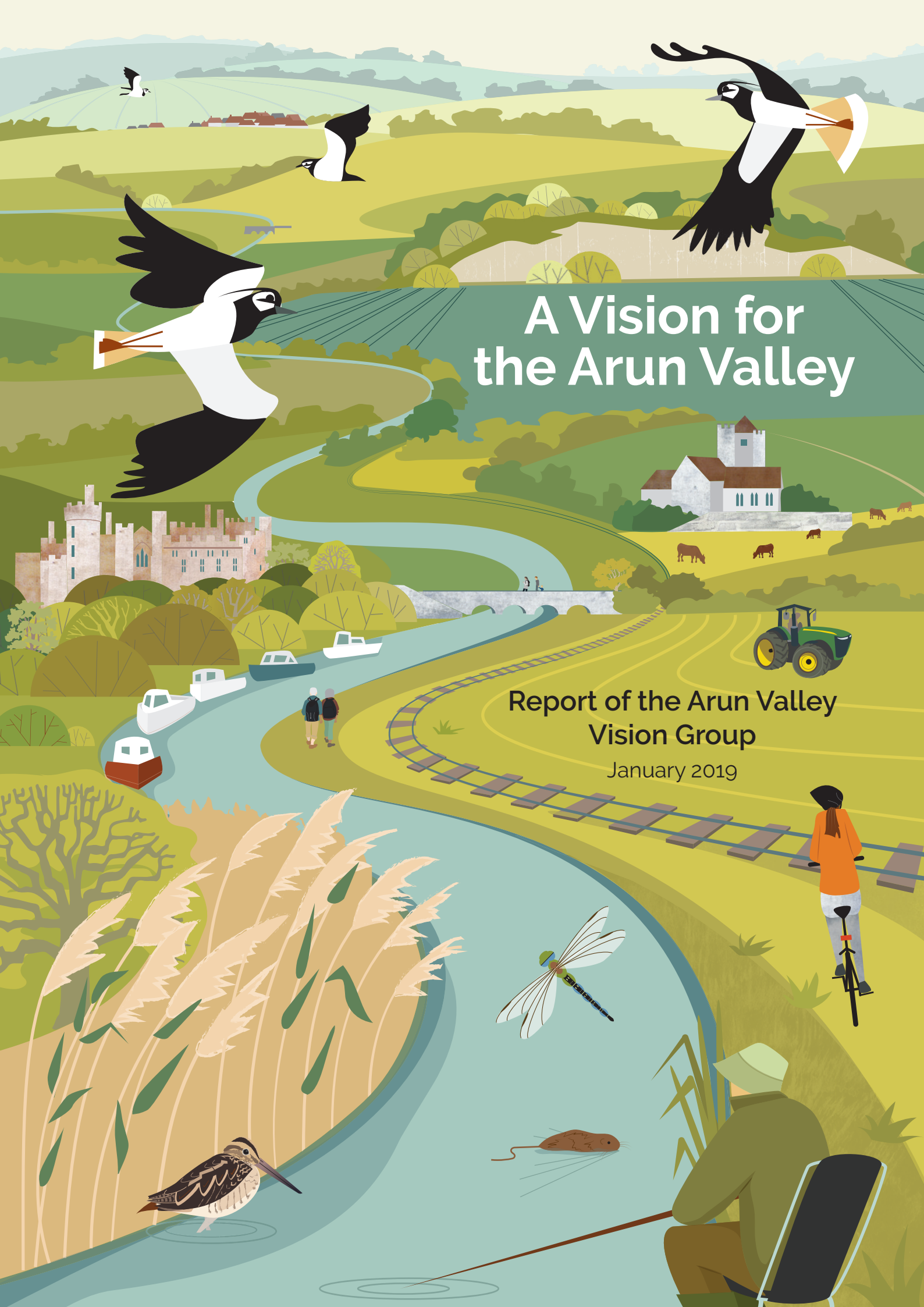
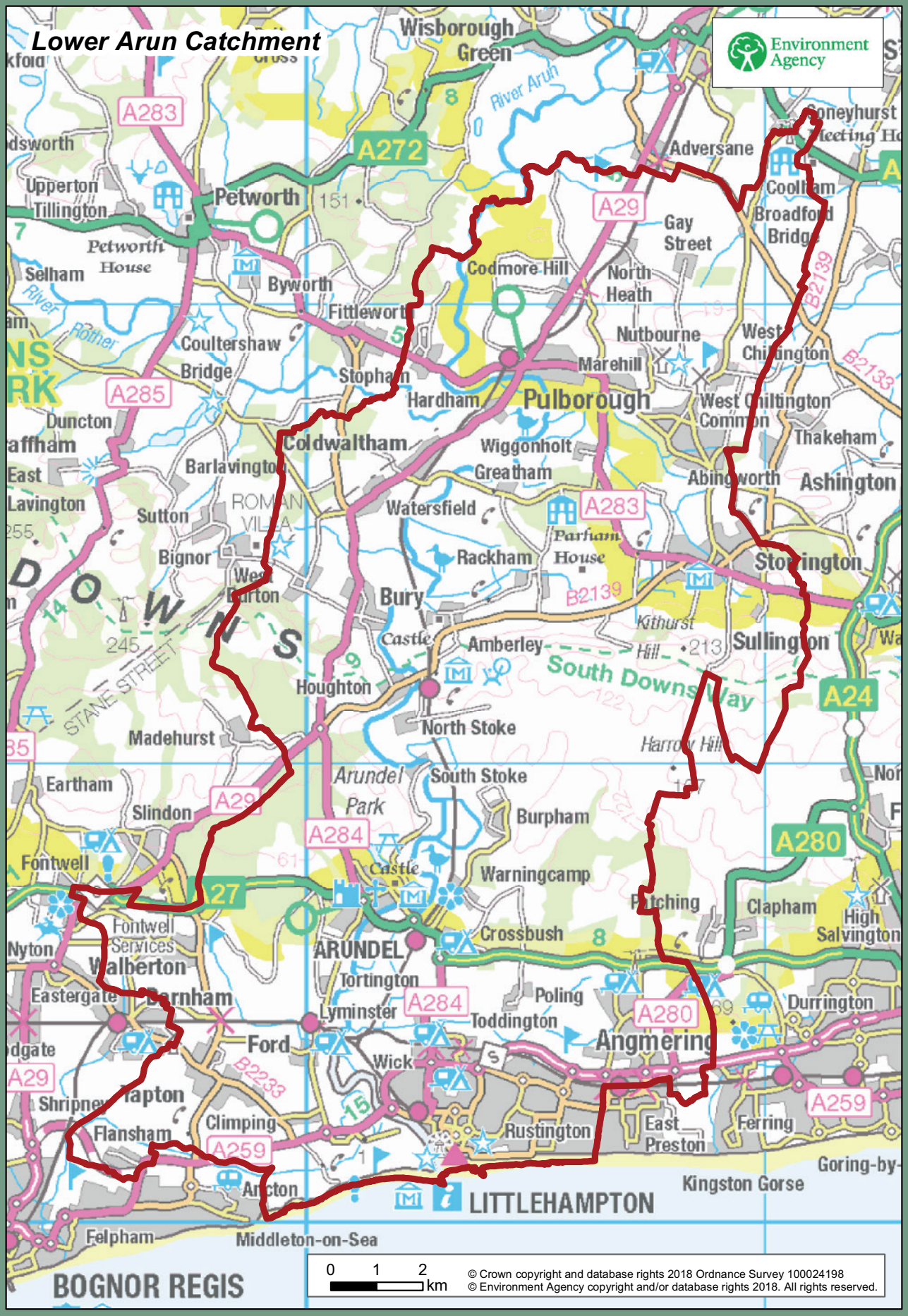


A Vision for the Arun Valley

Report of the Arun Valley Vision Group

January 2019


Lower Arun Catchment
Environment Agency
Wisborough Green
River Arun
A283
A272
A29
Petworth
Upperton
Tillington
Petworth House
Selham
River Rother
Byworth
Fittleworth
Coultershaw Bridge
A285
Duncton
Coldwaltham
Barlavington
Sutton
Bignor
ROMAN VILLA
West Burton
DOWNS
STANE STREET
Madehurst
Eartham
Slindon
Fontwell
A27
Fontwell Services
Walberton
Eastergate
Barnham
Nyton
Ford
B2233
Shripney
Tapton
Flansham
Climping
A259
Arlington
Felpham
Middleton-on-Sea
BOGNOR REGIS
Codmore Hill
Adversane
Gay Street
North Heath
Nutbourne
Marehill
Pulborough
Hardham
Stopham
Coolham
Broadford Bridge
B2139
West Chiltington
B2133
West Chiltington Common
Thakeham
Abingworth
Ashington
Wiggonholt
Greatham
Watersfield
Rackham
Parham House
Storrington
Sullington
Kithurst Hill
South Downs Way
A24
Bury
Castle
Amberley
Houghton
North Stoke
Harrow Hill
Arundel Park
South Stoke
Burpham
A284
A280
Warningcamp
Castle
Crossbush
ARUNDEL
Tortington
Lyminster
Poling
Toddington
Angmering
Wick
Rustington
East Preston
Ferring
Goring-by-Sea
Kingston Gorse
LITTLEHAMPTON
Durrington
Clapham
High Salvington
Patching
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Foreword

BY THE RT. HON. NICK HERBERT CBE MP

It is my great pleasure to write this Foreword to the report of the Arun Valley Vision Group.

The Group was set up in January 2017 on my initiative as a community partnership made up of the major stakeholders in the Lower Arun Valley between Pulborough and Littlehampton.

The Group's brief was to work in collaboration and develop a viable long-term vision for what the wider community wants for the Valley and a plan for how that vision could be achieved and managed.

Over the last two years, the Group has come together to agree a vision for the Valley which is based on the concept of Adaptive Management.

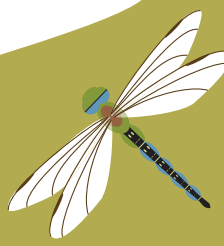
This approach seeks to protect key areas of importance by upgrading local flood defence structures, but will also create wetland habitats for flood storage for long-term flood resilience.

The vision is accompanied by a plan of action, which specifies lead roles for the various agencies involved.

I am very grateful to all those who have worked hard to agree and deliver this report: the Environment Agency, which hosted the project, Sara Denton, the project officer, members of the Group, and especially its independent co-chairs, John Godfrey and Gill Farquharson, who have given a huge amount of time to this initiative.

I commend the report to all those interested in the future management of the Valley.

Nick Herbert



Executive Summary

The Arun Valley Vision Group (AVVG) was established at a conference on 20th January 2017 in Arundel convened by Nick Herbert MP for Arundel and South Downs. This followed representations he received from constituents concerned about the future management of the River Arun, particularly in relation to implementation of the Lower Tidal River Arun Strategy (LTRAS) (see Appendix 2) and the abolition of the Arun Valley Internal Drainage Board (IDB).

The aim of this two year project has been to:

- Carry out a new community-led partnership project to develop a sustainable long-term vision for the Lower Arun Valley.
- Provide a landscape-wide context for the consideration of flood management issues; and
- Find a sensible and affordable balance between the needs of conservation, land management and protection of people and properties against flood risk as time passes.

This document is the final report of the AVVG, providing the Group's recommendations and an overview of how the project developed.

A Vision for the Future of the Arun Valley

As an initial exercise, members of the Group, which comprised representatives from key stakeholders and organisations in the Valley, were asked to provide statements concerning their aspirations for future management. This exercise began the process of enabling participants to better understand each other's positions and to begin the process of identifying common ground, leading to informed discussion about a way forward that would be acceptable to all interested parties. A key aspect of these early stage discussions was the observation that an agreed way forward should retain an element of flexibility and the ability to respond at short notice to changing circumstances.

These discussions enabled a joint vision to be agreed, which aspires to ensure that:

- Communities are supported to create a healthy local environment which supports multiple benefits to society
- The long-term economic, social and environmental sustainability of the landscapes, wildlife and communities of the Arun Valley are secured
- Farmers and landowners are fairly rewarded for their vital roles in producing food and actively managing the environment
- The risk of flooding is managed effectively and sustainably for the long term

- Enhanced rural tourism and other linked opportunities provide important support for the local economy
- The Valley makes an enhanced contribution to the health and well-being of the people of West Sussex and visitors from further afield.

