which farmers had not been able to get on to their land because of the unusual snow and ice conditions. Indeed, this highlights the point that engaging with farmers is difficult and unpredictable. Eight farmers and their representatives attended the workshop. However, the workshop was well attended and supported by NFUS (including those who sat on the NFUS Land and Environment committee) who were able to relate the views of a wider set of individual opinions and specific cases. The attendance by the NFUS was particularly important as they represent 9,000 full time farmers (75% of the total) who manage two thirds of Scotland's land mass. The workshops were the first

time that NFUS representatives had the opportunity to see and discuss NFM in detail. The discussion from the group was lively and constructive. Whilst a lot of the views were captured in detail the agreed headline messages that farmers felt the flooding policy needed to know about farmers involvement in NFM are set out below.

Pragmatism

The single most important message that farmers wanted passed onto the flooding policy community was that pragmatism in all things was vital, and would facilitate a better relationship between agencies and land managers in all issues.

Communication: The issues

- One of the key issues was the need for better communication to help farmers understand what NFM is about, why it is important, and how it fits in with other rules and regulations land managers are subject to.
- Farmers were keen to understand the NFM approach in the context of the whole catchment.
- Farmers' perception was that different agencies give different messages and information about water quality, quantity and associated regulations. Farmers requested that the information and message be consistent across agencies.

Communication: Potential solutions

- NFM messages to farmers must be presented in a concise and accessible fashion. Farmers do not have time to read long winded reports.
- To facilitate communications, farmers suggested focus farms be used to demonstrate NFM to land managers.
- Local catchment champions were proposed, to act as a "trusted intermediary" between agencies and farmers. The "catchment champion" would promote and ease the implementation of NFM features in an integrated and pragmatic manner.

Economics: The Issues

- Farmers were concerned that whilst NFM may be cost effective for society as a whole, it has a cost, and it would be unfair to expect farmers to bear all of that cost.
- There was concern expressed about the potential impact that NFM features on farmland might have on "eligibility" for single farm payment (SFP), the potential for other economic activities (including the opportunity cost), and the capital value of land.
- Incentives for farmers to implement NFM will be important, but incentives do not necessarily have to be financial.

Economics: Potential solutions

- Farmers did not see the current Scottish Rural Development Programme (SRDP) as providing a way forward to incentivise NFM (a results which confirms findings from Donaghy, 2010), but they did suggest that incentives for NFM should be integrated into discussions on CAP reform.
- Farmers requested clarity about the impact of implementing NFM features on eligibility for SFP. Unfortunately, under the current system it is not as simple as being eligible or not, as a number of factors affects eligibility, such as whether they are in a particular scheme like Rural Priorities. However, reform of the Common Agricultural Policy is currently underway and provides an opportunity for flood management to be included within the wider agricultural support regime in a clear, simple and transparent way. Farmers concern about clarity could be addressed for the future. The [Final Pack Report](#) (2010) argues that integrated land and water management (i.e. natural flood management) in a changing climate should be considered as one of the "global challenges" within the Top-Up funds. The report states that: "Top Up payments using Pillar 1 money are designed to incentivise transformational change to develop farming

systems which produce food in a competitive way, but which also address the global challenges and deliver important public benefits.” Recommendation 6 of the report is: “A proportion of Pillar 1 funding should be used to create a Top Up Fund to encourage transformational change: in short, a more sustainable agricultural industry which contributes towards tackling the global challenges.” This provides a clear opportunity for flood management, but any work in this area needs to happen now as reform of the CAP is currently underway and once decisions are made, they are difficult to change for many years.

- Farmers suggested that costs associated with implementation of NFM measures (such as potential income lost and gained) should be better mapped out and communicated.

Legislation and Regulation: The Issues

- Farmers view the Scottish Environment Protection Agency (SEPA) as a strict enforcement agency, that lacks flexibility and has little understanding of the farm-wide (or catchment-wide) context.
- There was significant frustration with policy on dredging of ditches/ canals/ drains/ water bodies. Specifically, farmers were unclear when dredging could and could not be carried out without a licence.
- Farmers were concerned that flood regulations would be just another layer of regulations on top of the many they are already subject to.

