Resilience and Adaptation – ICZM 2021 and beyond

Long term Integrated Coastal Zone Management for the Manhood Peninsula

Introduction

Resilience and Adaptation – ICZM 2021 has been written to provide parishes, communities and environmental groups on the Manhood Peninsula with information and practical ideas about climate change issues affecting the peninsula.

> *"Climate change will exacerbate the already significant exposure of the English coast to flooding and erosion. The current approach to coastal management in England is unsustainable in the face of climate change"*
> Committee on Climate Change, 2018.
> (.https://www.theccc.org.uk/publication/managing-the-coast-in-a-changing-climate/)

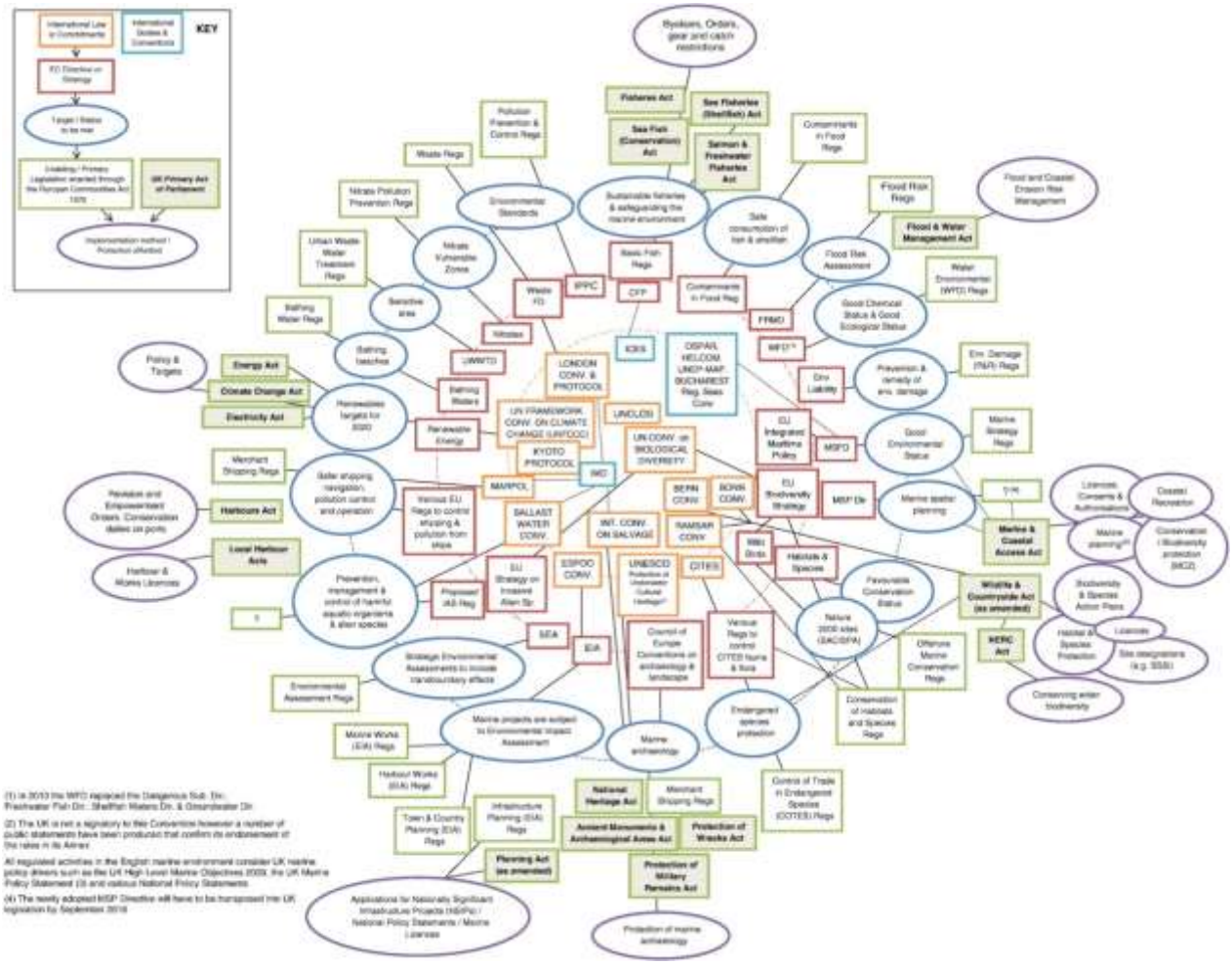
The Manhood Peninsula is an acute example of a coastal area facing dynamic coastal and climate change together with an intractable transport problem due to its geography as a small, low-lying triangle of land on the south coast of England bordered by the open coast and two harbours. Long hours of sunshine, a mild climate, open landscape and big skies mean it has long been recognised as a desirable area to live, holiday, foster businesses and grow food. It has a thriving economy based on fishing, farming and tourism.