Collaborative Scenario Appraisal

To develop how these aspirations can be delivered it has been important to recognise some of the complexities, uncertainties and practical realities affecting the Valley. In particular there is much uncertainty concerning the implications of future agricultural policy, the potential scale of climate change impacts and any associated adaptation that would need to take place to help the internationally important wildlife interest in the Valley.

In light of such uncertainty, the Group jointly contributed to a description of four scenarios which helped develop a shared understanding of the achievable and desirable outcomes. The following three scenarios were considered by the Group either to be too costly, not widely acceptable to the whole community or entailing too great a risk to wildlife, people, properties and farmland:

- Do Nothing: The option that no further co-ordinated management, planning and delivery would be undertaken was considered unacceptable on the basis that it would make catchment and landscape scale outcomes nearly impossible to deliver. There would be no way of resolving wide scale issues or conflict between distributed interests in the Valley.
- Hold the Line: The option to find an engineered solution to increase the height of all embankments and undertake a dredging maintenance programme was seen as too costly as it would require very significant private investment and there are no obvious sources of funding that could be used for this purpose. It would also restrict opportunities to provide space for wildlife to adapt to climate change in the future.
- Managed Re-naturalisation: This option was considered to provide significant wildlife and flood resilience benefit, but it would be extremely controversial. It would be costly to deliver as landowners would potentially dispute the impacts to farmland and rural livelihoods. A far reaching option such as this would require such a substantial change to the rural economy in the Valley that the Group considered delivery would be unrealistic within a foreseeable timeframe.

Adaptive Management – The Preferred Approach

Adaptive Management, the fourth scenario, was considered to represent the most realistic way of developing a co-ordinated approach that balances the interests of all stakeholders. We define Adaptive Management as:

A long term, co-ordinated approach, which recognises the dynamic and unpredictable challenges on the horizon. Adaptive Management refers to a process of continuous assessment and responsive consultation to find the right solution for the appropriate time and place. This would enable a joint process shared by relevant stakeholders within the Valley to continue reviewing key areas of importance, exploring options to upgrade local protection standards and seeking to secure localised storage measures offering multiple benefit wetland solutions where appropriate.

It provides a balanced approach which uses a combination of management

techniques, including the upgrading of local flood defence structures and the creation of wetland habitats for flood storage and long term flood resistance. It enables gradual, targeted and managed interventions to increase flood resistance and adapt to climate change and, over time, will allow more natural flood management in appropriate circumstances, alongside traditional management.

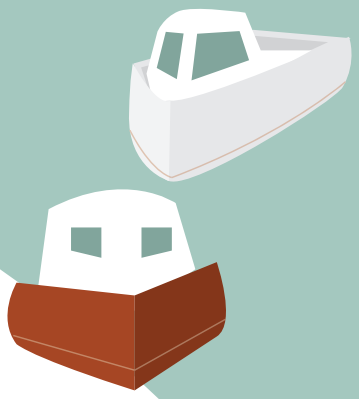
Key Recommendations

Taking this forward, the report expands on how an Adaptive Management approach for the Arun Valley should be developed in the next two-year phase of the project. In particular we propose:

- The establishment of a strategic partnership body to assess, prioritise and co-ordinate the interests of all stakeholders, seeking to identify public and private funding opportunities as appropriate to each case; and
- The delivery of a robust assessment of the natural, economic, agricultural, social and cultural capital within the Valley and the production of a strategic plan for the future of the Valley.

In addition, the Environment Agency will work with landowners with the assistance of the NFU to help them to determine how, individually and collectively, they wish to operate following the possible abolition of the IDB and the proposed implementation of the relevant provisions of LTRAS.

The success of implementing these recommendations will rely on securing external sources of funding and the continuation of a partnership approach with support of key organisations such as the Environment Agency, the South Downs National Park Authority and local authorities.



1. Introduction

The Arun Valley Vision Group (AVVG) was established in January 2017 following discussions between Rory Stewart MP (Environment Minister 2015-16), Nick Herbert, MP for Arundel and South Downs, the Duke of Norfolk and the Environment Agency.

This led to the creation of a community-led partnership made up of key representatives in the Arun Valley, including the Environment Agency (EA), Natural England (NE), the South Downs National Park Authority (SDNPA), the Royal Society for the Protection of Birds (RSPB), Sussex Wildlife Trust, Southern Water, Arun District Council (ADC), Arun Town Council, West Sussex County Council (WSCC), the Country Land and Business Association (CLA), the National Farmers Union (NFU), and landowners, including the Norfolk and Angmering Park Estates.

The stated aims of the partnership group were that the AVVG would:

- Carry out a new community-led partnership project to develop a sustainable long-term vision for what interested stakeholders and the wider community want for the lower Arun and how it could be achieved and managed.
- Reflecting our sense of pride and place in the Arun Valley and its special qualities, our aim is to provide a landscape-wide context for the consideration of flood management issues.
- Working collaboratively we will aim to find a sensible and affordable balance between the needs of conservation, land management and protection of people and properties against flood risk as time passes.

Further terms of reference and membership of the steering group are set out in Appendix 1.

The exercise was conducted within the context of two existing EA-administered projects: firstly, the proposed implementation of the Lower Tidal River Arun Strategy (LTRAS), an £85m plan for flood related activities and expenditure in the Arun Valley during the next 100 years. The Strategy divided the area into seven Strategy Units (SUs) to assist in the identification of appropriate management practices (see Appendix 2 for details). The EA agreed to delay implementation of this Strategy during the two year life of the AVVG.

The second project was the proposed abolition of the EA-administered River Arun IDB, a body responsible for the management of drainage within the Valley to control water levels and to reduce the risk of flooding from smaller 'ordinary' watercourses. This proposal was the subject of a Local Public Inquiry in February 2018, as a result of which further investigations are currently proceeding.

The wider policy context and key driving factors impacting on the Arun Valley,

including the proposed new system of agricultural payments and the landscape-scale approach, are described in Appendix 3.

The AVVG was asked to report in January 2019 on a landscape-wide context for the consideration of flood management issues, aiming to find a sensible and affordable balance between the needs of conservation, land management and the protection of people and properties against flood risk. While not a decision-making body, the Group would make recommendations to decision-makers on the way forward for the benefit of all interested parties.

The Group has met 14 times in the two year period in addition to a number of smaller sub-group meetings and one-to-one meetings held by the Chairs to consider specific issues. The Group has heard position statements, discussed areas of agreement and dissent and received expert testimony from a variety of organisations, including Defra, Highways England and the Association of Drainage Authorities. We also set up a website (**www.avvg.co.uk**), which enabled interested people to monitor our progress.

The road to achieving consensus has not always been straightforward and, for all parties involved, the process has required a need to be flexible, recognising there are complex overlapping priorities. From this perspective the findings of this report should be seen very much as a landmark on a much longer journey, where our recommended approach still requires further consensus building, consultation and development. To ensure that the communities of the valley, its wildlife and farmland have a bright and sustainable future, our recommendation is for a balanced approach where social, economic and environmental priorities should all be achievable in time.

In this light, whilst representing the final report of the AVVG, it is perhaps more fitting that this document should be seen as a report on work in progress, but nonetheless one with a clear sense of direction. We now commend this ongoing process to the decision-makers and communities of the Valley as a mechanism and direction of travel for achieving together a safe, prosperous, inclusive and landscape-scale approach to flood risk management within a healthy catchment in the future.

Dr. John Godfrey and Gill Farquharson
Co-Chairs, Arun Valley Vision Group

January 2019

2. The significance of the Arun Valley

The Sussex poet and writer Hilaire Belloc described Arundel and the Arun Valley as "the jewel for which the whole county of Sussex was made and the ornament worthy of its setting"[1].

While other areas might dispute this title, there is no doubt that the Arun Valley is a very special place. Situated at the very centre of the South Downs National Park, equidistant from Winchester and Eastbourne, it contains woodland, wetlands, chalk grassland and sites of international and national importance for nature conservation, amid landscapes that reflect the essence of lowland England.

The River Arun provides the vertical axis of the area, with the escarpment of the South Downs serving as the horizontal access. There is a community of interest among those who live in the Arun Valley, which has some of the characteristics of a French *pays*[2].

The river is tidal up to Pallingham Weir, some 30 kilometres inland of the mouth of the river at Littlehampton. Draining most of the western Weald of Sussex, the Arun is one of the fastest flowing rivers in England, with a tidal range of some three metres at Arundel Bridge.

Upstream, the river rises on the southern slopes of the Surrey Hills, flows through Horsham to Pulborough, where it is joined by its tributary, the western Rother, and thence it flows to the sea.

For administrative purposes, the Valley falls wholly within the county of West Sussex. The district council boundary between Horsham

1 H. Belloc, *The Four Men* (1911)

2 "Every village, every valley, *a fortiori* every *pays* (a word derived from the Gallo-Roman *pagus* and meaning an area with its own identity, as in the *pays de Bray, pays de Caux*), every town, every region, every province has its own distinct character – visible not only in the particular features displayed in the landscape and in the many imprints man has left upon it, but also in a lived culture, 'a way of life and death… a set of rules governing basic human relations between parents and children, men and women, friends and neighbours." Fernand Baudel, *The Identity of France, Volume One: History and Environment* (London, 1988), p37.

and Arun runs along the escarpment of the South Downs, with the northern half of the Valley being in Horsham district and the southern half in Arun district.

The Valley is sparsely populated but accessible from neighbouring and more distant centres of population, including by the Arun Valley railway line, with connections to London, Croydon, Gatwick Airport, Horsham, Brighton and Portsmouth. The majority of the population is concentrated in coastal towns such as Littlehampton which contain areas of significant social deprivation.

Opportunities for outdoor countryside recreation abound: the Valley benefits from an extensive network of well-maintained public rights of way, including the South Downs Way national trail, the Wey-South Path (which follows the line of the old Wey & Arun Canal) and the Monarch's Way.

At Arundel, Watersfield and Pulborough, the Valley contains important centres for outdoor education and recreation, and both the River Arun and the sea at Littlehampton provide opportunities for water-based recreation.

The Valley is steeped in history, with an abundance of listed buildings and many conservation areas. Arundel Castle, the Cathedral and parish church, and the historic town itself attract many visitors.

The prosperity of the Valley was traditionally dependent on the continuing success of the downland sheep-corn economy, with sheep on the hill, arable on the lower slopes and summer grazing of cattle in the valley floor. While modern agricultural methods have enabled greater flexibility in land management practices, farming patterns still reflect the realities of geography and topography.

Arundel has its own craft brewery and the Valley lies at the centre of the highly successful West Sussex wine industry, specialising in the production of top quality English sparkling wine.

Increasingly, tourism makes a major contribution to the local economy, supplementing farm incomes and providing a renewed purpose for market towns and villages whose traditional commercial functions have been affected by changes in shopping habits.

This project, and the work which will flow from it, provides the opportunity to promote the Arun Valley as a destination and a brand, further strengthening the economic potential of the area.

An extract from the OS 1:50,000 map showing the area we have identified as the Arun Valley for the purposes of this report appears on the inside front cover.

3. The Starting Position

As a first step, all the locally based organisations represented on the Group were invited to submit a position statement setting out their organisation's views on the issues the Group needed to discuss.

These position statements are included on the AVVG website, but for ease of reference are summarised below. The relevant policies and programmes of national and quasi-national bodies, such as Defra and English Nature, and the South Downs National Park Authority, are summarised in Appendix 3.

The NFU

In its position statement the NFU expressed concern about the health, safety and welfare of farmers and rural communities who live in flood affected areas such as the Arun Valley. It highlighted that the 2013/14 winter flooding, which caused the need for houses to be evacuated and farmers to access livestock by means of canoes, was not a "perfect storm". Had there been a coinciding spring tide, the flooding could have been far more devastating. One of the NFU's main concerns has been that the withdrawal of flood risk management services has the possibility of increasing the risk to life and livelihood during extreme events. It wishes to see some level of management capability and coordination retained, so that local farmers and communities are able to achieve their own local priorities. Going forward the NFU recognises there are limitations on public spending but nonetheless there will still be a continuing need for watercourse management. Whilst the NFU and members recognise the "fair share" that each riparian owner will need to provide in terms of maintenance, it also highlights how in many cases there are significant public benefits to continuing co-ordinated management which is not always achievable or affordable by the relatively small farms situated along the banks of the river. In this context the NFU called for more innovative approaches to generating partnership funding (i.e. funding contributed by local communities and businesses), so that some management capability can be continued in the future and suggested that targeted economic development should be seen as the best means by which additional revenue can be generated to contribute towards the delivery of environmental and flood risk management services.

