

Climate Change Adaptation Plan
Report by Head of Strategy and Projects

Summary: The report outlines progress made with the Climate Change Adaptation Plan and provides a draft for Members to consider whether it should be sent out for wider consultation. The draft provided is for a simplified version of the plan suitable for all with a more technically detailed plan being developed to be sent to Defra in due course. The draft has been discussed with key partners and provides a partnership position.

Recommendation:

Members are asked to support the draft plan and to agree:

- (i) that the plan should be sent out to key stakeholders for their comments;
- (ii) that using the responses received to refine the draft plan as necessary and create a final version for consideration later in the year; and
- (iii) that using the responses received to also refine the more technical version of the Plan ready for submission to Defra in the spring.

1 Background

- 1.1 Members will remember the Broads Climate Change Adaptation Panel was established in 2009 as a way of coordinating the approach of the key agencies to adaptation planning for climate change in the Broads. The Panel oversaw the development of a Preliminary Draft Adaptation Approach for the Broads that was sent to Defra in 2011 as part of the Adaptation Reporting Powers process and used to help create the National Adaptation Plan.
- 1.2 The Plan was preliminary as the Authority supported the Panel in its view that further discussion was needed with a wider set of stakeholders to determine the details. This process was discussed over the following year and it was agreed to undertake some deliberative engagement in 2013 under the Broads⁰ Community banner with the prime target groups being parish councils, farmers and landowners, tourism businesses and young adults. With climate change at that time being low on the political agenda, economic challenges dominating thinking and the uncertainty and complexity of the climate projections not making it easy for many to address the issue, engagement was limited. It was agreed therefore to try a different approach.

- 1.3 The approach then centred on creating a plan with sufficient content to help people react to the ideas and actions being proposed for addressing climate change. As the Preliminary Draft Plan was reviewed by officers a new approach was adopted making use of a concept called 'Climate Smart' used to excellent effect by the National Wildlife Federation in the USA. The creation of the Broads Climate Change Adaptation Plan and its consultation were chosen as a Strategic Objective for the current year.
- 1.4 The timetable for the Strategic Objective slipped to enable the revised approach to be tested with the Panel and key partners but it is now possible to share a draft of the non-technical plan that it is proposed to use for wider consultation.

2 Next Steps

- 2.1 The draft document is attached as Appendix 1. It has been deliberately kept short and seeks to use language that will be understood by all. It is proposed that the final version for consultation is enhanced through the addition of some pictures /images and simple design to make it as engaging as possible. This would suggest a consultation period from late February for a period of six weeks. This also allows time for any initial comments from Members to be incorporated.
- 2.2 The document reflects the thinking of the core partners on the Panel on the best approach for the Broads and would require reasoned argument to alter. This means the consultation process would be best directed at relevant organisations (although any members of the public would be welcome to respond), and seek to gain responses to a series of questions about the structure and how understandable the document is, and whether the ideas expressed would be useful to their organisation. Appendix 2 lists the likely consultation bodies.
- 2.3 As part of the consultation process time would be taken to present the Plan to the Broads Forum (which has always been used as a way of keeping the development process open and transparent), the Broads Local Access Forum, Navigation Committee and any other relevant formal bodies with an interest in the Broads and water management. There would be an open offer to also attend relevant meetings to facilitate discussion around the document using the supporting materials developed for the Broads⁰Community.
- 2.4 Any responses received will be reviewed and used to inform any necessary revisions to the document and to the larger, technical plan that will be sent to Defra.
- 2.5 There will often be mixed views about when we need to act to adapt to a changing climate. Most projections suggest that it will be some decades before the alterations are really felt although the last 18 months has certainly been party to a wide set of unusual weather conditions which have tested society's ability to cope. As many of the adaptation options would require significant funding or changes to decision making processes which will take

time, the Panel's conclusion is that the process of planning ahead needs to be tackled sooner rather than later. The adaptation plan is therefore seen as a mechanism to stimulate debate and help people prepare for the changing environment in a cost effective way.