Legislation and Regulation: Potential solutions

- Farmers thought that a more pragmatic approach to enforcement of regulations would be helpful for NFM uptake. For example, if the farmer was allowed to maintain (dredge) a particular ditch, he may be willing to allow another specified area of land to flood.
- Clarification was requested on the rules of dredging of ditches. Subsequent to the workshop, it has become apparent that this is not an isolated expression of this concern. Further SEPA included a feature on dredging in their 11 March 2011 Weekly Update. This included reference to a number of sources in this area: leaflet [Floods, dredging and river changes](#); [Good practice guide to sediment management](#); [Position statement on sediment management](#); [CAR Practical Guide](#).
- Catchment champions were again suggested as a means to facilitate a more pragmatic approach to rules, since they could provide a catchment wide view, policy-wide view, and negotiate between SEPA and land managers.

The attendees at the farmers workshop are included in appendix 2. The feedback they provided about the workshop was very positive. The group benefited from both the practical elements provide by the site visits and emphasised the need for pragmatism, integration and communication about the issues discussed.

4.2 Policy Community

The flood policy community attended Day 2. Twenty-eight people from 17 organisations ranging from research interests through government departments and NGOs and a private consultant attended (appendix 2). After the same introduction used with the farmers, Andrew Bauer (NFUS) provided the headline summary from the previous days discussion (see [NFM workshop webpages](#)). All participants attended the fieldtrip to view and discuss the NFM features. To conclude the morning, a short presentation was made by Mike Donaghy with the results of interviews he had carried out with farmers to discover views on the SRDP and NFM in the Spey catchment.

In the afternoon the delegates were divided into three breakout groups to discuss Economic issues, Legislative issues and Communication issues – corresponding with the prioritised needs/requests from the farmers the previous day. Each group was tasked with agreeing a

common understanding of the issue and suggesting action(s) that could be taken to resolve the problem and turn it into an opportunity. The results of these discussions are set out below.

Economics: The issue

The issues set out by farmers relating to economics were discussed. It was thought reasonable that farmers should be financially compensated for lost income resulting from uptake of NFM features, and for any loss of capital value of land. It was noted that farmers had stated that compensation need not always be financial.

Economics: Potential solutions

Financial compensation

- The potential to provide compensation to farmers for losses associated with floods via wayleaves was discussed. Wayleaves are agreements that can be made between land owners and a third party to allow temporary access to, or through land. They have traditionally been used to grant rights for electricity powerlines, telecoms or fibre optics to go through specified land, but are also used to compensate farmers for allowing flood water on their land.
- Other sources of financial compensation discussed included the SRDP and agreements made between land managers and Local Authorities.

Non-financial compensation

- In response to farmers requesting greater flexibility in the application of regulations, it was suggested that examples from across Europe be found on how dredging of farm ditches is approached, so that Scotland may learn from them.
- It was also suggested that farms develop a sediment management plan – which when presented to SEPA may allow greater flexibility in managing water courses for the whole farm, both for flood management and other environmental benefits.
- Better communication with farmers was recommended in two specific areas: on the financial flows (positive and negative) likely to be associated with NFM features on farm land; and on the benefits of NFM. It was suggested that a “champion” may be needed for this communication to be effective.

Legislation: The issue

- This group felt that a change in ethos was needed on the farmers part as they tried to manage the farm for modern productivity, but with new issues to address, such as a rising water table and new regulations.
- This group did not agree with farmers that there was goldplating in transposing the Water Framework Directive, but agreed that the key issue with respect to legislation and regulation was how it was all communicated to farmers.

Legislation: Potential solutions

- It was argued that much better communication with farmers was needed. Farmers needed targeted advice, in appropriate language via a trusted and local source. The group suggested a process whereby:
 - There is screening of catchments at risk.
 - There is application of Best Management Practice (BMP).
 - Catchment groups are set up based on the Scottish Flood Forum (SG funded) model, providing a local farmer-led network for NFM.
 - Local catchment officers (a “champion”) facilitated the on-going process. There was concern about the costs [NB: Hugh Chalmers at the Tweed Forum is funded through LEADER].

Communication: The issue

Communication between farmers, agencies and government was a key issue in all groups in both the farmers and policy community workshops. The policy group discussing this agreed there was a lack of knowledge about NFM in the farming community, and that better information about NFM itself and the context surrounding it in terms of costs, benefits, regulations etc needed to be provided.