Landowners

The Norfolk and Angmering Park Estates, who between them own some 20 per cent of the land in the Valley, focused their comments on the proposed withdrawal of maintenance from SU4. This proposal would impact adversely on both estates in that, if maintenance were withdrawn, the continued agricultural use of some 300 hectares of land would be under threat. The estates were also concerned about the impact such withdrawal might have on their duty of care to the owners of adjoining land, who might be impacted by flood water from estate-owned land. This issue was thrown into sharp relief by the deterioration of the condition of the embankment to the Arun Valley railway line at South Stoke. The Norfolk Estate had offered to contribute £15,000 pa towards the estimated £35,000pa cost of maintaining flood defence structures in SU4. The estates' concerns about the proposed abolition of the Arun IDB were shared by the Amberley Landowners Group.

The EA

The EA explained the legal basis for its flood management activities, emphasising that relevant legislation gives it powers, but not duties, in relation to flood management and that its investment in capital and revenue works is governed by HM Treasury rules which, in an environment of public expenditure constraints, focus available resources on the protection of life and property in heavily populated areas. The proposal to withdraw maintenance in SU4 was included in LTRAS, which had been approved by the EA Board in 2014, but the EA had agreed, following the establishment of the AVVG, to further suspend its implementation for two years until the Group had reported in January 2019. The EA reported that the River Arun IDB was the only IDB remaining in the country for which the EA Board was the responsible authority. This anomaly needed to be corrected. If, following the abolition of the IDB in its present form, affected farmers and landowners wished to consider setting up some alternative arrangement to oversee the maintenance of flood defences on their land that would then be a matter for them. The EA were available to offer any advice and assistance.

Southern Water

Southern Water pointed out that changes to land and water management in this area have the potential to impact on its infrastructure and operations. Its key concerns were around the following potential impacts: increased saline intrusion, affecting ground and surface water supplies; changes to flow regimes affecting discharges from their wastewater treatment works; any changes which affect its ability to service their own assets and Water Framework Directive status changes.

Nature Conservation Organisations

The Sussex Wildlife Trust (SWT) and the RSPB reported that they are both significant landowners in the Arun Valley, primarily in LTRAS SU3, and they also have a wider interest in the future management of the Valley. They supported a strategic landscape-scale approach for the future of the catchment, as part of the wider catchment landscape, from both ecological and socio-economic perspectives. They would like to see a strategy put in place to address key issues which will impact on both people and wildlife across the catchment in the long term. This might be achieved by developing a dynamically functioning river valley, which also allows a greater role for natural processes, whilst protecting and enhancing existing natural assets, delivered through strong collaborative working amongst landowners and key stakeholders. Similar

views were expressed by the SDNPA and Natural England. On the specific issue of the management regime in SU3, all these bodies are involved in the work which the EA is undertaking in relation to the internationally important sites for nature conservation in the Arun Valley and note that LTRAS provides that maintenance should continue in the short term while this work is completed.

Arun and Rother Rivers Trust

The Arun & Rother Rivers Trusts (ARRT) considered that it was essential to take a whole catchment approach to the problems of the Lower Arun. Its vision was of a sustainably managed water environment that enables native wildlife to thrive and which people will use, enjoy and value for generations to come and the Trust looked forward to playing their part in its development and delivery.

Local Authorities

West Sussex County Council (WSCC) as Lead Local Flood Authority (LLFA) presented and reiterated to the Group its role and associated statutory responsibilities within the county. These duties include the preparation and update of a strategy for local flood risk management (WSLFRMS), strategic overview in the co-ordinating of views and activities with other Risk Management Authorities (RMAs) as well as other local bodies and the community. This is achieved through public engagement and project delivery. The LLFA maintains a register of assets, investigates significant local flooding incidents [s19 FWMA2010] and plays a leading role in emergency planning and recovery after a flood event. The involvement of community groups is a key element of its approach, with some funding being available for local initiatives through Operation Watershed. Arun District Council (ADC) supported the proposed abolition of the IDB and is intending to use the money previously used to meet its share of the IDB precept to employ an additional member of staff to help with the transition (back to riparian responsibility), inspect flood defences in the District, drawing any problems to the attention of the landowners concerned and in certain circumstances, to fund flood prevention work around the District. We did not receive a position statement from Horsham District Council (HDC). Arundel Town Council (ATC) expressed concern about the need to find a practical and affordable solution to the problems relating to flood prevention in Arundel, and also about the possible consequences for the town of the withdrawal of maintenance in SU4. No other town or parish councils submitted any views to us.

Overall Direction of Travel

A constant theme in all the position statements we received was the uncertainty of the policy environment in which we were operating. Relevant factors include environmental change (including climate change, sea level rise, flood maintenance and collective responsibility), constrained public resources (having to deliver more for less), localism and the implications of Brexit. This thread of uncertainty was to be a continuing feature of our work and was an important factor in shaping our conclusions and recommendations. It is important that any agreed way forward retains an element of flexibility and the ability to respond at short notice to changing circumstances.

Having discussed these position statements and identified key themes, we then set up three sub-groups, which began to consider sustainable catchment management (led by Claire Kerr, RSPB), community consensus (led by Tom Ormesher, NFU) and delivery mechanisms (led by Mat Jackson, WSCC). There were limitations in the extent to which these sub-groups were able to develop in

the time available, but the exercise began the process of enabling participants to better understand each other's positions and to begin the process of identifying common ground, leading to informed discussion about a way forward which would be acceptable to all interested parties.

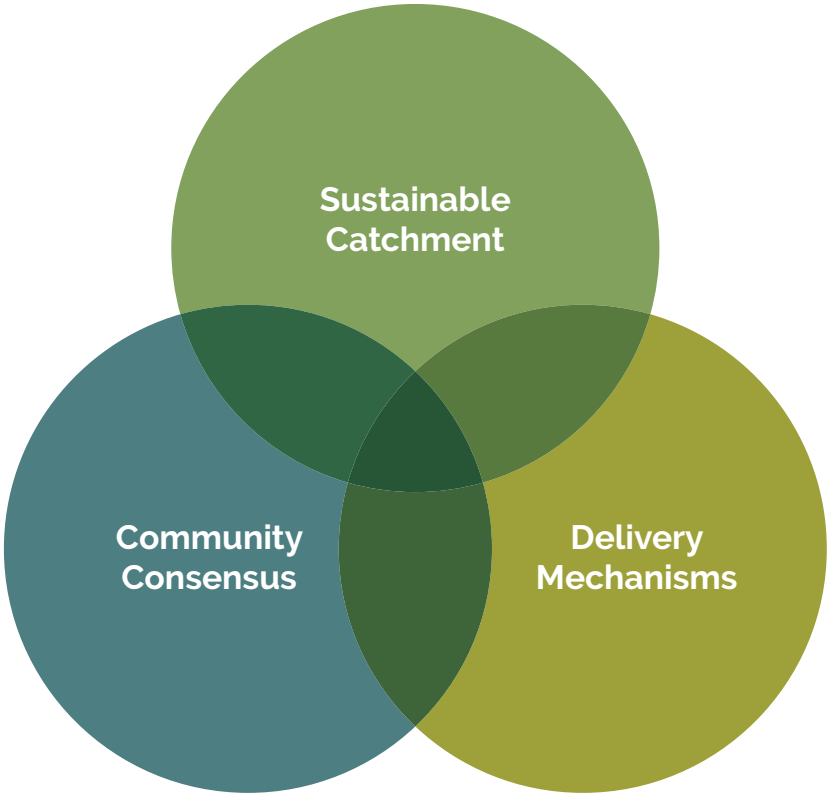
As the date for the submission of the Group's report came closer, successive drafts of sections of the eventual final report were circulated to all members of the Group and discussed, both at meetings and off-line. The continuing dialogue has fostered a positive and collaborative atmosphere, and has highlighted a continuing need to develop closer and more joined up approaches to objective setting and ultimately delivering management outcomes. The working of the Group has led to an increasingly robust understanding of the issues and potentially shared responsibilities, enabling us to rally round the proposed middle ground solution of Adaptive Management described below. This collaborative approach now needs to be further consolidated and captured in a sustainable governance structure for the Valley as a whole.

4. Our vision

Having listened to the opinions of all contributors, the Arun Valley Vision Group has agreed on a joint vision which aspires to secure that:

- Communities are supported to create a healthy local environment which supports multiple benefits to society
- The long-term economic, social and environmental sustainability of the landscapes, wildlife and communities of the Arun Valley are secured
- Farmers and landowners are fairly rewarded for their vital roles in producing food and actively managing the environment.
- The risk of flooding is managed effectively and sustainably for the long term
- Enhanced rural tourism and other linked opportunities provide important support for the local economy
- The Valley makes an enhanced contribution to the health and well-being of the people of West Sussex and visitors from further afield.

After determining this common ground, the Group has sought to develop four scenarios as a way of considering how these shared aspirations might be achieved. As set out in detail in the next section, the four scenarios take as a background our vision for the valley as well as the three pillars of delivery we have identified – Community Consensus, Delivery Mechanisms and Sustainable Catchment.



5. Potential Scenarios for the future of the Arun Valley

In seeking to investigate the practicalities of how we achieve our vision for the Valley, we have given detailed consideration to four possible scenarios in terms of the short, medium and long term impacts as seen from the perspectives of farmers and farmland, the natural environment and the wider community.

This section of the report outlines the key aspects of those scenarios and a much more detailed assessment of them is included in Appendix 4.

Option 1 – Do Nothing

An active decision by the Environment Agency to cease maintenance in sections of the Arun Valley in accordance with LTRAS.

Summary of Key Issues/Opportunities:

- Could by default result in an unmanaged and uncontrolled partial re-naturalisation of the Arun Valley flood banks.
- No strategic or co-ordinated approach and no formal management plan in place.
- Watercourse maintenance would be the individual responsibility of each riparian landowner
- Potentially unmanaged impacts on road, rail, water and sewerage infrastructure leading to future risk of catastrophic failure.
- Could lead to deterioration in community engagement meaning that their wider priorities are not taken into account.

Option 2 – Hold the Line

The Lower Arun Valley continues to be managed and maintained as an engineered landscape.

Summary of Key Issues/Opportunities:

- Significant investment required to upgrade embankments and river capacity to accommodate high flows within the channel.
- Treasury spending rules will not justify the significant investment required.
- Future agricultural policy will focus on natural capital outcomes and could therefore take away opportunities for local farmers and land managers to take advantage of new schemes.
- Future upgrades will need to take account of climate change
- Combination of authorities and possible (new/ replaced) IDB with contributions from riparian landowners and other third parties.
- Buys time to identify longer term solutions but this option will itself take a long time to negotiate and deliver.

Option 3 – Managed Re-naturalisation

The active decision to no longer maintain existing flood defences in parts of the Lower Arun Valley allowing the river and floodplain to function naturally, which could include the targeted removal of existing embankments to create additional floodplain wetland habitats

Summary of Key Issues/Opportunities:

- Opportunity for bio-diversity enhancement (provided other impacts are addressed as well), long term climate resilience and sustainability.
- A fully planned and costed approach would be needed to deliver extensive landscape scale habitat creation.
- Targeted mitigation and compensation would be required for the loss of land and property
- Unknown socio-economic outcomes for agriculture and local communities.
- Likely to be contentious for communities directly affected.
- Lack of a co-ordinated approach could lead to deterioration in community engagement meaning that their wider priorities are not taken into account.

Option 4 – Adaptive Management

Adaptive management would take a long-term planned approach which uses a combination of management techniques. This approach seeks to protect key areas of importance by upgrading local flood defence structures, but will also seek to create wetland habitats for flood storage for long term flood resilience.