The Manhood is also a fragile environment. It has suffered from significant and increasingly frequent flood events, resulting in several events since 2012 where people have had to vacate their properties, and faces worsening flood risk in the near future. There is need for an updated and rigorous Integrated Coastal Zone Management plan addressing climate change, sea level rise, changes in rainfall patterns and temperature and its impact on the environment, settlements and business to ensure it has a sustainable future. Like the Manhood's original 2011 ICZM policy, an updated plan needs to include consultation with local parishes, and be capable of informing both parish Neighbourhood Plans and CDC's Local Plan Review.

The future of the Manhood Peninsula is affected by two things: the changing physical environment and manmade constraints. The changing environment consists of rising sea-levels and inland water table and changes in storm frequency and rainfall intensity. Manmade constraints include:

- Mind Set - the still prevalent mind-set that coastal change can at worst be ignored and at best be prevented
- Financial– the UK does not have sufficient funds to defend the entire coastline and insurance for homes more likely to flood is declining;
- Perception –people like living by the coast and builders like building on flat land where people want to live. Continuing to build as normal in vulnerable coastal areas may lead to a perception that there is no risk.
- Sustainability – existing coastal flood defences will not be sustainable indefinitely to sea level rise and there is insufficient flexibility in current planning policies to help the local community determine a socially, economically and environmentally favourable way forward to enable the peninsula to thrive for as long as possible as it transitions and adjusts to climate related changes.

Constraints also include marine governance. The policy making area of the coastal zone is hugely complex due to the number of terrestrial and marine agencies and organisations involved. In turn this impacts on decision makers such as a planning authority. The complexity is reflected in the following marine governance diagram, which reflects why things sometimes don't run smoothly!



Changing Environment

The key drivers for our changing environment, whether natural or man-made, centre on those things we can't control but, as a forward thinking population, we need to be aware of:

- Climate change
- Sea level rise
- Storm frequency and intensity
- Rising water table
- Increased ground water and surface water flood risk
- Loss of coastal wetlands and beach due to coastal squeeze
- The extra space needed for wetland roll back and to cater for wetland birds and migrating bird species

Sea-level rise and increased storm frequency mean coastal flooding is set to occur more frequently and with greater severity.

Without significant investment the result is likely to be increases in the rate of coastal erosion and the potential for flooding in low lying communities on the Manhood Peninsula. The Chichester coastal plain needs to be prepared for this future and take action now.

Climate Change

The vulnerability of the peninsula to climate change was recognised more than two decades ago when the area was the subject of an Anglo-Dutch workshop comprising experts in coastal and water management and planning.[1] The workshop, which involved significant community input, led to the formation of the Manhood Peninsula Partnership (MPP).[2] As a result of Going Dutch and the MPP, the community has begun to confront the challenges it faces in a proactive manner. Most notably, the Dutch recommended a realignment of the coast to create a softer sea defence and additional wetland habitat, which would enhance the area's important green tourism sector while still providing flood defence to vulnerable properties.

Following extensive consultation on the 2008 Pagham to East Head Coastal Defence Strategy, managed realignment became the adopted solution for Medmerry. The subsequent Medmerry Managed Realignment Scheme, now RSPB Medmerry, successfully fulfilled all three of these important social, economic and environmental ambitions and has been largely embraced by the community.[3] The MPP has also worked closely with the community to improve drainage in the area by enhancing the peninsula's existing rifes and ponds and increasing its wildlife supporting water storage capacity.

But action is needed within a long term planning strategy to ensure the peninsula and its communities can continue to thrive for future generations by adapting to changing conditions instead of trying to maintain a *status quo.* This document aims to provide the basis for an updated ICZM to ensure the area is as resilient and adaptable as possible to predicted sea level rise and other climate change impacts.

In my lifetime I have played cricket, grown onions and caught prawns, on the same spot.'
(George Woodland – retired Second Coxswain, Selsey RNLI, 2011)

[1] Going Dutch
[2] The MPP comprises ……
[3] Medmerry also won …name awards.

Local Plan

Included in the current Chichester Local Plan Key Policies (2014-2029) is an integrated Coastal Zone Management policy for the Manhood Peninsula (Policy 22, page 127).
It reflects the views expressed 10 years ago well, but it is not thought sufficiently robust in the face of accelerating climate change and its consequences. The policy was derived following public consultation and comments on *Towards ICZM on the Manhood Peninsula*, an integrated coastal zone management document produced as part of the Coastal Change Pathfinder project in 2011.

Also included in Chichester Local Plan Key Policies (2014-2029) are policies for strategic development in Selsey and East Wittering & Bracklesham. Similarly these are not thought sufficiently robust on the matters of climate change and carbon neutrality.

The forthcoming Local Plan Review acknowledges climate change in the Strategic Flood Risk Assessment documents, but Towards ICZM has not been included in the documents associated with the Local Plan Review 2035. There is nothing specific to the coastal plain, the area of Chichester District most vulnerable to coastal flooding and the effects of climate change: http://www.chichester.gov.uk/CHttpHandler.ashx?id=31036

Aims and objectives

Aims of this document:

- Identify the issues
- Promote building on higher, safer ground, or in a water adaptable way.
- Promote development which is resilient to sea level rise and coastal change
- Ensure consideration is made for the appropriate life time of a development, taking into account coastal erosion, flooding, and whether/when homeowners may be willing to abandon property – 50 years or 300?
- Update existing long term Integrated Coastal Zone Management (ICZM) plans and policies for the coastal plain

Objectives of this document:
To promote sustainable development that is resilient to sea level rise / coastal change by:

1. Raising awareness of climate change and its impacts by encouraging people to think about the best form of land use to make the area more resilient socially, economically and environmentally.
2. Actively promoting buildings that are resilient by building in the most suitable locations using appropriate drainage systems, building methods, materials and designs.
3. Understanding options for adaptation including “retreat” and timescales in which nature and communities can thrive for future generations.
4. Providing evidence that can support sustainable development through the Local Plan.
5. Providing parishes with ideas and information to include in their individual responses to the Local Plan for Chichester District by scoping out the options.

