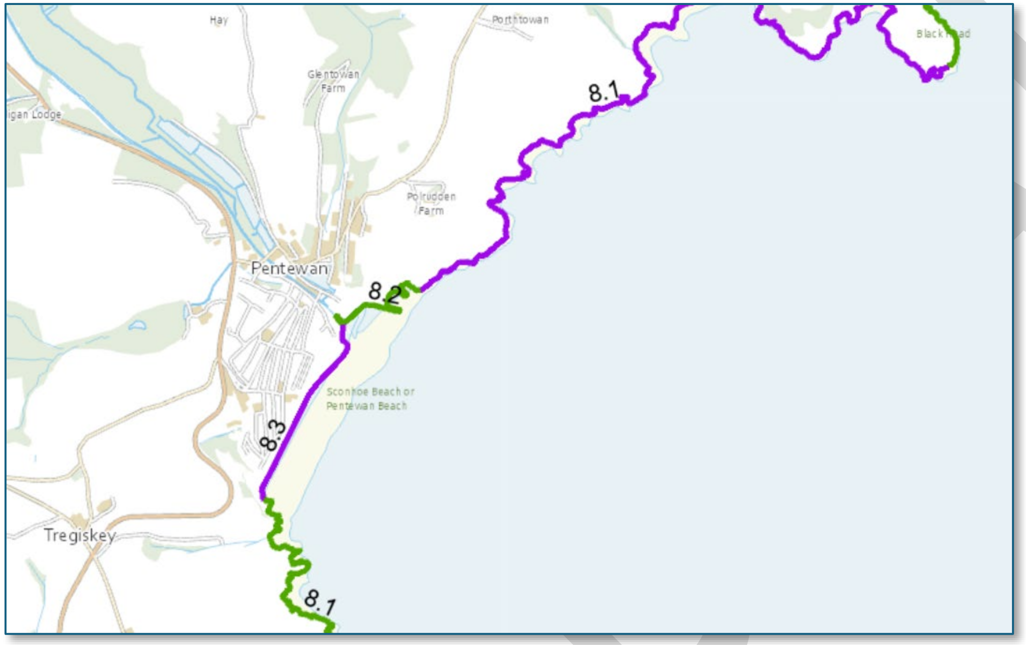
PENTEWAN VALLEY PARISH NEIGHBOURHOOD DEVELOPMENT PLAN - COASTAL EROSION AND FLOODING BACKGROUND NOTE.

Coastal Erosion

1. Coastal erosion is a natural process which needs to be planned for where it may impact property and infrastructure or result in coastal squeeze[1]. Climate Change is also expected to lead to higher and more frequently stormy seas, which could accelerate coastal erosion processes. Pentewan village and its hinterland lies within a dynamic coastal environment that is increasingly vulnerable to the effects of climate change, including rising sea levels, increased storm frequency, and coastal erosion.

2. The Environment Agency published updated **National Coastal Erosion Mapping** (**NCERM2**) estimates earlier in 2025. The latest projections can be viewed on the, public CC SFRA map or the EA's SMP Explorer. Pentewan Valley Parish's coastline is within Policy Development Zone 4 (PDZ4), in Management Area 8 (MA8),Policy Units 8.1, 8.2 and 8.3, see Map 1 below.



Map 1: Policy Units within Pentewan Valley Parish

[1] See: What is coastal squeeze? - GOV.UK (www.gov.uk)

3. The Shoreline Management Plan [SMP2] gives the proposed broad management approach for each of these areas.

Policy Unit	Name	Epoch: 0 to 20 Years (2005 to 2025)	Epoch: 20 to 50 Years (2025 to 2055)	Epoch: 50 to 100 Years (2055 to 2105)
8.1	Undefended cliffs	Main policy: No active intervention Sub Policy: Do not defend	Main policy: No active intervention Sub Policy: Do not defend	Main policy: No active intervention Sub Policy: Do not defend
8.2	Pentewan Harbour & village	Main policy: Managed realignment Sub Policy: Natural features	Main policy: Managed realignment Sub Policy: Natural features	Main policy: Hold the line Sub Policy: Natural features
8.3	Pentewan Beach	Main policy: No active intervention Sub Policy: Local activity only	Main policy: Managed realignment Sub Policy: Natural features	Main policy: No active intervention Sub Policy: Local activity only
SMP Policy Definitions				
	Do not Defend	Where no defences are present, and it would be technically/ environmentally unacceptable to introduce any due to the impact.		
	Natural Features	Where the intent is to maintain the integrity of the natural feature (e.g. dune, spit, shingle barrier) to provide a defence function rather than fix its position, by active management of the natural feature but not structural intervention.		
	Local Activity Only	Where works to repair or construct short stretches of defences within a long length of otherwise NAI shoreline might be permitted to provide local protection (e.g. to a slipway, access point or isolated properties).		

4. For each it gives a more detailed summary of the management approach and an action plan where necessary.

8.1 Undefended cliffs					
Summary management approach	**Action Plan Reference No.**	Action Description	Action Lead Organisation	Action Progress Status	Priority
Allow natural coastal evolution to occur to support conservation interest of protected sites.	-	-	-	-	-
8.2 Pentewan Harbour & village					
Summary management approach	**Action Plan Reference No.**	Action Description	Action Lead Organisation	Action Progress Status	Priority
With consideration of local objectives for flood risk management and regeneration, investigate realignment options that would allow transition of the beach to a more sustainable position that could be maintained to at least the lifetime of the SMP. A scheme is currently under development to manage flood risk to the village from wave run at the northen end of the beach. This comprises a set-back reinforced beach bund, which will provide a 1	7.025	Develop a community adaptation strategy to climate change to improve community resilience to flooding. Adaptation strategy included in Neighbourhood Planning.	Pending agreement	Not yet started	Medium

in 40 year standard of protection. The scheme is due to be built in 2024.					
8.3 Pentewan Beach					
Summary management approach	**Action Plan Reference No.**	Action Description	Action Lead Organisation	Action Progress Status	Priority
Allow beach to respond naturally to sea level rise. Avoid constraining and reducing beach and dune width. Guide land use planning towards a roll back policy through a managed realignment approach, with consideration of implications for sustainable highway links in the area and ongoing local activity to manage the shoreline where required. The management approach at this location will be further informed by Cornwall Council's 'Making Space For Sand' project, which is being undertaken during the period 2021 - 2027, funded by the Environment Agency's Flood and Coastal Resilience and Innovation Programme.	17.026	Develop a Beach and Dune Management Plan to establish viability of dune enhancement programme and improve understanding of processes, behaviour and sediment availability. Monitor key habitat types and areas, and enhance dune ecology and integrity while adapting caravan park.	Pending agreement	Not yet started	Medium
	17.027	Deliver actions for Making Space for Sand (MS4S) study site funded by the Flood & Coastal Resilience Innovation Programme (FCRIP)	Cornwall Council	Progressing	Medium-low
	17.032	Develop an adaptation plan (supported by the Sustainable Coastal Communities project for the wider area). Ensure that the future flood risk implications to the community of not restoring the dunes as a more sustainable defence line, and the impact of the caravan park private defences on beach amenity, is communicated clearly as part of the ongoing engagement with the caravan park and wider community.	Pending agreement	Not yet started	Medium-low

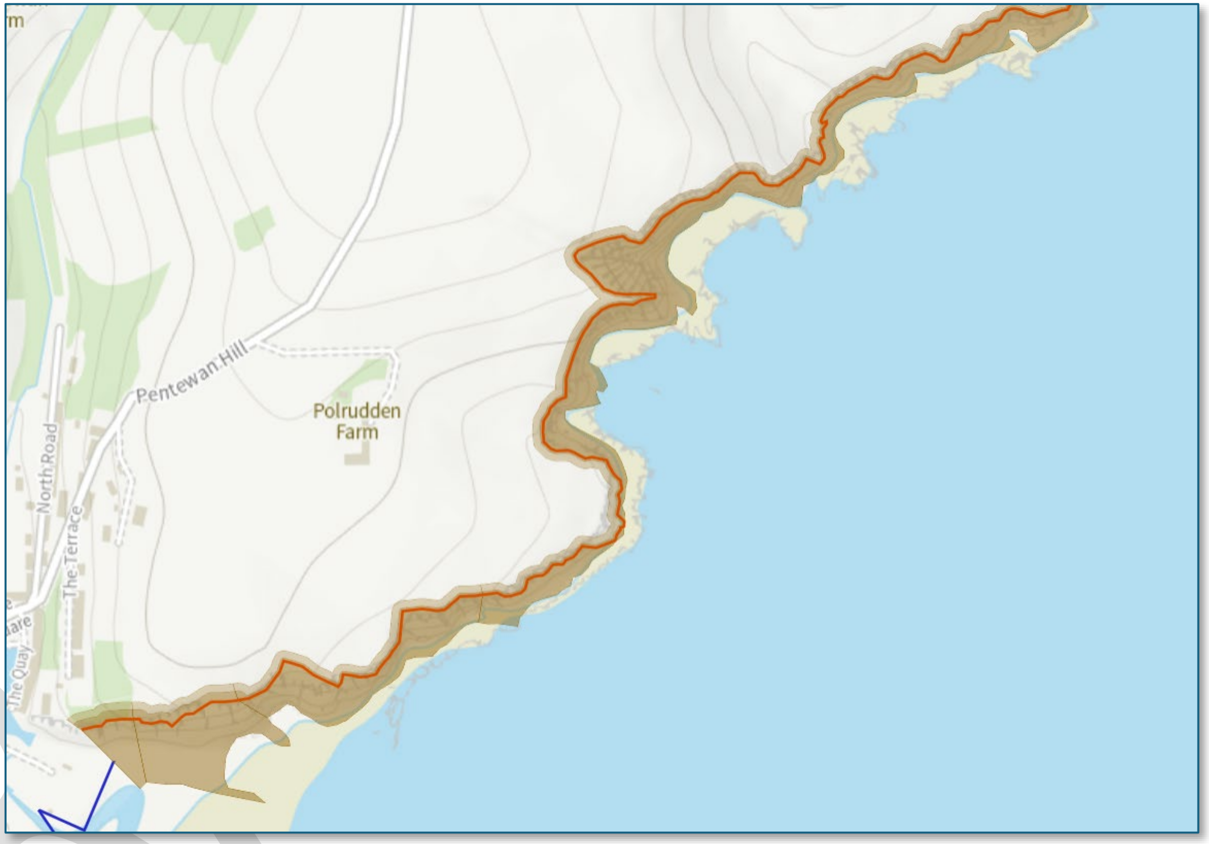
5. For each the SMP Explorer map shows the land area likely to be at risk of coastal erosion by the years 2055 and 2105. Coastal erosion risk is calculated for different coastal management scenarios and climate scenarios. gives scenarios for the 2025-2055 and 2055-2105 epochs, with projections for No Further Intervention (NFI) or for SMP policy delivered over 3 climate change scenarios (best, medium and worst case scenarios). The extent of the worst case scenario is illustrated on map 2 following.