Summary of Key Issues/Opportunities:

- Gradual targeted and managed interventions to increase flood resilience and facilitate adaptation to climate change and sea level rise.
- Will be consistent with Environmental Land Management (ELM) and will assist farmers in attracting public goods and services payments.
- A recognised and sustainably funded management body or partnership in place to manage, lead and monitor the interests of all stakeholders.
- Local measures designed in consultation with stakeholders would seek to improve resilience of Natura 2000 network and other natural capital assets.
- Over time options will be to reconnect floodplains allowing for more natural flood management and sustainable urban drainage systems (SuDs) alongside traditional management. This approach facilitates adaptation to climate change in line with national policy and allows time to implement solution to other compounding anthropogenic influences and fully mitigate impact on designated sites.

Adaptive Management – the best option

We conclude that Adaptive Management represents the best option for the future management of the Arun Valley, which we propose can be defined as "a structured approach to management and decision-making that accumulates and incorporates knowledge to reduce uncertainty".

Adaptive Management is an iterative, systematic, decision-making process, requiring continual evaluation to inform the planning and delivery of projects. By its very nature it requires oversight and programme management by a representative body so that all stakeholder interests can continue to be served as more detailed projects develop.

Adaptive Management should seek to provide a balanced approach which uses a combination of management techniques, including the upgrading of local flood defence structures and the creation of wetland habitats for flood storage and long term flood resilience. It enables gradual, targeted and managed interventions to adapt to climate change, over time allowing more natural flood management in appropriate circumstances alongside traditional management.

The Group concluded that Adaptive Management is the best option for farmers and farmland, the natural environment and the wider community. The timing is right for such an initiative, given current government and local policies, and the fact that the introduction of the new system of farm payments and the EA's withdrawal of maintenance from LTRAS SU4 (Houghton to Arundel) are both likely to occur in early 2021, allowing two years for further investigation and preparation. Subject to ministerial decision, the abolition of the River Arun IDB may occur before that date, in which case some of the further work described below may need to be advanced to provide an earlier indication of the way forward.

6. Working towards adaptive management

We now consider how the principles of Adaptive Management might be applied in the Arun Valley. We conclude that there are two related, but separate, strands of work which need to be pursued to deliver our vision.

The first priority is for all relevant stakeholders to work together to develop a strategic plan for how the principles of Adaptive Management can best be applied to the particular circumstances of the Arun Valley. Adaptive Management is not cost free and this work needs to keep a close eye on the potential availability of alternative sources of funding, including any money available for natural flood management projects, the new farm payments scheme and other sources of partnership contributions. Innovative sources of partnership funding could potentially be considered such as those linked to local growth plans or skills development initiatives.

The next priority is that we suggest that the use of a natural capital approach (see Appendix 3), suitably adapted to local circumstances, is potentially helpful. An approach such as the Capitals Approach provides a methodology to assess the value of the Arun Valley to the community as a whole in terms of all forms of capital (natural, social, human, manufactured and financial). Utilising a "capitals accounting" process should therefore provide a benchmark against which decisions on investment can be fully understood by potential funding partners. The scope of such an accounting process should concern:

- Natural Capital (the stock of natural assets such as soil, air, water and all living things): For example, increasing the capacity for land to store water through various techniques will potentially improve resilience to flooding and climate change at a catchment and farm holding scale. As such services hold a value, a capitals accounting process would provide a useful starting point to incentivise further delivery of such outcomes.
- Social and Human Capital: The Arun Valley provides value as a place of recreation and renewal, learning and personal development. A capitals accounting process will help to further describe how

and to what level the Valley provides these essential services. By doing so an Adaptive Management approach can then work with stakeholders to enhance and improve the social and human capital services provided.

- Manufactured and Financial Capital: A capitals accounting process can help to describe the interdependencies between various types of capital. For example, as healthy soil is a necessity for producing a high yield of crops, so many other natural assets are also a precursor for generating economic gain. In specifically evaluating these relationships for the Arun Valley it will underpin justifications for delivering environmental gain whilst enabling sustainable economic growth to support the ongoing viability of business activity within the area.

To take this forward, we propose that, during the period between now and 2021, when the EA proposes to withdraw from maintenance in SU4, further work should be done, by appropriately qualified professionals and using a methodology such the Capitals Approach, to develop a strategic plan or roadmap for the management of the Arun Valley, based on an assessment of the natural, economy, agricultural, social and cultural value of the Valley and providing a framework for attracting new resources to the area.

This project needs a clear point of co-ordination. Changing national priorities mean that the EA is unable to continue in this role and presently none of the local authorities has offered to lead, though all will continue to be involved in some form. Given the central importance of the Arun Valley to the South Downs National Park, there is potential for the SDNPA to play a facilitating role during the two-year transition phase, working in partnership with other key contributors. To enable this, a costed plan of the work required to deliver an Adaptive Management approach needs to be set out and agreed. The project should be undertaken by a part-time project officer, supported as necessary by consultants, and in liaison with a steering group of representatives of stakeholders, to maintain momentum and collaboration for the project while a new, permanent mechanism is established.

At the same time, consideration needs to be given to the form which any new structures for the co-ordination and funding of relevant land and water management practices in the Valley might take to manage, lead and monitor the interests of all stakeholders in the Arun Valley in the longer term. Options which have been identified include a partnership board, a charitable trust, co-operative voluntary arrangements between landowners and farmers such as Farmer Cluster Groups, a rural Business Improvement District (BID), a new locally accountable IDB, a river authority or a limited company; there may well be others. The river authority option, which was the subject of a Private Member's Bill in the 2017-18 Parliamentary session[3], would enable a body with overall responsibility for water management in a river catchment to raise precepts to meet the cost of any works.

3 Rivers Authority and Land Drainage Bill 2017-2019 **https://services.parliament.uk/bills/2017-19/riversauthoritiesandlanddrainage.html**

CASE STUDY: COASTAL PARTNERSHIPS EAST AND SUFFOLK COAST FORUM

In July 2017 a member of the AVVG steering group met with Environment Minister Dr Therese Coffey MP. During that meeting a question was asked about how to secure ongoing watercourse management for rural catchments in light of the limitations on public expenditure. Dr Coffey commended the examples of the Suffolk Coast Forum and Coastal Partnerships East as ways of developing more consistent delivery of local priorities:

- The Suffolk Coast Forum "*brings together a partnership of statutory agencies, local authorities, community groups and other key players involved in the management of the coast, estuaries and hinterland*" with recent initiatives focusing on innovation, consultation and habitat restoration.
- Coastal Partnerships East "*brings together the coastal management expertise from four local authorities into a single team*". A partnership model to address jointly shared issues to justify the resourcing of critical specialist roles reflecting key priorities in the area.

www.greensuffolk.org/about/suffolkcoastforum

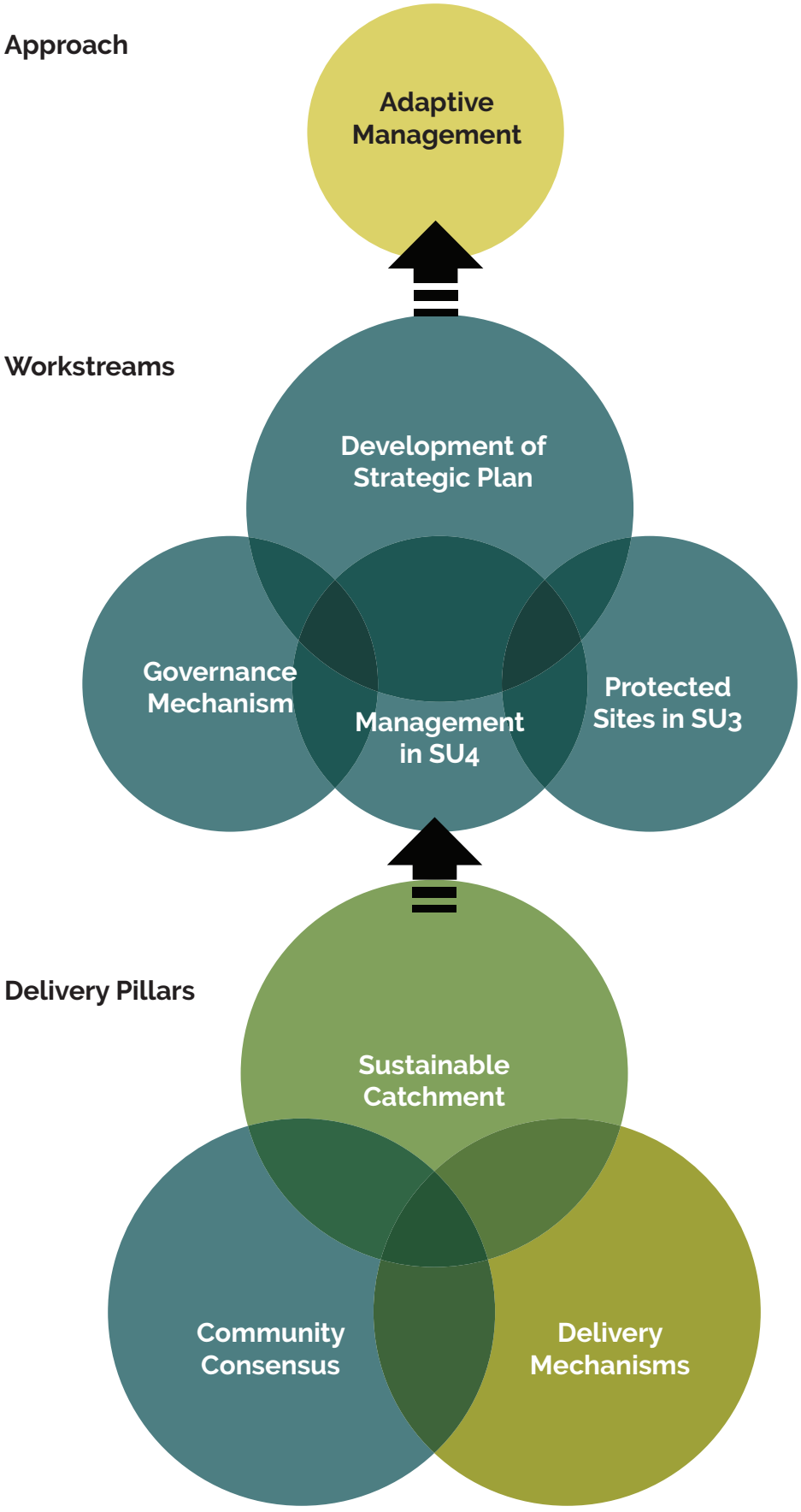
www.coasteast.org.uk

In tandem with the above, further investigations need to be carried out into the current and future potential for the adaptation of internationally protected sites within the Valley towards a more resilient ecosystem which can adapt to the challenges of climate change. The original aim of the international protected sites network was the conservation of the status quo of habitats and species within the core areas but in light of changing climate, it is evident that maintenance of viable populations and habitat integrity may only be achieved by expanding the current protected area estate and ensuring functional connectivity beyond protected areas[4]. The Adaptive Management issue is one with multiple facets and impacts and further investment will be needed to gather evidence in relation to the conservation objectives for the sites, possible adjustments to policy and legal frameworks for their protection, impacts of concern and social considerations. However, any flexibility with regard to the protected sites must not come at the price of weakening the existing legal obligations for nature conservation: any decisions relating to changes will need to be evidence-based and go through a rigorous process of scrutiny at the local, national and international level.

Now is the right time to take forward the initiatives outlined above and to turn our vision for the Arun Valley into a practical programme of action on the ground. The Government's timetable for the phased introduction of the new, post-Brexit system of farm payments, coupled with their new approach to ELM provides for business as usual between 2018 and 2020. The new procedures which will then be progressively introduced over the following years accord with our aspirations for the future management of the Arun Valley, providing "public goods for public money" and the Valley would be the ideal location for an early national, pilot project to test the new approach. Our proposals are consistent with Natural England's Conservation 21 policy statement, which recognises the need to work at landscape scale with people and stakeholders to explore the best options to achieve resilient healthy landscapes and seas, and to put people at the heart of environment.