Background papers: Preliminary Draft Broads Climate Change Adaptation Plan can be found at: <http://www.broads-authority.gov.uk/looking-after/climate-change> along with other background material

Broads Plan Objectives: CC1-4

Author: Simon Hooton

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List of Appendices: APPENDIX1: Draft (non-technical) Broads Climate Change Adaptation Plan – 'The changing Broads... climate smart planning in the Broads'

APPENDIX 2: Consultation list

Appendix 1 *This could be just a web link to save having 12 pages of appendix but would it be read?*

Climate Change Adaptation Plan – Non technical version (draft text 31/12/14-
–to be redesigned as a 12-page booklet with illustrations)

Title of document:

The changing Broads...

Climate-smart planning in the Broads

Introduction

The Norfolk and Suffolk Broads is an ever changing landscape, shaped over centuries by nature and people. Rich in wetland habitats and with 200km of open water and winding rivers, it is recognised and valued for its wildlife, heritage and recreational importance. Its low-lying nature and closeness to the East coast makes the Broads particularly vulnerable to the impacts of climate change and sea level rise. These impacts are likely to become increasingly significant as we move through the century. **The changing Broads...** looks at the impacts of climate change and sea level rise on this special area and suggests a way forward. It summarises the more detailed **Broads Climate Change Adaptation Plan** produced for Government as part of the Adaptation Reporting process.

If we want the best for the Broads and for all who live, work and play here it makes sense to start planning now. This document is produced to help stimulate thinking and progress the process of seeing how the area can be more resilient and plan to cope with the changing environment. Get involved and help agree the best action to take to build a resilient future for this special area.

Join the

BROADS
°COMMUNITY

Broads Climate Change Adaptation Partnership

Broads Authority, Environment Agency, Natural England,
National Farmers Union, University of East Anglia and local
authorities *insert logos?* .

How is our climate changing?

Climate science has been evolving for decades, using evidence from the past and computer modelling to project what is likely to happen in the future. While climate predictions are extremely complex with many variables to be considered, modelling results are coming closer together.

Based on probable projections, over the coming 50 years the Broads is likely to see:

- * Hotter, drier summers with more cloud-free days and future *average* temperatures closer to current *maximum* temperatures. Extreme precipitation still possible
- * Slightly wetter, warmer winters with rainfall in more intense bursts
- * Streams and the sea getting warmer, with associated changes in wildlife and water make up
- * More extremes in the intensity and frequency of rainfall and storms, and possibly heatwaves and drought. These could coincide with surge tide events, creating still higher flood levels

Sea level is already rising due to land settlement. In addition, the expansion of water as it warms up suggests that sea level will be 30-40cm higher by the end of the century. If climate 'tipping points' are reached, suddenly enabling lots of polar ice to melt, sea levels could be much higher.

How will these changes affect the Broads?

The Broads is a unique and internationally important wetland, a living and working landscape shaped and nurtured by its inhabitants since at least Roman times. A member of the UK National Parks family, the Broads is designated for its landscape, nature conservation and cultural features, and is a popular visitor destination.

In Table 1 below, we have assessed the likely climate impacts on the Broads, focusing in particular on these **special qualities** that define the area's character and value:

1. Rivers and open water bodies ('broads')
2. Fens, reed beds and wet woodlands
3. Grazing marshes and ditches
4. Estuary and coast
5. Navigable, lock-free waterways
6. Farmland
7. Abundant wildlife
8. Historic structures, especially mills
9. Countryside access on land and water
10. Tranquillity, wildness and 'big skies'

Table 1

Climate variable	Likely impacts in the Broads	Impacting on these special qualities									
		1	2	3	4	5	6	7	8	9	10
Hotter drier summers	Lack of water for abstraction and the environment	x	x	x		x	x	x	x		x
	Lack of water reducing flushing of system - more pollutants	x	x	x	x		x	x			
	Changes in species mix and growth	x	x	x	x	x	x	x	x	x	x
	Changes in tourism patterns and visitor numbers	x	x					x		x	x
	Drying of ground and materials affecting historic environment and landscape character			x			x		x		
	Intense precipitation periods	x	x	x	x	x	x	x	x		
Warmer wetter winters	Less die-off of pests and diseases	x		x	x		x				
	Higher peak and resting water levels possible	x	x	x	x	x	x	x	x	x	
	Changes in species mix and growth	x	x	x	x	x	x	x	x	x	
	Changes in tourism patterns and visitor numbers	x	x				x	x		x	x
Sea level rise	Flooding of land primarily through overtopping or breach	x	x	x	x	x	x	x	x	x	x
	Increasing salinity in predominantly freshwater system	x	x	x	x		x	x	x		
	Changes to other water levels (including indirect)	x	x	x	x	x	x	x	x	x	x
Extreme events (e.g. storms, heatwaves)	Sediment washed off land into waterways	x	x		x	x	x	x	x		
	(Flash) Flooding of land and infrastructure more likely	x	x	x	x		x	x	x		x
	Tidal surges created by weather systems and high tides	x	x	x	x	x	x	x		x	x
	The cumulative effects of unusual weather patterns putting coping strategies under stress						x	x			

