

Turning the tide on flooding

A WWF Scotland report



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WWF SCOTLAND

8 The Square, Aberfeldy
Perthshire PH15 2DD
Tel: +44 (0)1887 820449
Fax: +44 (0)1887 829453

1 Turning the tide on flooding

Flooding is becoming an increasing symptom of wider climatic changes in Scotland. This summer alone saw serious flooding in Inverness-shire, Perthshire, Glasgow and the Borders.

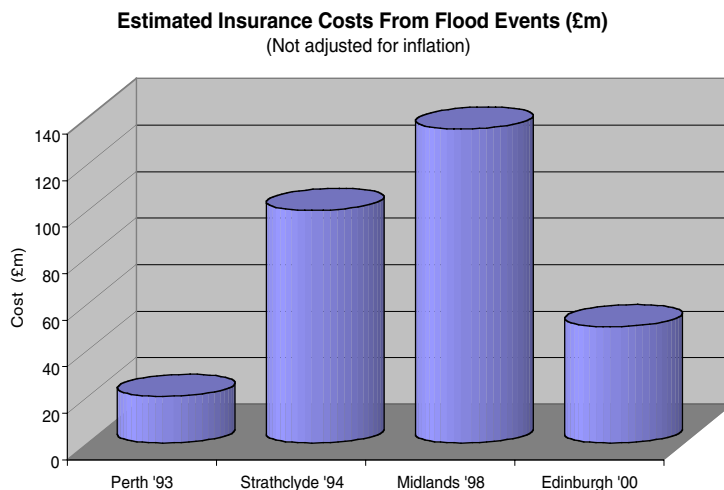
Despite all the dramatic pictures of streets turned into rivers and waterlogged houses over the summer, Scotland has not yet faced up to the fact that a sandbag and concrete response is no longer an option. It is time that we calculated the true costs of our current piecemeal, reactive approach and seized every opportunity to tackle the root causes of flooding.

1.1 WHAT ARE THE COSTS OF FLOODING IN SCOTLAND?

The cost of floods is ever increasing. The largest recent flood in the UK was in England and Wales in autumn 2000, with an estimated cost of £1,300m. Scotland has not experienced one single flood of the same magnitude in recent years but has been hard hit by devastating regional flooding. The Association of British Insurers estimates that in the last decade, the three largest floods in Scotland cost the insurance industry £170m.

The Scottish Executive has reported that around 170,000 properties are threatened by flooding in Scotland. Given that the average insurance claim for a flooded residential property is £28,000, homes worth nearly £50m are at risk from flooding.

In addition to insurance costs, there are other financial costs such as emergency services, travel disruption and damage to crops. There are no detailed calculations on these costs for Scottish floods, but for the autumn 2000 floods in England and Wales they totalled approximately 25 per cent of the total insurance costs, around £325m.



Source: Association of British Insurers

A final cost, often overlooked and difficult to quantify in economic terms, is the human cost of direct and indirect health impacts, loss of earnings etc.

Shettleston Floods, Summer 2002

"I've never known anything like this. The reality of our situation has not sunk in yet. What we have experienced is unbelievable."

"It's something you only expect to see on TV. What we have left we've packed into one suitcase."

David Cairns – local resident quoted in the Evening Times.

"There was nothing I could do. I was so helpless. The rooms quickly filled up. The water lifted the furniture off the floor. Everything began to float – chairs, tables, everything."

Rita Hendry – local resident quoted in the Evening Times.

1.2 CLIMATE CHANGE SCENARIOS

The UK Climate Impacts Programme 2002 indicates that, under the medium-high climate change scenario, by the 2080s winter precipitation in Glasgow could increase by 15 to 20 per cent. Along parts of the east coast of Scotland, the increase could be as much as 30 per cent.

Summer precipitation is projected to reduce by 20 to 30 per cent. However, drier summers do not necessarily mean less flooding: water runs off dry ground more quickly, especially in peat-covered areas, and the number of days of intense summer rainfall in Scotland may become more frequent. There could therefore be an increase in floods as drains and sewers struggle to cope with sudden peaks in water flow. The events in Glasgow and Inverness in summer 2002 are examples of localised summer floods that could become a regular occurrence in years to come.

More severe floods are predicted to occur more frequently in the future. A medium climate change scenario predicts that a 1 in 100 chance flood in any year could reduce to a 1 in 65-70 chance flood in any year by the 2020s, and to a 1 in 40 - 60 chance flood in any year by 2080s.

So what will this mean for ordinary people? We can expect a massive increase in insurance claims, increased insecurity as insurance gets more difficult and expensive, more travel chaos, lost lives, and damaged businesses.

1.3 WHO IS RESPONSIBLE FOR FLOOD MANAGEMENT IN SCOTLAND?

There is no one body with an overview of flood management in Scotland. Responsibility is divided between the Scottish Executive, local authorities, the Scottish Environment Protection Agency, Scottish Water, the emergency services and flood appraisal groups, but there are still major gaps. In the Clyde catchment alone there are 14 organisations with responsibility for flooding, excluding the flood appraisal groups and the emergency services. Even within the Scottish Executive, responsibility for flooding lies with separate engineering and planning units, rather than with the water unit, and focuses on concrete defence schemes. This division is mirrored in most local authorities. SEPA can advise local authorities on flood risk but often does not have the information it needs to do so, leaving flood risk assessments up to the developer. In any case each housing development is looked at separately, with no catchment overview. (see Who Does What? in Clyde case study).

