The Somerset Levels and Moors Flood Action Plan

A 20 year plan for a sustainable future

"We cannot let this happen again" Prime Minister, David Cameron, 13th February 2014

The prolonged wet weather and subsequent flooding in Somerset began in mid-December 2013. Within the Levels and Moors over 150 properties are now flooded internally and 11,000 hectares of agricultural land remain under water. Over 200 homes in several communities have been cut off, some for more than two months.

On 27 January the Secretary of State for Environment, Food and Rural Affairs, Owen Paterson, visited Somerset to see the effects of flooding. He challenged Somerset to develop an Action Plan for a long-term sustainable future for the Somerset Levels and Moors.
This is the Plan that was prepared by a broad partnership of local and national organisations, building on the extensive work already undertaken and the views articulated by local communities. It covers the catchments of the rivers Parrett, Tone, Axe and Brue.
Local communities and partners have agreed the vision for the Somerset Levels and Moors, namely:

> *We see the Somerset Levels and Moors in 2030 as a thriving, nature-rich wetland landscape, with grassland farming taking place on the majority of the land. The impact of extreme weather events is being reduced by land and water management in both upper catchments and the flood plain and by greater community resilience.* (Reference: The Somerset 'Task Force', 2014)

Managing the impacts of floods and achieving the right amount of water, at the right time, in the right locations across the Levels and Moors is going to be increasingly challenging, as weather patterns change. Because water management on the Levels and Moors is complex, how we can achieve these outcomes will need to be an integrated mix of actions across the whole catchment which both impact on the likelihood of flooding and make us more able to cope with it. We will never be able to stop flooding completely.

Determining the long term sustainable future for the Somerset Levels and Moors (SLM) will require careful assessment of the options and evidence and difficult decisions around investments and how the community can adapt. It will need work to understand and agree what is an acceptable level of risk and what is a reasonable standard of protection for people, property, agriculture and the environment. It will also critically need to set out the case for why such intervention is fundamental to smooth operation of the economy in the area and the wider South West. This will need to look to the long term, at least 20 years ahead, to respond to likely future pressures. This reflection must better involve the local community but also involve understanding what that means for investment choices affecting others both elsewhere in Somerset and across the country.

For ease of understanding we have grouped the Actions in our plan into different types of activity:

Risk reduction actions:

- Dredging and river management
- Land management – recognising that what happens in the upper and mid catchment has an impact on the lowlands
- Urban run-off

Mitigation actions:

- Infrastructure resilience (road, rail, sewerage, power and telecommunications)
- Building local resilience

Some actions we can get on with now and we will be able to see real results in the first year. There are others that we have a good understanding of, we know they will have an impact, are relatively cheap and although currently not funded, we can see how existing funding mechanisms can be tapped relatively easily and quickly. But there are others, and they are all expensive, that might have significant impact where the situation is far more complex and challenging because:

- The most cost effective mix of flood management measures that will work is unclear
- The precise mix of flood management and infrastructure resilience actions that is most cost effective is unclear

As a result, a number of different possible actions are included in this plan that could form part of the solution to reduce the frequency, duration and impact of floods. Ensuring we have a better understanding of the relative cost effectiveness of these and blending proposals together to create the most acceptable and fundable package will require careful partnership work during the first year of the Action Plan. This will include working in partnership to develop new approaches for long term funding of management work on the Levels and identifying additional and innovative sources of funds to deliver elements of the plan. Detailed assessments and business cases will need to be produced to make the case for some of the investment choices, including how they compare to other projects across the country.

HOW WILL THE PLAN BE DELIVERED?

This Plan must result in real action and changes on the ground. Throughout this plan, we have identified a number of actions which will make a real difference to flooding on the Levels and Moors. We have worked closely with our partners and Government over the past six weeks to identify where options exist and choices need to be made. The Action Plan is directly aligned with the Strategic Economic Plan, which has flagged up flooding and water management as a priority. The challenge now for us all is to ensure that the actions within this document are delivered for those communities and business within the Somerset Levels and Moors.

