

COMMUNITY LED FLOOD MITIGATION - 10 YEARS OF SUCCESSFUL IMPLEMENTATION BY THE MORAY FLOOD ALLEVIATION GROUP, SCOTLAND

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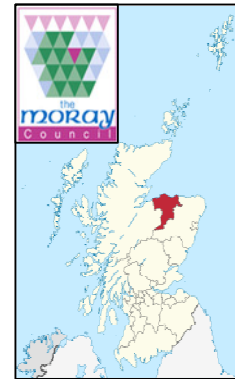
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Introduction

The local authority of Moray is located between Inverness and Aberdeen, and is quintessentially Scottish; famous for its Speyside malt whisky, salmon fishing and highland scenery.

Moray has the smallest population of Scotland's 32 Council areas and is rural in nature. Elgin, with a population of 25,000 is the capital of Moray and one of Scotland's oldest towns. Elgin has grown along the banks of the River Lossie for over 900 years. Moray communities have a long history of suffering from floods with 20 documented events dating back to 1755. 11 of the 20 documented flood events have occurred in the last 50 years, an indicative flood frequency of once every 4.5 years.



In 1997 severe flooding affected large areas of the United Kingdom, including Moray. All of Morays main communities were affected, with Elgin, Forbes and Lhanbryde the worst hit. Over 1200 people were evacuated from 400 homes and businesses. The region's economy and transport system were badly affected with both the main trunk road and railway line damaged and impassable for several days. Many minor rural roads were flooded isolating numerous small communities. Sadly one life was lost when an elderly gentleman had a heart attack waiting to be evacuated from his home. Council spent £3.5 million reinstating flood damage to their housing stock and insurance claims from individual business were as high as £30 million.



1997 Flooding in Elgin, Moray, Scotland

Following 1997, Council decided to adopt a long term approach to reducing flood risk. Council embraced the philosophy and approaches advocated in the influential UK Government sponsored Egan Report 'Rethinking Construction' (1998). The Egan report identified five key drivers of change: committed leadership, a focus on the customer, integrated processes and teams, a quality driven agenda, and commitment to people.

This paper highlights some of the key aspects of a 10 year programme of community consultation and engagement that reached 5,000 people and 1,000 businesses: The paper will discuss the range of engagement techniques utilised and how they helped deliver Scotland's largest programme of flood mitigation.

Moray Flood Alleviation Group

In 2001, following an extensive tendering process, the *Moray Flood Alleviation Group* (the Group) was established as a partnership between:

- The Moray Council,
- Consultant (Royal HaskoningDHV) and
- Contractor (Morrison Construction).



From day one the Group were co-located in Council offices (in Elgin, therefore within the study area and main catchment) to facilitate integrated team working, development of local catchment knowledge and programme acceleration.

The Group made an early and conscious decision to put the local community and key stakeholders at the heart of the flood risk management process. The Group believed that tapping into the community and stakeholder flood knowledge and mitigation ideas, concerns and aspirations would be essential to successful delivery and would ultimately reduce scheme costs and timescales. From day one the Group considered the community to be their client.

The Group set itself three high level objectives:

- To alleviate flooding for the communities of Moray.
- Build community infrastructure that works today and tomorrow – *"learning from the past, designing for the future"*.
- Achieve community investment legacy, not just flood mitigation.

The Group monitored its own performance via a range of 'soft' and 'hard' Key Performance Indicators (KPI) including several that were specifically designed to monitor community and stakeholder interaction and satisfaction. KPI's were scored monthly by all staff working in the Group and actions identified and taken by the Groups management team. Example, community orientated, soft KPI's included: "Community and stakeholder awareness of the schemes" and "Community and stakeholder satisfaction". Example community orientated, hard KPI's included: "Community and / or stakeholder complaints or commendations received".



The Moray Flood Alleviation Group, Cooper Park, 2002

Delivered Schemes

To provide the rest of the paper with as much context as possible, this section gives a brief summary of the flood schemes delivered by the Group since 2002.

Lhanbryde Flood Mitigation Scheme (FMS) - 2004



- Village suffered from flooding on average every 2 years during 1990's.
- Upstream storage basin and channel capacity improvements downstream.
- Trout pond / fishery incorporated into design at landowners request.
- 1 in 100 year ARI + climate change standard of protection.
- Protects 25 homes and 8 business properties.
- £1.4mn investment with a 1:1.5 Cost Benefit Ratio (CBR).