The Scottish Executive provides 50 per cent of the cost of flood defence schemes, and authorises borrowing for the remaining 50 per cent. These grants are usually restricted to large 'hard' concrete schemes, often costing more than £250,000. The amount of central grant aid has tripled since devolution in 1999, and currently runs at nearly £10m per year. For smaller schemes, local authorities are expected to provide funding. 'Softer' flood alleviation, working with floodplains rather than straitjacketing them, or avoiding development on high-risk areas, is not budgeted for.

With no national overview in Scotland, flood management is reduced to over-reliance on concrete defences and flood warnings. This response to flooding tends to be reactive and piecemeal, with no attempt to effectively anticipate flooding, avoid building in high-risk areas, make the most of natural storage, and work with partners up and down the river to reduce flood damage.

1.4 FLOOD INSURANCE

One of the main drivers of change felt by the public is the availability of insurance to protect against flooding. In February 2001, the Association of British Insurers advised government that the guarantee of continued cover for residential properties and small shops will be withdrawn on 31 December 2002 unless:

- stricter planning guidelines and controls are issued, and
- satisfactory progress is made on the issue of flood defence work.

The ABI announced on 26th September 2002 that the guarantee would indeed be withdrawn at the end of 2002, owing to failure in England to meet the insurance industry's requirements. This withdrawal will affect Scotland equally.

Without insurance cover, there are major implications for mortgages and consequently property prices. These costs may well be borne by people in the poorest housing in high-risk areas.

1.5 PLANNING

Local authorities control building development on floodplains. To aid the decision-making process, Scottish local authorities, unlike those in England and Wales, can establish Flood Appraisal Groups (FAGs). FAGs were set up by the Scottish Executive National Planning Policy Guideline 7 – Planning and Flooding (NPPG 7). These groups now cover 93 per cent of the land area of Scotland, and have great potential to involve stakeholders, share information and set strong flood policies. These FAGs have succeeded in ensuring that consideration of flooding receives a higher profile within the planning process. Unfortunately the role of FAGs in taking a catchment overview is limited by the failure of NPPG7 to give them a clear role and membership, or a consistent approach based on sustainable flood planning. Crucially, neither they nor the development planning system can influence wider catchment land-use.

What is the best way of combating flooding?

There are two options available for dealing with floodwaters: either move it or store it. In natural, unaltered river systems, both these processes take place. Wetlands and washlands provide areas of flood storage, while water moves quickly through steep-sided areas.

Traditional flood protection has tended to focus on moving water, using expensive hard defences such as flood walls to protect specific areas, like the £23m wall built recently to protect Perth. This has often only led to problems being transferred further downstream. The fragmented responsibilities for flood protection and land ownership issues have worsened the situation. Unless these defences are adequately maintained they will not function properly, and they require an ongoing financial input in addition to sizeable initial capital costs.

Sustainable flood management, in contrast, aims to tackle flooding by looking at the bigger picture. By looking at a whole river rather than a particular hotspot we can reduce the overall pressures on a whole river system from farming, development or climate change. For example, preserving or re-instating natural floodplains upstream can help soak up floodwater before it spills into urban areas.

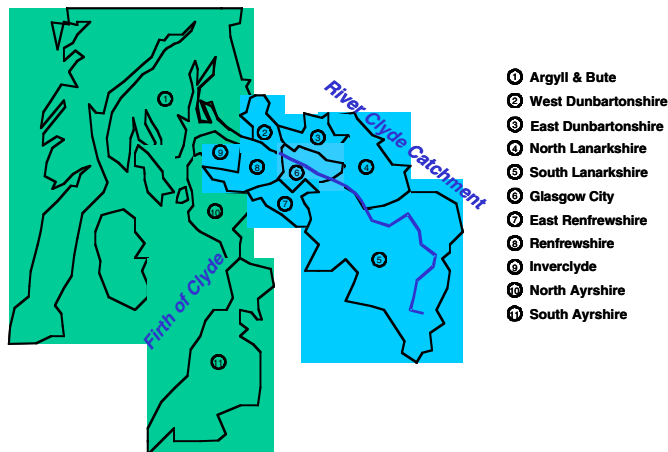
The following case study uses the Clyde to illustrate why Scotland needs to take this wider, catchment approach if it is to tackle the causes of flooding.

2 Case study – the Clyde: how sustainable is its flood management?

Setting the Scene

The River Clyde flows for around 100 miles from its source in the Southern Uplands, down through the former industrial heart of central Scotland to Glasgow and out into the Firth of Clyde.

On its journey from the hills to the sea it flows across many council boundaries and collects drainage from a large geographic area.