4 Wilke, C. and Rannow, S. (2013): Management Handbook – A Guideline to Adapt Protected Area Management to Climate Change. HABIT-CHANGE

THE ADAPTIVE MANAGEMENT MODEL



Our proposals also recognise and celebrate the contribution which farming makes to food production and identify the Capitals Approach as a way to find the right balance between farming, environment and other relevant factors. Situated at the heart of the South Downs National Park, the Arun Valley provides a possibly unique opportunity for the SDNPA to take the lead in ensuring that the relevant policies in its statutory plans are put into practice. Our proposals are consistent with the aspirations of the EA to implement its own plans for its work in the Arun Valley, beginning in 2021, providing two years in which the further work we are recommending can be completed, a strategic plan for the Valley agreed and arrangements put in place to ensure that, where ongoing maintenance on flood prevention structures is deemed by the landowners and farmers concerned to be in their business interests, they are able to collaborate to ensure that this takes place, with the value of their work being appropriately recognised through the new farm payments system and other mechanisms identified in the evaluation process. Our proposals are also consistent with the local plans and flood management strategies of the local authorities and the aspirations of town and parish councils in the Valley. We commend our report and recommendations for approval.

7. Summary of recommendations

1. Adaptive Management should be adopted as the agreed way forward for the management of the Arun Valley. Further work is now needed to understand how this approach might best be implemented, for the benefit of all relevant stakeholders in the Valley.
2. Over the next two years and using an appropriate methodology such as the Capitals Approach, work should be taken forward to implement our vision and develop the Adaptive Management approach for the Arun Valley into a costed strategic plan, based on an assessment of the natural, economic, agricultural, social and cultural value of the Valley and providing a framework for attracting new resources to the area.
3. To maintain momentum and collaboration for the project, the SDNPA should be asked to take on the facilitation of the two-year transition phase, working in partnership with other key contributors. The project would be undertaken by a part-time project officer, supported as necessary by consultants, and in liaison with a steering group of stakeholders.
4. During the two-year transition phase, the steering group should develop a proposal for a recognised and sustainably funded management body or partnership to manage, lead and monitor the interests of all stakeholders in the Arun Valley.
5. At the same time the EA should be asked to work with affected farmers and landowners with the assistance of the NFU, to help them determine how, individually and collectively, they wish to operate following the abolition of the IDB and the proposed implementation of the relevant provisions of LTRAS, taking into account the potential availability of future alternative financial support mechanisms.
6. The decision of the EA to proceed with the completion of £4m worth of improvement works in Arundel to reduce the risk of flooding in the town by autumn 2020 should be welcomed and applauded.
7. The EA, Highways England, Natural England and the local planning authorities (including the SDNPA) should consider how the planning and construction of the Arundel A27 bypass can contribute positively towards the Adaptive Management of the Arun Valley.

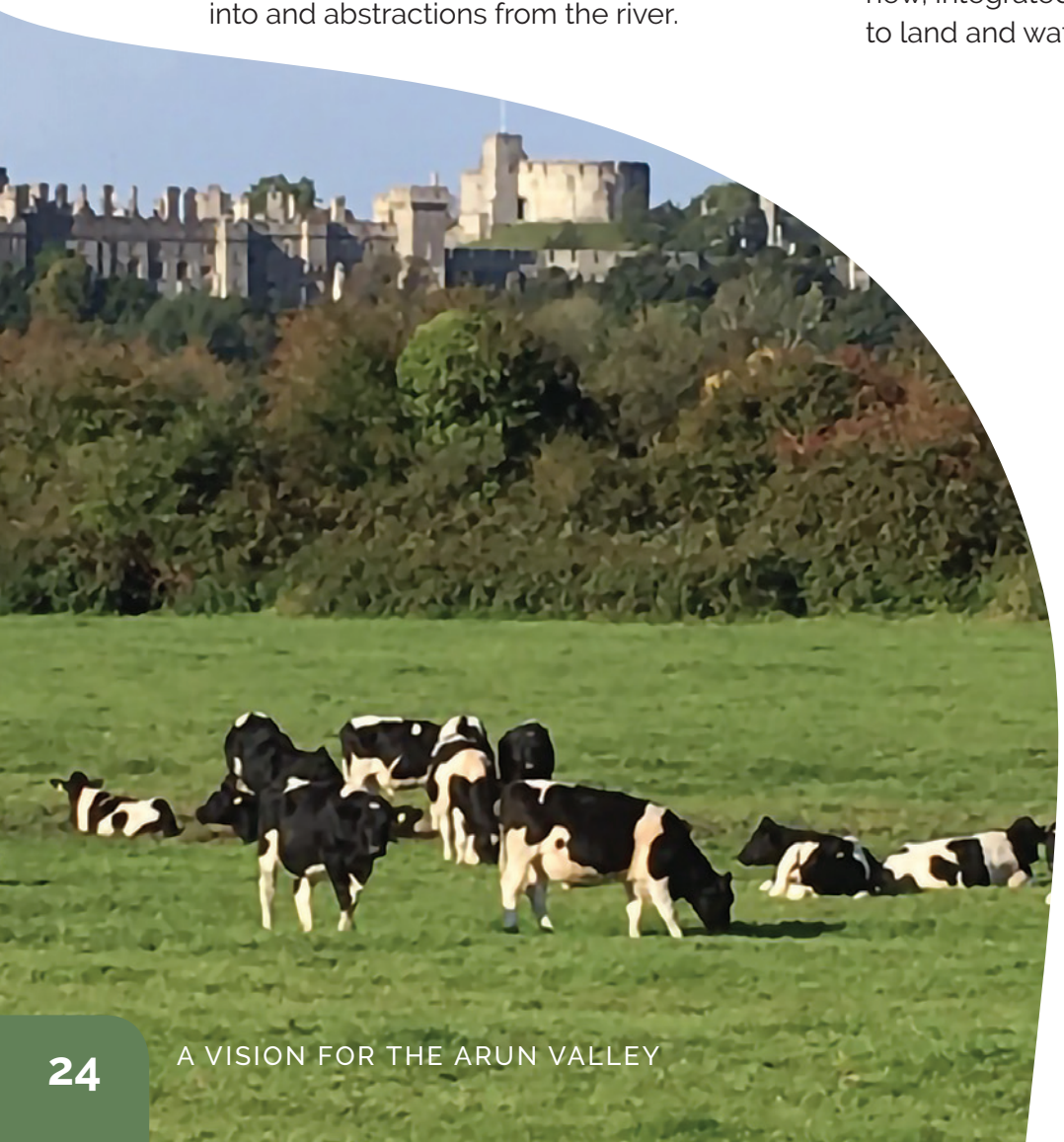
8. Defra, Natural England and the EA should recognise that further investigations need to be carried out nationally and locally into the current and future potential for the adaptation of the internationally protected sites in the Valley towards more naturalistic and climate proofed ecosystems and a more robust ecological network, to enable the implementation of Adaptive Management in those areas with government support and agreement.

9. The EA should engage with the local planning authorities (including the SDNPA) and Southern Water to ensure that the need to improve water quality in the river is taken into account in planning decisions on future developments in the area to the north and west of the catchment and in decisions on consenting discharges into and abstractions from the river.

10. Further steps should be taken by the EA and local authorities to enable solicitors, estate agents, developers and the public to be more fully aware of the responsibilities of riparian owners and the roles of the various statutory bodies involved in flood management.

11. The contents of this report and our recommendations should be made available widely to all relevant local authorities, organisations, communities and individuals, building a broader base of consensus.

12. This report should be submitted to the Secretary of State for the Environment, with the request that he endorse its contents and recommendations, and agree that the Arun Valley would be a suitable location for a national pilot scheme to test the Government's new, integrated landscape approach to land and water management.



Appendix 1: Terms of Reference

Arun Valley Vision Group (AVVG) Terms of Reference (March 2017)

Aims of the Arun Valley Vision Group

- The Arun Valley Vision Group (AVVG) will carry out a new community-led partnership project to develop a sustainable long-term vision for what interested stakeholders and the wider community want for the lower Arun and how it could be achieved and managed.
- Reflecting our sense of pride and place in the Arun Valley and its special qualities, our aim is to provide a landscape-wide context for the consideration of flood management issues.
- Working collaboratively we will aim to find a sensible and affordable balance between the needs of conservation, land management and protection of people and properties against flood risk as time passes.

Objectives of the Arun Valley Vision Steering Group

- Working together to understand the strategic challenges and opportunities that exist within the Arun Valley.
- Production of a strategic long-term vision (including an action plan) that identifies agreed outcomes and details what on the ground activity is needed in order to achieve them. The vision and action plan will focus on working in partnership and implementing actions that will seek to reduce flood risk, improve water resources and water quality and identify opportunities for improved nature conservation, access and recreation in the Arun Valley.
- Ensure that work to improve rivers and reduce flood risk in the Arun Valley is well informed by evidence/data and best practice. Ensure that the work of the steering group and wider partnership takes account of all relevant plans and strategies that include the Arun catchment area.
- Co-ordinate and integrate existing collaborative groups and activity with relevant aims into the Arun Valley 'Vision' where appropriate.
- Maximise the use of steering group resources/skills and develop a funding strategy identifying key funding sources.
- Direct and oversee the work of any task and finish groups in order to deliver work on the ground that achieve the agreed outcomes.
- Ensure effective communication and engagement by adopting a joined up approach to engagement with communities, government and MPs.
- Ensure completion of all of the above at the latest by January 2019

Membership responsibilities

Members of the Arun Valley Vision Steering Group commit to:

- Work collaboratively, using an honest and transparent approach.
- Regular meeting attendance, avoiding delegation.
- Contribute to agenda setting and agreeing the direction for the group.
- Share organisational priorities for managing flood risk
- Bring strategic issues raised within their organisation to the group for discussion.
- Feedback relevant information to colleagues within their organisation.
- Developing and communicating partnership key messages externally.

Ways of working

- Agenda items will be led and owned by a variety of organisations.
- Actions will be delivered by all group members.
- Discussion will focus on issues relating to flood risk management, which are within the control of the represented organisations.

Meetings and secretariat

- **Frequency** – The Arun Valley Vision Steering Group will meet approximately every 6 weeks. The frequency of meetings will be reviewed as the project progresses. Where members agree, additional telecons or meetings may be arranged.
- **Location** – A programme of meeting dates and locations will be agreed in advance.
- **Chair** – The group will be independently co-chaired by Dr John Godfrey and Gill Farquharson.
- **Secretariat** – The Environment Agency will provide the secretariat for the group, including distributing papers before the meeting, producing action notes and issuing external communications about the partnership. All group members are expected to contribute to meeting papers for agenda items on which they are leading.