Planning

Recent directives from government agencies surrounding the planning environment and risk management have changed markedly for areas particularly vulnerable to the impact of climate change, particularly flood risk and rising sea levels during the last two years.

The 2020 Flood and Coastal Erosion Risk Management Strategy

The Environment Agency states that:

- *This Strategy's long-term vision is for: a nation ready for, and resilient to, flooding and coastal change – today, tomorrow and to the year 2100.*
- *This Strategy is seeking to better prepare us for 2°C warming in global temperatures as well as planning for higher scenarios, such as a 4°C rise in global temperatures.*
- *We need to both limit future climate change as well as adapt to the climate change that now cannot be stopped*
- *It is therefore important that risk management authorities are planning for the impacts of sea level rise to ensure today's flood and coastal erosion protection infrastructure is resilient to tomorrow's climate.*
- *As a nation we need to be 'climate ready' so that we are resilient to future climate hazards and potential economic shocks that impact our prosperity.*

- *This Strategy calls for the nation to embrace a broad range of resilience actions including better protection to flooding and coastal change.*
- *We frame resilience in terms of the capacity of people and places to plan for, better protect, respond to, and recover from flooding and coastal change. This includes making the best land use and development choices, protecting people and places, responding to and recovering from flooding and coastal change whilst all the time adapting to climate change. This aligns with the description of resilience in the government's Flood and Coastal Erosion Risk Management Policy Statement which describes actions to better protect the country grouping together the protect and plan, and actions to better prepare the country, grouping together the respond and recover elements (Defra, 2020e).*
- *Climate change is already changing our weather and increasing our risks of flooding and coastal change. The government's 25 Year Environment Plan (Defra, 2018) states that current global commitments under the Paris agreement are insufficient to limit the average temperature rise this century to well below 2°C above pre industrial levels. We need bold and transformative action if we are to become a climate resilient nation. We need to be able to plan to adapt to a range of climate change scenarios, including higher scenarios such as a 4°C rise in global average temperatures.*
- *Cover all sources of flooding and coastal erosion: The Environment Agency's updated National Flood Risk Assessment, due in 2024, will support improvements to the evidence base for fluvial, coastal and surface water flooding*
- *Local people and local partners should be at the heart of making local choices about the best combination of resilience actions for achieving greater flood and coastal resilience in the places in which they live and work.*
- *Be adaptable to future climate risks: Planning and adapting to future climate risks is crucial to making sure places remain resilient to future flooding and coastal change over the longer term. This means looking out to 2100 and beyond to ensure we are resilient to future climate hazards.*

To be better prepared for climate change we need to take action now, so we are ready for the impacts and can make sure the places people live and work in are safe and resilient to future flooding and coastal change. The Committee for Climate Change (2019) and Organisation for Economic Co-Operation and Development (2019) have highlighted the importance of adaptation to rising sea levels and flood and coastal risks. Both indicate that the longer-term costs to society of not pursuing adaptation will be far greater than the costs of investing in resilience and adaptation today.
Adapting now to a changing climate is in our economic self-interest.

— local land use and development choices by accounting for a range of climate futures and reducing economic damages from flooding and coastal change

Between now and 2050 risk management authorities will help coastal communities

Adaptation to future flooding and coastal change also needs to account for the impacts to habitats and natural landscapes. This is important because we know that the current pattern of protected habitats cannot be sustained exactly as it is, due to climate change. For example, in some places along the coast, freshwater habitats protected by coastal defences may change into salt-water habitats as the sea rises. Risk management authorities and Natural England should work together to develop innovative approaches to conservation that enable adaptation to sea level rise and a changing climate.
It is therefore essential to continue to avoid inappropriate development in areas at high risk of flooding and coastal change.

The government's National Planning Policy Framework makes clear that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk.

On the coast, the government's National Planning Policy Framework is equally clear about reducing the risk from coastal change by avoiding inappropriate development in vulnerable areas and not exacerbating the impacts of physical changes to the coast. Local planning authorities are encouraged to embed local shoreline management plan policies in their spatial plans. They are also encouraged to identify coastal change management areas where rates of shoreline change are significant over the next 100 years, taking account of climate change. Coastal change management areas should make provision for any vulnerable properties and infrastructure that may need to be relocated at a future point. This could include supporting roll back of the coastline or development facing the threat of coastal erosion. The Environment Agency will support coast protection authorities in updating and maintaining shoreline management plans and will advise planning authorities on the designation of coastal change management areas.