2.1 HISTORIC DEVELOPMENT OF THE RIVER CLYDE

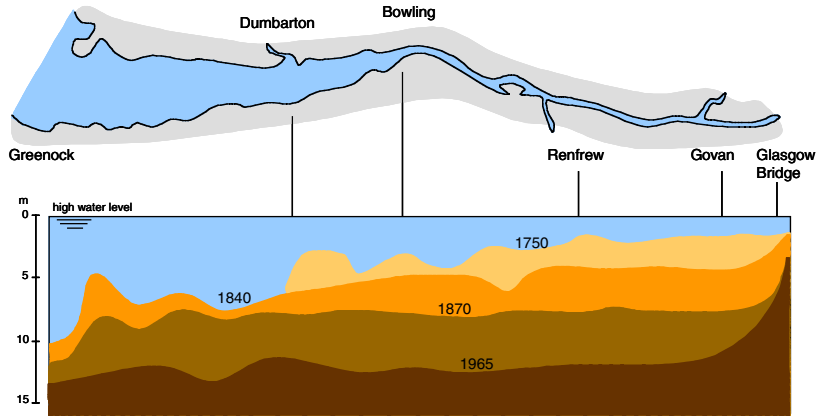
The River Clyde is one of the main arteries of Scotland, and has historically attracted development along its banks – drawn to the river as a means of transport, a source of water, fish and power, and the opportunity to farm its rich, fertile banks. As the Clyde and Glasgow in particular developed, the industrial and economic prosperity was achieved at the price of a much altered river in terms of shape, capacity and water quality.

The natural Clyde was a shallow river with shoals, which posed a problem for trade as ships were unable to navigate the river channel up to Glasgow. While ports were developed in the lower estuary it was not long before efforts were being made to deepen the river, achieved by narrowing the channel, building quay walls and by dredging. These alterations have changed, and will continue to affect, how the river responds to flood events.

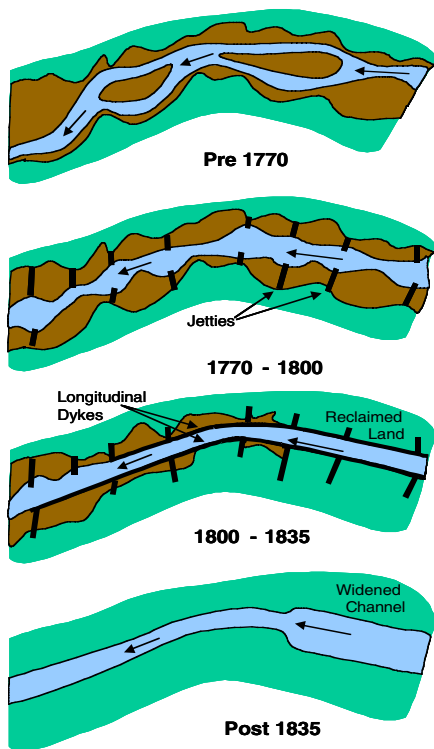
The Present Day Clyde

The River Clyde is in a transition period, and has been since the decline of shipbuilding in the 1960's. There is now a new impetus to regenerate the lower reaches of the river fuelled by large commercial and residential developments. There is also an increasing awareness of the possible effects of climate change, and the implications of major forthcoming legislation, all of which are

contributing to the need to improve the understanding of what flood risks are posed and how they can be best managed.



Effect of dredging on the bed of the Clyde
(adapted from 'Clyde Navigation', J. F. Riddell (1979))



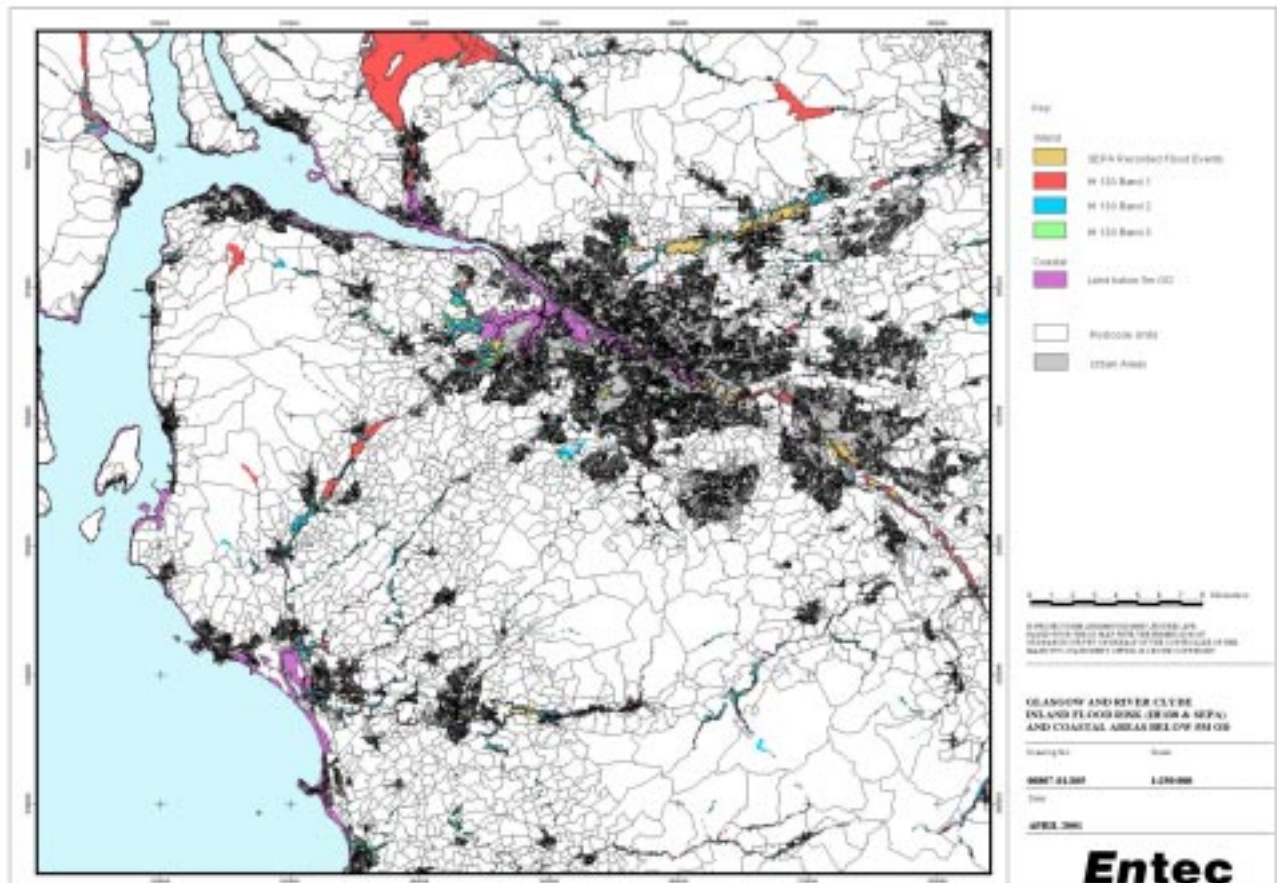
Development of the lower Clyde for navigation
(adapted from 'Clyde Navigation', J. F. Riddell (1979))