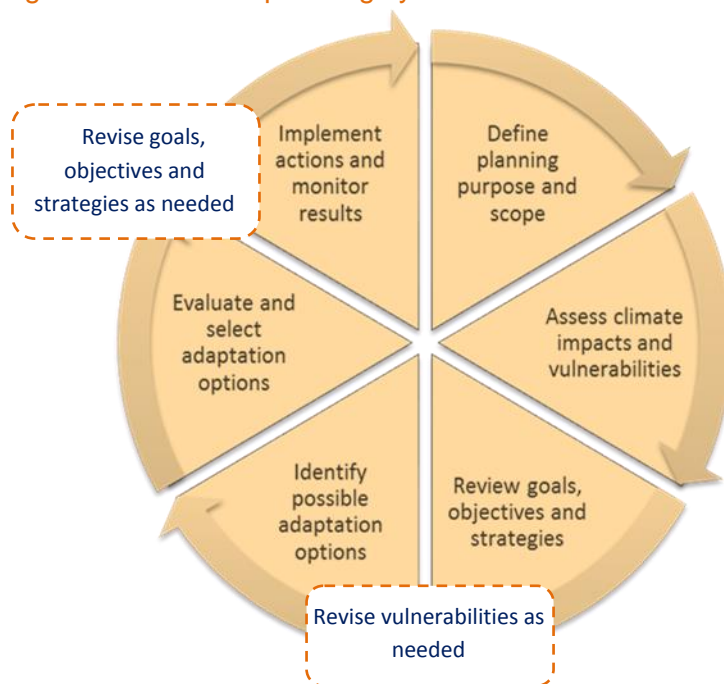
How can we respond?

With the impacts of climate change and sea level rise in mind, what can we do about it? To help develop our responses, we are suggesting a 'climate-smart' approach. In simple terms, this is about adding a layer of 'climate-smart thinking' to our management planning, strategy and actions. It can be done at a small, local site level (such as a farm, tourist attraction or nature reserve) or a large organisational level (such as an angling strategy, species recovery plan, or policy development).

Climate-smart principles seek to:

- * Sustain our natural environment and the multiple benefits it provides for people and nature
- * Understand how climate change might affect our goals, objectives and management choices as they may need to be modified to be realistic
- * Focus on future possibilities rather than trying to retain the past
- * Be flexible to cope with the uncertain nature of climate projections
- * Address climate impacts and uncertainties alongside other pressures
- * Consider what to do locally within the context of the broader landscape
- * Reduce greenhouse gas emissions
- * Avoid adaptation that actually makes (other) things worse
- * Improve evidence and understanding

Fig.1.Climate-smart planning cycle¹



Common responses to change are shown in Table 2. Alongside these, we can also consider management change (altering the way we do things), technological or constructional change (altering the way things are built or bringing in new technology) or relocation (moving something, or recreating something similar elsewhere).

¹ Adapted from 'Climate-Smart Conservation: Putting Adaptation Principles into Practice' (National Wildlife Federation, 2014)

Table 2

Responses to change	Example - <i>Flood risk and footpath maintenance</i>	Considerations
Resist change and seek to make alterations that keep things the same	<i>Raise height of riverside wall to stop footpath flooding</i>	<i>Uses known techniques. May be costly. Diverted flood water could cause problems elsewhere.</i>
Accept change and make no alterations	<i>Accept that riverside footpath will sometimes be flooded and unusable</i>	<i>Could use low cost warning signage. May need review of risk assessment and public acceptability.</i>
Accept change and make alterations to get the best from the situation	<i>Install lengths of boardwalk to lift path above most flood levels in locations where impact is significant</i>	<i>Could be costly but may buy time to plan and fund alternative solutions.</i>
Accept change and alter goals, objectives or strategies	<i>Close existing footpath if flooding is happening regularly; replace with route away from flood risk or change recreation objectives in that area.</i>	<i>Assess what frequency of flooding justifies route closure and whether alternatives exist. Could be most sustainable long-term solution.</i>

This is a fairly simple example and there are likely to be some very difficult and complex decisions ahead. This is why planning now for the longer-term future is so essential. The closer we can get to consensus solutions will mean the choices made are better suited to all. This will help minimise unjust solutions and may require necessary ‘losers’ to be compensated in some way.

