

**MANAGEMENT UNIT STATEMENT
HAYLE ESTUARY**

KEY CHARACTERISTICS

Location

This unit covers the shoreline of Hayle Estuary, including the sand dunes either side of its mouth and the banks of the estuary to Griggs Quay. Commercial and industrial use of Hayle harbour is today much reduced from what it once was, and has been identified by private developers as a prime site for redevelopment.

Administrative Authority

Penwith District Council
Cornwall County Council

Nature of Existing Defences

- Dunes front the golf course on the west side of the entrance to Hayle Harbour.
- Walls and revetments throughout much of the harbour protect against erosion and flooding of the railway, highways and commercial / industrial land.
- Dunes front holiday accommodation on the east side of the entrance to Hayle Harbour.
- Sluice gates, including Copperhouse Pool, prevent tidal ingress to upstream areas.

Description of Beach

- Very wide sandy foreshore backed by low cliffs, and infilled river valleys forming arms of Hayle Harbour and Lelant Water; extensive backshore sand hills.
- Lelant Water is intertidal sandflat with central channel.
- Quartz/lithic/shell 10-25-65.
- Periodic resurvey/monitoring recommended *** to measure sediment flux across foreshore (movement of sand ridges) and assess carbonate contribution to beach volumes.

Key Processes

- Estuary mouth acts as trap for sediment swept in from St Ives Bay, augmented by shell carbonate inputs.
- The intertidal muds of the estuary are fed by fluvial inputs from the River Hayle.
- Existing built defences within the harbour are not detrimental to sediment processes.
- Sluicing from Copperhouse Pool can significantly alter beach/channel formations through the entrance.
- Dredging maintains harbour channel.
- Hard defences in areas of dunes could be detrimental to beach stability.

Development at Risk

- Erosion, or retreat, of dunes at the estuary mouth would cover railway line and part of golf course on west side and loss of holiday chalets on east side.
- Deterioration of defences within estuary would threaten developments including railway line, road and harbour structures.

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HAYLE ESTUARY**

Natural Environment / Conservation

- The Hayle Estuary is the most south-westerly estuary in Britain and its intertidal and saltmarsh habitats provide an important feeding and resting area for birds on migration.
- The whole of the western arm of the estuary together with Camsew and Copperhouse Pools form part of the Hayle Estuary and Carrack Gladden SSSI.
- This SSSI supports a diverse range of coastal, estuarine and intertidal habitats including several nationally rare plant species.
- The RSPB Reserve includes much of the upper saltings, saltmarsh and estuarine habitats.
- All of the intertidal and marine waters are included within the St Ives Bay SMA with sandy and muddy substrates that support ragworm and lugworm together with commercially important lobster, crawfish and crab fisheries.

Human Environment

- Lelant Towans Golf Course occupies the west bank of the mouth of the Hayle Estuary.
- St Erth to St Ives branch railway line runs along the west bank of the Hayle Estuary shoreline.
- Lelant Saltings railway station and associated car parking facilities lie behind the railway line on the west bank of the estuary.
- Several residential properties at Lelant back onto the railway line.
- Numerous quays and wharves in various states of repair extend along the eastern shore of the estuary. Some used for industrial purposes and fishing related facilities.
- Private pleasure craft use the harbour.
- Causeway road extends along the eastern shore of the estuary to Hayle.
- Harbour supports an active fishing industry which has an emphasis on shellfish.
- Major development proposals for a marina and residential complex have been proposed for Hayle harbour.
- Lelant and Hayle have been designated Conservation Areas worthy of protection due to their historic wharves, railway infrastructure; and extensive quays and numerous waterside features respectively.
- Area of palaeo-environmental potential.
- There is a Medieval chapel along the Lelant waterfront and the Lelant Wheal Towan mine is situated on Lelant Towans at the entrance to the estuary.