Flooding on the River Clyde

The threat of flooding from the Clyde is not a new phenomenon but something that generations of Clydesiders have had to face. The earliest record of the Clyde bursting its banks dates from 738 AD, and over the period 1780 to 1930 there were 12 flood events significant enough to

merit recording, equivalent to around one major flood event per decade. In recent decades we have seen widespread flooding in 1994, 1985 and 1977. If predictions of the effects of climate change are accurate, an increase in the frequency of flooding in the future is likely.

Glasgow and River Clyde inland flood risk (IH Report 130 and SEPA) and coastal areas < 5m



Some features of this map are based on digital spatial data produced by the Centre of Ecology and Hydrology, © CEH, © MAFF. The flood-risk areas have been generated using a generalised technique and should not, by themselves, be used to infer that specific areas are, or are not, at risk from inundation. Flood risk at any specific location may be influenced by local factors – not least flood defences – that have not been taken into account.

2.2 A PIECEMEAL APPROACH IS TOO HIGH A RISK

Flood risk in the Clyde area

The catchment of the River Clyde is home to 1.8 million of Scotland’s 5 million inhabitants, with over 600,000 living within Glasgow. Glasgow ranks fourth among UK cities at risk from flooding, with Edinburgh ranked seventh. Recent research for the Scottish Executive showed that around 23,000 properties are at risk from a 1 in 100 chance flood in any year from the River Clyde and its tributaries, with a further 23,000 properties at risk from tidal flooding in the Clyde estuary, out of a total number of around 780,000 properties.

The Firth of Clyde and Clyde Valley account for c.40 per cent of Scotland's GDP, around £193m. In Glasgow, 9,482 properties are believed to be at risk from a 1 in 100 chance flood in any year, of which 8,914 are residential. Extrapolating from the National Flood Insurance Claims Database estimate of £28,000 damage per house, a flood of this size could cost over £250m. The Clyde has been significantly altered over the centuries, especially over the past 250 years. This has been most pronounced in the urban areas, where developers have tried to increase the movement of water through developed areas by constructing hard defences at the expense of floodplain storage areas.

Work carried out for Glasgow City Council suggests that floodwall overtop is likely to be caused by tides, although high river flows would worsen the situation, particularly if flows in tributaries or drainage networks backed up. Low-lying land in the Clyde estuary is at risk from tidal inundation, as are various locations along the Inverclyde and Ayrshire coast. **It is important to recognise that, while flooding cannot be prevented, its impacts can be significantly reduced by tackling the causes of flooding within the catchment, choosing the best flood protection options, and by accurate flood forecasting.**

2.3 TYPES OF FLOODING

River flooding occurs when a river breaks or overtops its banks, inundating the surrounding area, as recently seen so dramatically across central Europe. The key factors are intensity and duration of rainfall and initial catchment conditions; a wet catchment has no extra capacity to store water, so river flows peak faster.

Coastal/tidal flooding can occur during exceptionally high tides or during storm events when low pressure systems result in storm surges that batter our coast lines and funnel water up our estuaries. Wind action causes increased wave heights which also contribute to coastal flooding.

Urban flooding: drainage networks underlying urban areas have been developed to drain surface runoff and foul water. These can be old, and have insufficient capacity if they have not been upgraded to reflect increased development. They are generally designed to carry runoff from a 1 in 5 chance storm in any year, i.e. with a 20 per cent chance of occurring in any given year. During more intense storm events urban drainage networks can be overwhelmed and surcharge, causing flooding.



Flooding on a natural floodplain.



Flooding on a developed floodplain

2.4 FRAGMENTED RESPONSIBILITIES

In addition to the 14 separate organisations with responsibility for flooding in the Clyde catchment, there are three FAGs (Lower Clyde & Estuary, the Cart and the Kelvin) with an umbrella FAG covering the old Strathclyde region. However, North and South Lanarkshire do not play a part in this FAG, despite the fact that they are the critical upstream councils with potential for floodplain storage. While Glasgow City Council is involved with FAGs for the Rivers Cart, Kelvin and Clyde, there is no similar stakeholder involvement in consideration of the River Clyde in Glasgow as there is in other cities in Scotland, such as Edinburgh, Dundee, or Aberdeen.