In order to take this plan forward therefore, a renewed, coordinated and joined-up approach to addressing flooding and resilience issues upon the Somerset Levels and Moors is required. This will, by necessity, need to bring together Government, its Agencies, the heart of the South West Local Enterprise Partnership, Somerset's Local Authorities and the wider community and stakeholders. In doing so, there will be opportunities to develop new approaches to the management of the drained areas of the Levels and Moors and the wider catchment, and for enhanced local leadership.

But to take new and innovative approaches, this body will require not only local leadership but also need to:

- Incorporate a new way for all agencies both local and national to work together to identify the best possible package of actions;

- A recognition that funding flood risk management activities can avoid costs not just in repairing damaged infrastructure but also in avoiding the need to raise or redesign roads, railways and statutory undertakers' equipment;

- A recognition that the whole catchment has a role to play and that water management in our upland catchment and urban areas needs to be an integral part of the plan; and

- Investment in resilience, for when we do experience flooding.

National government has provided additional resources to respond to the situation in Somerset, with £10m from Defra for flood risk management, £10m from DfT for transport work, and £0.5m from CLG for community resilience. In addition, Somerset business, farms and households are eligible for support under a variety of national level flooding recovery programmes. Furthermore prior to this plan local partners had identified over £1.5m towards future flood risk reduction work.

Somerset County Council is committed to leading the further development and implementation of this plan, ensuring full engagement with local and national partners and engage with the community to build consensus and agree which actions should be implemented and how the community can increase its own resilience.

THE PLAN ACTIONS

SECTION 1

DREDGING AND RIVER MANAGEMENT

Effective management of the rivers, ditches, pumping stations and other structures is vital for all aspects of life on the Somerset Levels and Moors. It reduces the frequency, duration, depth and extent of flooding events. Managing water levels is essential for facilitating life on the levels, whether enabling farming, protecting the local economy and wider infrastructure assets, or maintaining the high value environmental sites that are central to the character of the Levels. It requires both one off investment to ensure the system is working effectively and most importantly regular ongoing maintenance.

Dredging of the Rivers Parrett and Tone has been identified locally as a key element in addressing future flood risk, and especially reducing the duration of flooding. Dredging can restore the system to the channel capacity put in place in the 1960s but it will need regular long term maintenance to keep rivers flowing well.

The use of the Sowy and King Sedgemoor Drain, combined with pumping at Beer Wall and Dunball to relieve pressure in the Rivers Parrett and Tone has been tested in late February 2014. This is a deliverable and effective flood management tool and a key priority of this plan is to undertake work to assess, identify funding for, develop and deliver approaches to ensure this option is available in the future.

There are other ways to reduce the frequency and duration of floods across the Levels and Moors including raising riverbanks and changing how and where floodwater is stored. In the longer term the development of a tidal barrier or sluice on the River Parrett below Bridgwater will be an important contribution to managing flood risk to Bridgwater, potentially reducing the amount of silt entering the Parrett and Tone from the Sea. It will also protect 17,500 properties within the town, both homes and businesses, and one of the county's key service and economic centres. More work is needed on the technical design of this project to see what difference it would make to floods on the Levels and Moors, and to see whether the existing long term funding plans can be accelerated, to allow the project to be built earlier than currently envisaged. There have been proposals for a possible Bridgwater Bay Barrage, which would be primarily a tidal energy generation project. However a developer has yet to come forward and the flood risk benefit of this would need to be explored as proposals are developed.

The public consultation has resulted in a number of innovative ideas, including some different engineering solutions, some questions about the maintenance of pen levels and river restoration, including learning from the Dutch. All of these ideas will need further consideration before they can be developed or costed.