Policy Unit				
8.1 Undefended Cliffs [Coastal Erosion Frontage ID 75573 - South of Beach]				
	Shoreline Management Plan Delivered		**No Future Intervention**	
	2055	**2105**	**2055**	**2105**
Present Day Climate (2020 data)	2m	4m	2m	4m
Climate Change (Higher Central)	3m	9m	3m	9m
Climate Change (Upper End)	3m	10m	3m	10m
8.1 Undefended Cliffs [Coastal Erosion Frontage ID 75525 – North of Beach]				
	Shoreline Management Plan Delivered		**No Future Intervention**	
	2055	**2105**	**2055**	**2105**
Present Day Climate (2020 data)	7m	11m	7m	11m
Climate Change (Higher Central)	9m	15m	9m	15m
Climate Change (Upper End)	9m	17m	10m	17m
8.2 Pentewan Harbour and Village [Flood Risk Frontage]				
	The main risk on this part of the coast is from flooding, and no erosion risk information is provided. However, coastal processes may still include some erosion or land instability which may pose a risk to property.			
8.3 Pentewan Beach [Coastal Erosion Frontage ID 75553]				
	Shoreline Management Plan Delivered		**No Future Intervention**	
	2055	**2105**	**2055**	**2105**
Present Day Climate (2020 data)	21m	30m	22m	30m
Climate Change (Higher Central)	35m	64m	34m	64m
Climate Change (Upper End)	40m	75m	38m	75m

6. The 'Shoreline Management Plan (SMP) delivered' scenario means the coastal erosion risk assuming the SMP management approach is followed. The 'No future intervention' scenario means the coastal erosion risk with no future investment in building or maintaining coastal defences.

7. The effect of climate change on coastal erosion is provided in the 'Higher Central' and 'Upper End' projections in the table and on the map. They use the UK Climate Projections Representative Concentration Pathway 8.5 (RCP8.5) 70th percentile (Higher Central) and 95th percentile (Upper End) sea level rise projections. What does this mean? Using the Climate Change Upper end as an example, it means that 95% of the possible scenarios fall below this level, while 5% fall above it. The RCP 8.5 value is a scenario used in climate modelling that considers the continued growth and production of greenhouse gas emissions. When planning for coastal change these worst-case scenarios, through more precautionary, help ensure that coastal management is, in the longer term, more resilient.

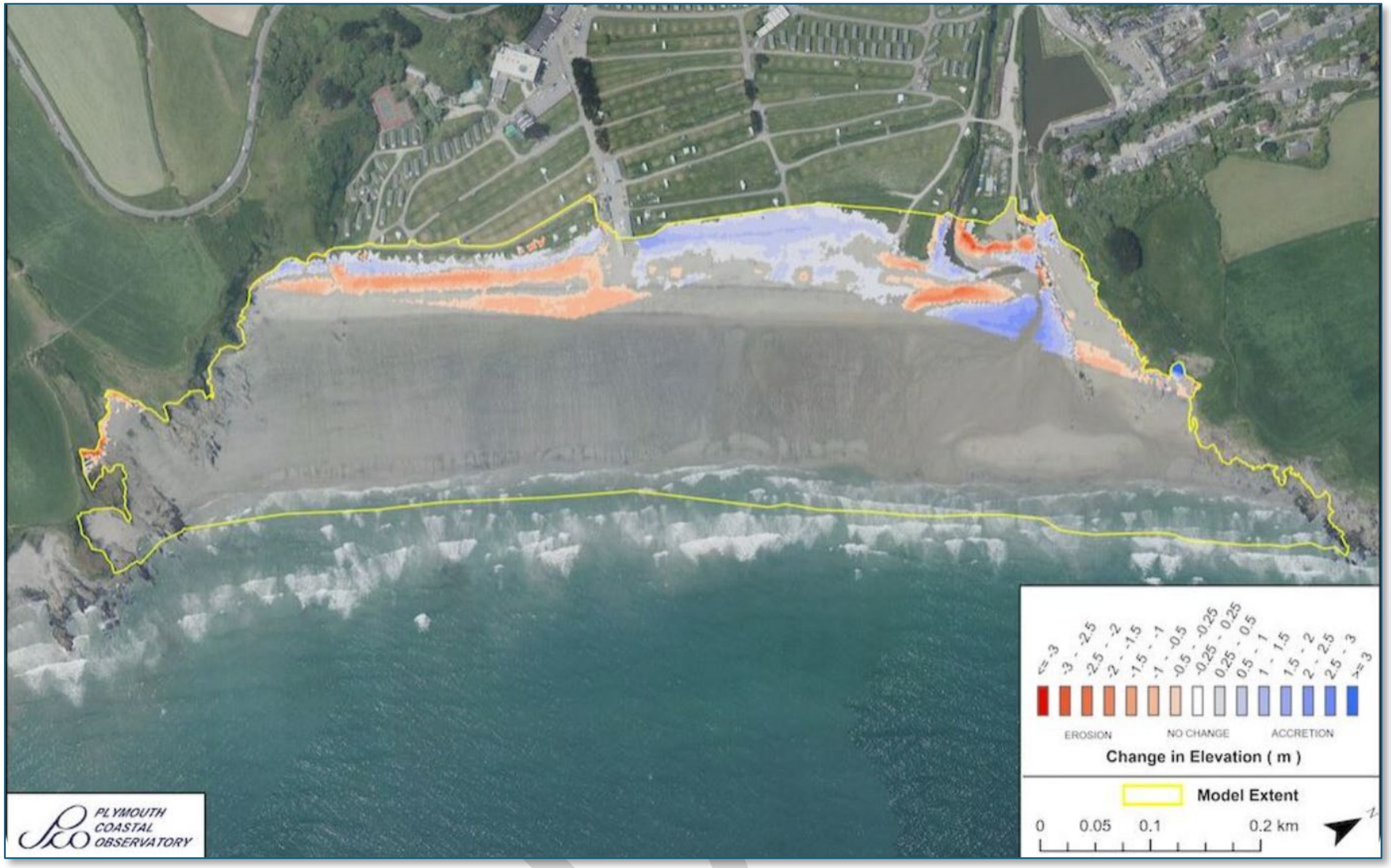
8. The mapping provides the best estimate of coastal erosion risk at a national scale. It uses the best available national and local data along with methods which can be applied at a national scale. The erosion projections associated with NCERM are intended for guidance and cannot provide details for individual properties. The NCERM data considers the predominant risk at the coast and frontages considered to be more at risk from flood risk or areas of complex cliff are not always included.



Map 2: Environment Agency SMP Explorer Map extracts for Pentewan Parish [Showing worse case scenario only].

Coastal erosion risk projections

- Shoreline Management Plan Delivered, Climate Change (Upper End), 2055
- Shoreline Management Plan Delivered, Climate Change (Upper End), 2105
- Flood frontage
- Erosion Feature Line
- Potential Ground Instability Zone (historic or recent features)
- Potential Zone of Future Ground Instability (not currently active)