2.5 FLOODING - WHO DOES WHAT?

In Scotland our approach to managing flood risk is fragmented with various organisations having a statutory responsibility on flood related issues.

The Scottish Executive

- overall responsibility for national flood prevention policy;
- provides local authorities with resources to address flood risk management

Local Authorities

- responsibility for the provision of and maintenance of flood defences, and maintenance of watercourses under the Flood Prevention and Land Drainage Act (Scotland) 1997
- responsible for planning issues and have control over development in areas at risk from flooding
- provide emergency support during flood events
- provide reception centres and temporary accommodation for the flood victims evacuated from their homes
- co-ordinate and lead the clean up operation

Scottish Environment Protection Agency (SEPA)

- responsible for flood warning
- maintains a network of river flow and rainfall measuring stations
- predicts where and when flooding is likely to occur
- notifies the emergency services and local authorities to allow an emergency response to be organised
- advise local authorities on flood risk with respect to planning issues

Scottish Water

- responsible for the urban drainage network in Scotland,
- provides water supply and deals with our waste waters and surface water runoff.

Emergency Services

- Police are responsible for co-ordinating the emergency response, taking the lead role in organising the emergency response and rescue effort, with assistance from the Fire Brigade, rescue services, local authorities and SEPA.

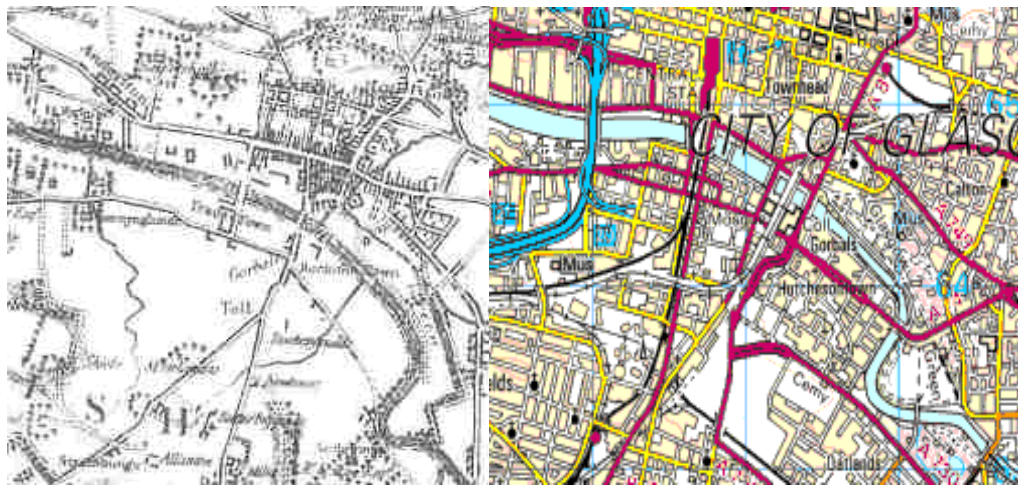
Flood Appraisal Groups

- can be convened by local authorities, to provide a wider forum to discuss flooding issues;
- can include representatives of agencies with flooding responsibilities, insurers, developers, community groups and other interested parties.

2.6 TO MOVE OR TO STORE?

How can flooding be managed?

There are two main ways of dealing with floodwaters: either move it or store it. In natural systems, both occur, but will be dependent upon local conditions. As catchments become more urbanised and require to be protected from flood risk, the traditional approach has been to concentrate on moving the water through and away from the area. Too often the bigger picture has not been examined, and defending one area has led to increased flooding elsewhere. Sustainable flood management aims to ensure that where increased flooding does occur, it happens in areas designated and prepared for flooding.



Glasgow city centre (1793)

Even by this stage, the river has been deepened and confined by quay walls to aid navigation. However, there still remains an area next to the river where there are no roads or buildings, providing a limited floodplain for the river.

Glasgow city centre (2002)

The river still flows through Glasgow, although the river has been significantly altered. The depth of river has increased through dredging, although this has now ceased in the upper reaches. The quay walls have all been raised and a tidal weir has been constructed at Glasgow Green to maintain water levels in the park. The limited floodplain seen in the 1793 map is no longer present. Roads, industry and housing have extended all the way to the edge of the riverbank.

Methods for moving floodwaters

- Flood defence walls or embankments: built to contain the river although this can increase the flood risk downstream as no water has been stored.
- Diversion Channels: Diverting river from natural course providing additional storage and habitat enhancement. A recent example at Maidenhead on the Thames cost £100 million, for an 11.6km channel.
- Restoring floodplains: floodplains act to convey water, although due to the large areas, flow is not great and depths shallow.

Methods for storing floodwaters

- Designated floodplains: allowing areas to flood, providing storage, more natural river movement and habitat benefits.
- Wetlands, washlands and flood meadows: natural attenuation features.
- Tidal barrier: can be closed across an estuary to stop high tides affecting developments within the estuary. (Thames Barrier). Tidal barrage will permanently exclude the tide from an estuary (Cardiff Bay Barrage)

The Clyde has a variety of engineered flood defences, the vast majority of which involve encouraging the movement of water. These are typified by floodbanks and floodwalls where rivers pass through built-up areas. These areas have no real potential for storage any more, and are highlighted on the main map overleaf.

