making space for sand

The story of Gwithian Towans

Lesson 3



Department for Environment Food & Rural Affairs
Environment Agency
Flood and Coastal Resilience Innovation Programme
Part of the Resilience Innovation Fund
CORNWALL COUNCIL
one and all • onen hag oll
geography southwest
SOUTH WEST COASTAL MONITORING


Where is Gwithian Towans?
Padstow
Wadebridge
Bodmin
Newquay
Lostwithiel
St Austell
Redruth
Truro
St Ives
Camborne
Falmouth
Penzance
Helston
2

Gwithian Towans: 1:50,000 map extract

Gwithian Towans is part of an extensive north-west facing sandy beach in St Ives Bay, located on the north coast of Cornwall.

At low tide, the 'towans' in St Ives Bay join to form a continuous beach 7km in length.



'Towan' comes from the Cornish word 'Tewyn', meaning **'sand dune'.**

What's the story of Gwithian Towans?

The beach at Gwithian Towans has a fascinating and varied history. We're going to take a journey through the past to discover how physical and human processes have shaped this stretch of the Cornish coast.



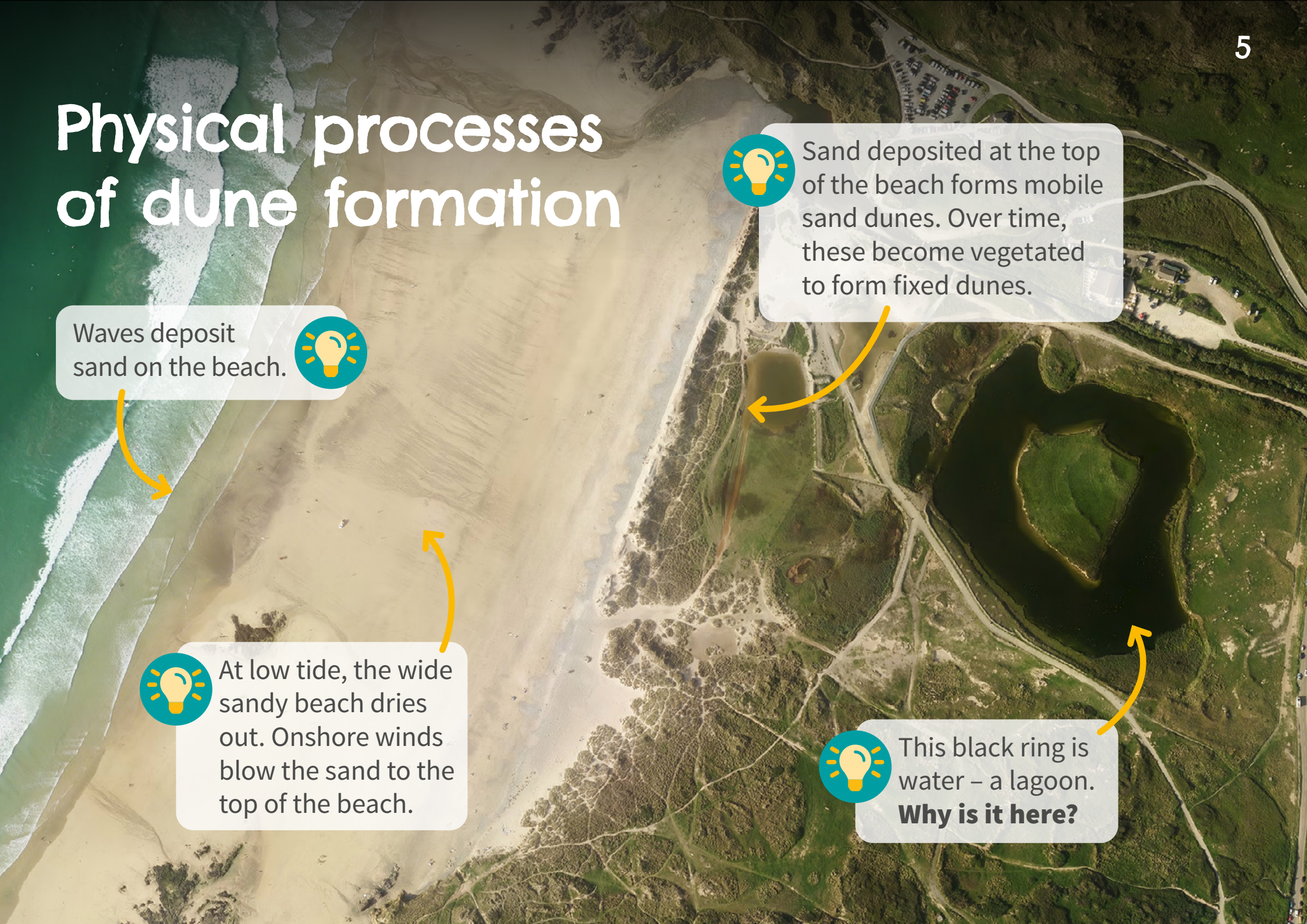








Physical processes of dune formation



Waves deposit sand on the beach.

Sand deposited at the top of the beach forms mobile sand dunes. Over time, these become vegetated to form fixed dunes.

At low tide, the wide sandy beach dries out. Onshore winds blow the sand to the top of the beach.