Forres Burn of Mosset FMS – 2008

- Town of Forres has a long history of flooding.
- > 500 homes, 50 businesses, a school, trunk road and main railway line at risk.
- Through town mitigation measures minimised to maintain historic setting and structures.
- 4.5mn m³ upstream flood storage basin (category A dam).
- Wetland and environmental habitat creation upstream and downstream of the dam.
- 200 year ARI standard of protection
- £8mn investment with a 1:8 CBR



Rothies FMS – 2010

- Severe flooding in 2003.
- 200 houses affected through flooding from three “burns” (creeks) that run through the town, as well as backwater flooding from the River Spey.
- Through town mitigation options constructed include channel widening, selective high risk property acquisition, levee walls and embankment as well as stream restoration and bridge blockage risk removal.
- 3 fishways incorporated into design to add environmental enhancement.
- 100 year ARI standard of protection.
- £20mn investment with a 1:3 CBR.



Elgin FMS – Under construction and due for completion in May 2015

- Flooded 11 times in last 50 years.
- 850 residential and 150 commercial properties at risk.
- Scheme concept is to reconnect the river with its natural corridor and floodplain: 'Room for the River'.
- Involved removing residential and commercial properties, removing defences immediately adjacent to the channel and 11km of new setback levees and floodwalls, channel widening, floodplain lowering and removal of hydraulic obstructions.
- £86mn investment with a 1:5 CBR.



Forres River Findhorn FMS – Under construction and due for completion in October 2015

- River Findhorn synonymous with the Highlands of Scotland has a long history of flooding the township of Forres.
- Nearly 1000 residences and 50 commercial properties affected by flooding.
- Scheme involves a series of setback flood levees allowing the river to use as much of its natural floodplain as possible whilst protecting property.
- £20mn investment with a 1:6 CBR.



The Burn of Mosset Flood Storage Dam (above) was tested just 2 months after completion and successfully attenuated a 1 in 100 year ARI flood event saving nearly 500 homes in Forres from inundation.

The Challenge and Scale of Ambition

The scale of the flood mitigation challenge in Moray was enormous, matched only by Council's appetite for taking an integrated approach to scheme development and a long term sustainable approach to reducing community risk. Key consultation related challenges that kept the team motivated included:

Scale and Nature of the Flooding – Flooding in Moray accounts for 3-4% of flood risk in Scotland. Catchment scale solutions were required in seven catchments ranging from 12km² to 800km², with a wide range of flood issues and mechanism and an even wider range of stakeholders and flood affected parties. Development of the flood mitigation schemes required consultation with 14 distinct communities.

Perception & Awareness of the Flood Problems and Potential Solutions – As is common, the general community perception was that the solution to the flood problems was relatively straight forward, quick and cheap to implement: simply 'clear out' / dredge the river.

Active Local Flood Action Groups – Several highly active, well connected and politically astute flood action groups existed.

Business Sector Pressure – Employment in many of the flood affected communities was dominated by a few large employers. There was a high (and vocal) risk of businesses either folding or relocating as a result of flood risk and damages and being unable to obtain flood insurance.

Funding and Local Affordability – As the smallest local authority in Scotland, Moray has a comparatively small capital expenditure budget. Competing infrastructure needs and plans included a trunk road by-pass for Elgin, new schools, a housing stock replacement programme and significant contaminated land remediation needs. Securing significant (80%) funding from the national (Scottish) government was essential to the schemes being implemented.

Council's Experience and Capability to Deliver Major Infrastructure – Key Council departments: planning, legal, estates and finance, had a lack of experience and capacity to deliver such large flood mitigation schemes / infrastructure investments. The appetite for the flood scheme development and such large investment was not evenly spread across all Council departments.

Political Pressure – Subsequent severe flooding in 2002 and near miss (bank full) events in 2004 and 2009 kept flooding high on the political agenda and pressure on the team to not only produce designs but deliver schemes and risk reduction. A flood alleviation sub-committee was setup by the Council in 2002 to maintain scrutiny and pressure on the programme of flood mitigation works.

Changes in Local Government – Several political cycles occurred during the life time of the project bringing with them changes to political landscape and funding priorities.