The government's National Planning Policy Framework recommends that local planning authorities identify places which are, or are expected to be in future, unsustainable. This could include places subject to coastal erosion or disruptive or hazardous flooding. It is therefore important that risk management authorities work closely with local planning authorities to ensure spatial plans take an adaptive approach to planning for future climate risks.

"*There is no doubt that many of the climate change scenarios are extremely challenging to our flood defence role. Southern Region is dominated by its coastline. Climate change will make it extremely difficult to maintain standards of defence against both flooding and erosion.*"
(https://ukcip.ouce.ox.ac.uk/wp-content/PDFs/SE_summary.pdf)

The Missing Vision

…turning a Negative into a Positive:
There are ways in which this can be achieved. We **can** secure a future for the Manhood Peninsula and the Chichester coastal plain in the face of sea level rise. The community working with Chichester District Council and the Environment Agency has already shown the international community how it can make difficult decisions and turn a negative situation into a positive one through Medmerry– Europe's largest open coast realignment scheme.[4] Medmerry Nature Reserve is not only a more sustainable sea defence than the previous shingle bank it now attracts many migrating and breeding birds, among the rarest in the UK, as well as local and international human visitors.

Taking a long term view of the coastal plain and adapting accordingly will help alleviate the consequences of sea level rise and tidal surge as well as hinterland flood risk from rising water tables and surface water flooding. Measures can transform a low lying area at risk from change into a thriving place for the natural environment, communities and businesses. However we need to carefully consider what is right for us.

We need to consider…

What needs changing?

- Recognition of Limited Resources – the natural capital of wetlands, farmland, and biodiversity needs to be fully explored when assessing the best use/allocation of land. The desirability of living on the coast needs to be assessed against the subsequent loss of vital wetland capacity, wildlife habitat and, in the short to medium term, prime farmland; the cost and social devastation of regular property flooding and the risk of locking future generations into costly and technically difficult flood and erosion defences.
- Communication. What form of land use allocation/development will facilitate the appropriate risk recognition of current and future residents?
- Timescales – should planning for vulnerable locations be concerned with the future of communities for one, two, three or four generations. Are we building homes for 50 years or communities for several centuries?

[4] http://epc.sagepub.com/content/33/5/1024.short

http://jwcc.iwaponline.com/content/6/1/25

https://link.springer.com/chapter/10.1007/978-94-007-0785-6_14
https://www.tandfonline.com/doi/abs/10.1080/17567505.2017.1317081
https://www.icevirtuallibrary.com/doi/abs/10.1680/cm.61149.263
https://www.icevirtuallibrary.com/doi/abs/10.1680/cm.61149.283

Portsmouth – an urban version of the Manhood Peninsula

Before considering the future of the Manhood Peninsula, it is worth examining the dilemma now facing Portsmouth, an urbanised peninsula, close to and almost identical in topography to the Manhood Peninsula.

The photograph below shows (from top to bottom) the peninsulas of Gosport, Portsmouth, Hayling Island, Thorney Island and the Manhood Peninsula.

The image clearly shows their vulnerability to future catastrophic flooding from climate change induced sea level rise. While Portsmouth is already heavily built up, the others less so, particularly Thorney Island and the Manhood.

The Facing Up To Rising Sea Levels study by the Institute of Civil Engineers examined the options available to Portsmouth to cope with sea level rise this century.[5]

The Options

The options relevant to the Manhood Peninsula were:

Retreat

- designating parts of the lower lying edges of the city for salt marsh creation to compensate for existing salt marsh that will be lost to sea level rise
- creation of a salt-marsh sheep farm
- confining new development to the hills and higher land to the north of the city, where homes would be safer and insurable
- relocating the M27, part of the main east/west trunk road linking Southampton to Eastbourne, further north on higher ground
- finding new uses for existing buildings liable to flood, residents moving to upper floors, adaptations made to cope with more frequent and severe flooding
- revitalising the frontage to the south of the city as a public beach
- defending the naval base and ports from the rising sea for national security reasons
- Hayling Island becomes a 'water based' island with an appropriate economy
- Continuing sea defences are recognised as being time limited

[5] ICE document

Defend

- Building tidal gates to protect the harbour from tidal surges
- Constructing a new high and wide sea wall around the city, publicly and privately funded, and comprising high value residential and commercial units with maintenance programs put in place for a 200 year liability, ensuring long-term underwriting of properties.
- Creating public space in front of and behind the new sea wall.

The ICE study points out the extreme and costly measures UK coastal cities must get ready to take to prepare for sea level rise expected from this century onwards. The UK is far behind countries like China, which is already spending billions on climate change mitigation in its coastal cities and relocating millions of people inland to new cities on higher ground.[6]

Chichester is in a more fortunate position in that its coastal plain is much less developed than Portsmouth. But as pressure for development grows, it is imperative that the risks and opportunities of climate change are incorporated into planning policies as soon as possible. Inappropriate development on the low lying hinterland will lock future generations into costly, or possibly prohibitive, coastal defence costs or exposure to catastrophic flooding.