This black ring is water – a lagoon. **Why is it here?**

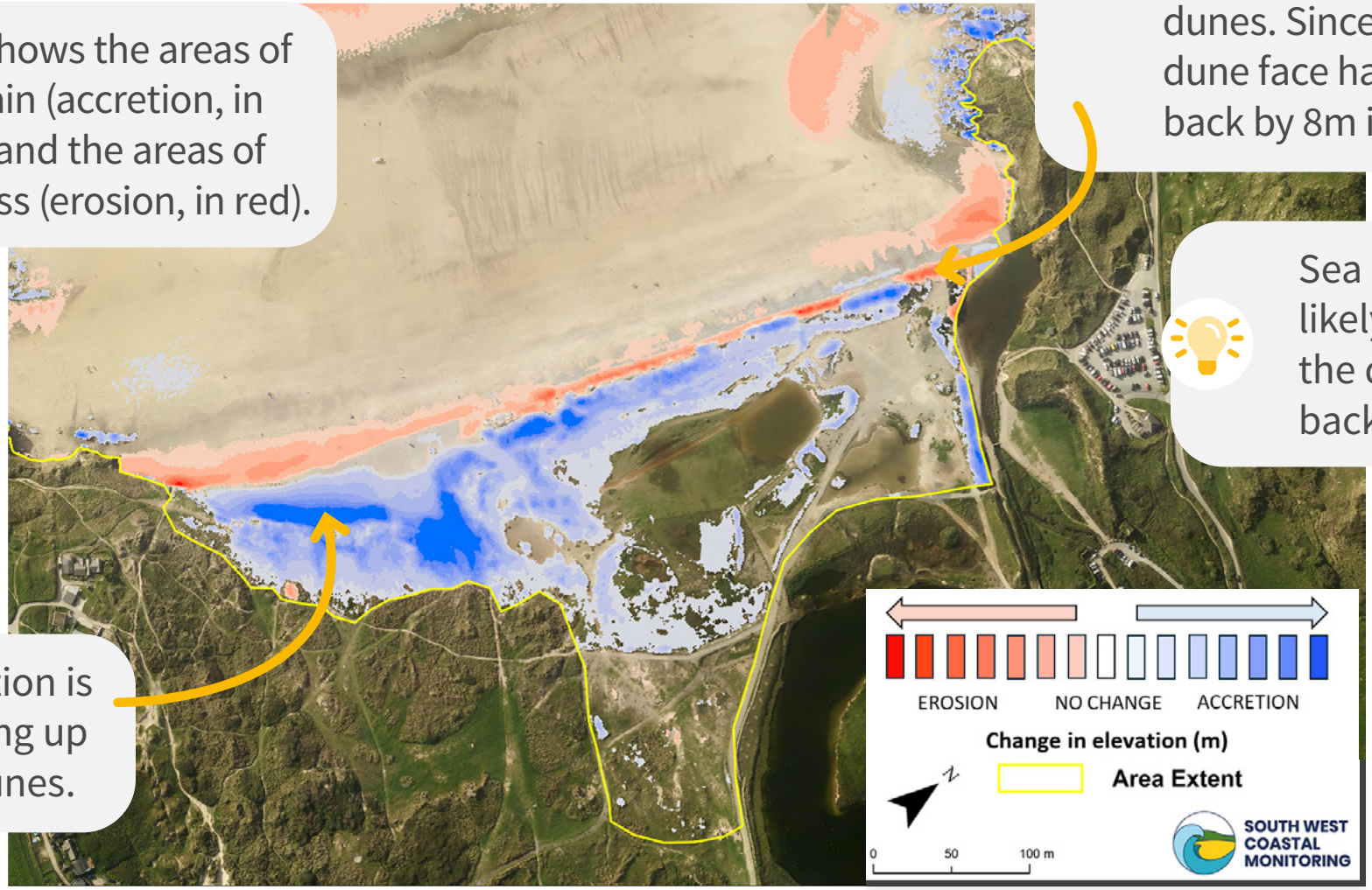
The changing beach at Gwithian Towans

This shows the areas of net gain (accretion, in blue) and the areas of net loss (erosion, in red).

Erosion is taking place at the foot of the sand dunes. Since 2008, the dune face has eroded back by 8m in places.

Sea level rise is likely to cause the dunes to roll back further.

Accretion is building up the dunes.



What's emerging from the cliffs?

- In 2022, walkers on the beach spotted a strange object jutting out from the cliffs.

What do you think it is?



Photo: CornwallLive
www.cornwalllive.com/news/cornwall-news/gallery/history-100-year-old-cart-5001747

Cornwall has a long history of tin mining!

It's a cart used to transport tin sand from the beach!

- The Red River (see Slide 3) enters the sea at the northern end of the beach. Its name reflects the colour of waste sediment washed out of the nearby South Crofty tin mine (closed 1998).
- Did you know that the Cornish word for 'red river' is Redruth, as in the town!



Photo: Cornish Story
http://cornishstory.com/2020/11/30/gwithian-tin-sand-works-part-two-processes-and-people/

What is tin sand?