Many adaptation choices will require time to gain necessary agreements or changes in practice or policy, or to gather more evidence about what may be technically, socially, environmentally and economically possible or acceptable. Having said that, there may be ‘low regret’ actions we could take now that would still keep options open for the future. The more we plan ahead and understand the implications the easier it will be to remain sufficiently flexible to deal with the actual conditions being felt.

Being climate-smart in the Broads

Following on from Table 1, Table 3 below suggests some possible adaptation options and low regret actions, with a rough indication of the level of cost and challenge to implement them. These and other options and actions would need to be considered in detail within the climate-smart planning cycle and principles.

Table 3

(Cost and challenge: 1=lower end of range, 5=higher end of range)

Climate event	Significant climate impacts & vulnerabilities	Possible adaptation options	Indicative Cost	Challenges	Low regret actions
Hotter drier summers	Lack of water for abstraction and the environment – lack of water to flush system	* Alter abstraction licensing or processes.	2	2	a. Review abstraction licencing to seek sustainable solutions for environment and users. b. Promote grants to create farm reservoirs and processes to hold back water c. Improve monitoring to understand sources and flows of pollutants.
		* Hold back water – holistic water management	2	2	
		* Reduce levels of nutrients/pollutants.	3	3	
	Changes in species mix and growth	* Change species management.	1	2	a. Review site management plans and change goals or management as appropriate. b. Pilot experimental conservation techniques. c. Assess potential for and trial re-location of key habitats
		* Greater control of water levels.	2	1	
		* Relocate to where conditions are suitable	3	4	
	Changes in tourism patterns and visitor numbers	* Market forces to determine response.	1	2	a. Develop tourism vision to steer future investment b. Promote mechanism for growth/development to contribute to conservation management.
		* Identify sites vulnerable to disturbance and invest in better visitor management	1	2	
	Drying of ground and materials affecting historic environment and landscape character	* Revise site water management.	2	2	a. Historic environment agencies to identify main risks and provide guidance within planning system. b. Develop scheme to record asset details to monitor change and create legacy if asset lost.
		* Proactive protection of structures/assets.	3	3	
		* More recording to retain knowledge.	1	1	
	Intense precipitation periods	* Improve temporary water management structures	3	3	a. Improve water infiltration rate of land (rural and urban) b. Increase amount of buffer land to protect water courses and
		* Improve holding capacity of land	2	2	

Climate event	Significant climate impacts & vulnerabilities	Possible adaptation options	Indicative Cost	Challenges	Low regret actions
					vulnerable areas.
Warmer wetter winters	Less die-off of pest and diseases	* Breed for disease resistance.	3	3	a. Improve risk assessments and plan ahead. b. Reduce other stresses so greater ability to resist disease /pests. c. Monitor for natural resistance within species.
		* Modify management practices.	1	2	
		* Minimise other threats to help keep healthy populations.	2	2	
	Higher peak and resting water levels possible	* Increase scope and height of flood defences.	4	2	a. Model river levels taking into account worst case climate impacts to assess issues. b. Identify impacts on bridges of higher water levels. Review what other facilities might need to alter.
		* Allow higher water levels generally.	2	3	
		* Alter navigation infrastructure.	3	3	
	Changes in species mix and growth	* Modify management processes.	1	2	a. Review site management plans and change goals or management as appropriate.
		* Revise site objectives.	1	1	
		* Alter water control.	2	2	
	Changes in tourism patterns and visitor numbers	* Allow market forces to determine response.	2	2	a. Develop vision for tourism industry. b. Enable contributions from growth to help site management.
		* Plan for growth in tourism season.	1	1	
		* Increase investment in visitor management.	2	2	
Sea level rise	Flooding of land, primarily through overtopping or breach	* Strengthen coastal defences.	4	4	a. Further studies on implementation of Shoreline Management Plans. b. Share case studies on relocation costs. c. Raise awareness of vulnerable people to adaptation options.
		* Install localised site specific protection.	3	3	
		* Realignment schemes.	3	3	
		* Relocate vital assets.	4	5	
	Increasing salinity in	* Introduce salt barriers.	5	4	a. High level financial and technical review of