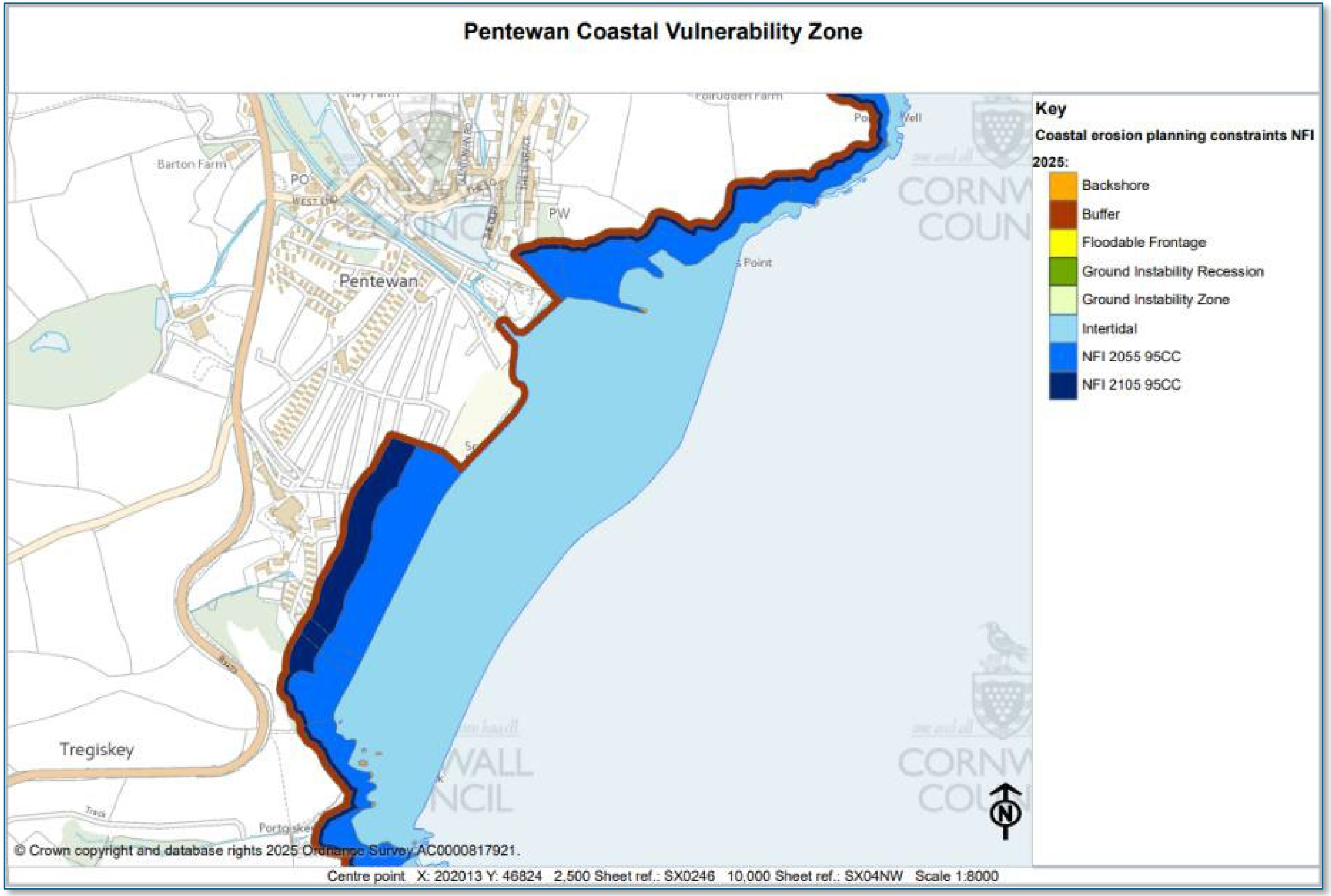
9. The **Making Space for Sand** initiative referred to above has produced a 'Pentewan Beach Report' giving a topographic and LiDAR data analysis that provides additional information on the likely extent of coastal erosion.

10. The picture opposite represents a combination of LiDAR data captured from c2006 to the present day and the shading illustrates how sand (sediment) has been gained and lost over this period of time. The areas shaded blue are areas where sand has built up (increase in sediment) and areas shaded red show where sand has been lost (erosion of sediment). The deeper the shade of red or blue, the greater the level or erosion or accumulation. For screening purposes, we use the No Further Intervention (NFI) projection to ensure all planning applications in the Coastal Vulnerability Zone are sent to the Coast Protection Officer for review. For planning decisions, the SMP Delivered scenario is used.

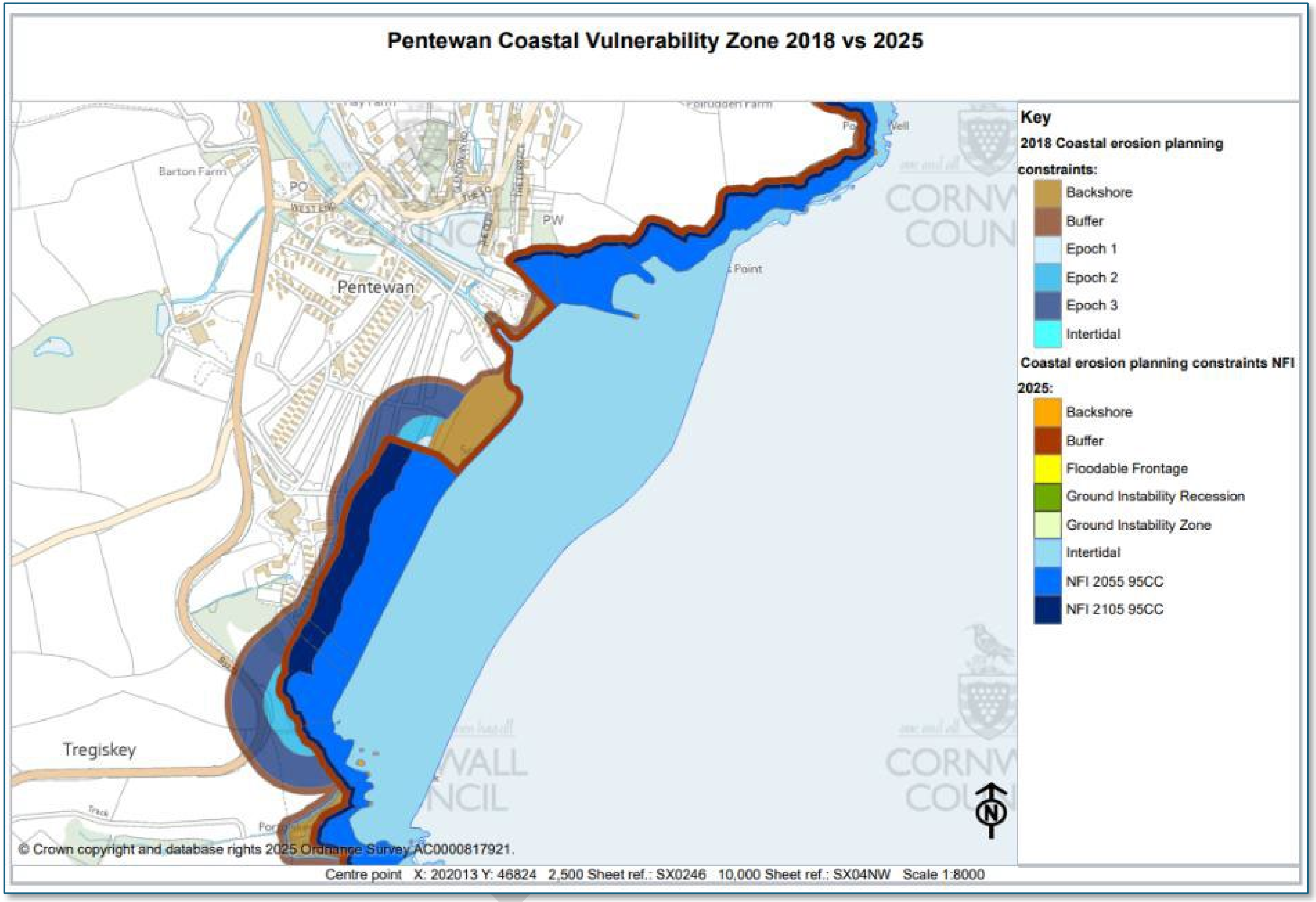
Coastal Vulnerability Zone (CVZ)

11. Cornwall Climate Emergency DPD Policy CC1 defines a Coastal Vulnerability Zone (CVZ) for the whole of Cornwall on the Policies Map. It sets out the constraints and criteria applying to development in the CVZ, including when a **Coastal Vulnerability Assessment** (CVA) will be needed. Any planning applications within the CVA, including for replacement dwellings or flood defences, should follow the guidance in the Climate Emergency DPD, including the requirement for a Coastal Vulnerability Assessment. The map extract below shows the latest Cornwall Council Coastal

Vulnerability Zone which is used for Planning purposes. It uses the No Future Intervention (NFI), Long Term and 5% probability scenario with an added 10m precautionary buffer.



12. The map below shows how the CVZ has changed from the previous 2018 version due to the more up to date NCERM2 erosion projection. The projected erosion risk and planning constraint area for the B3273 Pentewan Road and holiday park has been reduced.

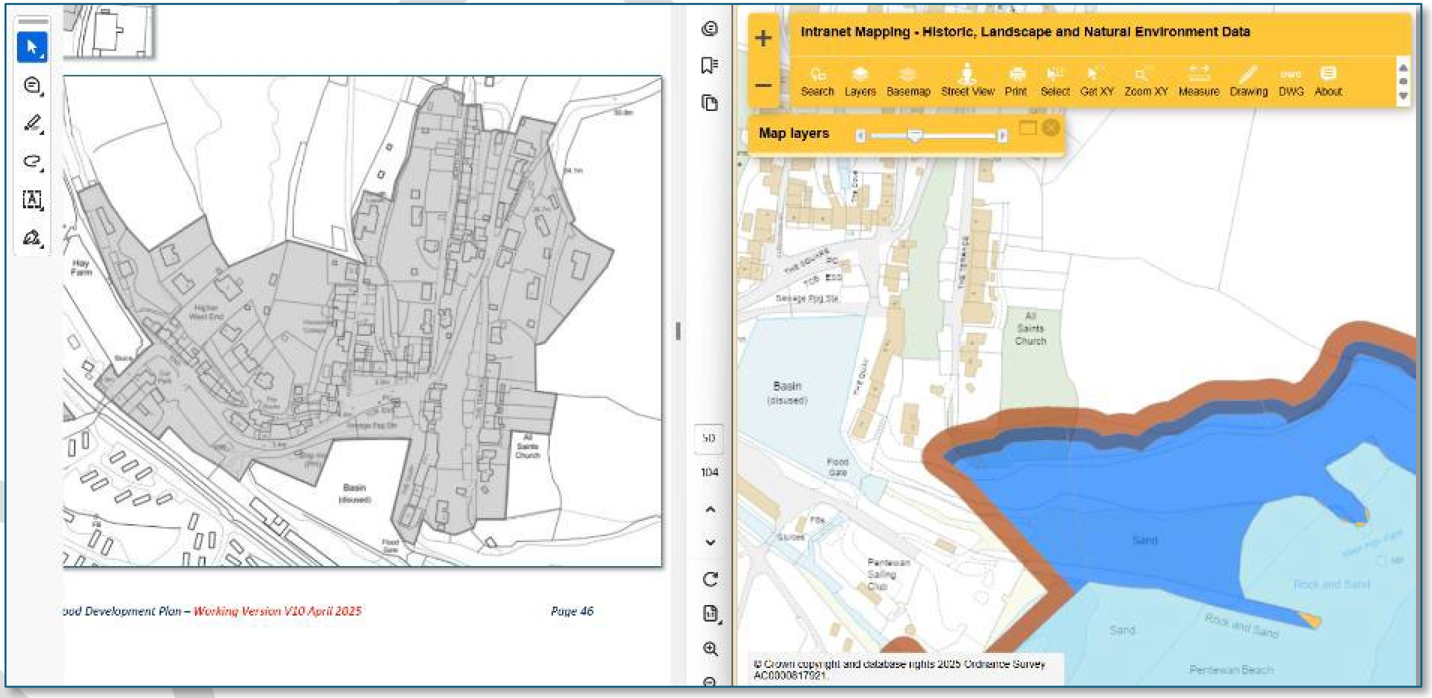


13. As a general rule Development Boundaries and allocated sites in NDPs should be outside the CVZ where the SMP policy is No Future Intervention (NFI) or Managed Retreat (MR) scenarios. This is because the CVZ constraints apply to replacement properties and including existing properties in an area identified by a Development Boundary as suitable for development could result in a policy conflict. Existing properties could still apply to repair