OUTCOME	ACTION	WHEN	HOW MUCH DOES IT COST	WHO LEADS IT?
Reduce duration and/or frequency of flooding Maintain access for communities Ensure strategic transport connectivity	Dredge 4km of River Tone upstream of Burrowbridge and 4km of the River Parrett below their confluence at Burrowbridge, to 1960s river profile.	To start by end March 2014 (conditions permitting)	£5.7m	EA/Defra
Reduce duration and/or frequency of flooding Maintain access for communities Ensure strategic transport connectivity Maintain special characteristics of SLM	Maintain rivers and small watercourses to achieve conveyance most effectively	ongoing	Currently £2m per year (reviewed annually)	EA, IDBs, and landowners
Reduce duration and/or frequency of flooding Maintain access for communities Ensure strategic transport connectivity Maintain special characteristics of SLM	Additional maintenance including maintaining newly dredged profiles	On-going	£1.2m per year	New Somerset rivers board
Reduce duration and/or frequency of flooding	Review effectiveness of temporary operations and if appropriate install permanent infrastructure to enable temporary pumping sites at Dunball Sluice and Northmoor as well as Bridgwater Taunton Canal for future use	By autumn 2014	£2000k	EA
Reduce duration and/or frequency of flooding	Consider making permanent existing temporary local protection e.g. at Aller, Westonzoyland and others	By end 2015	£500k	EA and others
Reduce duration and/or frequency of flooding Maintain access for communities	Repair and reinstate existing river and flood banks and spillways Review and where appropriate Implement small scale ring bank improvements e.g. Thorney village and Thorney Pottery	By end 2015	£3m-11m £150k	EA, IDBs and others,
Reduce duration and/or frequency of flooding	Expand existing river models to assess effectiveness of actions and identify most cost effective options	By end March 2014	£500k	EA

Maintain access for communities Increasing resilience to flooding Maintain special characteristics of SLM	Review impact of existing water level management plans on 2013/14 flood event	2014/15	Staff time only	IDBs and NE
	Develop a Flood Risk Management Strategy for Levels and Moors including actions from other workstreams	2014/15	£250k	EA, IDBs NE and LAs
	Review the effectiveness and identify locations of further dredging across the Levels and Moors	2014/15	£25k	EA, IDBs NE and LAs
Reduce duration and/or frequency of flooding	Enhance role of voluntary rhynesmen to inspect, undertake small scale maintenance activities and liaise with the IDBs and SCC to identify where riparian owner works are required, ensuring local knowledge of drainage network is captured and retained.	2014/15	£10k	SCC/IDB/Community
Reduce duration and/or frequency of flooding Maintain access for communities Ensure strategic transport connectivity Maintain special characteristics of SLM	Sowy/Kings Sedgemoor Drain Capacity Improvements: Develop options for increasing the capacity of the Sowy/Kings Sedgemoor Drain system Undertake appropriate road works to enable the River Sowy channel to be widened. Deliver an effective scheme to increase capacity of the Sowy/Kings Sedgemoor drain system	 Autumn 2014 2014	 £25k £2m £6m+	EA, SCC and other local partners
Reduce duration and/or frequency of flooding Maintain access for communities Increasing resilience to flooding Maintain special characteristics of SLM Business confidence and growth	Review design options for Bridgwater tidal barrier/sluice	By summer 2014	£10k	EA
	Discussions to identify approaches to accelerate the build programme and financing of the barrage/sluice	By end 2014	Staff time only	SDC, EA, central government
	Build Bridgwater tidal barrier/sluice	By 2024	£27-30m	SDC, EA and developers/investors
Maintain access for communities Strategic transport connectivity Reduce duration and/or frequency of flooding	Develop future governance and funding model for local flood and water management – a 'Somerset rivers board' - working with local partners, including EA, IDBs and relevant stakeholders	Proposals by end 2014 In place by 2015/16	£100k+	Requires partnership approach

LAND MANAGEMENT

Every farm and every stream has a part to play in water and flood management in Somerset. Farming lies at the heart of Somerset's rural economy, employing 10,000 residents and worth in the region of £200m per annum. The county has varied and complex soils that support a wide range of farming, from intensive cropping (potatoes) and dairying but elsewhere only support extensive grassland systems for beef and sheep.