Climate event	Significant climate impacts & vulnerabilities	Possible adaptation options	Indicative Cost	Challenges	Low regret actions	
	predominantly freshwater system	* Review objectives to accommodate more salty conditions.	2	4	<ul style="list-style-type: none"> b. Continue to investigate new technological options to protect from saline intrusion. c. Review site management plans (and legislative constraints) for Natura2000 sites. 	
		* Modify management practices.	2	2		
	Changes to other water levels (including indirect)	* Create overspill areas to accommodate excess.	3	3		<ul style="list-style-type: none"> a. Develop solutions to problems with landowners, particularly through catchment approaches/ Water Framework Directive. b. Review Local Plan policies.
		* Localised defence structures to maintain levels.	3	3		
		* Move vulnerable habitats/historic buildings to new locations.	4	4		
		* Review objectives to allow higher water levels.	2	2		
	Squeeze of marine habitats against barriers	* Consider realignment of existing barriers	3	3	<ul style="list-style-type: none"> a. Build in sufficient room for change in all new designations and/or coastal defence schemes b. Identify potential areas for new coastal habitat so land managers can consider if that option is viable in future planning 	
		* Create new areas of coastal habitat to compensate loss elsewhere	3	3		
	Extreme events	Sediment washed off land into waterways	* Site management to minimise sediment loss.	2	2	<ul style="list-style-type: none"> a. Use Water Framework Directive to implement multiple benefit projects. b. Provide advice on funding support through Catchment Management Plans.
			* Proactive management of waterways and infrastructure to create sediment buffers.	3	2	
(Flash) Flooding of land and infrastructure		* Increase scope and height of defences.	3	3	<ul style="list-style-type: none"> a. Integrate Catchment Flood Management Plans and Surface Water Management 	
		* Develop temporary flood areas.	3	2		

Climate event	Significant climate impacts & vulnerabilities	Possible adaptation options	Indicative Cost	Challenges	Low regret actions
	more likely	* Increase opportunities to hold water upstream and improve percolation into the ground.	2	2	Plans to identify priority locations for action. b. Develop best practice advice for 'holding up' water in catchment. c. Develop new funding routes to improve water management
		* Improve advance warning and advice.	1	1	
	Tidal surges created by weather systems and high tides	* Build potential surge extremes into modelling and adapt Shoreline Management Plans accordingly	4	4	a. Review existing tidal surge data and model possible impacts with recent extremes built in to identify vulnerabilities
	The cumulative effects of unusual weather patterns putting coping strategies under stress	* Build in contingency to cope with extremes.	1	3	a. Develop advice for home owners and site managers on localised best practice to cope with changing weather extremes. b. Make vulnerable wildlife and heritage sites more robust and resilient including lessening other stresses.
		* Review current goals and objectives to cope better.	1	2	
		* Improve awareness of risks and best practice responses.	1	1	

Managing flood risk in the Broads

Managing water resources is obviously central to the Broads wetland environment. With 95% of the executive area lying within the floodplain and the proximity to the coast, flood risk is a major issue. As a starting point for debate, we have made a high level assessment for managing this risk.

What is the scope?

- * To identify flood risk adaptation options for the Broads within the wider context of the rivers catchment, coast, and urban and rural surrounds
- * To evaluate adaptation options against desired goals, objectives and strategies

What are the impacts and vulnerabilities?

The impacts of climate change and sea level rise include:

- * The sea overtopping or breaching defences and/or surging up the rivers
- * Squeeze of coastal habitat as it becomes eroded by the sea and cannot move past existing barriers
- * Excessive rain, which may also be held back by the tide, overtopping and breaching defences
- * Ground and surface water flooding

These impacts will bring risks of: Flooding threats to life, property and infrastructure; pollutants and excess nutrients, sediments and salinity; coastal habitat squeeze; and changes in the mix and growth of species. Extreme weather events in combination (such as

storms, high tides and heavy rainfall) may affect coping regimes (such as existing flood walls).



Fig.2. Broads Executive Area (in grey) and wider catchment

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What are our current goals, objectives and strategies?