Future Options for the Manhood Peninsula

The communities of the Manhood have already accepted a process of managed retreat for part of the peninsula following extensive public consultation since 2001, resulting in the Medmerry coastal realignment scheme. That decision was part of a decade long consultation process in which the communities and local councils determined that the protection of the coast through managed retreat and the creation of saltmarsh and freshwater wetlands presented a long term sustainable option which reinforced the area's environmental based economies of food production and tourism.

New climate change flood risk maps prepared by the EA and CDC prevent building on sites likely to suffer from tidal inundation by 2115, such as those surrounding East Wittering and Bracklesham. But there are as yet no building controls for the rest of the peninsula and coastal plain less than 7m above sea level, even though these areas will face coastal inundation within 200 years, ie within three generations.

The question CDC and local communities and parish councils must therefore address is how to plan for the most resilient and sustainable short, medium and long term future for the area. As demonstrated in the Portsmouth case, without the construction of a significant sea wall along the entire coastal frontage and the use of pumps throughout the peninsula to drain the surface water, communities must learn how to live with and adapt to increasing water tables and flood risk.

Holding the line option may work for the coastal communities of West/East Wittering/ Bracklesham and Selsey and the harbour villages of Itchenor, Birdham, Earnley, Appledram and Sidlesham for the current generation.

[6] https://climateadaptationplatform.com/adapting-to-floods-by-creating-sponge-cities-in-china/

As a result, the peninsula communities are not facing the prospect of relocation or abandonment in the near future, like some coastal communities in the UK. However, it would be negligent and short sighted of parish councils and CDC not to help prepare for the medium and long term futures of their communities.

Optimum land use
Before examining the best methods and materials for flood resilience construction, planners and communities need to ascertain what would be the best use of land on the peninsula and other parts of the low lying coastal hinterland - economically, environmentally and socially.

Wetlands
Chichester's coastal plain is the last significant stretch of undeveloped coastal hinterland between Southampton and Eastbourne, containing internationally important areas of wetland in Chichester, Medmerry and Pagham Harbours. Wetlands are one of the ecosystems most under threat globally and in the UK both from coastal development and sea level rise. These biodiverse habitats are also one of the most effective for CO2 sequestration. As a result, wetlands have a huge natural capital as a vital resource globally. Leaving space for Chichester's wetlands, and associated species, to migrate inland and to merge with one another is probably one of the most important and sustainable land use functions of the area. Making space for water is not only good for biodiversity and CO2 absorption, it also provides important flood mitigation which is of huge social and economic benefit to the local communities. Allocation of the land for the future migration of wetlands will also benefit the green/outdoor/natural tourism economy which already forms a major part of the area's revenues and employment.

The UN Millennium Ecosystem Assessment determined that environmental degradation is more prominent within wetland systems than any other ecosystem on Earth. Wetlands are the most effective carbon sinks on Earth. They reduce the intensity of waves, storm surges, and tsunamis, shielding the 60 per cent of the global population who lives and works along coastlines from flooding, property damage and loss of life.

In 2016, the UK government funded the establishment of the 'Blue Forests' initiative run by British organisation, Blue Ventures. The aim of the project is to reduce deforestation of mangroves habitat, create new sustainable livelihoods, support community health and women's empowerment and increase climate resilience in coastal communities. So why is the UK government condoning building on low lying coastal hinterlands that will be needed in the future for wetland migration/conversion?

Wetlands play an irreplaceable role in regulating the global climate, maintaining the global hydrological cycle, protecting the ecosystem diversity, and safeguarding human welfare. Wetland ecosystems can not only bring indirect services to human beings, but also bring direct economic values to human beings. The value per ha of wetland ecosystem services ranks first among all kinds of ecosystems, and the total values of wetland ecosystem services account for 47% of the values of the global ecosystem. Therefore, it is one of the most important and productive ecosystems.

Davidson estimated that wetlands around the world had degraded by about 87% since 1700 in data existing regions, and the degradation mainly occurred in the 20th and early 21st

centuries. The OECD (Organization for Economic Co-operation and Development) and Ramsar have both estimated that the world had lost 50% of its wetlands since 1900.

Ramsar Convention Secretariat reported a 35% reduction of global wetlands with data available between 1970 and 2015.

Since most of the services provided by wetland ecosystems have not been traded in the economic market, the value of wetland ecosystems continues to be neglected or underestimated by stakeholders, government, and public. Wetlands not only contain the value of biodiversity and as habitats for plant animal and fish species, but also can bring many environmental services or functions. Thus, wetland policy has begun to shift from encouraging development to protecting and rational utilization.

Ramsar Sites are wetland reserves. The area of a Ramsar Site and the actual area of wetland in a site are two different concepts. In general, the area of a Ramsar Site will not change unless it is expanded, adjusted, or merged with other protected areas.

Marine/coastal wetlands are most affected by pollution and climate change, which may be due to the economic development of coastal cities and sea level rise caused by climate warming.[7]

Chichester District already has two important Ramsar Sites, Chichester and Pagham Harbours and the potential for further designations such as Medmerry Harbour. However, predicted sea level rise means that the future integrity of its wetlands needs to be recognised in Local Plans going forward by allowing space for creation, expansion, migration and merger of coastal wetlands in the district.