Environmental Legislation – Moray is an area of outstanding natural beauty and biodiversity. Many areas of the seven catchments are highly environmentally designated (National and European designations) for specific habitats and species including Atlantic Salmon, Otters, Pearl Mussels and Lampreys.

Media Attention and Scrutiny – The team encountered consistently high local and national media interest with varying degrees of journalistic accuracy.

Identifying the Consultation Community

Before being able to actively and effectively consult, it was first important to identify the full range of community and stakeholder groups that required engagement.

This is important because if you inadvertently miss a community or stakeholder group from your consultation process, there is a risk you spend a lot of time, effort and money consulting but ultimately still end up with scheme objections. This is particularly relevant in the context of the Scottish planning framework as even a single formal scheme objection can result in a Local Planning Inquiry, potentially costing the Council millions of £'s. Not being (sufficiently) consulted over scheme impacts could be deemed to be a legitimate objection.

With the above in mind the Group cast its consultation net wide. Key community and stakeholder groups consulted could broadly be categorised into 5 groups:

- Residents
- Businesses
- Statutory Regulators
- Non Statutory Organisations
- The Media

Residents – This involved consulting with the *community as a whole*, as well as *specific groups of affected residents* i.e. a cluster of properties / residents either flood-affected by a specific mechanism or by an impact of a mitigation option under consideration. Informal but very active and well organised *Flood Action Groups* also fell into this group. Individual Councillors were consulted on a regular basis as key influencers of the community.

Businesses – All business within the community were consulted in the same way as residents; to learn about their flood experiences, knowledge and ideas. Where possible, consultation effort was rationalised by meeting business representative groups such as *Chambers of Commerce* and *Rotary Groups*. A lot of time and effort was spent consulting one to one with businesses either flood affected and in danger of becoming bankrupt or potentially affected by flood mitigation measures.

Statutory Regulators – The flood mitigation process in Scotland requires statutory consultation with a long list of organisations including *The Scottish Government*, *Scottish Environmental Protection Agency*, *Scottish National Heritage*, *Historic Scotland*, *Scottish Water* and the *County Archaeologist*. In addition the key *Council Departments*: Legal, Estates, Planning and Finance, and the *Council Flood Alleviation Sub Committee* represented statutory consultees.

Non Statutory Organisations – This group of consultees was extensive, wide ranging and very scheme specific. Organisations that were at some point integral to the scheme approval process included *Network Rail*, *The Trunk Road Authority*, the *Royal Air Force* (Moray is home to two major air force bases), *WWF Scotland*, *Salmon and River Trusts*, *Walking / Rambling Groups*.

The Media – Immediate media interest in the Flood Group and mitigation schemes highlighted the media, in particular local (but also national) newspapers and TV as important consultees. The key aim of consultation with this group was to get 'on the front foot' and promote positive, accurate scheme information and messages rather than reacting (fire-fighting) against misleading or inaccurate and emotive articles. Several senior Group members undertook media training to be able to cope with the pressures of being on regularly on the spot.

Consultation Strategy

With a consultation challenge encompassing local and national government, regulators and media, seven catchments, 14 communities and an ever growing list of 'interest' groups it was decided early on that our consultation plan needed a *strategy*. The strategy consisted of an overall approach that if implemented stood the best chance of securing flood mitigation scheme consents, approvals and funding and importantly community backing. The following three measures formed the back-bone of our consultation strategy.

Dedicated Consultation Team

A dedicated consultation team was established in 2002 and co-located with the design teams and Council staff. The team's aim has always been to undertake '*early, meaningful and ongoing consultation to win community trust and progress the flood mitigation schemes*'. The team members have remained consistent during the 12 year lifetime of the project developing working relationships and trust within the communities. The team has fluctuated between 2 and 5 full time equivalent staff members, depending upon the stage of scheme development and consultation demand. Importantly, the consultation team leader was a highly experienced water engineer who had lived and worked in the area for over 30 years and subsequently was well known and respected throughout the community.

Scheme and Community Consultation Plans

The consultation aims, challenges and subtleties were different for each of the 5 flood mitigation schemes and each of the 14 communities affected. Recognising this, a considered and focused consultation plan was developed for each flood scheme at the outset of scheme development. The plan documented the likely consultation issues, challenges and opportunities, key groups or individuals with whom to consult, and the consultation approach most likely to be successful. The development of these plans recognised that from a consultation perspective a 'one size fits all' approach doesn't necessarily work. The consultation plans were kept as live documents and regularly reviewed and updated to maintain flexibility and to introduce new stakeholders and consultation measures as required.