or alter a property but would need to carry out a Coastal Vulnerability Assessment [CVA][2] for this. Gardens and other amenity areas can exist within the CVZ on the understanding that they are likely to be lost over time.

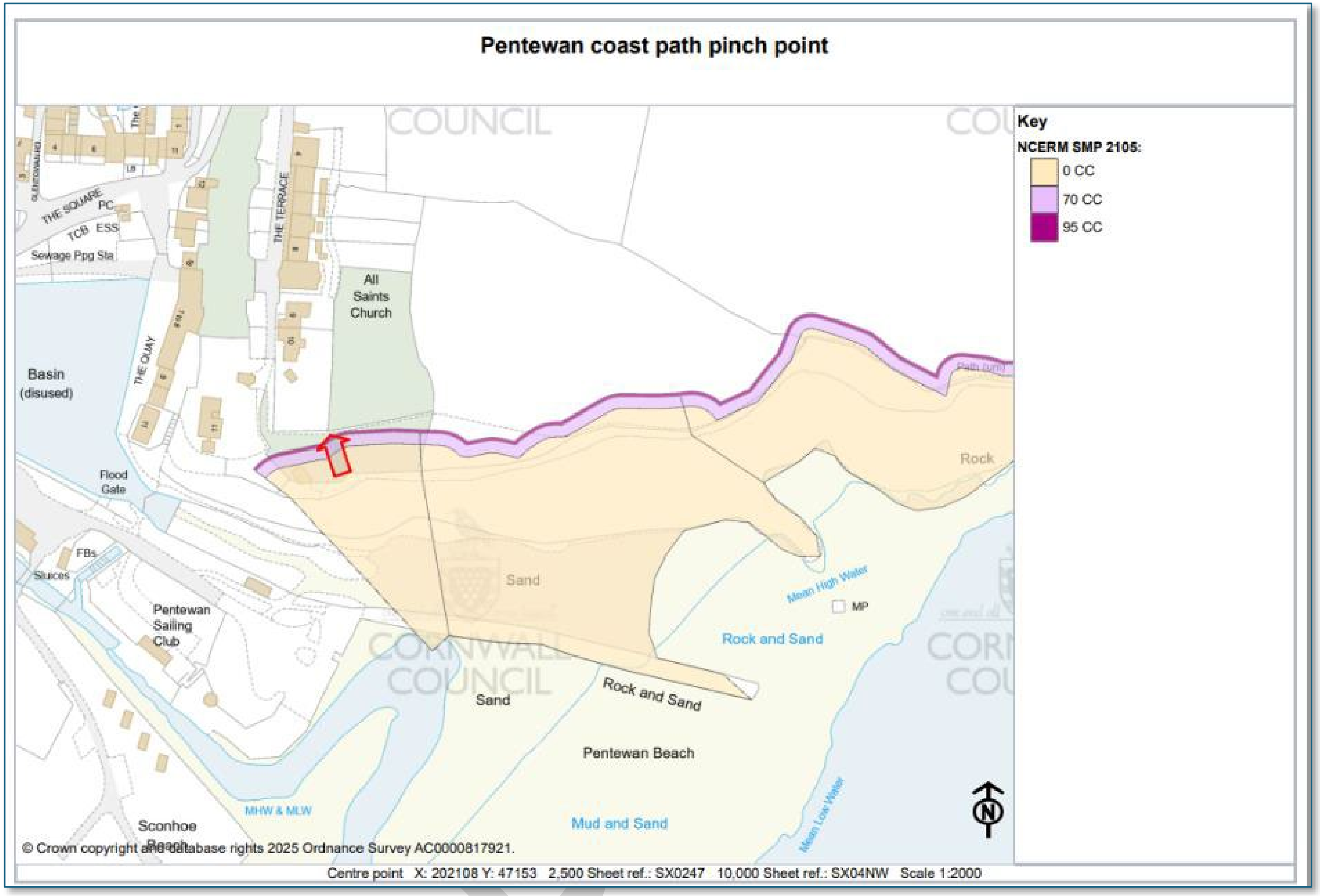
14. The settlement areas identified in the Pentewan Valley NDP as sustainable locations for growth include Pentewan village. The assessment by which these settlements were identified concludes that *'Pentewan village is tightly constrained by its topography, flood risk, coastal erosion and the need to preserve its historic character. The entire settlement lies within a designated Conservation Area and the Cornwall National Landscape (formerly AONB), adding to its sensitivity. While there may be scope for very limited infill development in discreet locations, opportunities for larger-scale growth are not appropriate and would risk undermining the village's historic form, setting, and landscape value.'*

15. The map extracts below [Map XX] compare the proposed settlement area with the CVZ boundary. No properties in the settlement area are in the CVZ other than small portions of the gardens of of Nos 10 and 11 the Terrace. Part of the land to the south of The Terrace was subject to a lawful development application relating to the residential use of land and buildings without planning permission for over ten years. The certificate was granted, in the form of a Certificate of Appropriate Alternative Development, a PiP and Certificate of Lawfulness of Existing Use or Development (CLEUD) and the site is now recognised as having C3 residential use. As such, it may now be considered Previously Developed Land (PDL), potentially attracting future development proposals. However it lies within the CVZ and so is excluded from the settlement area.



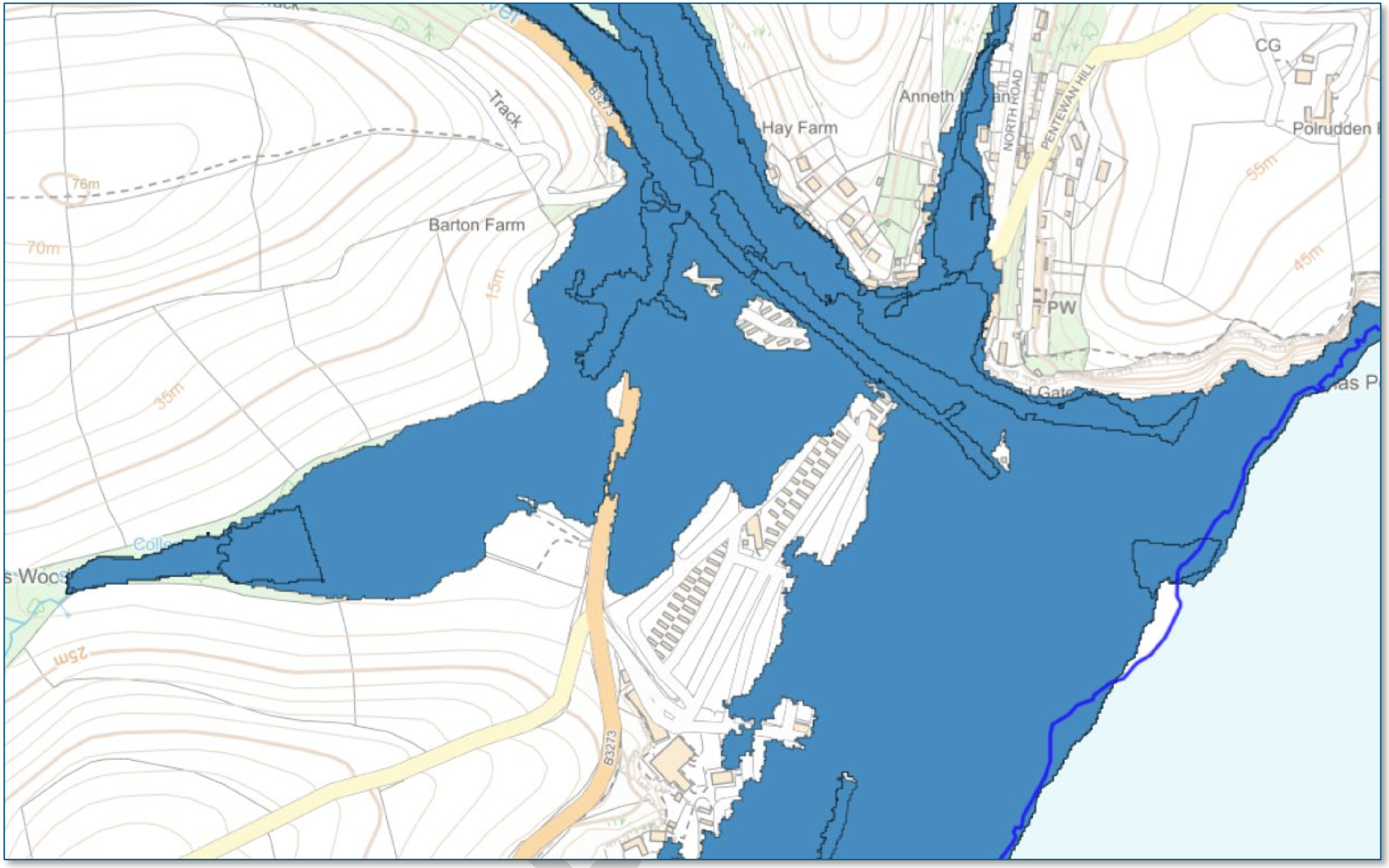
16. The following map illustrates that the coast path is at risk from coastal squeeze at this point. Any fixed development in the area just behind the erosion line could prevent it from being rolled back as coastal erosion progresses.