Scientific evidence[1] shows that how land is managed can affect flood risk and sediment transport, and also has a major influence on water quality, biodiversity and drought resilience, although it is recognised that changed land management practices would not have lessened the impact of an event on the scale of the floods this year. Effective land management through the entire catchment can make a real difference to flood risk in local areas and have a significant effect on sediment at the catchment level. Securing benefits in the upper catchment is particularly important. A range of activities can contribute – improving soil management and reducing erosion, harvesting rainwater on farms, intercepting overland flows, slowing the flow in watercourses, restoring and creating wetland areas that absorb and store water, woodland planting and management. The internationally important environmental and wildlife sites on the Levels are central to the character of the area, and have been supported through on going environmental stewardship schemes targeted at maintaining and enhancing wet grassland in the floodplains.

To maximise the potential for land management to contribute to the overall enhancement of the catchments, by reducing flood risk and soil erosion, improving water quality and environmental management, there is need for an expansion of the existing farm advice and support package to assist and encourage land managers with making the necessary changes. This must build on existing programmes, such as Catchment Sensitive Farming and environmental land management schemes that are already widely accepted and respected by the land management community. This expanded programme needs to be aligned to local priorities and must cover the whole catchment, from adaptation in the floodplains of the Levels to its headwaters.

OUTCOME	ACTION	WHEN	HOW MUCH DOES IT COST	WHO LEADS IT?
Increase resilience to flooding Reduce duration and/or frequency of flooding Maintaining special characteristics of the SLM	Somerset partners to pilot, with support from Defra, a new approach to Catchment Sensitive Farming that covers flood risk management as a well as water quality, through integrated advice and support to assist land managers, including: • Encouraging adoption of a range of practices that intercept and retain water, reduce run off and erosion and maximise the benefits from natural flood management actions required throughout the catchments. • Supporting adoption of more flood resilient farming systems,	Package put together by Sept 14 Operational by January 2015	Approx £0.6m pa (of which £150-200k will come from EAFRD for skills and farmer support) in addition to existing CSF funding	Partnership of NE and FWAG/RSPB/ SWT/NFU/CLA/R oyal Bath & West

[1] Summarised in the Construction Industry Research and Information Association (CIRIA) report C719 (2013)

	voluntary adaptation, restructuring and relocation of farm businesses. • A locally administered capital grant fund (to be supported by the Royal Bath and West Society) • Explore the potential of delivery through locally defined Nature Improvement Areas, ecosystem services and off-setting approaches.			
Reduce duration and/or frequency of flooding	Slow the flow in watercourses, from woody debris dams in tributaries to restoring river meander	From January 2015	Approx £0.35m pa	Partnership of FWAG/RSPB/ SWT/NFU/CLA
Reduce duration and/or frequency of flooding	Review current High Level Stewardship schemes at their 5 year break clauses and agree adaptations to take account of flood protection benefits where the benefits are deemed significant.	From 2015	With current funding	NE
Reduce duration and/or frequency of flooding Maintaining special characteristics of the SLM	Ensure that next agri-environment scheme (NELMS) takes into account benefits from natural flood management. Encourage take up and use of environmental land management schemes, including woodland planting	Ongoing	With current funding	NE, IDBs, Forestry Commission with FWAG/ RSPB / SWT / NFU / CLA
Reduce duration and/or frequency of flooding	Put in place simplified approvals process to allow land managers to carry out work on the minor watercourses and ditches, where there is no increase in flood risk and within a strategic framework	By September 2014	Staff time	SCC, EA and IDB
Increasing resilience to flooding Maintaining special characteristics of the SLM	Pilot a locally operated Payment for Ecosystem Services scheme delivering a reduction in local flood risk, carbon flux, conservation of peat soils and water quality.	March 2014, operational 2014/15	Approx £0.03m in total	Partnership of NE / IDB & FWAG/ RSPB / SWT / NFU / CLA?
Reduce duration and/or frequency of flooding	Defra will consider how best to secure flood risk benefits in the forthcoming decisions on approaches to all Common Agricultural Policy (CAP) funding	March 2014	Staff time	Defra
Increasing resilience to flooding Maintaining special character of the SLM	Examine innovative mechanisms such as developing a Community Land Management Trust to support a Land Swap/ Transfer/Purchase Scheme.	March 2015	Staff time	SCC, EA, NE