Wide Range of Consultation Measures

Key to the consultation strategy and its success has been the use of a wide range of consultation measures, which have included:

- Public open / drop in events
- Formal public meetings
- Community newsletters
- Press releases and articles
- Interactive Website
- YouTube videos and animations
- Formal consultation documents
- Targeted Stakeholder working Groups
- Targeted Presentations
- One to one stakeholder meetings



The following link is to a You Tube animation explaining the Forres River Findhorn FMS in plain English:

http://www.youtube.com/watch?v=UsrZhTNcOeA&list=UU1CcVPHn4Zzs_wZJQ7NeJBw#t=271

Case Study - The Elgin Flood Alleviation Scheme - Community Consultation Strategies and Results

The following is an outline of the consultation strategy and results gained for the Elgin flood mitigation scheme, the largest ever developed in Scotland.

A series of *public open events*, ranging between 1 day and 3 days long, were run in 2001 to establish initial engagement with the community. The key aims of the events were to raise awareness of the project, its aims and objectives, challenges, programme (expectation management to a degree), and to tap into the communities flood knowledge of historic events, flood mechanisms, flow paths, flood depths, hydraulic model calibration material (photos and videos), data, rainfall records, and mitigation ideas. On average the events attracted 300 - 500 people a day demonstrating the communities interest in the flood scheme.



Further scheme awareness was achieved through *media articles, press releases, school visits and competitions*. The main idea with here was to reach as much of wider community as possible and promote positive messages about the scheme.

Influential individuals within a community were quickly identified and significant efforts made to consult with them and bring them along on the journey knowing they would help influence the community as a whole. This group included high profile Councillors, community leaders and elder statesmen. In one community the support of a retired RAF Captain proved to be pivotal to obtaining community backing to the preferred flood mitigation option.

Stakeholder working groups were set up between key statutory consultees i.e. Council departments, the Scottish Environmental Protection Agency and Scottish Natural Heritage to tackle specific known scheme development issues. The working groups were a big success as they not only streamlined the consultation process but allowed stakeholders to hear and understand each other's (often conflicting) policies, points of view, concerns, and aspirations. Generally speaking, the different parties in a working group would start the consultation process at polar opposites to each other, but through regular discussion and debate would begin to understand and respect each other's positions. Once that was achieved, stakeholders were willing to search for common ground and mutual scheme benefits.



A key constraint, only overcome through close collaboration within a stakeholder working group was the historic riparian setting of Elgin Cathedral (pictured below): built in 1224 by King Alexander II and surrounded by consecrated land.

Historic Scotland initially position was to formally object to any works in the cathedrals vicinity. But through a 2 year process of engagement and dialogue they became to understand the urgency for flood mitigation and how various mitigation options could be implemented in a manner sensitive to the vicinities historic, archaeological and landscape setting.

A '*long list*' of over 20 options (structural and non-structural measures) was identified through stakeholder and expert working groups. The list included 8 upstream flood storage sites, various channel diversion routes, flood walls and levees, property

removal, channel widening and floodplain lowering. It was an important consideration to ensure that all identified options were initially put on the table and given due consideration: given at least some 'air time' regardless of how obvious their end viability was. A lesson learnt from the development of previous flood schemes was that unless you table and document all possible options (however briefly) you leave yourself open to criticism for not doing so and potential back tracking (and associated additional cost and programme) to further justify the preferred option. Involving the community and key stakeholders in the mitigation option development and appraisal process adds considerable weight to scheme momentum, acceptance and chances of funding.


Formal consultation documents outlining the potential benefits and impacts of a rationalised 'long list' of mitigation options were written (using plain English) and distributed to the community and key stakeholders. Formal written consultation responses were invited and encouraged. Care was taken to provide balanced and accurate information on each scheme option under consideration including: number of properties and businesses potentially protected, community and environmental impacts and benefits associated with final scheme as well as during construction, scheme cost. Visualisations of the option were provided whenever possible to help the consultee understand how the scheme might look and work. The Group found this strategy to be very effective in drawing out scheme concerns and potential objections early on in the scheme development process, thus allowing time for them to be addressed. The act of asking consultees to formally write down their scheme preferences and concerns, rather than express them verbally in a meeting was very powerful.