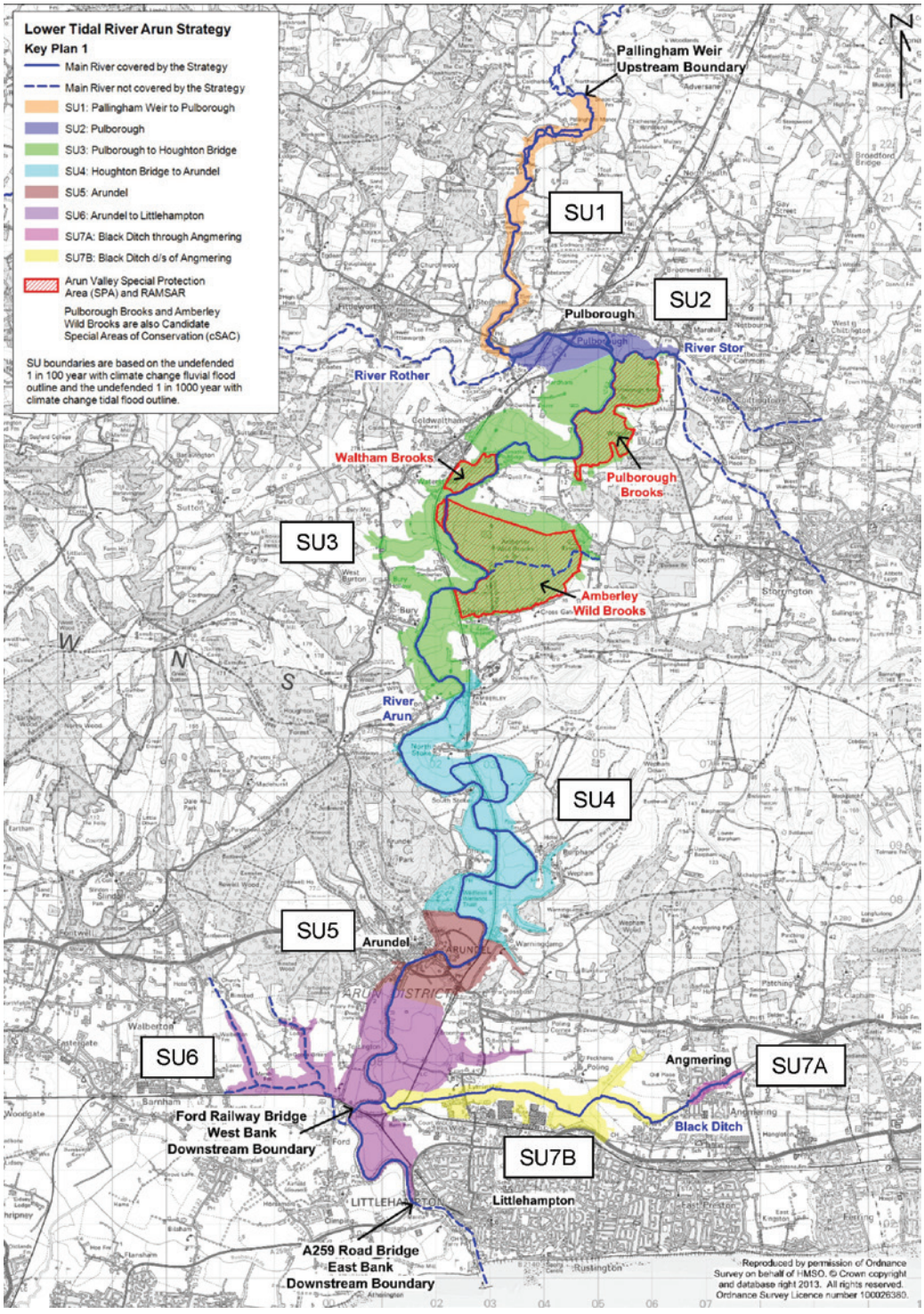
Steering Group Members

Name	Organisation
Dr John Godfrey	Independent Chair
Gill Farquharson	Independent Chair
Gordon Wilson/Dave Robinson/Sara Denton	Environment Agency
Kate Rice	Southern Water
John Archer	Arun and Rother Rivers Trust
Jim Seymour/Sue Beale/Louise Bardsley/Elaine Webster	Natural England
Claire Kerr/Julianne Evans/Steve Gilbert	RSPB
Fran Southgate/Henri Brocklebank	Sussex Wildlife Trust
Peter Knight	Norfolk Estate
Adrian Waller	Amberley Landowners
Matt Jackson	West Sussex County Council
Tom Ormesher	NFU
Roger Spencer	Arun District Council
Derek Waller	Arundel Town Council
Matthew Woodcock	Forestry Commission
Jeremy Burgess/Claire Kerr	SDNPA
Tim Bamford/Robin Edwards	CLA
Nigel Draffan	Angmering Park Estate
Martin Brightwell	Horsham District Council

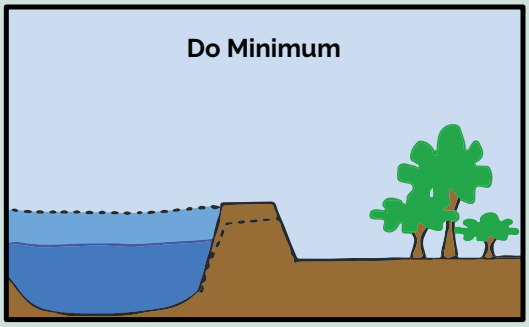
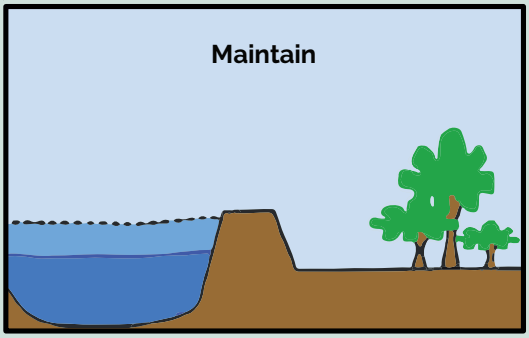
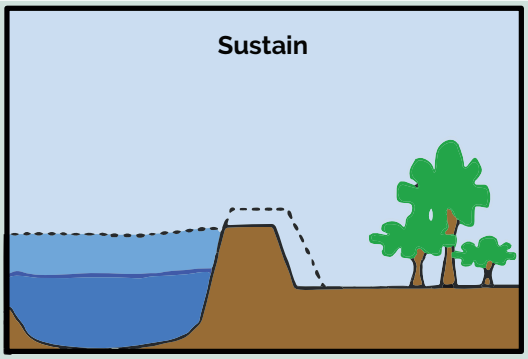
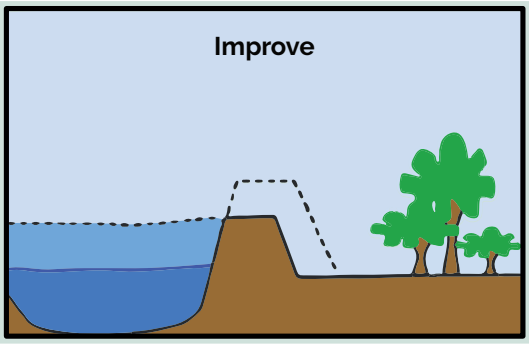
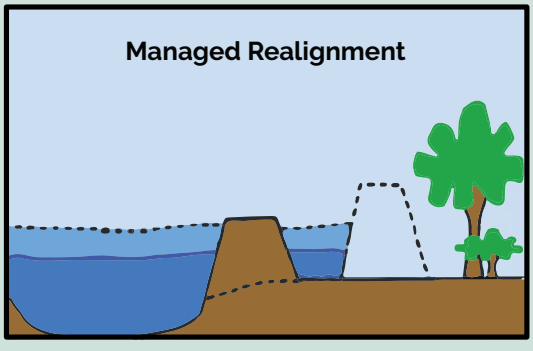
Appendix 2: Lower River Arun Strategy (LTRAS)

The Lower Tidal River Arun Strategy (LTRAS) is an £85m plan for flood related activities and expenditure in the Arun Valley during the next 100 years. The Strategy divided the area into seven Strategy Units (SUs) to assist in the identification of appropriate management practices.

EXTRACT FROM THE ENVIRONMENT AGENCY'S LTRAS REPORT



Strategy unit		Our draft recommended option	Benefit Cost Ratio	Approximate number or properties at risk from flooding if the existing defences were to fail	
				Now 2012	Future 2112
1	Pallingham Weir to Pulborough	Withdraw Maintenance	0	2	4
2	Pulborough	Do Minimum and Withdraw Maintenance	2.1	9	10
3	Pulborough to Houghton Bridge (includes 'Arun Valley')	Sustain for 10 years	0.5	16	19
4	Houghton Bridge to Arundel	Withdraw Maintenance	0	9	55
5	Arundel	Sustain to 1 in 75 with new inland defences	2.8	168	457
6	Arundel to Littlehampton	Maintain for 50 years	2.1	24	38
7	Black Ditch	Maintain with a new inland defence	37.3	208	284

Option	Description
	The minimum amount of action or intervention necessary to maintain the defence. No work is carried out to replace defences should they fail. This means that over time, the defences will deteriorate and eventually fall down and the natural floodplain will be reinstated. How long a defence will last with the minimal maintenance work before it fails depends on how good the condition of the defence is today. The better the defence condition, the longer it is likely to last.
	Work is done to the existing defences to keep them in good condition and prevent them from falling down. As the sea levels rise and rainfall becomes more extreme, flood risk increases over time which means the amount of protection from flooding provided to the land and property behind the defence today will gradually decrease. When the defences reach the end of their life, it is recommended they be replaced to the same height as the existing defence.
	In general, the same works are done as the 'Maintain' option, but in the future the defences would be built higher as the sea levels rise and rainfall becomes more extreme. This means over time the amount of protection from flooding provided to the land and property behind the defence today stays the same.
	Defences are improved to increase the protection provided to land and properties behind them.
	A new line of defence will be created, set back from the existing defences and then the current defence would be deliberately removed. This option is often used to provide a better and stronger line of defence, or to allow land to flood to create a new environmental habitat.

Appendix 3: Background: Plans & Policies

In parallel with, and arising from, the work described previously we reviewed the relevant policies and plans of a wide range of official and unofficial bodies, national, regional and local, which reflect the significance of the Arun Valley and provide guidance on its future use and management. We took the view that, if the vision which we agreed upon was to have a significant chance of being achieved, it was essential that, as well as local buy-in and support for our conclusions and recommendations, we also could secure the commitment of a wider range of partners and potential funders for our proposals. With this in mind, we conducted a review of current governmental and other policies.

The legal background to these issues is set out in the **Flood and Water Management Act 2010**[5] that outlines the statutory roles and responsibilities of the EA and Local Authorities. The national planning background is set out in the **National Planning Policy Framework 2018**[6]. These two documents determine the framework within which the group has developed its understanding of the implications of national policy.

Defra's 25-year Plan states that the Government will seek to achieve its ambition "to leave our environment in a better state than we found it" by, among other things, "improving how we manage and incentivise land management; designing and delivering a new environmental land management system; bringing the public, private and third parties together to work with communities and individuals; reducing risks from flooding and coastal erosion; expanding the use of natural flood management solutions; putting in place more sustainable drainage systems and making 'at-risk' properties more resilient to flooding[7] The Plan also sets out the need to achieve clean and plentiful water by improving at least three-quarters of our waters to their natural state and restoring one million hectares of terrestrial and freshwater protected sites to favourable condition, clearly showing the close relationship between the management of flood risk, land management and the on-going diversity of wetlands. The Plan also refers to the Government's proposed new system of support for farmers and to the importance of the concept of natural capital in decision-making.

These ideas are developed in Defra's subsequent paper on the future of food, farming and the environment after Brexit, which proposes that in future agricultural policy should be underpinned by the payment of public money for the provision of public goods, involving "a new environmental land management system … that pays providers for delivering environmentally beneficial outcomes."[8]

5 Flood and Water Management Act 2010 **www.legislation.gov.uk/ukpga/2010/29/contents**

6 National Planning Policy Framework 2018 **www.gov.uk/government/collections/revised-national-planning-policy-framework**

7 Department for Environment, Food & Rural Affairs, *A Green Future: Our 25 Year Plan to Improve the Environment* (London, January 2018)

8 Department for Environment, Food & Rural Affairs, *Health & Harmony: the future for food, farming and the environment in a Green Brexit* (London, February 2018)

CLIMATE CHANGE

Climate change has been a high profile topic throughout the AVVG process, rising sea levels leading to breaching of sea defences being a pivotal issue. In November 2018 the Met Office Hadley Centre published the UK Climate Projections 2018 – or "UKCP18". It is the **most comprehensive picture yet** of how the climate could change in the UK. (November 2018).

One key figure in the report is the rise in summer temperatures – up to 5.4C warmer than the average between 1981 and 2000. This would only happen, according to the Met Office, if the world was to continue increasing emissions of carbon dioxide rather than reducing them as most governments intend. However even under a low emissions scenario, the Met Office says that the UK will see an increase in the average yearly temperature of up to 2.3C by 2100.

The report contains many maps showing more localised trends in these predictions and the Arun Valley sits in a band along the South Coast where these changes are expected to be the most significant.

However, the Arun Valley is particularly influenced by rainfall, with fluvial and surface water issues and the increased intensity of summer rain events compounding the issues that the AVVG has been considering.

Unsurprisingly the report reminds us that the UK faces wetter winters and drier summers. These warmer summers of the future are likely to be much drier too, with average summer rainfall dropping by 47% by 2070. Winters could be warmer by up to 4.2C but they will also see more rainfall, increasing by up to 35% by 2070, under the worst emissions scenario.

Raised sea levels are also one of the consequences of a warmer world and according to the report, they could increase by 1.15 metres in some areas by 2100. The report says the UK is set to see an increase in both the frequency and magnitude of extreme water levels.

Just a few weeks ago the UK's Committee on Climate Change (CCC) warned that by 2080 up to 1.2 million homes may be at increased risk of flooding. This inevitably will include properties in the Arun catchment.