[2] A Coastal Vulnerability Assessment (CVA) is a systematic analysis used to evaluate and quantify the potential risks that a property may face from erosion, flooding, sea-level rise, storm surges, and other related hazards.



Flooding from Rivers and Sea

Map x below illustrates the yearly chance of flooding [combined rivers and sea] between 2036 and 2069 according to the National Flood Risk Assessment (NAFRA2) otherwise known as the 2025 Flood Map for Planning.



Track
B3273
Barton Farm
Hay Farm
Anneth
NORTH ROAD
PENTEWAN HILL
CG
Polrudden
76m
70m
15m
35m
25m
55m
45m
PW
B3273

Coastal Change Management Area Proposal

1. Justification

17. Physical change through erosion, coastal landslip, permanent inundation, flooding and pollution can have significant effects on human health and well-being and also detrimental impact on the natural environment. New development proposals, existing buildings, roads or other assets become at risk from the effects of climate change.

18. Therefore, it is important to ensure that inappropriate development is not built within or near the vulnerable coast, ensuring that any development:

    a. Will be safe through its planned lifetime, without increasing risk to life or property, or requiring new or improved coastal defences;

    b. Will not affect the natural balance and stability of the coastline or;

    c. Exacerbate the rate of shoreline change to the extent that changes to the coastline are increased nearby.

19. NPPF Paragraph 184 says, “Plans should reduce risk from coastal change by avoiding inappropriate development in vulnerable areas and not exacerbating the impacts of physical changes to the coast. They should identify as a Coastal Change Management Area any area likely to be affected by physical changes to the coast, and:

    a) be clear as to what development will be appropriate in such areas and in what circumstances; and

    b) make provision for development and infrastructure that needs to be relocated away from Coastal Change Management Areas.”

20. According to NPPG Para 72, Coastal Change Management Areas [CCMAs] are intended to identify areas where the coastline is expected to change significantly over the next 100 years. They are intended to cover the areas likely to be affected by physical changes to the coast. Such changes include erosion, coastal landslip, permanent inundation or accretion.

21. Such designation is appropriate where the relevant Shoreline Management Plan (SMP) does not commit to a long-term strategy of “holding the line” through the maintenance or construction of flood and coastal erosion infrastructure.

22. Pentewan lies within a dynamic coastal environment that is increasingly vulnerable to the effects of climate change, including rising sea levels, increased storm frequency, sea surge flooding and coastal erosion. Historically, the village of Pentewan has been susceptible to flooding from both the Pentewan Stream and coastal surges threatening the small beach and posing a risk of inundation to the harbour and village. The core of Pentewan Village is within the 100 year medium risk tidal extreme, whilst large areas of the surrounding coast are within an area of planning constraint due to coastal erosion. This area has been identified as a Coastal Vulnerability Zone where restrictive Policy CC1 of the CEDPD applies.

23. The Shoreline Management Plan for the area describes the projected coastal change for the area as significant and recommends a strategy of managed realignment in epoch 2 (2025-2055) at Pentewan harbour (PU 8.2) and Pentewan beach (PU 8.3).

24. Although the Climate Emergency DPD does not specifically identify Pentewan as a potential Coastal Change Management Area (CCMA), the Neighbourhood Plan should propose that Pentewan village and its surrounding hinterland be designated as such, in recognition of the risks identified above, to ensure that future development fully takes account of the potential impacts of coastal change. Cornwall Council’s Environmental Resilience and Adaptation (ERA) Team have supported this proposal.

2. Extent of Proposed CCMA

25. The CC Planning team advise that a CCMA normally needs a Coastal Change Management Plan (CCMP) to inform the amended boundary of the CCMA (if it is to differ from the CVZ). There is no adopted CCMP for Pentewan and one will not be available in the near future. Therefore, pending the production of a CCMP, the CCMA for Pentewan is proposed to include the CVZ plus the area that is identified as being at risk from flooding from rivers and sea between 2036 and 2069 according to the 2025 Flood Map for Planning. This reflects the situation that Pentewan has a significant sea 'Flood Risk Frontage' at the harbour and village, into which two main rivers flow [to the north-west the Pentewan Stream and to the north-east St Austell River], plus three minor local streams. The catchment for the Pentewan and local streams is relatively short, but that of St Austell River, stretches several kilometres inland through clay country, towns, villages and steep sided wooded valleys. This configuration has led to significant inundations, for example in 1974, 1997, 2010, and 2014 [see https://pentewanvillage.co.uk/gallery-2/past-floods-and-storms/].
26. Map X below shows the proposed extent of the CCMA. It follows the CVZ with the exception of the intertidal part, since this lies below the mean low water mark, and is thus outside the Designated Area of the NDP and is beyond the limits of formal planning control. On the landward side adjacent the village it extends to cover the area of flooding from rivers and sea between 2036 and 2069 according to the 2025 Flood Map for Planning, with small extensions to enclose the entire curtilage of properties that are only partly within the flooding area since these comprise the likely 'planning unit' for development management purposes.
27. Further advice will be sought from the Environment Agency as to the landward extent of the proposed CCMA.
28. Looking forward, when the Coastal Change Management Plan (CCMP) for the area is completed, the CCMA designation can be reviewed in a future revision of the NDP.

3. Effect of the CCMA Proposal

29. NPPF Paragraph 184 states that plans should reduce risks from coastal change by avoiding inappropriate development in vulnerable areas and not worsening coastal impacts. It requires identifying Coastal Change Management Areas (CCMAs), clearly defining suitable development types and conditions within them, and planning for relocating affected developments and infrastructure away from these areas.
30. National Planning Practice Guidance says that:

    a) Essential infrastructure may be permitted in a Coastal Change Management Area, provided there are clear plans to manage the impacts of coastal change on it, and it will not have an adverse impact on rates of coastal change elsewhere.

    b) Within the short-term risk areas (i.e. losses are expected within 20-years), a limited range of development directly linked to the coastal strip, such as beach huts, cafes/tea rooms, car parks and sites used for holiday or short-let caravans and camping – all with time-limited planning permissions;

    c) Within the medium (20 to 50-year) and long-term (up to 100-year) risk areas, a wider range of time-limited development, such as hotels, shops, office or leisure activities requiring a coastal location and providing substantial economic and social benefits to the community. Other significant development, such as key community infrastructure, is unlikely to be appropriate unless it has to be sited within the Coastal Change Management Area to provide the intended benefit to the wider community and there are clear, costed plans to manage the impact of coastal change on it and the service it provided.

    d) Existing buildings, infrastructure and land-use subject to the relevant planning permission could adapt and diversify to changing circumstances, where it reduces vulnerability, increases resilience and raises funds to facilitate subsequent relocation

e) Permanent new residential development (including through change of use) will not be appropriate within a Coastal Change Management Area.

31. This guidance is reflected in Cornwall Climate Emergency DPD ‘Policy CC2 – Candidate Coastal Change Management Areas’ which says that:

> Proposals for development within these areas will be subject to the precautionary principle and determined in accordance with Policy CC1 where they fall within the Coastal Vulnerability Zone or the provisions of any Coastal Change Management Plan prepared for the area.
>
> Where existing development and infrastructure is at risk or vulnerable and needs to be relocated away from an unsafe area within the Coastal Change Management Area and a Coastal Change Adaptation Plan has not been prepared or adopted, development may be permitted as an exception subject to the
>
> following criteria:
>
> 1) The new development is located in an area demonstrated to be at less risk of coastal erosion and meets the requirements of policies on the undeveloped coast or open countryside; and
>
> 2) The replacement property is located close to the community from which it is displaced and has an acceptable relationship with it in terms of character, setting, and local amenity (normally adjacent to the urban area or development boundary, where it exists); and
>
> 3) The site of the building or use to be replaced is cleared and restored; and
>
> 4) Replacement buildings should be broadly comparable to the size, scale and bulk of that being replaced and of an appropriate scale and character to its location.

32. Policy CC1 says that:

> 1) New development including replacement buildings (unless classified as exempt) within the Coastal Vulnerability Zone will only be permitted where it can be demonstrated through a Coastal Vulnerability Assessment that it:
>
> a) Is consistent with policy statements for the local policy unit in the current Shoreline Management Plan; and
>
> b) would not impair the ability of communities and the natural environment /biodiversity to adapt sustainably to the impacts of coastal change (including coastal squeeze); and
>
> c) will be safe through its planned lifetime, without increasing risk to life or property; and
>
> d) provides safe access and egress for the site and its users; and
>
> e) would not affect the natural balance and stability of the coastline or exacerbate the rate of shoreline change to the extent that changes to the coastline are increased nearby or elsewhere; and
>
> f) where applicable, makes provision for coastal access and the South West Coast path to be rolled back (moved inland).
>
> Exceptions will only be granted within the Vulnerability Zone for the creation of garden or open space or where it can be demonstrated that a time limited permission would be operationally necessary for a coastal compatible use and consistent with the above criteria.