**MANAGEMENT UNIT STATEMENT
HAYLE ESTUARY**

STRATEGIC OPTIONS

Implementation Lengths (see map)

- 1 Porth Kidney Sands – sand dunes and wide beach on west side of estuary mouth.
- 2 Lelant Towans to Carnsew Pool – partially defended mixed use frontage.
- 3 Carnsew Pool to end of North Quay – defended frontage, including harbour quays.
- 4 Harvey's Towans – sand dunes backed by tourist accommodation on east side of estuary mouth.

Options Considered (see Impacts Matrix)

Throughout the estuary the coastline, including the dunes at the mouth, is closely backed by developments and commercial assets. These are protected by a combination of defence structures and the sand dunes. As well as numerous residential, commercial and industrial assets, there are also highways, a railway line and a golf course located along this frontage, and any retreat, of either hard defences or the dunes, would result in the loss, and flooding, of assets. This makes set back of the current defence position under either a retreat or do nothing strategy unacceptable.

A long term advance would offer no additional benefits to hold the line on the dune frontages, and would impact on their environmental value and interaction with the fronting beach, therefore it is not considered.

MANAGEMENT UNIT: HAYLE ESTUARY

	DO NOTHING		RETREAT		HOLD		ADVANCE
	SHORT TERM	LONG TERM	SHORT TERM	LONG TERM	SHORT TERM	LONG TERM	
IMPLEMENT	n/a	All	n/a	n/a	n/a	All	② and ③
COASTAL PROCESSES (OBL. 1)		Acceptable <ul style="list-style-type: none"> Long term return to natural tidal regime 				Acceptable <ul style="list-style-type: none"> Maintain existing processes Enhance dunes at mouth 	<ul style="list-style-type: none"> May influence estuarine dynamics
NATURAL ENVY (OBL. 2)		Acceptable <ul style="list-style-type: none"> Maintain existing SSSI habitats 				Acceptable <ul style="list-style-type: none"> Provided no defences on intertidal flats 	<ul style="list-style-type: none"> Impacts on SSSI habitats in ②
LANDS AT CAPE (OBL. 4)		Unacceptable <ul style="list-style-type: none"> Impacts of delapidation of defences 				Acceptable <ul style="list-style-type: none"> Maintain current situation 	<ul style="list-style-type: none"> Possible aesthetic impacts
LAND AT RISK (OBL. 6)		Unacceptable <ul style="list-style-type: none"> Loss of road, railway, harbour facilities, etc around estuary 				Acceptable <ul style="list-style-type: none"> All human assets protected 	<ul style="list-style-type: none"> No added defence benefits to hold
HUMAN ENVY (OBL. 5, 7, 8)		Unacceptable <ul style="list-style-type: none"> Loss of harbour economy Loss of recreational facilities 				Acceptable <ul style="list-style-type: none"> Continued need for dredging Harbour maintained 	<ul style="list-style-type: none"> Possible harbour developments in ③

Objective numbers as stated in Part 2 Section 4 (see pull-out list at back of document for quick reference)

**MANAGEMENT UNIT STATEMENT
HAYLE ESTUARY**

STRATEGY

Preferred Strategic Options (based on assessment in Impacts Matrix)

There is long term potential for the sand dunes backing Porth Kidney Sands (length 1) to naturally roll back causing loss of part of the golf course and the railway line. In order to prevent this loss, and to maintain the habitat value of these SSSI designated dunes, it will be necessary to undertake management of the dunes. This will seek to maintain the current position of the dunes, making hold the preferred strategy.

On the east side of the estuary mouth, within length 4, dune erosion could result in the loss of holiday chalets. Again, in order to prevent this loss, and to enhance their habitat value, it will be necessary to undertake management of the dunes. This will seek to stabilise and maintain the current position of the dunes, making hold the preferred strategy. On this frontage the proximity of the tourist developments makes any retreat difficult, however, the relocation of the more seaward chalets may be necessary to allow a more natural dune to form in the long term.