The Broads Plan (2011) sets out a long-term aim for the Broads in response to climate change and sea level rise. It states that “All of the key agencies believe that the Broads will remain a special area, retaining its wildlife and heritage importance and continuing to offer extensive recreation and socio-economic opportunities. Longer-term aspirations and decisions will be informed by robust evidence and wide ranging debate on the most appropriate management options”.

This aim was supported in 2014 by a resolution from the Broads Authority that:

(Tidal) surges pose a critical threat for both Broads’ communities and the protection of the very precious freshwater ecology that makes the Broads so special. We recognise the considerable amount of investment made in flood protection and stress the importance of preventing salt water and saline intrusion. (Broads Authority, January 2014)

The Environment Agency manages flood risk from main rivers, estuaries and the sea, and is responsible for river and tidal flood defences. County Councils are Lead Local Flood Authorities, managing flood risk from surface water, ordinary watercourses and groundwater, and Internal Drainage Boards manage land drainage in lowland areas.

Currently, 13km of frontline sea defences between Eccles and Winterton protect the Broads from flooding directly from the North Sea, as part of the Kelling to Lowestoft Shoreline Management Plan. There is a ‘hold the line’ policy approach to maintaining the beaches and existing sea defence structures along this frontage. By later in this century this becomes conditional depending on the climate experienced. It is therefore vital to continue with the evidence gathering to monitor and predict conditions. It is recognised that other management approaches will have to be considered if the ‘hold the line’ position becomes unsustainable. Further inland, the Broadland Flood Alleviation Project 2001-21 is strengthening and maintaining existing flood defences and making new provisions for undefended communities in the Broads.

There is great emphasis on a managed approach and each time a managed approach is put off, the likelihood of an unmanaged change increases.

What are our adaptation options?

As a starting point, we have looked at seven possible adaptation responses to flood risk.

Table 4

Response to change	Change management	Change technology	Relocate	No action
Resist change, make alterations to keep things same		1		
Accept change, make no alterations				2
Accept change, make alterations to get best from situation	3	4	5	
Accept change, alter goals/strategies/objectives	6	7		

	Possible adaptation options	Considerations
1	Make incremental additions to existing flood protection as conditions dictate. May be achieved through management change, but more likely to require technological/built solutions to maintain current situation.	May appear a lower cost option but as each incremental cost is added it can become high cost over time. This can mask the underlying increase in risks and be a false economy. Many experts believe a 'business as usual' approach would not provide the necessary risk management. Changing conditions may create very technical challenges and require increasingly complex solutions. Potential for increasing inequality as poor and small communities receive less favourable solutions.
2	Accept there will be increased fresh and salt water flooding leading to (slow) change of freshwater habitat to brackish and saline, coastal habitat squeeze, increased impacts and constraints to riverside economy and recreation. Minimise threat to life and property through advanced warning systems.	Unlikely to be an acceptable option to local people, visitors and, to a certain degree, current legislation. Dwells on unmanaged change.
3	Find new places to direct excess water (making space for water), perhaps in 'downstream' locations and/or less populated areas. Increased flood protection at local level (such as around individual properties, small settlements or very valuable land) by individuals/communities or through public bodies. Promote holistic water management trying to use freshwater excess to minimise potential for drought impacts.	Likely to be medium cost; would require new uses for land to retain economic viability; could enhance some services (e.g. wildlife, recreational opportunities); and could be gradually introduced as conditions altered. Holistic water management could bring multiple benefits but would require new governance processes to be created/emerge. Likely to create significant challenges for freshwater habitats seeing a gradual