Natural England, in its conservation strategy for the 21st Century, focuses on the need to reverse biodiversity loss, sustain distinctive landscapes and enhance engagement with nature. The strategy emphasises the need to work at landscape scale, to put people at the heart of environment and to grow **natural capital**. "Natural capital encompasses the elements of nature that directly or indirectly produce value to people. This includes ecosystems, species, freshwater, land, minerals, the air and oceans, as well as natural processes and functions. The approach can help us all understand what we get from the natural world. It offers the potential to make environmental planning central to local and national decision-making.[9] In connection with the proposed withdrawal of maintenance of the main river flood defences in SU4, the EA, with support from Natural England, will need to undertake a Habitats Regulations Assessment (HRA) on the possible impacts of the withdrawal on both the "off-site" interest features of the nearby Special Area of Conservation (SAC) and also the plant and invertebrate species covered by the Ramsar designation.[10] If notice is served on the landowners prior to the completion of the HRA of the intention to withdraw maintenance, a caveat will be included to ensure that the conclusions of the assessment will determine any future actions within SU4.

9 Natural England, *Conservation 21: Natural England's Conservation Strategy for the 21st Century* (Sheffield, October 2016)

10 **https://rsis.ramsar/ris/1011**

The future of the protected sites in LTRAS SU3, including Amberley Wildbrooks, remains under consideration. There is no intention on the part of the EA to change the management arrangements while further studies are carried out into the effects of climate change on these internationally designated sites. Phase 1 of the SU3 investigations is completed but Phase 2 is still being planned. It should be noted however that these issues cannot be solved locally but will need national government involvement. Natural England has published a **Site Improvement Plan (SIP)** for the Arun Valley, which provides a high level overview of the issues (both current and predicted) affecting the condition of the Natura 2000 features of relevant sites in the Arun Valley.[11] The main issues that were identified for the Arun Valley were inappropriate water levels; inappropriate ditch management and water pollution, all of which have the potential to impact on the features for which the site is designated, namely water bird assemblages and a suite of important plants and invertebrates. For each issue, the Plan sets out the mechanisms available for combatting the issue, along with the funding options, timescales and delivery body. The further studies being undertaken by the EA on the future of the protected sites need to take into account all these relevant policy issues.

A NATURAL CAPITAL APPROACH

A natural capital approach to the environment brings established economic and accounting methods for public and private assets together with the best natural science understanding. Properly measured and accounted for, the approach brings disparate activities and their consequences together into a single strategic perspective that addresses the complexity and long-term nature of making the most of our natural capital.

Economic and social opportunity that can genuinely transform the natural environment, support the growth of the economy, allow citizens to reconnect with the health, wellbeing, spiritual and educational benefits of interacting with nature, and gift our children a richer, better and more resilient natural inheritance. With a natural capital approach, the environment should no longer be regarded as an obstacle to development; rather, a healthy environment is the basis of sustainable economic growth.

The Arun Valley has a wealth of natural capital which delivers a wide range of ecosystem services. For example, the wetlands in the Valley are a significant natural resource, supplying both the landscape and its inhabitants with water and delivering other ecosystem services such as flood storage and climate change buffering.

Natural Capital Committee – Advice on Government's 25 year Environment Plan (September 2017)

11 Natural England, *Site Improvement Plan: Arun Valley (SIP004)* (Sheffield, October 2014)

The concept of natural capital is key to much of this thinking, but its scope needs to be broadened if it is to be useful in the context of the Arun Valley. Specifically, such an assessment of the value of the Valley should encompass agricultural, economic, social, recreational and cultural value as well as that of the natural environment. This is consistent with the **Capitals Approach** which has been advocated by a number of relevant policy centres, including Forum for the Future[12] and is one of several natural capital approaches which is currently being developed. The adoption of an approach on these lines would potentially provide a more comprehensive assessment of the value of the Valley to the community and the nation at large, and identify policy initiatives and possible funding opportunities that might be available to implement our vision for the Valley. The Arun Valley has so much to offer, and a professional assessment of its value to the community at large would potentially unlock its economic and cultural potential as a distinctive locality.

These policy themes all helped to shape the Government's proposals for the reform of the agricultural payments system contained in the **Agriculture Bill** currently before Parliament. These proposals may well be amended during the passage of the Bill but, as currently drafted, it provides that the existing Basic Payments (BPS) and Countryside Stewardship (CS) systems will continue until 2020. There will then be a transitional period from 2021 to 2027, during which farmers will be encouraged to move to a new Environmental Land Management (ELM) approach, which will be universally applied when direct payments are eventually phased out from 2028. Farmers will be encouraged to enter into ELM contracts that "help to deliver improved air and water quality; protect and enhance biodiversity on farmland by providing habitats for wildlife; prevent, reduce and adapt to climate change and other environmental hazards like flooding and drought; provide public access to their land and contribute to the public's understanding and enjoyment of nature; and protect the historic rural environment and our distinctive landscape features."[13] The NFU and the Tenant Farmers Association (TFA) emphasise the continuing importance of food production, urging the Government to "show that it will use its powers to introduce assistance to the farming industry to continue to deliver high quality food to the UK and international consumers, produced to high standards of animal welfare and environmental management at prices consumers can afford and at returns that reward the risk, investment and effort of the farming community."[14] It will be some time before the final details of the new arrangements for agricultural payments emerge, but it is important that our conclusions and recommendations are informed by an understanding of the Government's present intentions. Once again, this continuing uncertainty dictates flexibility.

The Environment Agency (EA) recognises its key role in implementing the **Government's 25-year Plan** for the environment and identifies the following areas on which it will concentrate: clean air, clean and plentiful water, thriving plants and wildlife, reducing risk of harm from environmental hazards, using resources from nature more sustainably and efficiently, enhancing beauty, heritage and engagement with the natural environment, mitigating and

12 Forum for the Future, *The Capitals Approach* (**www.forumforthefuture.org/the-five-capitals**)

13 National Farmers Union, *Briefing on Post-Brexit Agricultural Policy: Agriculture Bill* (London, September 2018)

14 Tenant Farmers Association, reported in *West Sussex Gazette*, 24th October 2018

adapting to climate change, minimising waste, managing exposure to chemicals and enhancing biosecurity.[15] In October 2017, the EA published a report on the role of natural flood management in reducing flood risk. The report noted that working with natural processes to reduce flood risk is not a new concept but explained that this was the first time that the evidence of more than 60 case studies had been brought together from across England to explore how successful the approach is, how it could be used elsewhere and what research may still be needed. Natural flood management is when natural processes are used to reduce the risk of flooding and coastal erosion. Examples include restoring bends in rivers, changing the way land is managed so soil can absorb more water and creating saltmarshes on the coast to absorb wave energy[16]. The concept, which has relevance to the Arun Valley, and specifically to the offer of the Norfolk Estate to make available land in their ownership for this purpose, is explained in the box.

NATURAL FLOOD MANAGEMENT

"I often think improving flood resilience is like a mosaic, many different pieces need to come together to complete the resilience picture. Natural flood management is an important part of that mosaic when used alongside more traditional engineering. These projects also provide fantastic opportunities for community involvement and leadership.

Many of our flood schemes already feature a mixture of hard and soft engineering and natural flood management. It can be a cost-effective and sustainable way to manage flood risk alongside traditional engineering, while creating habitat for wildlife and helping regenerate rural and urban areas through tourism.

Natural flood management works best when a 'catchment based approach' is taken, where a plan is developed to manage the flow of water along the whole length of a river catchment from its source to sea. This way, natural processes can be used upstream and on the coast to complement engineered flood defences – such as walls and weirs – in populated areas.

Natural flood management not only reduces flood risk it can also achieve multiple benefits for people and wildlife, helping restore habitats, improve water quality and helping make catchments more resilient to the impacts of climate change.

The Environment Agency hopes that the evidence directory will help flood risk managers, local authority engineers, non-governmental organisations and community flood action groups to incorporate natural approaches to flood risk management into their plans to reduce flood risk.

Earlier this year the government announced a further £15m for natural flood management schemes across England."

John Curtin, Executive Director of Flood & Coastal Risk Management at the Environment Agency

15 Environment Agency, *Environment Agency: Our ambition to 2020* (London, June 2016)

16 Environment Agency, *Natural flood management* (London, October 2017) **www.gov.uk/government/news/natural-flood-management**

Locally, the **EA**'s plan for its work in the Arun Valley is described in LTRAS, which is discussed above. In urban areas, the strategy recommends maintaining and enhancing many existing, and providing some new, flood defences to manage increasing flood risk from climate change. The new defences will not be needed for many years and they will depend on funding. Central government funding is limited, and it is likely that substantial contributions will be needed from other sources. In some rural areas this strategy recommends new approaches such as working with natural processes and more landowner involvement in decisions. We are pleased to note that the Environment Agency is working with people who are affected to understand and explore how this might work best.[17]

The **South Downs National Park Authority's Partnership Management Plan** includes policies to improve the sustainability of water resources and waste water management through partnership working across the water sector; support and promote river catchment management approaches that integrate sustainable land management, wildlife conservation, surface and groundwater quality and flood risk management; actively promote water efficiency measures and more sustainable patterns of domestic, industrial, farming and leisure water use; raise awareness of the importance of chalk streams and rivers and develop a programme of restoration and rehabilitation.[18]

All these policies and plans identify climate change and sea level rise as key issues, with profound implications for the management of the Arun Valley, its landscapes, communities and wildlife. At a time when state funding is ever more constrained, both the desirability and practicality of maintaining hard engineering flood defences is coming under question. Priority in the distribution of available funds must inevitably favour areas where significant numbers of people and properties are under threat.

ARUNDEL FLOOD ALLEVIATION SCHEME

We were delighted to hear in the course of our deliberations that the EA has been able to accelerate its timetable for the completion of improvement works in Arundel to manage the risk of flooding in the town by autumn 2020. The EA anticipates the scheme will better protect around 130 properties from flooding and up to 30 properties against river erosion (on both river banks between the Queen Street and A27 road bridges). Repairs to the collapsed wall at River Road will be completed first, and work there will begin by autumn 2019. The current best estimate of the cost of the scheme is £4 million, funded by a combination of Government grant and contributions raised locally (with the support of local councils). Improvement works on the fast-flowing river Arun provide a significant engineering challenge. The EA will carefully manage the risks to minimise the potential impacts this may cause.

17 Environment Agency, *Policy Paper: Lower Tidal River Arun flood risk management plan* (Worthing, September 2015)

18 South Downs National Authority, *Partnership Management Plan 2014-19* (Midhurst, 2013)

In rural areas, the proposed withdrawal of maintenance of main river flood defences in the Valley between Houghton and Arundel (LTRAS SU4) and the proposed abolition of the River Arun IDB have caused consternation among members of the farming community, which led directly to the creation of the AVVG. The EA has now confirmed that it proposes to proceed with the withdrawal of maintenance in SU4 in 2021. It will be for the landowners and farmers concerned to decide what measures they wish to take in their own business interests to defend their land from flooding or to manage it in other ways, and the same principle will apply to the management of watercourses in the Valley currently dealt with by the IDB[19]. From both points of view, there is a need for new mechanisms to be put in place to plan, co-ordinate and deliver whatever maintenance it is decided is necessary. The EA and the NFU have offered their services to assist the farming community to find a mutually acceptable way forward in this connection. The parties concerned should now use the two years available before the withdrawal of maintenance is implemented and the new ELM scheme comes into operation to put in place whatever new arrangements are needed and affordable.