Along the main tourist developed frontages of the estuary (lengths 2 and 3) those assets at either erosion or flooding risk in the near future are currently largely protected by defence structures. Protection of assets could be achieved through continued defence on this line. A hold the existing defence line strategy is preferred for this frontage as it will ensure the continued protection of human assets including the road, railway line and properties in Hayle and Lelant as well as the continued provision of quay walls and hence the operation of Hayle harbour. On those frontages which are currently undefended there is considered little need for intervention to protect assets. However, should works be required, impacts on the SSSI designated estuary mudflats would have to be fully assessed in conjunction with the RSPB who own much of the intertidal area.

An advance the line strategy may be considered within the estuary as offering the potential for tourist or harbour related developments. However, within length 2, and the Carnsew Pool area of length 3, the conservation value of the mudflats would make an advance unacceptable. On the main Hayle harbour frontage a limited advance may be acceptable, although, detailed study would be required to assess impacts on tidal dynamics and the any knock-on effects on other areas of the estuary.

Strategic Option	Implementation Length			
	1	2	3	4
Do Nothing	Unacceptable	Unacceptable	Unacceptable	Unacceptable
Retreat the Line	Unacceptable	Unacceptable	Unacceptable	Acceptable (Long Term)
Hold the Line	Preferred	Preferred	Preferred	Preferred (Short Term)
Advance the Line	Unacceptable	Unacceptable	Acceptable (pending study)	Unacceptable

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HAYLE ESTUARY**

Implementation and Monitoring Guidance

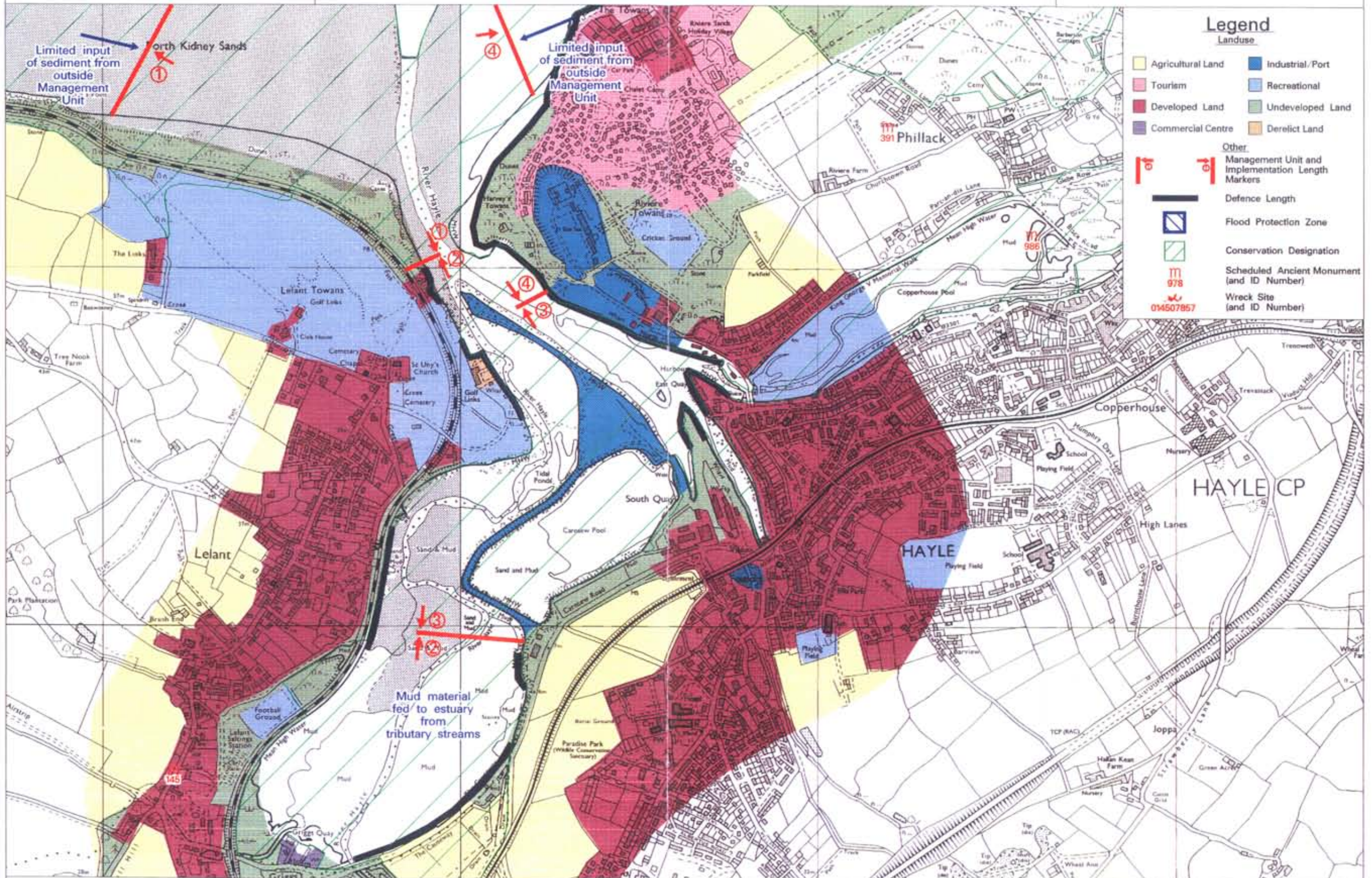
Implementation Length & Defences	1	2	3	4
Proposed Standard	None	7A2:04.01-08	7A2:04.09-12	None
Existing Standard	n/a	50-200	100-300	n/a
Priority Score	n/a	Poor condition (<5)	Poor/bad condition (<2)	n/a
Urgency Score	n/a	8	8	n/a
Economics Score	n/a	6	6	n/a
Total Score	n/a	10	10	n/a
	n/a	24	24	n/a