Communication: Potential solutions

- Information should be provided by local champions and farmers themselves, with support from agencies.
- SEPA general awareness meetings, community councils, NFUS regional meetings and the existing farm press were all fora that could be used to get information across.
- The Scottish Government climate change focus farms were considered to be potentially useful in illustrating NFM to farmers.
- Education of future farmers and farm advisers was also considered an important part of getting the message across, via schools and agricultural colleges.

4.2.1 Policy Workshop Feedback

The feedback from the attendees (detail in appendix 4) was extremely positive. It is evident that nearly all of the attendees appreciated the need for a more integrated and joined up approach with a deeper understanding of different roles and responsibilities related to NFM within its wider context. Many of the comments related directly or implied the need and understanding of the role of better communication and ongoing dialogue with land managers.

5. DISCUSSION

The results from this project are confirmed by other recent work carried out around this topic. Colleagues at the Macaulay land Use Research Institute are involved in the REFRESH project. This aims (amongst other things) to understand what constrains and influences actions to help the water environment. In a farmer workshop held in November 2010 concerns were expressed about equity and responsibility with respect to the water environment, in that land-managers feeling they are being unfairly targeted. In a very similar vein to the findings above farmers argued that policy related to drainage and ditch management are confusing and contentious, so must be checked, clarified and clearly justified. Further the REFRESH workshop also found that finances were not the only issues involved in implementation of water management features, but that issues of time and labour were also important. Finally, REFRESH also highlighted the importance of inclusive and joined –up thinking on the water environment.

Donaghy (2010) reports findings from another relevant project, whose findings are similar to those reported above. In interviews with farmers he found that farmers did not know about NFM, but that once explained they were positive about their potential role. If there were to get involved they wanted to deal with just one authority rather than a myriad of agencies, and that a trusted intermediary was needed to liaise between the farmer and the flood policy community.

6. OUTPUTS TO DATE

- Web resource of workshops
- Briefing paper
- Pictures for schools website
- Article in Holyrood Magazine
- Results fed into SEPA NFM workshop at the SNIFFER flood risk management conference, February 2011.
- Final report

7. CONCLUSIONS

The headline message from both workshops was the urgent need for a programme of awareness raising and communication about NFM targeted specifically at farmers. Such a programme should clarify, inform and facilitate.

- Clarification needs to address three key farmer concerns
 - Eligibility of land under NFM features for single farm payment
 - The rules (and flexibility) on dredging ditches, burns and other water courses
 - Financial flows likely to be associated with NFM

- Information is needed on the wider context associated with NFM, including:
 - The multiple (environmental) benefits that can come from NFM
 - How NFM measures on particular farms fit within the whole catchment context
 - How NFM features have worked on other farms in practice

- Facilitation: In just about every context the need for a “trusted intermediary” or a local catchment champion was highlighted. This would facilitate:
 - Negotiation between farmers and agency on regulations to enable pragmatism
 - Access to a variety of funding streams
 - An integrated catchment approach to water, environmental and farm management

Whilst the SRDP was not considered appropriate for NFM, NFUS representatives stressed the need to integrate discussion on the future funding of flood risk management with discussion on CAP reform, which are ongoing now.

The workshop was successful in meeting its objectives. All of the participants on both days responded very positively; the occasion provided a good opportunity for networking. The site visits raised awareness of how these features may start to look like in the landscape context. The central message from farmers was the need for ongoing dialogue and communication at a number of levels between farmers and the policy community, and that a catchment “champion” would offer many benefits in facilitating this communication. This improved relationship and communication will help ensure any measures and their payment mechanisms to encourage uptake of NFM are attractive, fit for purpose and have a higher chance of being implemented.

8. REFERENCES

Donaghy, M. (2010) *Strathspey land managers on NFM measures, funding schemes and their response to climate change impacts*.

Pack, B. (2010) *The road ahead for Scotland. Final report of the inquiry into future support for agriculture in Scotland*, Scottish Government, Edinburgh.