Farmland and Fishing

Food production, through agriculture, horticulture and fishing, is, along with tourism, the major economic sector on the peninsula and coastal plain. Maintaining as much land as possible for growing food, and maintaining healthy seas for fish, will help the environmental, economic and social resilience of the community as it adjusts and transitions with rising sea levels. Farmers have managed the drainage of this lowlying area, maintaining and digging ditches and ponds, for centuries. As ground water and sea levels rise and rainfall intensifies, farmers will help the area adjust and can provide land for future wetland migration as is needed.

Wetlands, farming, fishing, aquaculture and tourism will symbiotically enhance the area's ability to cope with climate change providing it with more opportunity than risk in the short to medium and long term.

7

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6571829/
https://freshwaterhabitats.org.uk/news/uk-government-taken-to-court-over-unprotected-wetlands/
https://www.dur.ac.uk/research/news/item/?itemno=35217
https://www.nature.com/articles/s41467-018-05080-0#Fig1

Housing Development
As the whole of the area will be subject to catastrophic coastal flooding within three to four generations without significant reinforcement of existing sea defences going forward, mass housing development should only be considered if the provision of housing is considered more important than wetland and farmland provision and if there are no better locations on which to build.

If land is allocated to building it should be accompanied by significantly increased commitment and resources to protect the area from rising sea levels. This is the conclusion of the HRA consultants employed by CDC, who state that no development should take place in areas which would require new defences in the future. (see 3.36 below).

In Chichester District, the planning authority's consultants produced an assessment of the local plan policies.
https://www.chichester.gov.uk/media/30918/Habitat-Regulations-Assessment-Chichester-Local-Plan-Review/pdf/Chichester_Local_Plan_Review_HRA_Issue_V2_9_Nov_2018_(2).pdf
Habitat Regulations Assessment: Chichester Local Plan Review Chichester District Council Project number: 60549754November 2018 (AECOM Infrastructure & Environment UK Limited)

The HRA assessment on Coastal Squeeze notes that:

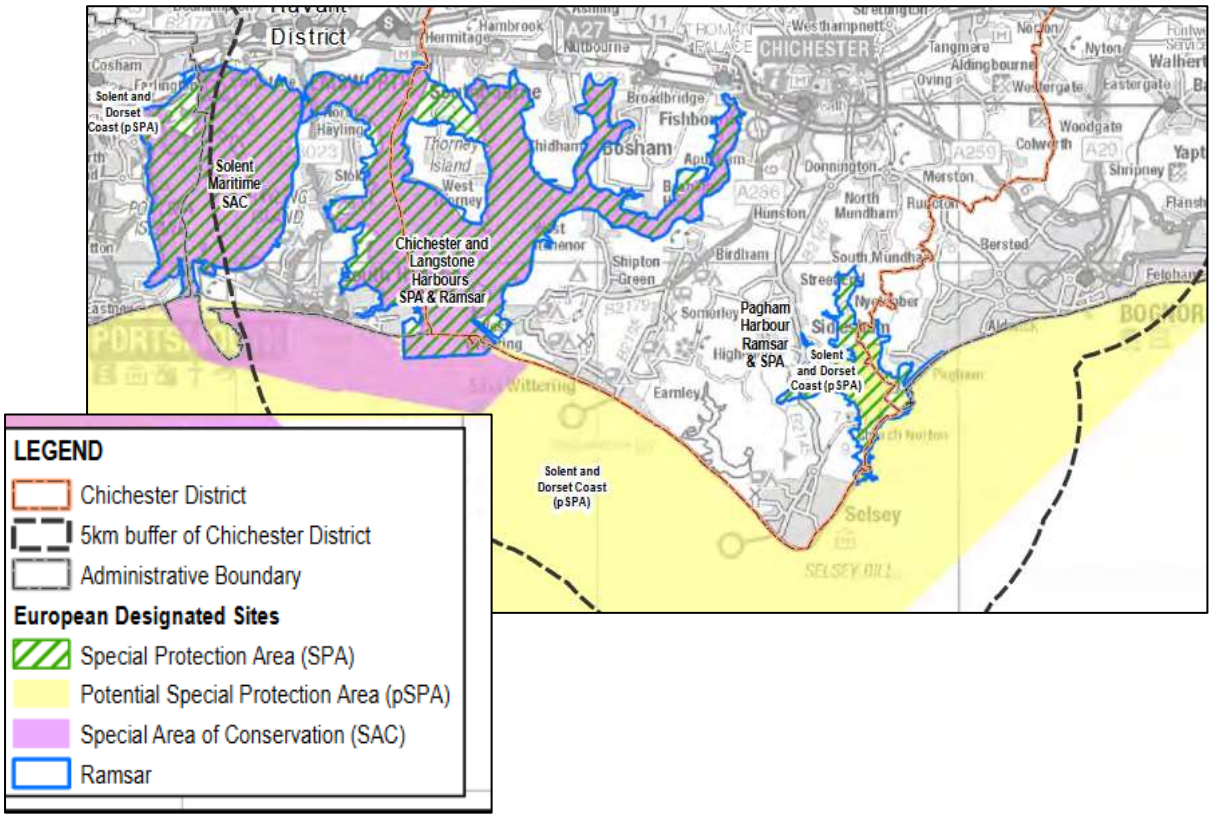
3.32 Rising sea levels can be expected to cause intertidal habitats (principally saltmarsh and mudflat) to migrate landwards. However, in built-up areas, such landward retreat is often rendered impossible due the presence of sea walls and other flood defences.
3.33 In addition, as development frequently takes place immediately behind the sea wall, flood defences often cannot be moved landwards to accommodate managed retreat of threatened habitats. The net result of this is that the quantity of saltmarsh and mudflat adjacent to built-up areas will progressively decrease as sea levels rise. This process is known as 'coastal squeeze'. In areas where sediment availability is reduced, the 'squeeze' also includes an increasingly steep beach profile and foreshortening of the seaward zones.
3.34 The North Solent Shoreline Management Plan (SMP) units for Chichester and Langstone Harbours indicate that there will be a combination of 'Hold the Line', 'Managed Realignment' and 'Adaptive Management' strategies. An HRA of the draft plan indicated that Hold the Line will have no effect on habitats behind the defences, whilst Managed Realignment is likely to "have a significant detrimental effect resulting in loss of designated terrestrial habitats including coastal grazing marsh, saline lagoons and grasslands."
Managed Realignment is proposed in the short term for part of Chichester Harbour. Although Hold the Line is the preferred approach for the majority of the shoreline, the SMP notes that further studies on Chichester and Langstone Harbours may lead to revision of this for significant lengths of shoreline in the inner harbours.
3.35 The South Downs SMP for areas fronting Pagham Harbour identifies a mix of Hold the Line and Managed Realignment strategies.
The SMP states that a Managed Realignment strategy is being adopted to maintain the integrity of the harbour with its nature conservation value as a primary consideration.