2) Private sea defences or cliff stabilisation works will only be e permitted where it can be demonstrated that the works would accord with wider coastal management objectives and are:

a) consistent with the Shoreline Management Plan; and

b) required for public health and safety purposes or;

c) are intended to conserve heritage at risk and remain consistent with the Shoreline Management Plan;

3) Soakaways and other infiltration based sustainable systems within 5 metres of the Cornwall Coastal Vulnerability Map (CCVM) zone or discharge of surface water over or down the face of a cliff will not be permitted unless demonstrated through a Coastal Vulnerability Assessment that the proposed drainage method would not adversely affect coastal stability.

Coastal Change Adaptation Plan

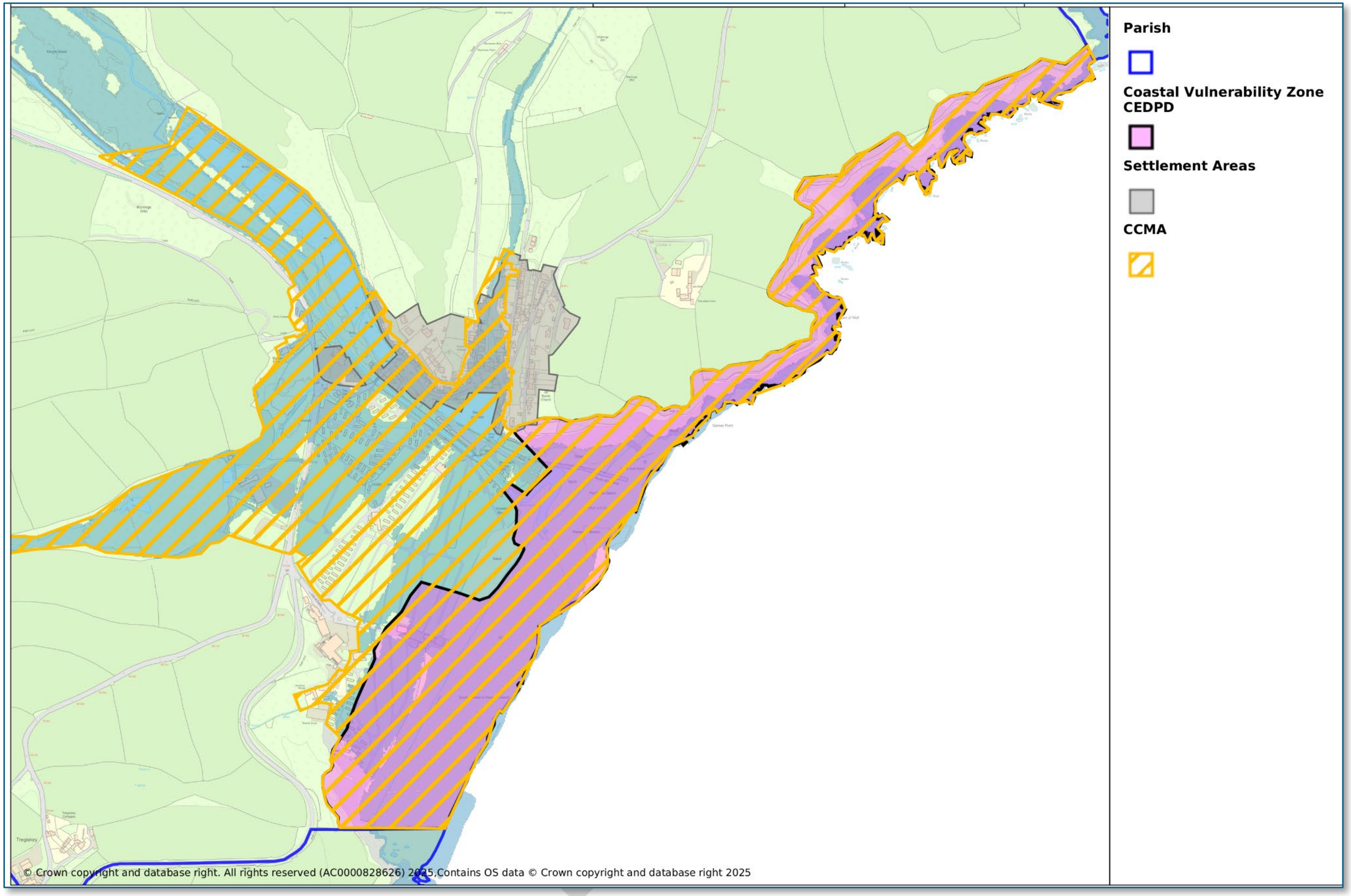
33. A Coastal Change Adaption Plan [which may be combined with a CCMA] covers the identification of infrastructure at risk from coastal change including roads and community facilities and if appropriate identifies areas for relocation of such dwellings and infrastructure that are at risk from coastal change.
34. Policy CC2 of the CEDPD provides that where existing development and infrastructure is at risk or vulnerable and needs to be relocated away from an unsafe area within the Coastal Change Management Area and a Coastal Change Adaptation Plan has not been prepared or adopted, development may be permitted as an exception subject to strict criteria.
35. A Coastal Change Adaptation Plan will ultimately be necessary for Pentewan, and any land that needs to be allocated as adaptation/ roll-back land can be identified in that Plan and included in a future review of the NDP.

Conclusions

1. The Coastal Change Management Area [CCMA] for Pentewan be defined in the NDP by the CVZ plus the area of flooding from rivers and sea between 2036 and 2069 according to the 2025 Flood Map for Planning [EA to be asked for further guidance on the landward extent].

2. That the NDP refer to the need for a Coastal Change Management Area Management Plan and Adaption Plan.

3. That the NDP be reviewed to include amendments to the CCMA and identify and allocate any adaptation/ roll-back land requirement in due course when such requirements are known.



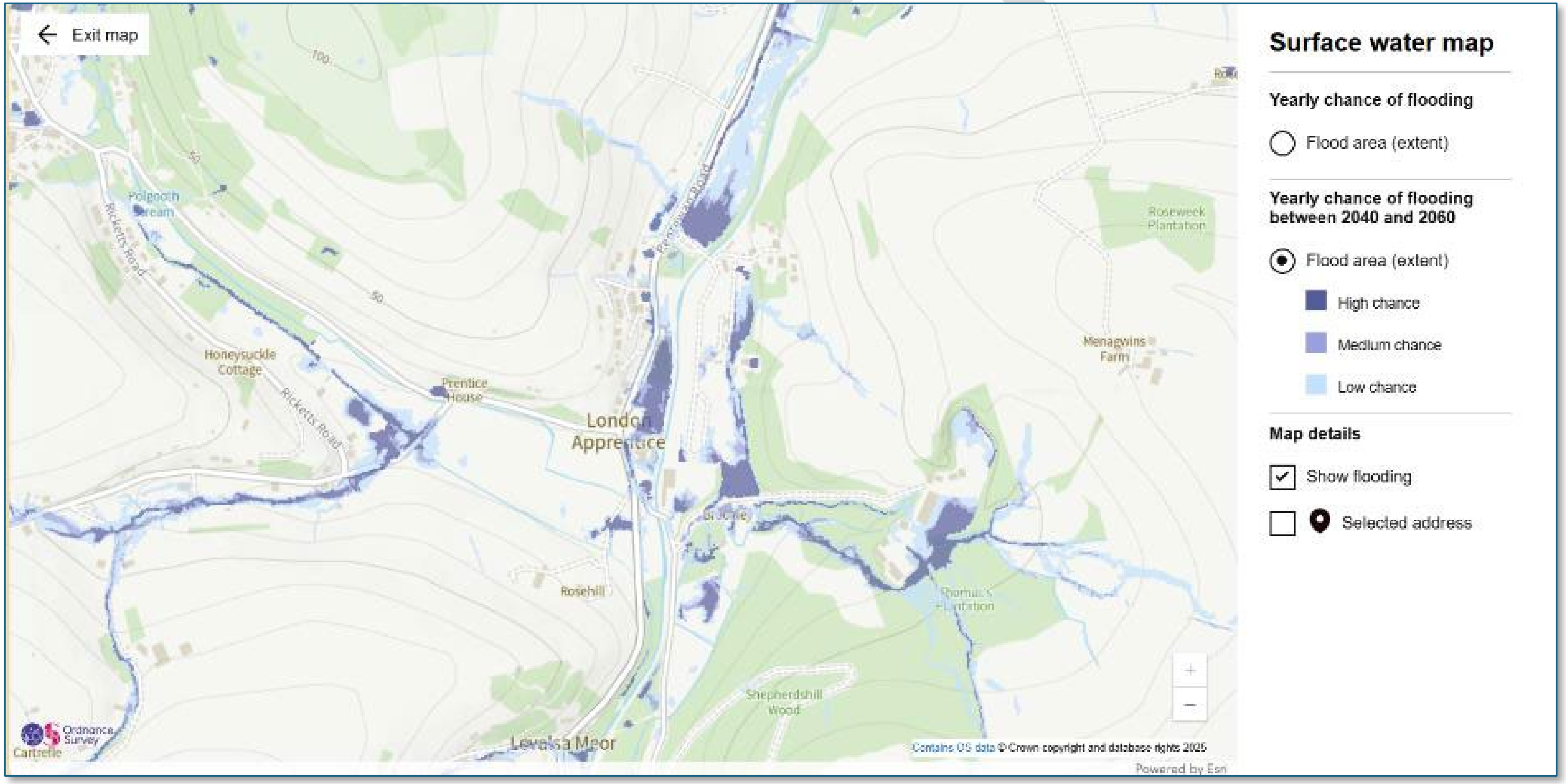
Map XX: Combined map showing CVZ, flooding from rivers and sea between 2036 and 2069 according to the 2025 Flood Map for Planning, proposed settlement area and proposed CCMA.