URBAN WATER MANAGEMENT

Rainfall in developed areas often falls on hard impervious surfaces such as roads, roofs and pavements so it runs off fast and cannot infiltrate into the ground. This can increase the risk of flooding, particularly locally. This is why the planning system requires that new developments do not increase flood risk either by slowing down run off and increasing infiltration within the development or adjacent to it often through incorporating Sustainable Drainage Systems (SuDS). These involve the use of such mechanisms as permeable paving, soak aways, swales and holding ponds.

The current National Planning Policy Framework states that any new development must not make flooding downstream worse and it also must take into account future climate change. Thus new development often provides betterment – at least in the shorter term, and no worsening of the situation in the long term. The Flood and Water Management Act 2010 will establish the SuDS approving bodies (SABs). In this area the SAB will be Somerset County Council who will have statutory responsibility for approving Drainage Applications and in some cased adopting the approved drainage systems.

This does not mean we should be complacent. Development across Somerset must continue if the county is to remain an economically sustainable community. We need to ensure that all policies and standards going forward are sufficiently robust for the future. The action plan suggests a review of current national policies (in light of the local extreme events), to ensure that this position is maintained.

Studies have shown that run off from the developed areas is perceived to be a more significant contributor to flooding than it actually is (see Appendix A, Environment Agency 2014). This is the case even though, in the more distant past, developments were constructed without SUDS. However, there is an opportunity across the county for individual businesses and home owners to improve drainage locally and decrease run off where it does cause a problem, by putting in place things such as permeable paving, green roofs etc. The plan includes an action about retrofit schemes where run off is identified to be an issue, and an action about working with local partners to provide and promote advice to individuals or businesses who wish to implement schemes.

OUTCOME	ACTION	WHEN	HOW MUCH DOES IT COST	WHO LEADS IT?
Reduce duration and/or frequency of flooding	SCC as the Lead Local Flood Authority will provide an easy to use online source of expert guidance on the design and delivery of sustainable drainage systems (SuDS) for planners and developers. This will include examples of success, and bespoke advice for major sites.	By end 2014	Funded business as usual	Somerset County Council
Reduce duration and/or frequency of flooding	LPAs with Somerset County Council will determine* whether national SuDS Approving Body standards are sufficient for the requirements in Somerset and whether more robust standards are needed. A new	Review by March 2015	Funded business as usual	SCC, LPAs and CLG

	Supplementary Planning Document (SPD) will be produced, if required, to meet district and local needs. *following enactment w.e.f. October 2014			
Reduce duration and/or frequency of flooding	Somerset County Council as the SAB will provide advice to people and businesses so they can reduce runoff from existing premises and developments.	ongoing	Funded business as usual	Somerset County Council
Reduce duration and/or frequency of flooding	Authorities will work with public and private organisations that occupy large areas to encourage them to use permeable materials and install SUDS when they replace or maintain hard surfaces.	ongoing		DEFRA/SCC/ LPAs
Reduce duration and/or frequency of flooding	All Somerset LPAs will review their planning policy with regard to flooding and if necessary develop local policies (in line with National Planning Policy Framework) in light of recent extreme events in Somerset. This will include consideration of what development within the flood plain is admissible. All Somerset LPAs will review their condition compliance / enforcement processes to ensure that any flood risk mitigation measures covered by condition / S106 Agreement is delivered.	2 – 5 years	Funded business as usual	LPAs
Reduce duration and/or frequency of flooding	Local Authorities will maximise the opportunities to reduce downstream flooding whilst delivering planned growth. They will identify and deliver strategic flood mitigation sites upstream of developments including the planned flood alleviation reservoir between Wellington and Taunton.	2016-19	£10 - £20m but depends on size of scheme – likely to include substantial contributions from developers and possible CIL but other public funding streams will be required e.g. LEP funding	LAs
Reduce duration and/or frequency of flooding	SCC (as Lead Flood Authority), LPAs, EA and Wessex Water will identify hotspots with a high risk of urban run off and put in place appropriate schemes and identify funding to tackle the problems	2015	Dependent on size and number of schemes	SCC, Local Authorities, EA, Wessex Water via the Regeneration Directors' Group
Reduce duration and/or frequency of flooding	Wessex Water will improve the performance of combined storm overflows in Bridgwater to reduce the volume of spill by 50% and undertaking some integrated urban drainage in Bridgwater	By 2020	£16m	Wessex Water