		move towards brackish and salty conditions.
4	Increase protection through construction of rigid defences. This may be localised raising of flood walls, strengthening of sluices and bridges, etc., but may also include more significant protection through provision of barrier(s) to prevent sea inundation. While raised barriers keep flood water out, the water has to go somewhere. This suggests that over time the defences will have to increase in coverage and potentially in height and strength.	Likely to be high cost; may require high quality modelling and widespread forward planning to ensure problems not transferred elsewhere; likely to provide feeling of greater security for area and people; could be tackled incrementally (topping up as needed), although to get wide protection extensive work might be needed. Multiple benefits might accrue from barrier approach but there are technical challenges to ensure all processes continue appropriately (e.g. passage of boats; getting balance right to allow brackish areas to remain as such) and high financial burdens.
5	Seek to relocate features unable to cope with changing conditions: Move upstream, to higher ground or away from area of risk completely. Some elements would become impossible over time, e.g. boat passage under low bridges.	Likely to be medium to high cost, take a long time to happen and be very challenging for certain habitats. It would also create challenging governance issues.
6	Accept that new conditions will prevail and current goals and objectives need to change. This is likely to relate primarily to managing the land/water in a different way for different outcomes.	Likely to be low to medium cost. By accepting there are inevitable climate impacts that make original goals difficult, new goals can take clear account of the changing climate, allowing a simpler approach to coping and so reducing costs and technical challenges.
7	Technological changes may be directed mostly at human infrastructure (health, education, nutrition) and properties. Instead of seeking to protect riverside properties, repeated flooding could be accepted with the objective to minimise the time spent out of action and the resources wasted in dealing with the aftermath. At this stage options may seem limited and innovation and fresh approaches would be needed.	Likely to be low to medium cost. By accepting there are inevitable climate impacts that make original goals difficult, new goals can take clear account of the changing climate, allowing a simpler approach to coping and so reducing costs and technical challenges.

Evaluating the options

We would clearly need more information and discussion to evaluate these options fully. However, this simple analysis suggests that option 2 would be unacceptable, and that the high cost and technically challenging options can be improved. Revising our current goals or policies may have merit, provided adaptation actions for one requirement would not worsen impacts on something of equal or greater value. Short-term actions to retain the existing special features of the Broads may be preferable, where these would not have unacceptable costs or adverse knock-on effects.

Our conclusion is to seek to retain the freshwater elements of the Broads for the time being, in line with current policy. At the same time, we need to apply 'climate-smart' thinking to planning and major investment, and improve our knowledge about adaptation choices that could balance costs and benefits, and retain the Broads as a special place – although we may have to accept that one or more of the special qualities may not be the same.

The previous research on engineered barriers needs to be revisited to understand the technical and financial options relating to current modelling. If there are feasible solutions, seeking the finance and permissions will take time: If the solutions are not practicable or affordable effort can be directed at alternatives instead. Piloting short-term 'low regret' projects will help inform longer-term approaches and identifying what data needs to be collected to improve understanding would be helpful.

What happens next?

This document is a summary of the **Broads Climate Change Adaptation Plan**, which will be submitted to Government in May 2015 to inform the UK National Adaptation Programme.

What you can do

- * Give us your views on this report (and/or the draft full Broads Climate Change Adaptation Plan which can be found at [xxxxxxx](#)). This will help us refine the documents and present an approach that is well supported.
- * Get involved in the climate adaptation debate – share thoughts, ideas and practical suggestions through the Broads Community
- * Contact the Broads Climate Change Partnership to find out how the Partnership can support you in developing your own approach.

What we will do

Subject to the response to this draft document, the Broads Climate Change Partnership will continue to develop the climate-smart approach for the Broads. Over the next 2 years, we will:

- * Listen to, and work with, organisations and local communities to develop climate-smart planning, strategy and action.
- * Develop material that will help people consider climate projections and how they might impact on them and improve progress towards building resilience and adaptive planning.
- * Explore actions to collaboratively tackle flood risk management across a wide area through evolving integrated policy, identifying new funding sources and processes and sharing the responsibilities for the risk.
- * Build evidence and understanding of climate impacts and adaptation options
- * Share good practice and signpost help and support
- * Implement and monitor 'low regret' adaptation actions

- * Incorporate a climate-smart approach in the Broads Plan, following its review in 2015/16.
- * Promote and encourage a climate-smart approach in appropriate partner plans and strategies

Contact

- Visit: www.broads-authority.gov.uk/xxxxxxxxxxx
- Write to: Broads Community, c/o Broads Authority, 62-64 Thorpe Road, Norwich NR1 1RY
- Telephone: Simon Hooton on 01603 756025
- Email: Broadscommunity@broads-authority.gov.uk



Join the debate

This list is not exhaustive and is subject to change but forms the basis for consultation
(BF) = represented on Broads Forum