3.36 In order to conclude that development in the Local Plan area would not lead to a significant adverse effect as a result of coastal squeeze, it will be necessary to conclude that the Local Plan would not require the SMP (or resulting Coastal Strategy) policies for the frontage to be altered and would not be situated in such a position as to require new defences in currently undefended parts of the coastline or locate development in areas planned for managed realignment in the SMP or the Environment Agency Regional Habitat Creation Programme."

This assessment suggests that no housing developments should be planned or allowed without first determining the impact of short, medium and long term strategies for coastal management and how to ensure maximum flexibility for managing the coast in the future.

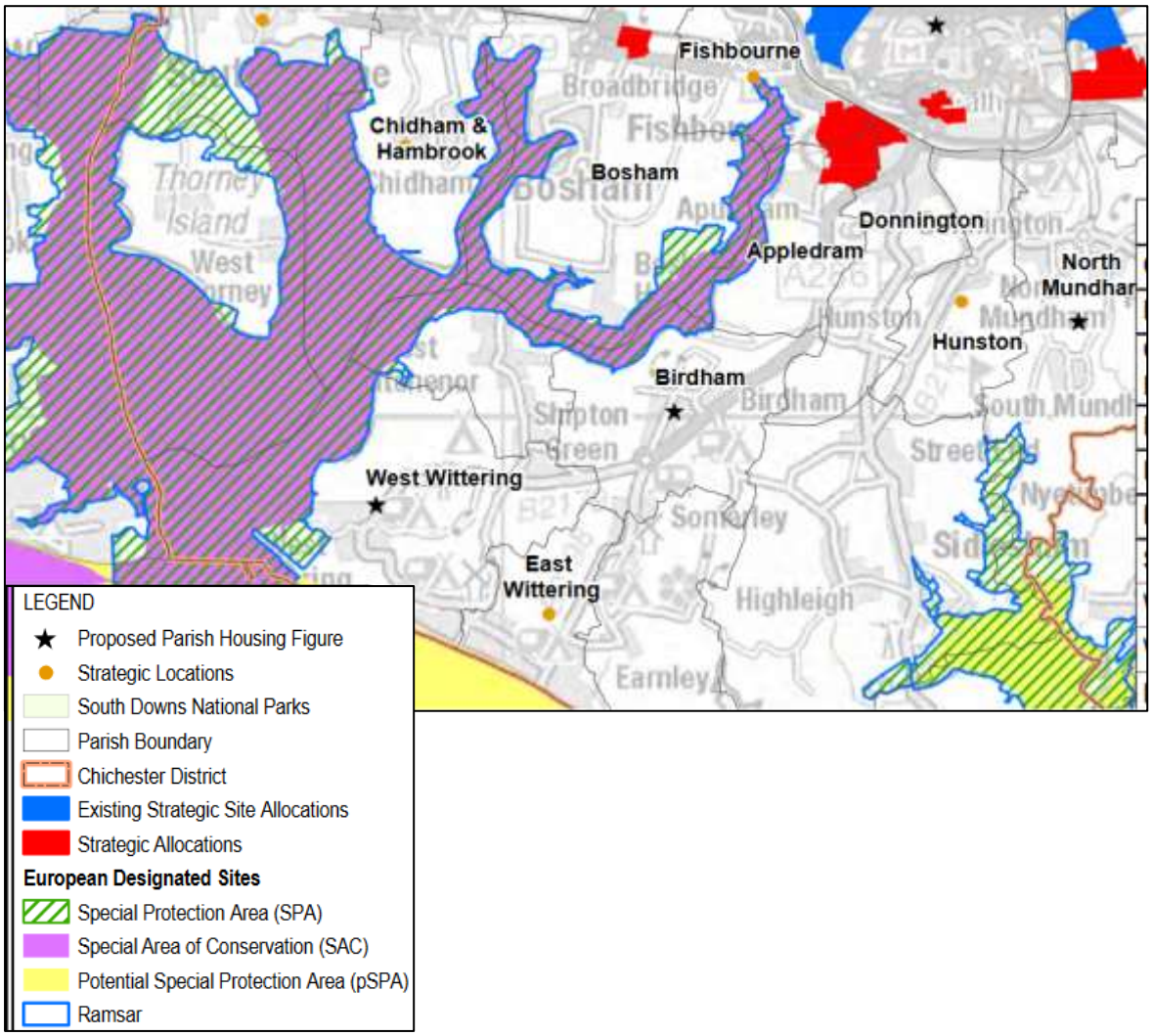
These habit assessments underscore national planning policy's precautionary policies. Chichester District Planning Processes needs to ensure future development will not rupture the 'in-between' areas between the existing wetland sites and the protected higher land on the South Downs.