RESILIENT INFRASTRUCTURE

The flooding of the Somerset Levels and Moors in 2012 and 2014 has seen major disruption to transport. Some communities have been cut off for weeks at a time. There has been major disruption to the road network with several A roads blocked, causing disruption and delay to peoples' travel and consequent costs to business; initial estimates of impacts are in the region of £100m. The strategic road and rail routes into the South West peninsula have been cut. Other important infrastructure was affected, with 57 BT telecommunications boxes under water and waste water treatment not possible for some isolated communities.

Effective infrastructure and transport links are vital both for individual communities and for economic prosperity and growth and the delivery of Nationally Significant Infrastructure Projects. We aim to ensure:

- A recognised community should have at least one access road, or if that is not possible, easy access to alternative means of transport
- Maintain strategic connectivity into and through the county
- Infrastructure at risk should be able to recover more quickly from flooding
- Where routes are likely to be subject to flooding the resilience of agreed alternative routes should be strengthened

There are short term actions that can both reduce flood risk and increase access, putting the road network back to a good state following the impact of the floods. There are a range of longer term actions that can increase the overall resilience of the transport infrastructure, which in some cases need to be considered alongside flood risk management measures to ensure maximum effectiveness and value for money as part of the wider consideration of a sustainable long term future for the Levels and Moors (see Section 2 on "Assessing the long term choices and options").

OUTCOME	ACTION	WHEN	HOW MUCH DOES IT COST	WHO LEADS IT?
Maintain access for communities Reduce duration and/or frequency of flooding	Deep clean of system, including review and survey of gullies and culverts	By April 2015	£1.7m	SCC/Highways Agency
Maintain access for communities	Pre-placed flood gates and signage (for diversionary routes) for roads that are at risk of flooding	By winter 2014	£75k	SCC
Maintain access for communities Strategic transport connectivity	Repair and resurface damaged roads (44km), using materials and road marking more resilient to flooding, allowing faster recovery in the future. Also to include maintenance to key rights of way	By winter 2014	£1.6m	SCC

Maintain access for communities Reduce duration and/or frequency of flooding	Implement minor flood alleviation management schemes e.g. to reduce road flooding of the strategic network	ongoing	£200k in 2014	SCC
Increasing resilience to flooding Business confidence and growth	Assess risk and as necessary implement flood alleviation measures at National Grid's Bridgwater electricity substation and Western Power's substations	2-5 years	Funding secured via Ofgen. Settlement subject to categorisation of risk to the site.	National Grid, Western Power
Increasing resilience to flooding	Assess risk and as necessary implement flood alleviation measures to ensure that mains water supply is unaffected by, or can be maintained in, a flooding event	2-5 years		Bristol and Wessex Water

BUILIDNG LOCAL RESILIENCE

Resilient communities are the cornerstones for protecting local lives and livelihoods. Somerset has a long tradition of self help, and we need to build on that, sharing experience of what works and work together to innovate and ensure excellence across the county. This is about helping people help themselves and each other to reduce vulnerability to future flooding events. Everyone needs to know what is expected from others and what to do for themselves; for example local residents can help themselves by installing flood gates and boards and through moving electric sockets and wiring above flood levels. Often grants are available for this type of work.

The first stage is to support people to re-establish their day to day lives, business connections, farming practices and community way of life, which have been so affected by the prolonged floods in 2014. The second stage is to work with households, businesses and landowners to prepare and adapt for possible future flooding.