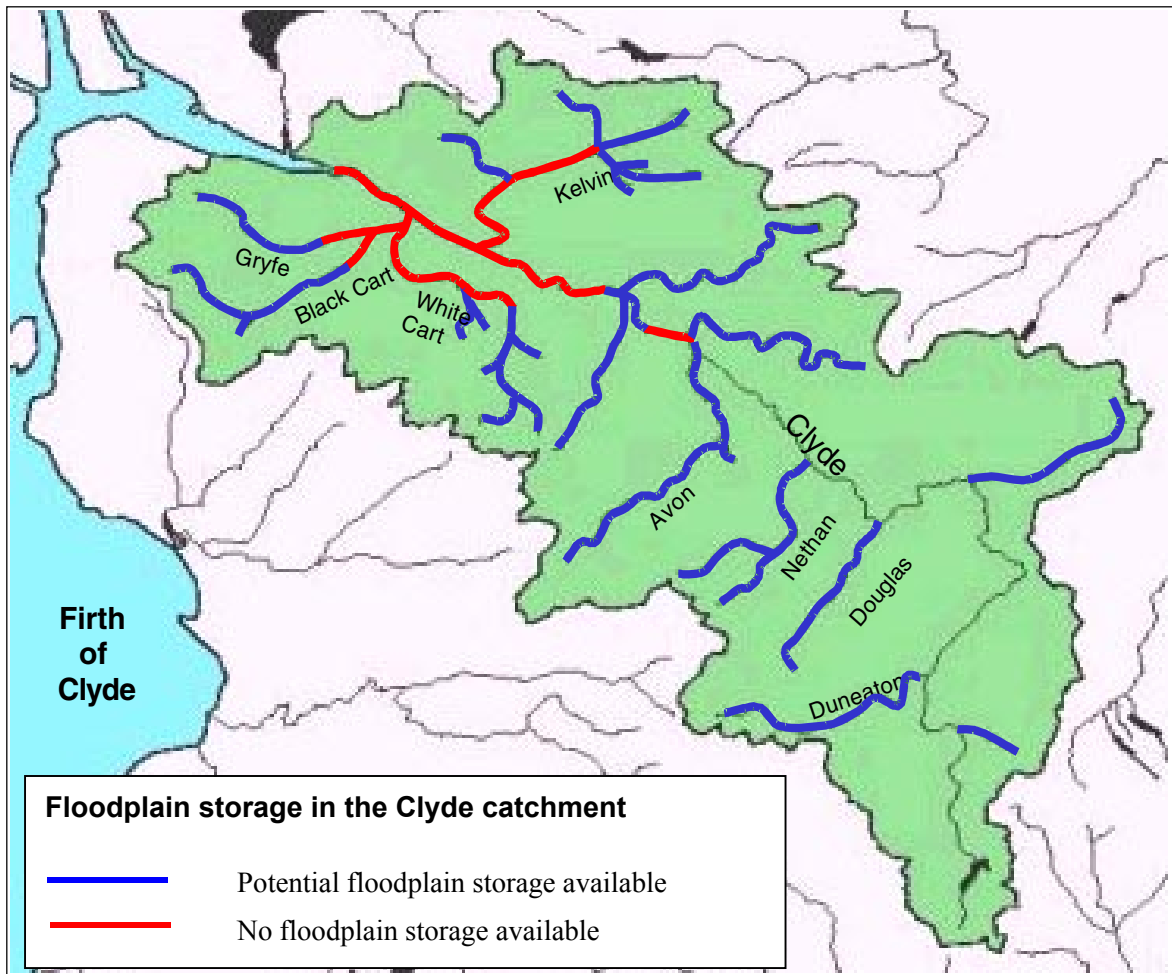
The surviving floodplain could be managed much more productively to reduce the impact of flood events. As experts predict greater and more frequent flooding, the additional protection required can at least partly be gained by improved use of the existing floodplain – or sustainable flood management.

2.7 FIRTH OF CLYDE

SEPA has operated a tidal flood warning scheme since 1999. Tide levels are monitored, and in conjunction with weather forecasts, computer models are run to predict extreme tides and storm surges. When extreme levels are predicted, warnings are issued.

Main flooding issues for the Clyde catchment

- Scotland's largest populated catchment
- Interaction of river and tidal extremes in Glasgow
- Siltation reducing channel capacity and changing flow regime
- River flooding from tributaries of Clyde, often in urban areas
- Tidal flooding in the estuary and in the Firth of Clyde
- Overwhelming of the urban drainage networks (especially older networks)
- Extensive geographic area, solutions may not be within local authority boundary



White cart flood alleviation scheme

A flood warning system has been operational on the White Cart since 1990, and is operated by SEPA.

Glasgow City Council has recently announced a £20m programme to alleviate flooding on the White Cart, which will involve a cross-council integrated catchment management plan addressing flood risk, habitat enhancement, recreation and planning.