Flood Risk

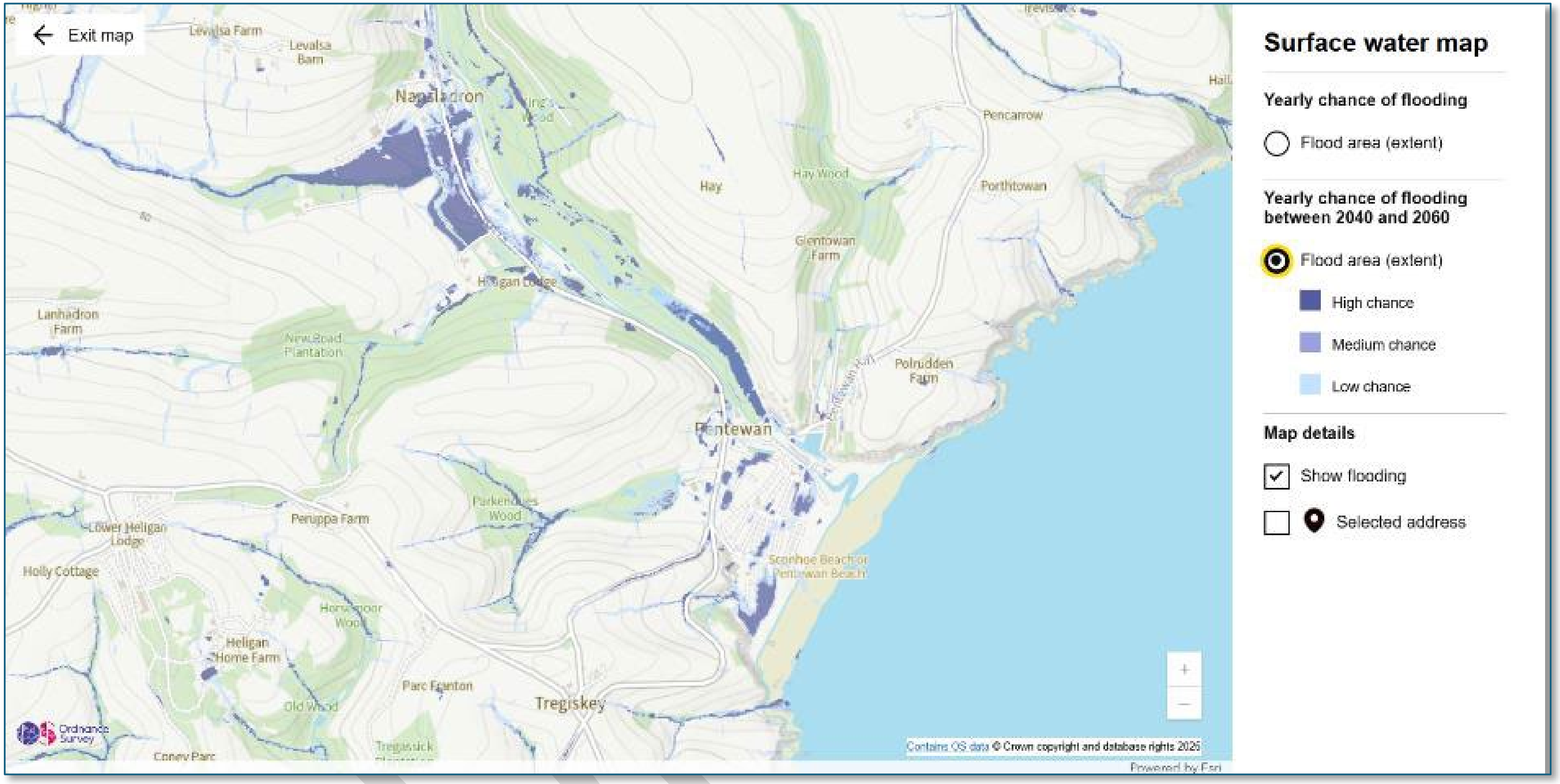
Surface water flooding

36. This occurs when rainwater travels across the surface of the ground or roads on its way to a drainage system, or flows out of an overloaded drainage system. It's usually associated with pluvial (rain) flooding and intense short rainfall events. Climate change is expected to result in more frequent intense rainfall events which may overwhelm drainage networks and increase the incidence of surface water flooding. The map extracts below show the parts of the main settlements in the parish most at risk from surface water flooding. A high risk of surface water flooding is defined as greater than 3.3% chance of flooding in any one year, or on average once in 30 years (not taking climate change into account).

London Apprentice

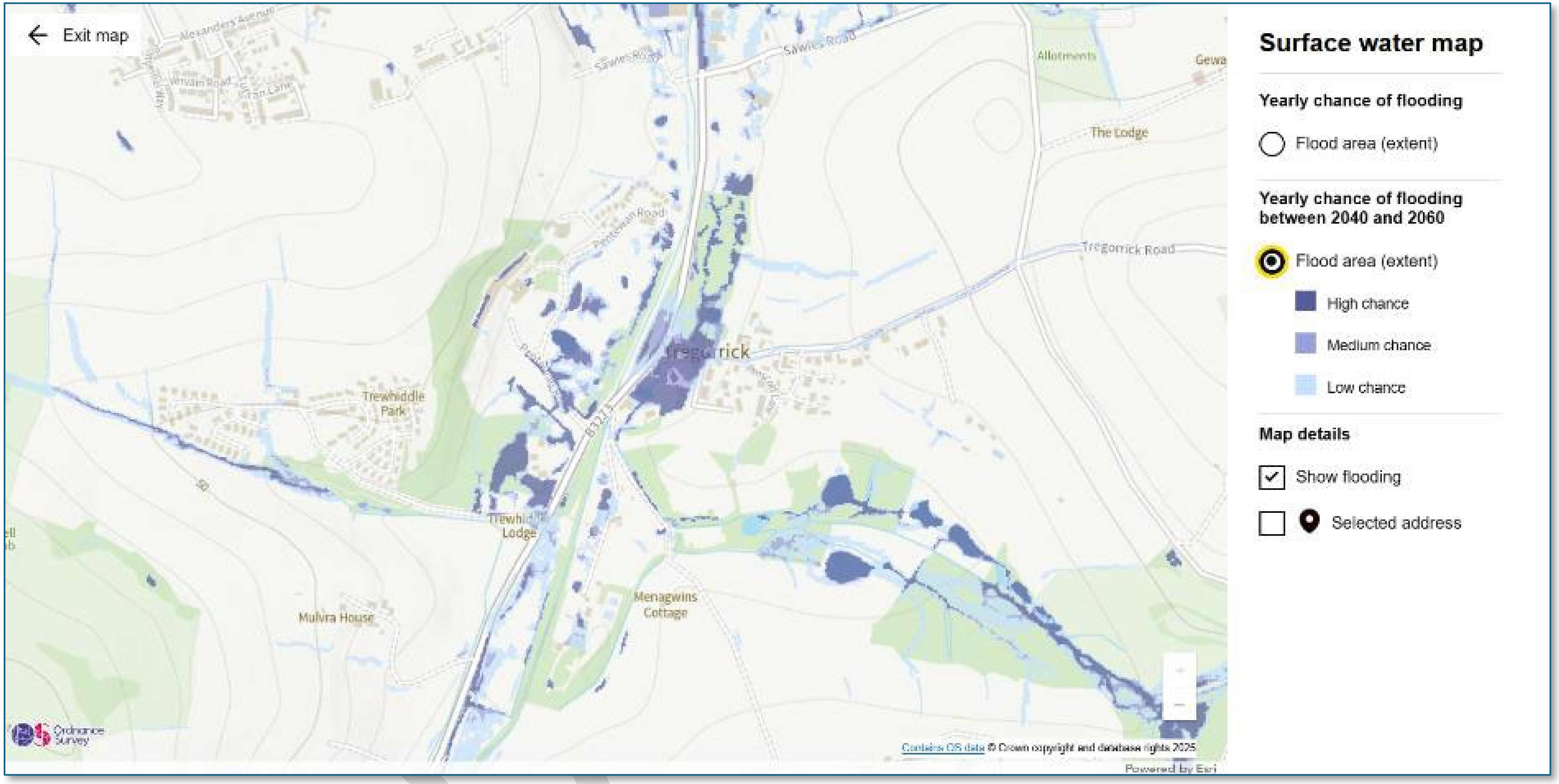


Pentewan



Exit map
Levalsa Farm
Levalsa Barn
Mevagissey
Pencarrow
Hay
Hay Wood
Porthtowan
Glentowan Farm
Heligan Lodge
Lanhadron Farm
New Road Plantation
Polrudden Farm
Pentewan
Parkenhues Wood
Peruppa Farm
Lower Heligan Lodge
Holly Cottage
Sconhoe Beach or Pentewan Beach
Heligan Home Farm
Parc Fenton
Tregiskey
Old Wood
Tregassick
Coney Parc
Ordnance Survey
Contains OS data © Crown copyright and database rights 2025
Powered by Esri
Surface water map
Yearly chance of flooding
Flood area (extent)
Yearly chance of flooding between 2040 and 2060
Flood area (extent)
High chance
Medium chance
Low chance
Map details
Show flooding
Selected address