OUTCOME	ACTION	WHEN	HOW MUCH DOES IT COST	WHO LEADS IT?
Increasing resilience to flooding	**During Recovery** Deliver a dedicated programme of targeted support to help individuals, farms, businesses and neighbourhoods to recover, including help to access resources and advice from existing and future Govt. and local agency programmes including the Somerset Community Foundation. Citizens Advise Bureau, and partners to Somerset Emergency Voluntary Agencies Group (SEVAG). • Local Authorities to administer local allocations from Government Flood Support Schemes. EG Repair and Renew grants; council tax rebates; NNDR Hardship Relief schemes; plus local schemes as agreed by each local authority (eg council tax, NNDR, loans and grants). • Ensure local access and take-up of other forms of support eg Farm Recovery Fund (DEFRA); Specialist agricultural and small business advice from banks; Rural Business Support Scheme • Continue to offer support to neighbourhoods / parishes to review and create local flood plans. • Establish sustainable funding and support for CRISP – Community Resilience in Somerset Partnership.	now	Individuals, farms, businesses are able to apply to national schemes for support	LAs through Somerset Civil Contingencies Partnership and Local Resilience Forum
Increasing resilience to flooding	**Somerset Resilience Website –** CRISP to continue their work t**o** improve existing website presence to provide a comprehensive and easy to access information source for resilience, linked to flood risk information	By autumn 2014	£15k	LAs through Somerset Civil Contingencies Partnership

Increasing resilience to flooding Business confidence and growth	**Build household, farm, business and neighbourhood level flood resilience** – support locally led action to plan, design and implement solutions to increase resilience, community preparedness and to adapt (including voluntary relocation). Use and learn from best practice for example through LGA network; National Flood Forum, the new national Community Prepared hub and Defra community resilience pathfinder projects. To include Flood Plans, small scale flood mitigation/protection schemes and equipment/boats to increase local resilience . Formalise the role of the Community Resilience in Somerset Partnership (CRISP) and provide sustainable funding and governance arrangements.	Over next 3 years	£100k/yr £100k one-off	Somerset Civil Contingencies Partnership / Local Resilience Forum; supported by Sector led schemes.
Increasing resilience to flooding	**Ensure households, farm, business and neighbourhoods can obtain affordable and comprehensive insurance** – including advice to households on available insurance through the new national Flood Re approach.	2014		Defra
Business confidence and growth	Help ensure Somerset is seen as good place to do business as well as ensure tourism businesses become more resilient to flooding	now	£250k to support local tourism and marketing activity – one off	Tourism Businesses/ STA/Somerset Chambers of Commerce

SECTION 2 – COMPLEX, INTERRELATED AND UNFUNDED

ASSESSING THE FLOOD RISK LONG TERM CHOICES AND OPTIONS FOR A SUSTAINABLE FUTURE FOR THE SOMERSET LEVELS AND MOORS

Determining the long term sustainable future for the Somerset Levels and Moors (SLM) will require careful assessment of the options and evidence and difficult decisions around investments and how the community can adapt. It will need work to understand and agree what is an acceptable level of risk and what is a reasonable standard of protection for people, property, agriculture and the environment. It will also critically need to set out the case for why such intervention is fundamental to smooth operation of the economy in the area and the wider South West. This will need to look to the long term, at least 20 years ahead, to respond to likely future pressures. This reflection must better involve the local community but also involve understanding what that means for investment choices affecting others both elsewhere in Somerset and across the country.

There is a complex interaction between different major capital investment opportunities which would be funded from a range of different central and local government groups as well as the private sector and other funders. Some of these opportunities are shown in the table below.

Currently it is not known if flood risk to rail and road routes is more cost effectively delivered by raising transport routes or managing the river system differently. These options need to be considered together to provide good evidence on the most effective and best value approaches, and how to maximise the funding opportunities from a range of potential sources. The testing of options requires improvements to the hydraulic model of the Somerset Levels and Moors and assessment of costs for all the different options. An initial assessment can be delivered by the autumn.