APPENDICES

Appendix 1 Workshop programmes

DAY 1

- 8:45 -9:15 Arrive, bacon buttie and coffee
- 9:15-9:30 Brief intro and overview of day (*Jonnie Hall*)
- 9:30-10:30 Why we are here; what NFM measures are; what we are going to see and why it matters (*Simon Langan*)
- 10:30-12:30 Field trip (2 minibuses) to 2 sites – a) buffer strips and breached leve b) wetlands and buffer strips (*Simon Langan, Wendy Kenyon*)
- 12:30 -13:30 Lunch
- 13:30-13:45 Intro to afternoon sessions “ so you’ve seen some of the things on the ground we’d like you to be able to consider doing, we now want to discuss what would support you or incentivise you to do this yourselves.....” – (*Jonnie Hall*)
- 13:45-14:30 Discussion in groups of 6: why are some of you in SDRP, why are some of you not – what works what doesn’t. What would make you get involved? WK
- 14:30-14:45 break
- 14:45-15:45 Discussion in groups of 6: What would get you to adopt NFM measures – incentives? Better information? [*NB need options paper for this session*] WK
- 15:45-16:15 16:15-16:30 Wrap up and next steps.SL/WK/JH
- [facilitators stay and finalise day 2]

DAY 2

- 8:30 -9:30 [facilitators final prep]
- 9:00-9:30 Coffee
- 9:30-10:30 Introduction, why we are here; what NFM measures are; what we are going to see and why it matters (*Simon Langan*)
- 10:30-12:30 Field trip (2 minibuses) to 2 sites – a) buffer strips and breached leve b) wetlands and buffer strips (*Simon Langan, Wendy Kenyon*)
- 12:30 -13:30 Lunch
- 13:30-14:00 What we learned from the farmers (*Simon and Jonnie*)
- Current opportunities and barriers
- Future
- 14:00-15:00 Group discussions (facilitated by M Stutter, J. Dunglison, K. Irving and K Macleod)
- 15:00-15:30 Feedback
- 15:30-16:00 What can we do better, new opportunities where next

Appendix 2 Workshop Participants

Farmers Day

Name	Organisation
Alan Crichton	Mill House, Kirkgunzeon, Dumfries
Hugh Chalmers	Tweed Forum
Gerald Banks	Friday Hill, Maud Peterhead
Donald Barrie	Glensaugh Farm
George Wordie	Mains of Cairnbarrow, Huntly
Jenny Kinaird	Scottish Government
Ian Spiers	Scottish Government
Debi Garft	Scottish Government
Jill Dunglinson	Macaulay Institute
Wendy Kenyon	Macaulay Institute
Simon Langan	Macaulay Institute
Andrew Bauer	NFUS
Jonnie Hall	NFUS
Lorna Paterson	NFUS
Kirsty Irvine	SNIFFER
Kirsty Holstead	Edinburgh University student

Participants at Agency Day

Name	Organisation	Email
Christine Skene	Cairngorms National Park Authority	ChristineSkene@cairngorms.co.u
Sue Walker	CAMERAS	sue.walkerbraemar@btinternet.com
John Barr	Dee CMP	N a
Stephen McFarland	Dee CMP	Stephen.McFarland@aberdeenshire.gov.uk
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Chris Spray	Dundee University	C.J.Spray@dundee.ac.uk
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Hugh Chalmers	Tweed Forum	hugh.chalmers@tweedforum.com

Appendix 3 Background material

All resources from the workshops can be found on the associated web pages:

<http://www.macaulay.ac.uk/water/nfmworkshop/index.php>

1. Introduction
2. Objectives
3. Results
4. Attendees
5. Resources - Workshop presentations (Simon Langan, Andrew Bauer, Mike Donaghy, Andrea Johnstonova), briefing paper (Wendy Kenyon)
6. Photographs and video clips
7. Other links

<http://www.scotland.gov.uk/Topics/Environment/Water/Flooding>

<http://www.scottishfloodforum.org/>

<http://www.sepa.org.uk/flooding.aspx>

<http://www.macaulay.ac.uk/flood/>

Appendix 4 Introductory discussion paper

Natural Flood Management

We want to understand what discourages and what could encourage farmers to implement natural flood management measures on their land....

What is Natural Flood Management?

Natural flood management (NFM) means working with or restoring natural processes with the aim of reducing flood risk and delivering other benefits. In practice this might mean:

- Creating, restoring and maintaining wetlands
- Managing floodplains in a particular way
- Creating woodland in appropriate locations
- Managing and restoring lowland raised bogs
- Creating buffer strips

These measures can slow the water flow and/or store water to help reduce the risk of flooding downstream. Such measures can provide additional benefits such as reducing diffuse pollution, improving biodiversity and providing opportunities for recreation. NFM can be more cost effective and sustainable over the long term compared to hard engineering solutions to flooding².