Tregorrick



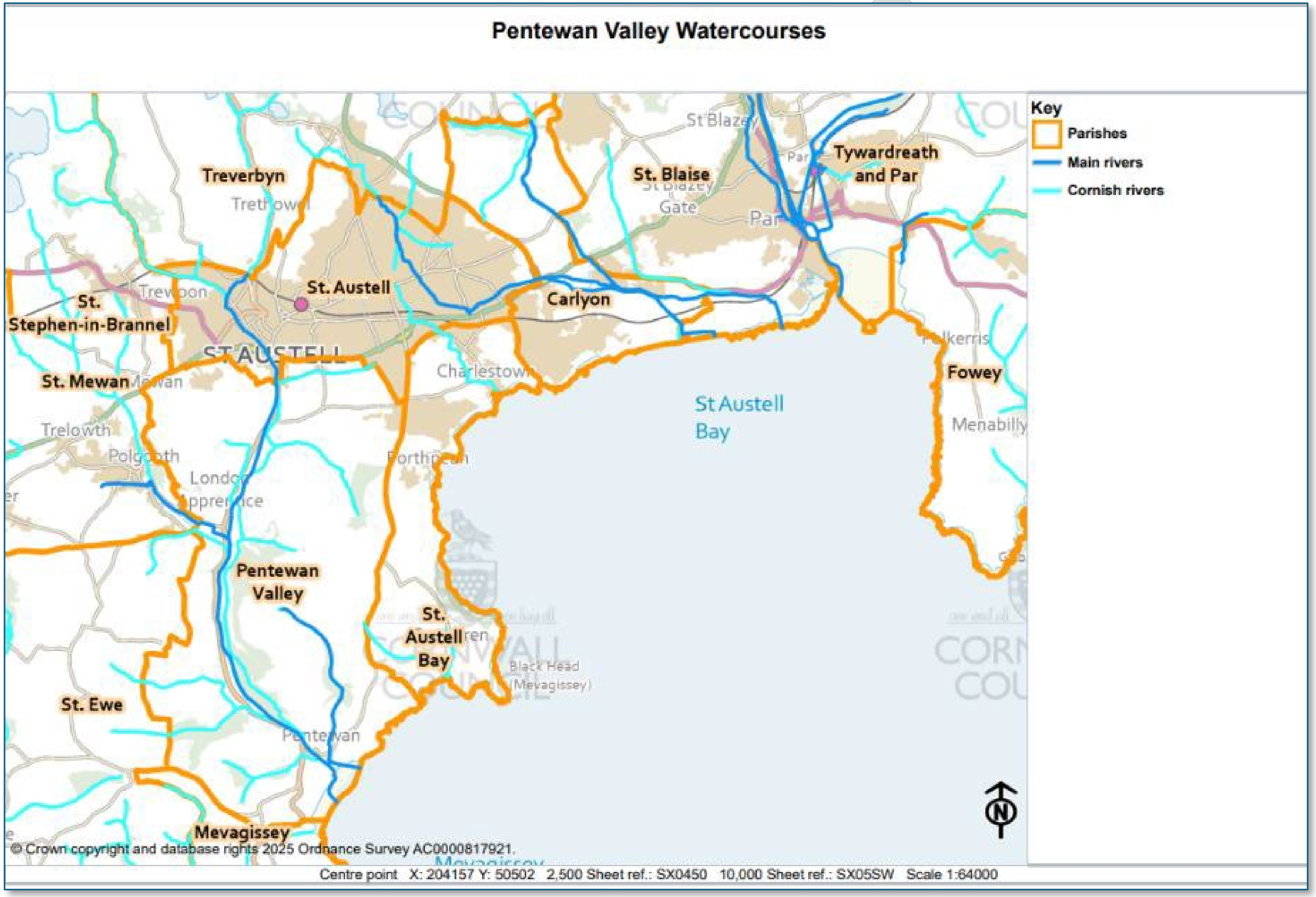
N.B: The surface water mapping is generic and modelled at a national scale. The fact that surface water flooding is a potential issue does not mean that it will flood and likewise, surface water flooding can occur in locations shown to be at low risk, due to blocked drains or the capacity of the drainage network being exceeded by extreme rainfall events.

Fluvial Flood Risk

37. Fluvial flooding happens when the capacity of a watercourse is exceeded and the banks are overtopped. Most rivers would naturally overflow onto their floodplain once a year or so, unless walls or embankments are constructed to contain them. Tidal flooding may occur onthe coast or in river estuaries and low-lying river reaches. High spring tides may be fairly predictable but weather conditions can create storm surges that add significantly to water levels.

Both tide levels and storm surge frequency are expected to increase due to climate change. In Cornwall, fluvial flooding may be increased through tide-locking at the river mouth. Coastal flooding is associated with high tides but also includes the additional effects of wind and waves. Coastal flooding may interact with coastal erosion issues.

38. The map extract below shows "Main Rivers" in dark blue and "Ordinary Watercourses" (Cornish Rivers) in light blue.



39. There are 3 Main Rivers in the parish:

    1) The **White River/ St Austell River** is designated as Main River from the Trenance Viaduct in St Austell. It has its source (as an OWC) higher up near Hensbarrow Farm and flows down the centre of Pentewan Valley parish beside the B3273 to the sea at Pentewan beach. The entire length of the White River is classed as a “modified attribution.”
    2) The lower part of the **Polgooth Stream**, which has its source at a spring by Burngullow in St Stephen-in-Brannel parish and joins the White River at London Apprentice. A leat in Polgooth is also called the Polgooth Stream, but I think the mapping must be wrong Source: Intranet Mapping - Historic, Landscape and Natural Environment Data. The lower part of the Polgooth Stream, which has its source at a spring by Burngullow in St Stephen-in-Brannel parish and joins the White River at London Apprentice. A leat in Polgooth is also called the Polgooth Stream, but this may be a map error and this is a tributary rather than the primary channel. This leat has its source at the Treloweth adit near Tyshute barn (see the Historic Environment polygon layer on the intranet mapping).
    3) The **Pentewan Stream** is a short river which has its source near Towan Lane at Lobbs Shop and flows south to join the sea at Pentewan beach.

40. There are 7 Ordinary Watercourses (OWCs) with various tributaries in the parish:

    1) A short unnamed tributary which has its source at **Mount Charles** and joins the White River at **Sawles Road** (it’s a modified attribution so may be associated with the nearby historic West Polmear or Gewans Mines).
    2) An unnamed 2-forked tributary which joins the St Austell River south of the sewage works at **Menagwins**. This stream has two sources – one north of **Tregorrick** and the other at **Penrice Wood**.
    3) A very short unnamed tributary which has its source at **Trewhiddle Park** and joins the White River at **London Apprentice**. The historic environment map polygon layer shows this to be a post medieval leat.
    4) A longer unnamed tributary which runs parallel to the White River joining it at **Pentewan** and with two sources at **River Valley Holiday Park** (nr. The historic Molingey corn mill) and from a spring above **Thomas’s Plantation.**
    5) **Little Polgooth Stream** – this is a very short tributary which has its source at **Lefesant** in St Ewe parish and joins the White River south of **London Apprentice**.
    6) An unnamed 2-forked tributary which has sources near **Higher Tregenna Farm** and at **Lanhadron Farm**, both in St Ewe parish. It joins the White River just north of **Pentewan**.
    7) An unnamed 2-forked tributary which has two sources north and south of **Parkendues Wood** and joins the White River at **Pentewan**.

41. The artificially straightened St Austell River channel, large number of watercourses, short tributaries on steep contours and modified nature of nearly all the watercourses contributes to the flood risk in the parish, especially at Pentewan which receives water from all the streams and rivers as well as the sea. NFM measures that slow the flow, store water, improve infiltration and renaturalise these watercourses will help to reduce flood risk and could also support drought resilience. Collaboration with neighbouring parishes would enable a whole catchment approach to be taken.

Catchments

42. Pentewan Valley parish is in the **West Cornwall and the Fal Management Catchment**.
43. Most of the parish is in the middle to lower part of the **St Austell River** waterbody catchment. The south-eastern corner of the parish is in one of several unhelpfully-named St Austell coastal catchments. A small area to the south is in the Mevagissey catchment but this may be a mapping error and the watershed between the St Austell and Mevagissey catchments is more along the parish boundary and Old Road.
44. Information about the ecological and water quality condition of the St Austell River catchments can be viewed at the Catchment Data Explorer. The coastal catchments aren't included on the tool. Issues identified on the CDE which could contribute to flood risk include sewage discharge and physical modification of watercourses.
45. The Flood Risk Assessment requirements are summarised for quick reference in the following table, but please also refer to the national guidance:

Flood Zone	Category	Technical Definition	National Planning requirement
Flood Zone 1	Low probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding.	A Flood Risk Assessment is required for: • developments of more than 1 Ha. • Developments of less than 1 Ha, including a change of use to a more vulnerable class (e.g. commercial to residential), where they could be affected by sources of flooding other than rivers and the sea (e.g. surface water, reservoirs). • Critical Drainage Areas.
Flood Zone 2	Medium probability	Land having between a 1 in 100 and 1 in 1,000 annual probability (1 - 0.1%) of river flooding; or land having between a 1 in 200 and 1 in 1,000 (0.5 - 0.1%) annual probability of sea flooding.	A Flood Risk Assessment should be provided with any planning application that falls within a Flood Zone 2 area with the exception of some minor developments.
Flood Zone 3a	High probability	Land having a 1 in 100 (>1%) or greater annual probability of river flooding; or Land having a 1 in 200 (>0.5%) or greater annual probability of sea flooding.	All development proposals within this zone should be accompanied by a Flood Risk Assessment.
Flood Zone 3b	Functional floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency.	All development proposals within this zone should be accompanied by a Flood Risk Assessment.

Groundwater flooding

46. Nearly all of Pentewan Valley parish is in an area susceptible to groundwater flooding. Groundwater is when the water table rises above the ground surface resulting in springs or boggy conditions. In Cornwall this may include break out from mine drainage systems. Groundwater flooding is linked to the ability of the ground to hold water. Due to its geology Cornwall has only minor aquifers and generally does not experience much conventional groundwater type flooding. The exception to this is found in areas that have extensive mine drainage systems, where blockages within drainage tunnels can lead to unexpected breakout of groundwater at the surface. From a SuDS perspective, site specific investigations should be completed.

Sewer Flooding

47. Sewers may carry foul water, rainfall or both ("combined sewers"). If the capacity of a rainwater or combined sewer is exceeded due to heavy rainfall then it can flood onto the surface. Combined sewers flow to sewage treatment works but may overflow into a watercourse through a combined sewer overflow (CSO), resulting in pollution of rivers and the sea.

    ENDS