The possibilities and options for adapting to changing pressures, including changing land use and buying out properties must also be considered as part of the overall assessment. Future maintenance of any capital schemes will also need to be planned for.

The immediate action flowing from the plan is to ensure the assessment of these options is carried out by autumn 2014, and to work with the wider community to reach a shared view on the best approaches to a long term sustainable future for the Somerset Levels and Moors. This will be a key task in the delivery of the plan, and a central role for the future delivery body.

The development of the new flood risk management plans and the review of the impact of existing water level management plans on this year's flood event will provide good evidence to underpin this work, supported by improving the existing computer river model to assess the impact of a range of options.

OUTCOME	OPTION	HOW MUCH DOES IT COST?	WHO LEADS THIS?
Maintain access for communities Strategic transport connectivity	Raise level of the A361 (East Lyng to Burrowbridge) - Feasibility study - Estimate of cost of work	Initial estimates suggest c.£1.55m c.£25m+ depending on scheme and EA linked solution	Requires local and central government partnership approach as local government could not afford to fund this scheme alone
Maintain access for communities Strategic transport connectivity Reduce duration and/or frequency of flooding	Raise level of the A372 – Othery to Aller (7 bends) and to allow larger culvert for Sowy channel (to be taken with River Sowy improvements below) - Feasibility study - Estimate of cost of work	Initial estimates suggest c.£1.05m up to £16m – there may be more innovative solutions including underpumping or aqueducts which may be cheaper	Requires local and central government partnership approach as local government could not afford to fund this scheme alone
Maintain access for communities Reduce duration and/or frequency of flooding	Design and implement road raising schemes to ensure access for Muchelney and other communities	Initial estimate £650K based on raising the road to the south of Muchelney	Requires local partner and DfT to determine effective and cost-effective solution.
Maintain access for communities l-t	Feasibility and assessment studies to identify key priorities for road schemes to ensure local access and delivery of schemes	Scheme value dependent on number and location of schemes to be taken forward.	Requires local and central government approach
Reduce duration and/or frequency of flooding Maintain access for communities Maintaining special characteristics of the SLM	Improve pumping capacity and operation, including upgrading Northmoor pumping station as appropriate.	£3.5m	EA and other local partners
Reduce duration and/or frequency of flooding Business confidence and growth	Further local protection e.g. ring banks, around communities	£2.5m	EA and other local partners
Reduce duration and/or frequency of flooding Maintain access for communities Maintaining special characteristics of the SLM	Additional dredging, identified as effective of key locations (other than the 8km near Burrowbridge), across the catchment, and implement as appropriate	£2.5m + ongoing costs of £100k pa	EA and other local partners

Reduce duration and/or frequency of flooding Maintain access for communities Maintaining special characteristics of the SLM	Improve the condition and raise floodbanks and spillways	£10m	EA and other local partners
Reduce duration and/or frequency of flooding Maintain access for communities Maintaining special characteristics of the SLM	Setting back defences to increase river channels and create floodplain within widened river channel	£3m	EA and other local partners
Reduce duration and/or frequency of flooding Maintain access for communities Maintaining special characteristics of the SLM	Spreading floodwater across the moors more evenly eg. Improved Lyng cutting	£2m + ongoing costs of £200k pa	EA, IDB and other local partners
Reduce duration and/or frequency of flooding Increase resilience to flooding	Create temporary flood storage areas particularly in the mid catchments – 500 ha within 20 years	£7m over 20 years	EA and other local partners
Maintain access for communities Strategic transport connectivity Reduce duration and/or frequency of flooding	Production of an economic impact study of the 2014 event to support related funding bids and provide a shared evidence base for future usage	£30k	Requires partnership approach
Strategic transport connectivity	A303 improvements to increase resilience, following Highways Agency feasibility study	To be determined	Highways Agency
Strategic transport connectivity	Network Rail to identify best value options for ensuring the resilience of 4.5 miles stretch of railway between Taunton and Bridgwater and to implement the findings	Initial estimates suggest 1m raise c£110m 2m raise c£132m	Network Rail