The long list of options was also put to the community via a 3 day open / drop in event manned by key flood experts and consultation staff.

A *short list* of three options: upstream storage, river diversion, and works within the river corridor through town, were taken forward to detailed option appraisal and put to the community via an *interactive website* and *further public open events*. The dedicated consultation team worked 1:1 with potentially affected parties to explain the three options, why they had been shortlisted and their potential benefits and impacts. This step was vital as each of three options involved highly emotive aspects; for example, the river diversion option involved tunnelling under 300 residential properties and the works through the river corridor option involved the removal of residential and business properties and more regular inundation in some areas.

The preferred scheme was to undertake works through the town's river corridor, essentially reconnecting the river with its natural floodplain, removing hydraulic constraints and creating more room for the river. The scheme capital cost is £86mn (AUD\$155mn), which was 80% funded by National Government and 20% funded by Council. This level of funding does not occur with a one off funding submission. The Scottish Government were highlighted as a key consultee very early on and continuously consulted throughout the 5 year scheme development process. The scheme broke new ground from a design, planning and funding perspective, so the Scottish Government and the Moray Flood Alleviation Group worked collaboratively to produce the business case that would secure such a level of funding.




As with all flood schemes the water needs to go somewhere. The Elgin scheme passes more flow downstream. The downstream community included very wealthy, well connected estate owners able to fund their own legal defence. This issue was effectively managed through one on one consultation and additional detailed hydraulic analysis of the downstream effects of the flood scheme, in particular on the changes to frequency and severity of flooding downstream and any increased likelihood of downstream flood embankment overtopping and /or breaching.




Elgin Flood Alleviation Scheme


Cooper Park

JANUARY 2014



The upstream section of Cooper Park embankment



The new floodplain

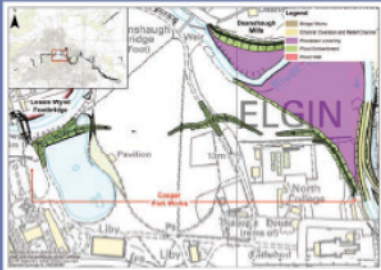
In total, three sections of earth embankment will run through Cooper Park, starting at Lossie Wynd Footbridge and ending at Brewery Bridge. The section upstream of Brewery Bridge was completed in Summer 2013.

Some of the paths in the park will be closed for pedestrian access until works are completed. However, temporary access paths are being provided.

The new floodplain has been constructed to reduce the energy in the River Lossie during high flows by increasing the width of the river.

Benefits

An area of more natural wetland habitat is being created by planting native trees, grasses and shrubs in the new floodplain. These include willow, alder, hawthorn and dog's-tail.



☐ Works are to be completed in Summer 2014

Typical consultation poster used at public open events

Conclusions

The following conclusion can be gleaned from the decision to put community consultation at the heart of the flood mitigation process:

- ✓ Whilst the programme of design work wasn't community led it was shaped, continuously challenged and backed by the community, such that there was nearly 100% "buy in" from the community at all phases of the project.
- ✓ A dedicated consultation team including water experts respected within the community was essential to achieving meaningful community engagement.
- ✓ Developing scheme and community specific consultation plans and deploying a wide range of consultation techniques was important of the effectiveness of the consultation investment.
- ✓ Community engagement lead to a higher degree of understanding of flood risk within the community, and the challenges associated with developing a mitigation scheme. Importantly the engagement also raised community awareness of how individuals, families, and communities can prepare themselves for future flooding to help manage "residual risk" in the instances where the design standard of a flood defence is exceeded.
- ✓ 'Community led' takes time and effort; a good example of the "Tortoise and the Hare". It can be frustrating and slow going at times, particularly at the early stages of engagement, but from the experience in Moray it definitely helped save time in the long-run by minimising re-work and lengthy legal / planning challenges.
- ✓ This important process was only possible due to the Council / Team commitment to an ongoing dialogue with the community and stakeholders.

Ultimately, adopting a community led approach; the Group have delivered five major fluvial flood mitigation schemes, with a total capital investment of over AUD\$200 million, from initial investigations through to construction in a 12 year timescale. The schemes protect over 2000 residential properties and 500 businesses and have left a legacy of community, recreational and environmental enhancement as well as flood protection.

References

1. Egan, J. (1998) Rethinking Construction: Report of the Construction Task Force