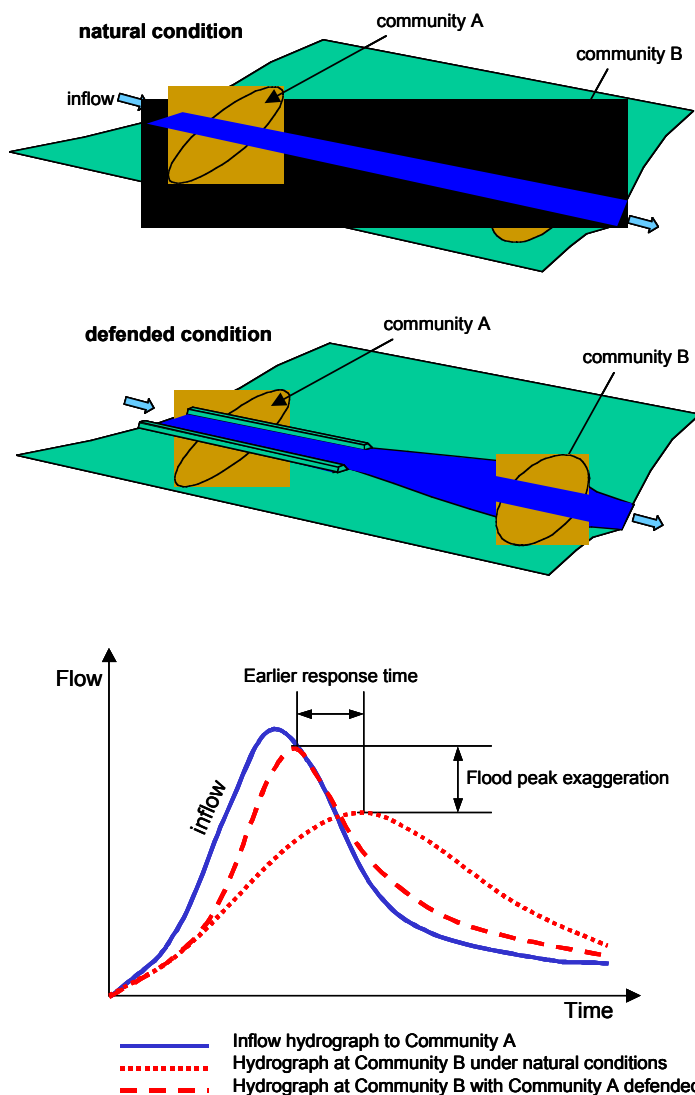
Upper Clyde catchment

Much of the Upper Clyde catchment has a floodplain which has been developed for agricultural use rather than housing or industry. There is the potential to make better use of these available areas to limit the overall effects of catchment flooding.

Examples of areas where flood attenuation can be provided at present are Strathclyde Park on the Clyde and Castle Semple, Lochwinnoch and Barr Loch (also operated as an RSPB reserve) on the Black Cart.

2.8 WORKING WITH RIVERS – THE BENEFITS OF SUSTAINABLE FLOOD MANAGEMENT

Sustainable flood management promotes a holistic approach to flood risk. This ensures that when protecting one particular area, another area downstream suffers increased flooding. In the figure below, Community A naturally floods when Community B does not. However, by providing flood defences to Community A, the floodwaters move more quickly through to Community B, causing flooding to occur. The hydrograph shows that the flood peak at Community B is increased and occurs more quickly than before as a result of constructing the hard flood defences at Community A. This highlights the wider issues that require to be considered, and where hydrological and hydraulic modelling can help our understanding of uncertainties.





Sources: 'Learning to Live with Rivers', Institution of Civil Engineers (2001)

Present day costs of addressing flood risk from the Clyde

Recent work undertaken on behalf of Glasgow City Council estimates that 15km of flood walls and embankments, between 0.75 and 1.75m above the height of existing quay walls, would be required to protect the city against a 1 in 100 chance river flood coupled with a 1 in 200 chance tidal flood in any one year. Estimated costs for this work vary from £22 to £40 million, depending on the level of replacement required for the existing walls. Another flood protection possibility for Glasgow is the construction of a tidal barrier downstream of Erskine, which is estimated to cost in excess of £100 million, and is outside the boundary of Glasgow City Council.

To put these costs into perspective, in 2000/2001 the Scottish Executive spent £4 million on major flood defence schemes, spend predicted to increase to £14 million by 2004/2005. Given that Scotland's GDP is around £500 million, resourcing a suitable flood alleviation project for the Lower Clyde alone will be a major commitment. The Clyde catchment generates 40 per cent of the national GDP, so it is vital that appropriate sustainable action is taken.

2.9 OPTIONS FOR FLOOD RISK MANAGEMENT

What Does The Future Hold?

High emissions scenarios predict that by 2050 the 1 in 100 chance river flood in any year will overtop the banks of the Clyde from Daldowie down to the city limits.

By 2050, sea level rises ranging from 80mm to in excess of 300mm have been predicted for Scotland's coastline, and increasing storminess will have associated storm surges and wave action. Under the most severe climate change scenario, a 1 in 100 chance tidal flood in any year would lead to overtopping at Pacific Quay in Central Glasgow.

2050: Traditional Approach Only

Given the predicted rise in the frequency and magnitude of both river and tidal flooding, the traditional hard engineering flood protection route will involve increasing the height of existing defences and building new defences to protect areas that are likely to be affected by flooding in the future.