There are also other issues identified with respect to coastal squeeze. Coastal squeeze also affects beaches by causing them to disappear. This is turn affects the amenity and attractiveness of the area to residents and holiday visitors, reducing the economic potential and sustainability of the area.



New Housing

If housing is built, its design and materials should reflect future flood risk, whether ground water, fluvial, coastal or surface water flooding. This is important not only to protect future and existing residents but also to create an understanding amongst residents of flood risk. Continuing to build housing estates in the normal manner will create a sense of false security and conflict with flood warning messages from the EA and Local Authorities.



There are many examples of floating, lifting houses or homes built on stilts, as well as floating neighbourhoods that could be investigated or trialled as options.[8]

https://www.google.co.uk/amp/s/www.lincolnshirelive.co.uk/news/local-news/futuristic-house-stilts-can-lift-667141.amp

https://www.google.co.uk/amp/s/www.newyorker.com/tech/annals-of-technology/a-floating-house-to-resist-the-floods-of-climate-change/amp

https://www.alisonbrooksarchitects.com/project/salt-house/

https://www.architecturaldigest.com/story/bjarke-ingels-plan-floating-cities-un

Other examples:

Conclusions and recommendations:

The communities of the peninsula have already engaged in 20 years of consultation with CDC, WSCC, EA and other stakeholders in the area on environmental, economic and social strategies for increasing the area's resilience to climate change both through the MPP and other facilitators and initiatives.

This has produced the UK's largest coastal realignment scheme, an ICZM document/policy, destination management plans, drainage and wildlife enhancement projects (such as FLOW), creation of Flood Action Groups, a growing network of cycle paths. All these community instigated projects are based on a strategy that will allow the peninsula to be as adaptable and resilient as possible in the decades ahead, supporting a strong visitor and food growing economy based on land use that will create an environment best able to absorb both CO2 and rising sea levels while minimising the risk to residents, wildlife and ecosystems.

'Plan your future as well as your sea defences' By looking ahead and maximising your potential, you will increase the importance of protecting your area but you will also be able to judge better what type of coastal management is preferable for your economy and environment.'
(Going Dutch II, 2008)

Author: Dr Carolyn Cobbold, MPP Project Leader

Contributions and guidance were gratefully received from:

- Jane Cunningham, MPP Project Officer – author *Towards ICZM 2011*; Coastal Officer and integrated coastal zone management lead during the Coastal Change Pathfinder Project 2011
- Paul Bedford, Chairman of the Surface Water Issues and Solutions (SWISh) subgroup of the Manhood Peninsula Partnership
- Coastal Engineers at Chichester District Council and the Environment Agency

Please send any enquiries concerning this document to Jane Cunningham and they will be forwarded as appropriate:
Email: jcunningham@chichester.gov.uk

References:

Committee on Climate Change, 2018. Managing the coast in a changing climate. Committee on Climate Change, London.
https://www.theccc.org.uk/publication/managing-the-coast-in-a-changing-climate/

Towards ICZM on the Manhood Peninsula:
https://peninsulapartnership.org.uk/projects/coastal-change-pathfinder-project/integrated-coastal-zone-management-iczm/towards-iczm/

Facing up to Rising Sea Levels:
https://www.ice.org.uk/getattachment/news-and-insight/policy/facing-up-to-rising-sea-levels/Facing-Up-to-Rising-Sea-Levels-Document-Final.pdf.aspx

Wrong Answers to the Wrong Questions:
https://www.tcpa.org.uk/the-wrong-answers-to-the-wrong-questions

Gary Lane, Regional Water Manager, Environment Agency, Southern Region [p28]:
in Wade, S., Hossell, J, Hough, M. & Fenn, C.(Eds.) 1999.
The Impacts of Climate Change in the South East: Technical Report, WS Atkins, Epsom.
https://ukcip.ouce.ox.ac.uk/wp-content/PDFs/SE_summary.pdf