Boating/Water Based Recreation

- Amateur Rowing Association (BF)
- British Canoe Union (BF)
- British Water Ski Federation (BF)
- Broads Angling Strategy Group (BF)
- Oulton Broad Watersports Centre (BF)
- East Anglian Waterways Association (BF)
- Eastern Rivers Ski Club (BF)
- Eastern Rowing Council (BF)
- Inland Waterways Association (BF)
- Norfolk and Suffolk Boating Association (BF)
- Norfolk Anglers Conservation Association (BF)
- Oulton Broad Users Community Enterprise (BF)
- Residential Boat Owners Association
- Royal Yachting Association (BF)
- Sailing, rowing and canoe clubs
- Sport England (BF)
- Yare Users Association (BF)

Land Based Recreation

- British Horse Society, Norfolk Branch (BF)
- Broads Local Access Forum (BF)
- East Anglian Trail Riders Association (BF)
- Gt Yarmouth Port Company Ltd
- Ramblers Association (BF)
- SUSTRANS (BF)

Commercial / Business

- British Marine Federation (BF)
- Broads Hire Boat Federation (BF)
- Broads Tourism (BF)
- Norfolk and Suffolk Pleasure Boat Owners Association (BF)
- Norfolk Chamber of Commerce & Industry
- Norfolk Tourism (BF)
- Suffolk Chamber of Commerce & Industry
- VisitNorwich Ltd (BF)

Wildlife and Conservation

- British Trust for Ornithology
- BTCV (BF)
- Butterfly Conservation
- Forestry Commission
- Friends of the Earth (BF)
- Norfolk & Norwich Naturalists' Society
- Norfolk Geodiversity Partnership
- Norfolk Wildlife Trust (BF)
- Norwich Fringe Project
- RSPB (BF)
- Suffolk Geodiversity Partnership
- Suffolk Wildlife Trust (BF)

Farming/Landowning / drainage & flood mgt

- Association of Inland Drainage Authorities (BF)
- British Association for Shooting and Conservation (BF)
- Broadland Environmental Services Ltd
- Broads Reed and Sedge Cutters Association (BF)
- Country Landowners and Business Association (BF)
- National Farmers Union (BF)
- Farm Conservation /Farming & Wildlife Advisory Group

Education

- Barton Turf Activities Centre (BF)
- Easton College (BF)
- Horstead Centre (BF)
- How Hill Trust (BF)
- Museum of the Broads (BF)
- Nancy Oldfield Trust (BF)
- Norfolk Schools Sailing Association (BF)
- Norwich City College (BF)

Cultural Heritage/Landscape

- CPRE
- English Heritage
- National Trust (BF)
- Norfolk Archaeological Trust (BF)
- Norfolk Coast Partnership AONB
- Norfolk Heritage Fleet Trust (BF)

- Norfolk Landscape Archaeology
- Norfolk Mills and Pumps Trust (BF)
- Norfolk Wherry Trust (BF)
- Norwich Rivers Heritage Group
- Suffolk Archaeological Service
- Suffolk Coast & Heaths AONB
- Wherry Yacht Charter Charitable Trust (BF)

Local charities

- Broads Charitable Trust
- Broads Society (BF)
- Ted Ellis Trust and Wheatfen Partnership
- Whitlingham Charitable Trust

Utilities/infrastructure

- Anglian Water
- Essex & Suffolk Water
- Water Management Alliance

Government/NPAs

- Association of National Park Authorities
- Campaign for National Parks
- County Councils
- District / Borough/ City Councils
- Environment Agency
- Local Strategic/Community Partnerships
- Members of European Parliament
- Members of Parliament
- Natural England
- Parish and Town Councils
- Ward councillors

Social/community/misc

- Arts Council England (East)
- BA staff and volunteers
- Police authorities
- Primary Care Trusts
- Racial equality groups
- Relevant working groups

Please be mindful of the Data Protection Act when using personal details.

Data Protection Act 1998

Personal details are protected under the Data Protection Act and may be used only where they are readily available to the public online or elsewhere. The Authority has a consultation database on Y:Drive. When contacting people on the database, it is suggested that you include a DPA statement such as:

Your contact details are held on the Authority's consultation database. These details are held in confidence and used for Broads Authority consultations and related purposes only, and will not be made available to any third parties. Please let us know if your details are incorrect or if you wish them to be removed from the database.

Freedom of Information Act 2000

The Authority complies with the Freedom of Information Act 2000, which promotes greater openness by public bodies. It gives a general right of access to all types of recorded information held by public bodies, sets out exemptions from that right, and places a number of obligations on public bodies.