Using estimated costs for Glasgow, it would cost approximately £2,000 per property for tidal flood prevention. Given that around 93,000 properties in Scotland are estimated to be at risk of tidal flooding, it would cost in the region of £188 million to protect these properties with hard defences. A similar financial investment is likely to be required to provide river flood defence walls for the further 77,000 properties at risk from river flooding.

Hard flood defences are a static approach to flood risk management, with a nominal design life of 50 years, a fixed level of protection and further investment required for their maintenance. The flood risk, changing climate and landuse are all dynamic, and the design parameters are constantly moving. Increasingly high flood walls are not an environmentally or economically sustainable option, isolating communities from the river, resulting in losses in amenity value, habitats and species, as well as natural flood alleviation potential.

2050: Sustainable Flood Risk Management

River flows during the 1994 floods on the Clyde were out of bank at Daldowie for more than 48 hours and a floodplain of 182km² filled with water to a depth 0.3m would have been required to store this water until the danger of flooding passed. This equates to approximately 10 per cent of the total Clyde catchment area to prevent flood damage, but a smaller area could provide vital flood attenuation.



River flows on the Clyde and time for the river levels to peak could be significantly reduced by improved management of upstream storage on the floodplains of the Clyde and its tributaries. While such floodplain storage measures will not directly help to solve Glasgow's tidal flooding problems they can attenuate the effects of high river flows coinciding with extreme tidal events. Floodplains are nature's way of dealing with flooding, and allowing areas to inundate can have many beneficial effects, in addition to flood attenuation, including habitat and biodiversity enhancement and the creation of wildlife reserves for community use. However, this requires a strategic approach across land uses, all tributaries and the estuary - something which is not in place at present.

It is difficult to quantify the cost of using floodplains rather than providing hard defences. Under the 2001 Rural Stewardship Scheme, 5.5km² of floodplain is managed on the agreement that flooding will not be prevented, at with a management fee of £2,500/km² (£25/hectare) per annum to landowners. Given that Scotland's total inland floodplain, not allowing for flood defences, covers 2,950km², there is plenty of potential for use of environmentally sensitive flood alleviation options. A catchment – wide approach to flooding should ensure that flood risk can be managed strategically and proactively, allowing the best option and the most sustainable balance to be reached.

3 Turning the tide with the Water Environment and Water Services Bill

The example of the Clyde is hardly unique to Scotland. It may represent the catchment with the greatest population, but the problems identified are repeated throughout Scotland.

In summary, these problems are:

- fragmented responsibilities for flooding, with no national overview and no role for catchment flood management;
- planners and Flood Appraisal Groups limited to the area within the planning system;
- continuing development of flood risk areas for housing due to weak flood policies in local and structure plans;
- inadequate flood risk information, with the developer often carrying out the flood risk assessment because SEPA lacks the necessary data;
- reactive, piecemeal approach, with total reliance on costly concrete to deal with the symptoms of flooding, leaving urban areas to clean up the mess;
- no proactive catchment overview to tackle the causes of flooding;
- no allocation of resources to restore natural floodplains;
- no links between the river and its estuary to tackle coastal and river flooding together; and
- poorly designed houses and inadequate drainage systems, with Scottish Water inadequately supported to improve infrastructure.

This failure to properly anticipate flooding in Scotland is only storing up more damage to the economy and more misery for homeowners in years to come. The example of the Clyde illustrates that flooding cannot be prevented, only better managed. However the impacts of flooding can be significantly reduced by sustainable flood management, using information on the whole catchment to design appropriate flood protection measures for the whole river.

WWF believes that Scotland is at a crossroads in terms of how we manage flood risk. We have the opportunity to deal with the problem at source, tackling flood risk alongside other water issues, such as water quality, land use, biodiversity and recreation. Alternatively, we can continue with the present fragmented approach, protecting one stretch of river at the expense of downstream inhabitants because no one stands back to look at the bigger picture.

The Water Environment and Water Services Bill, which transposes the European Water Framework Directive into Scots law, has the potential to provide for a whole catchment approach to all water matters.

Currently, there are serious shortcomings within the Bill, which could mean flooding is side-stepped. WWF is concerned that this could mean Scotland will end up with a Bill that takes a minimalist approach and stores up costs to the taxpayer in coming years. It is not enough simply

to 'manage' the existing fragmented system within the new legislation. What is required is a complete overhaul of flood legislation, flood defence funding and responsibilities.

In order to really make a real difference to flood management within the Water Environment and Water Services Bill, WWF is calling for:

- 1 A national flood strategy for Scotland, identifying responsibilities for a sustainable catchment overview.
- 2 A national River Basin Advisory Group for Scotland, consisting of all major stakeholders, to help SEPA to implement this strategy through the national River Basin Plan.
- 3 A network of Sub-Basin plans and Sub-Basin Advisory Groups covering the whole of Scotland, allowing for Flood Appraisal Groups to input to local flood plans.
- 4 Support and resources for floodplain storage, rather than just for hard flood defences
- 5 Support and commitment to a clear, strong role for Flood Appraisal Groups.

The Scottish Executive is increasing the resources being made available for flood management schemes from £4m in 2000/1 to £14m in 2005/6. This is taxpayers' money that needs to be spent on putting the necessary provisions for sustainable flood management in place. The Water and Environment and Water Services Bill is a unique opportunity which we must not miss. The security of the inhabitants of 170,000 homes at risk from flooding in Scotland depend on it.