In any move towards the more natural flood management of the Valley, the need to safeguard key features of infrastructure, including the Arun Valley railway line, roads, waste water treatment works and power lines must be acknowledged. Similarly, the need to improve water quality in the river and to take into account both population growth upstream in the Horsham area, with greater quantities of waste water entering the river system, and the restoration or protection of other freshwater inputs into the Valley must also be recognised as key issues. Finally, the proposed construction of an A27 Arundel bypass has implications for the management of flood risk to people and properties in Arundel and in the Valley generally and discussions need to take place with Highways England to ensure that this is taken into account as more detailed plans are developed.[20]

19 The Planning Inspectorate, *Report to the Secretary of State for Environment, Food and Rural Affairs by Clive Neil BSc(Hon), CEng, MICE, MCIWEM, C.WEM: Land Drainage Act 1991 The River Arun Internal Drainage District (Abolition) Order 2017 (Bristol, February 2018)*

20 Department for Transport, *Press Release:£250m Arundel bypass route revealed* (London, May 2018)

Appendix 4: Detailed Scenarios

	Natural Environment	Farmers and Farmland	Wider Community
Option 1: Do Nothing			
What this looks like	**Short term implications**		
Active decision by the Environment Agency to cease maintenance in the sections of the Arun Valley in accordance with LTRAS. A "Do nothing" approach would by default result in an unmanaged and uncontrolled partial re-naturalisation of the Arun Valley flood banks. There would be no strategic or coordinated approach and no formal management plan in place. All watercourse maintenance would be the individual responsibility of each riparian landowner. EA maintenance programmes will cease to operate. Landowners will be responsible for their own asset maintenance.		No central coordination of tasks, activities and risk management functions. Capability to make improvements would be limited beyond those enforced by riparian rights and responsibilities.	Lack of a coordinated approach could lead to deterioration in community engagement meaning that their wider priorities are not taken into account.
	Medium to long term implications		
	A possible "free for all" situation where maintenance is completed to varying standards on a piecemeal basis. Potential H&S risks to farmers and land managers during flooding. Reductions in land value as farmland becomes more frequently inundated. Additional regulatory burdens with cross compliance and enforcement on individuals.	Changes to habitats and agricultural land as the "renaturalisation" by default shifts the river system but re naturalisation will be restricted to certain parts of the lower valley and only apply to connection to floodplain not other processes. Connect parts of the riparian habitat of national or international importance with other anthropogenic influences before they could be improved (e.g. poor water quality). Over the longer-term a new "norm" will establish, which could either be positive (establishing a more resilient system) or negative. Timescales unknown creating uncertainty.	Potentially unmanaged impacts on road, rail, water and sewerage infrastructure leading to future risk of catastrophic failure. Lack of "positive" decisions will result in neglect. Possible impacts on property, livelihoods, landscape and ecology from flooding water quality and impacts on other infrastructure...

	Natural Environment	Farmers and Farmland	Wider Community
	Wider scale implications		
	Ability to recover from a flood event compromised. Viability of some farming compromised Limited support from authorities (restricted remit). Potential funding to be met by the landowner or secured on an individual basis. Disputes resulting in litigation?	WFD and other drivers will continue to deliver improvements for water quality. The features for which sites are designated could be adversely affected. Further research required into likely long-term impact. May be need for change in national policy to allow transition of habitats. No evidence this will result in net gain to natural capital without significant changes to other anthropogenic impacts. Does not facilitate adaptation to climate change	Timescale for "change" unknown? Communities/ individual landowners could undertake actions which will have wider implications on the "system". Wider scale socio-economic impacts not fully understood Risk to mental health and well-being of flood affected individuals.
Option 2: Hold the line			
Landscape of the Lower Arun valley maintained as an engineered landscape. Significant investment required to upgrade embankments and river capacity to accommodate high flows within the channel. Future upgrades will need to take account of climate change, so embankments will need to be larger and river capacity deeper simply to maintain current levels of protection. Combination of authorities and possible (new/ replaced) IDB with contributions from riparian landowners and other third parties.	**Short term implications** Public funding is unavailable to hold the line. Treasury spending rules will not justify the significant investment required. Delivery is likely to be either at the expense of private landowners or through generating substantial investment by third parties. Potentially buys time to identify longer term solutions, however this option will itself take a long time to negotiate and deliver.	Opportunity to preserve designated sites in their current location in accordance with current legal obligations.	Further investment in flood defence for Arundel Town may be available through this approach, however the detailed business case is as yet undefined. Local authorities would need to contribute partnership funding to achieve this outcome; however there is no budget or political support. Small number of properties protected from flooding.

	Natural Environment	Farmers and Farmland	Wider Community
	Medium to long term implications		
	Provides an opportunity to maintain productive farmland and land value. However no organisation has a specific mandate to deliver this outcome. High levels of ongoing cost to maintain structures in good working order. Requires an ongoing mechanism to fund maintenance work – still likely to be at landowner's expense? Costs involved are likely to outweigh the agricultural income opportunities? Continuing enforcement risk and risk of legal disputes.	New engineering project could cause significant landscape and visual impact within the National Park, requiring costly mitigation and offsetting? As the climate changes existing sites may no longer be suitable for the designated features of Arun Valley SPA SAC, Ramsar and SSSI so investment to preserve sites in situ may be in vain. Does not facilitate adaptation to climate change.	Continuing uncertainty of management oversight, responsibility and ongoing funding. Continuing contentious and divisive debate over management and spending priorities. Risk that wider community might think that nothing has changed and do not feel involved in the process Missed opportunity to enhance public recreation, health and well-being within the valley? Future schemes such as the A27 upgrade may offer opportunities for infrastructure development such as a tidal barrage however this is considered to be ambitious and hard to achieve within acceptable time frames.
	Wider scale implications		
	Future agricultural policy will focus on natural capital outcomes. A hold the line approach may therefore take away opportunities for local farmers and land managers to take advantage of new schemes. Missed opportunity to negotiate on wider scale business and development opportunities.	Adaptation to climate change constrained, impacting resilience of landscape, habitats & species. Hold the line does not mitigate the risks of habitat and species deterioration due to climate change and so may lead to wider scale, longer term impacts. Proving otherwise will require assessment and modelling however funding is not available for this purpose.	If public funding is made available this would involve reduced spending and services elsewhere, which would not be advantageous to the wider community. Wider scale socio-economic impacts not fully understood – no clear sense of how this option will deliver benefits to wider society. Higher defences could result in a greater risk of catastrophic flooding if defences are breached, so risk of ongoing maintenance liability is also much greater?

	Natural Environment	Farmers and Farmland	Wider Community
Option 3: Managed Re-naturalisation			
Active decision to no longer maintain existing flood defences in parts of the lower Arun Valley allowing the river and floodplain to function naturally. Targeted removal of existing embankments to create additional floodplain wetland habitats. Fully planned and costed approach to delivering extensive landscape scale habitat creation, which creates "room for the river" in line with the making space for water approach. Targeted mitigation and compensation for loss of land and property. Unknown socio-economic outcomes for agriculture and local communities (worst case scenario considered in this table).	**Short term implications**		
	Land potentially at risk of acquisition by third parties. Some landowners potentially subject to upfront costs in professional fees for dispute resolution. Mental health and welfare implications for affected farmers and families.	Significant opportunity for biodiversity enhancement (provided other impacts are addressed as well), long term climate resilience and sustainability. Significant upfront costs for modelling, design, consultation, dispute resolution and construction – not fully covered by SU3investigation? Funding previously available through European Union Natura 2000 however this may no longer be available post Brexit. Likely support from Environment Agency, Natural England and others as proposal fits with statutory objectives and is likely to be partially funded via OM4/ Flood Defence Grant in Aid.	Unknown outcome for initial community engagement. Proposal is highly likely to be contentious for communities directly affected. Welfare concerns for elderly and vulnerable individuals – risk of widespread furore if communications are handled badly. National press interest. Political football as issue will span general elections. As with Option 1, lack of a coordinated approach could still lead to deterioration in community engagement meaning that their wider priorities are not taken into account.

	Natural Environment	Farmers and Farmland	Wider Community
	Medium to long term implications		
	Major land use change associated with re-wilding the valley. Potential compensation for land compulsorily acquired. Business change opportunities potentially negotiable on a case by case basis relating to impacts of change. Loss of farming jobs from valley – fewer partners available in the local area, lack of local observations, more expensive local management costs, fewer animals available for grazing. Few if any long term maintenance costs.	Potential to provide significant landscape scale opportunity however: Risk lack of coordination, potential for isolation/ fragmented approach. Process of naturalisation may still be unpredictable and hard to define in sufficient detail for public scrutiny. Potential impact on designated sites – complex legislative background may constrain options in SU3 – current legislation may not allow this option unless significant further work has been undertaken to reduce other anthropogenic impacts.	Risk of flooding to property and land potentially impacting livelihoods and businesses. Unknown impact on water quality (sediment/salinity). As with Option 1, potentially unmanaged impacts on road, rail, water and sewerage infrastructure could still lead to future risk of catastrophic failure. Possible enhanced opportunities for recreation and public access. Possible job creation in tourism and land management. Possible to align large scale housing delivery targets and business improvement district and other investment in the valley e.g. From infrastructure providers such as Southern Water with substantial flood and habitat mitigation (creating winners and losers).
	Wider scale implications		
	Farming representative organisations likely to object to proposal. Transition costs due to disputes likely to impact on deliverability.	Scheme may require very high level political support alongside statutory provision, which may constrain deliverability.	Risk of a legacy of negative opinion if poorly handled and insufficiently funded.

	Natural Environment	Farmers and Farmland	Wider Community
Option 4: Adaptive Management			
A planned approach which uses a combination of management techniques. This approach seeks to protect key areas of importance by upgrading local flood defence structures, but will also seek to create wetland habitats for flood storage for long term flood resilience. Gradual, targeted and managed interventions to increased flood resilience and facilitation of adaptation to climate change. A recognised and sustainably funded "Management Body or Partnership" in place to manage, lead and monitor the interests of all stakeholders. Over time options will be to reconnect floodplains allowing for more natural flood management and SuDs alongside traditional management. Socio – economic impact and natural capital assessment of this approach for the Arun Valley needs to be fully understood. (e.g. agriculture, local communities).	**Short term implications** Defra proposed system of Environmental Land Management (ELM) will encourage farmers to prepare Whole Farm Plans to support sustainable farming outcomes. The Adaptive Management approach will be consistent with ELM and will assist farmers in attracting public goods and services payments. Through specifying targeted and coordinated actions designed to reduce flooding across the valley farmers will be assisted in developing tailor made solutions to reduce local flood issues. ELM buys time to identify longer term solutions and should provide tangible opportunities in the next few years.	Feasibility assessment needed to identify potential options for natural flood management and reconnection of the floodplain. Natural capital benefits of Lower Arun formally defined and provided with targeted outcomes, linking with wider priorities of AVVG steering group members. Local measures designed in consultation with stakeholders would seek to improve resilience of Natura 2000 network and other natural capital assets. Opportunity to use Arun Valley within Defra "Trials and Testing" developing new ways of working. Fully identifies other anthropogenic impacts and solutions to them.	Costed maintenance programme to be developed for critical existing flood defence structures (such as but not limited to Arundel Town and railway). Funding shortfalls to be identified as part of this process. Where public funding is unavailable alternative funding opportunities will be investigated and promoted. This may include a review of sustainable development opportunities within and surrounding the Valley to achieve community priorities. Public education, training and rehabilitation to be considered as options for management delivery. Approach will be fully consulted with local communities – ambition remains to achieve full parish council and local council representation.

	Natural Environment	Farmers and Farmland	Wider Community
	Medium to long term implications		
	Farming systems retained with Adaptive Management measures to provide improved on farm and off farm resilience (attracting public goods payments). Localised farming areas may no longer support agriculture but aim is to offset with wider opportunities and retain as many viable farming units as possible. Some farming areas defended through embankment restoration etc. with funding agreed on a case by case basis through ongoing work of the Management Partnership. Local business development opportunities from tourism, education, sport and rehabilitation available to estates and farmers in the Valley.	Facilitates adaptation to climate change in line with national policy. Allows time to implement solution to other compounding anthropogenic influences and fully mitigate impact on designated sites. Improved understanding of timescale and spatial mapping of a managed adaptation approach required through support from EA and other public authorities. Financial support needed for NFM plus maintenance of existing flood defence.	Supported by a holistic vision and strategy endorsed by all partners (via CMP or legacy mechanism)? Recognised Management Partnership in place to manage, lead and monitor the interests of all stakeholders. Partnership able to explore funding for programme of management and projects. Partnership to explore "value engineering" options to align with local authority priorities. Active engagement will all partners and landowners. Reconnect communities with river. Develop a "sense of place". Adaptive management approach would enable local communities to influence and inform management.
	Wider scale implications		
	Challenge to manage all expectations of so many potential partnersstakeholders? A new authority/organisation is likely to be complex. Potential for new disputes between landowners and new authority?	Fully conversant and compliant with legislation and regulation. Designed to produce a net gain in natural capital.	Other infrastructure – plans of other organisations such as SWS would need to take account of future plans & secure funding to adapt.

A VISION FOR THE ARUN VALLEY

REPORT OF THE ARUN
VALLEY VISION GROUP

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