Flooding and Flood Policy

There have been a number of severe flooding events in Scotland in recent years. The economic cost of flooding in Scotland is estimated to average £31.5 million per year from inland flooding and £19.1 million from coastal flooding³. Flooding may become more frequent in future as the climate changes. It has been predicted that over the next few decades the country will endure more severe rainfall events in winter, especially in the east⁴.

The Flood Risk Management (Scotland) Act 2009 is now in force and aims to 'deliver timely and sustainable approaches to reducing the impact of flooding to Scotland's communities, environment, cultural heritage and economy'. This will involve being more proactive and focussing on a catchment scale. The sustainable approach to flood risk management includes NFM, and farmers will have a key role in its success.

Natural Flood Management on Farms

Farmers may be prevented from implementing NFM for many reasons such as lack of funding, the need to use prime land for agriculture, poor of information etc. But, there are lots of examples from around Scotland, the UK and the world, where incentives are offered to farmers to carry out environmentally beneficial activities. Some may be relevant to natural flood management....

1. Land management options within the Scottish Rural Development Programme (SRDP) provide funding for a range of actions that benefit the environment, including flood management.
2. Grampian Region Priorities (water and soils theme) via the SRDP also provide funding for water and flood management.
3. SEPA's Water Restoration Fund provides funding for water management including natural flood management measures such as the re-meandering of the Balmaleedy Burn near Marykirk on the North Esk.
4. Local authority contracts with land managers can provide payments to enable land to be managed in a particular way. For example Aberdeenshire council in Tarland.

² SNH (2010) <http://www.snh.gov.uk/land-and-sea/managing-freshwater/flooding/>

³ Werritty et al (2007) <http://www.scotland.gov.uk/Resource/Doc/174676/0048938.pdf>

⁴ Scottish Government (2009) <http://www.scotland.gov.uk/Publications/2010/05/14113652/2>

5. Private organisations may fund NFM measures on farmland as part of their corporate responsibility programme. For example, HSBC has funded (via WWF) such measures in the River Devon catchment.
6. The French Flood Prevention Action Programme redirects floods from the most vulnerable (usually urban) to the least vulnerable (usually rural) areas. This exposes farmers to greater flood risks, and they are compensated for this additional risk. It has been suggested that (innovative) insurance and other financial contracts should be designed for the coverage of over-flooding on farmland.
7. Payment for ecosystem services may be a way of funding NFM. For example, New York City pays for water services in the Catskills and Delaware catchments. The programme conserves the Catskills watershed forests to maintain water quality. It cost the City about US\$1.5 billion—a considerable saving over the US\$8-10 billion that a water filtration plant would have cost – and is administered through a formal urban-rural partnership.
8. In north-eastern France, a scheme developed and implemented by Vittel (the bottled water company) addressed the risk of nitrate contamination caused by agricultural intensification by funding farmers in the catchment to de-intensify their farming practices.
9. Utility companies can be involved in payment for ecosystem services. For example, The SCaMP project is being undertaken by United Utilities in partnership with the RSPB in North West England. It is a partnership approach with private, public and non-governmental organisations managing the land for a wider range of ecosystem services and benefits.
10. Farm Assurance Schemes are voluntary schemes which establish production standards covering food safety, environmental protection, animal welfare issues - things deemed to be important by consumers. Could they be used to encourage natural flood management by farmers?
11. Changes to Good Agricultural and Environmental Condition could be used to require NFM on farms where appropriate.
12. Land may be bought or leased from farmers so that it can be used for flood risk management purposes. For example, White Cart for Glasgow.
13. 'Nurture Lakeland' – the Lake District initiative is where people (users of the park) are invited to make voluntary donations which in turn are re-invested back into the Lakes (akin to a voluntary user charge).
14. Environmental charities may be able to secure funding from various sources for natural flood management. For example, RSPB purchased Nigg Bay to allow coastal flooding on the land.
15. Catchment-wide bodies such as the Tweed Forum have been able to secure funding from a variety of private and public sources to plan and fund natural flood management measures in their area of interest.
16. Some farmers with the right information and support choose to implement natural flood management voluntarily, perhaps as part of an overall estate plan. This has happened with the MacRobert Estate in Tarland.
17. Agricultural consultants and advisers may be able to draw together a combination of funding, information and support that enables farmers to implement NFM.

What do you think would encourage farmers implement natural flood management measures?

*Wendy Kenyon and Jill Duglinson, Macaulay Land Use Research Institute, December 2010
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