Dune management measures should be carried out for the dune frontages (lengths 1 and 4). Whilst there have been some erosion problems around the east side of the entrance to the harbour, which could affect some holiday accommodation, there should be no hard defence intervention.

Throughout lengths 2 and 3, nearly all of the defences are reported to be in poor or bad condition, with a need to undertake remedial works assumed to be within 5 years. No requirement to increase the level of these defences has been determined from the data currently available, although it should be noted that no details exist for a number of these defences. No requirement for additional new defences where none exist at present has been determined and therefore no action is necessary in these areas. Future development proposals would, however, necessitate a more detailed examination of both of the above requirements. It is therefore probable that the preferred strategy for both these lengths can be achieved by improvements to the existing defences, with such works likely to satisfy grant aid requirements unless categorised as routine maintenance.

There is considered to be a general need for an integrated strategy study covering the whole Hayle Estuary which would examine the defence requirements more closely, including the dune belts and potential entrance blockage/sluicing scenarios.

Implementation Length & Defences	1	2	3	4
Proposed Standard	None	7A2:04.01-08	7A2:04.09-12	None
Existing Standard	n/a	50-200	100-300	n/a
Priority Score	n/a	Poor condition (<5)	Poor/bad condition (<2)	n/a
Urgency Score	n/a	8	8	n/a
Economics Score	n/a	6	6	n/a
Total Score	n/a	10	10	n/a
	n/a	24	24	n/a



Legend

Landuse

- Agricultural Land
- Tourism
- Developed Land
- Commercial Centre
- Industrial/Port
- Recreational
- Undeveloped Land
- Derelict Land

Other

- Management Unit and Implementation Length Markers
- Defence Length
- Flood Protection Zone
- Conservation Designation
- Scheduled Ancient Monument (and ID Number)
- Wreck Site (and ID Number)