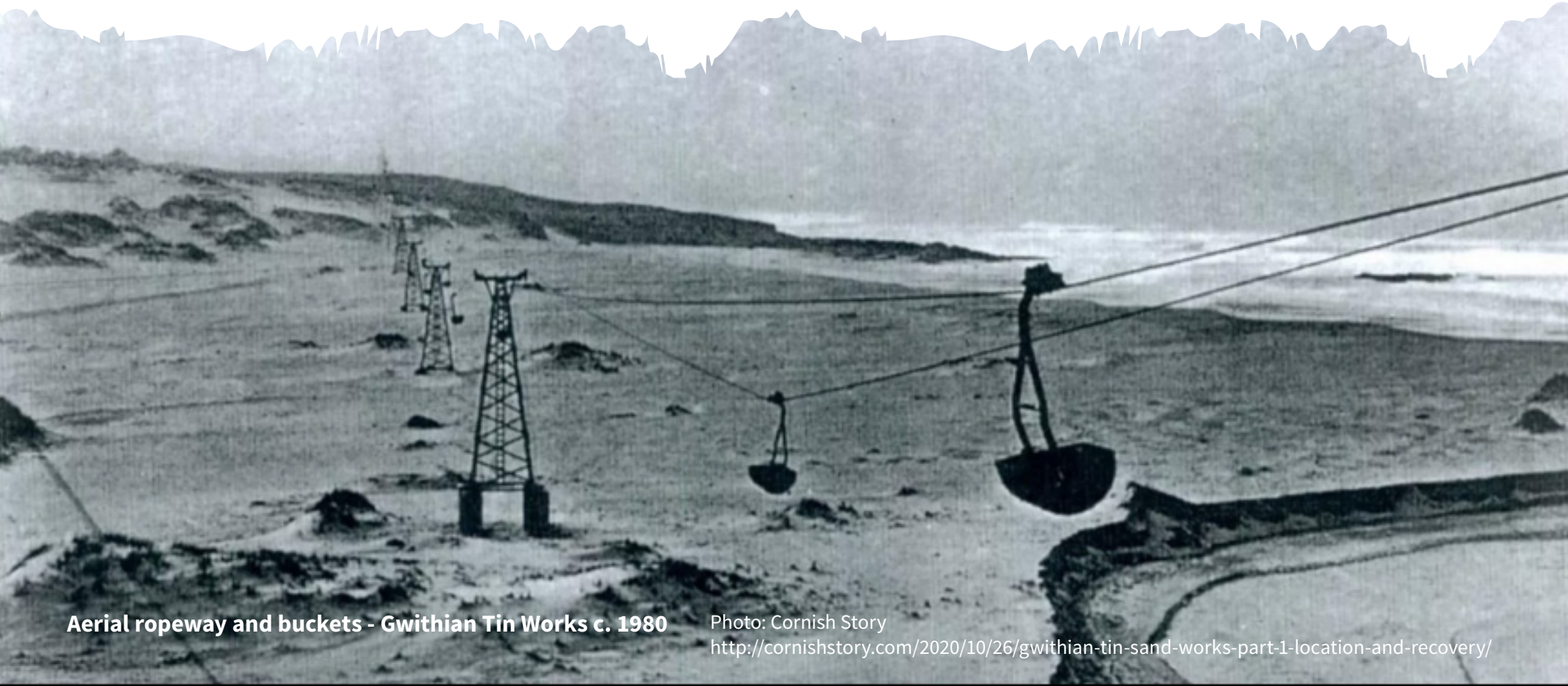
- The red waste from the tin mine washed up on the coast to form valuable ‘tin sand’.
- In 1913, Cornish Sands Limited began extracting tin sand from the beach at Gwithian Towans close to Peter’s Point.
- The tinsand was transported to the nearby tin works by horse and cart.
- Dynamite was used to blast the rock to create cartways through the cliffs.



Photo: CornwallLive
www.cornwalllive.com/news/cornwall-news/gallery/history-100-year-old-cart-5001747

Construction of an aerial ropeway

Later, an aerial ropeway was constructed as a far more efficient method of transporting tin sand from the beach to the tin works.



Aerial ropeway and buckets - Gwithian Tin Works c. 1980

Photo: Cornish Story
http://cornishstory.com/2020/10/26/gwithian-tin-sand-works-part-1-location-and-recovery/

Industrial extraction of sand continues

- When the tin works closed, sand was extracted from Gwithian Towans for many years.
- Huge quantities of sand were transported to Plymouth after World War 2 to support reconstruction of the bombed port.
- The lime-rich, shell sand from the higher dunes was used in agriculture to improve the soil.
- Sand extraction destroyed an extensive dune system.
- Buried beneath the sand, the Dark Ages settlement of Connerton was destroyed.



Photo: Cornish Story
http://cornishstory.com/2020/11/30/gwithian-tin-sand-works-part-two-processes-and-people/

Explosive works at Upton Towans

Further south, at Upton Towans (see Slide 3), are the remains of the National Explosives Company Ltd which manufactured explosives for the mining industry and for military use in World War 1. The photo shows the works constructed on the sand dunes in 1914.

Photo: Andrew Westcott 2003-2005
biggusbirdus@gmail.com



The site of the explosive works today

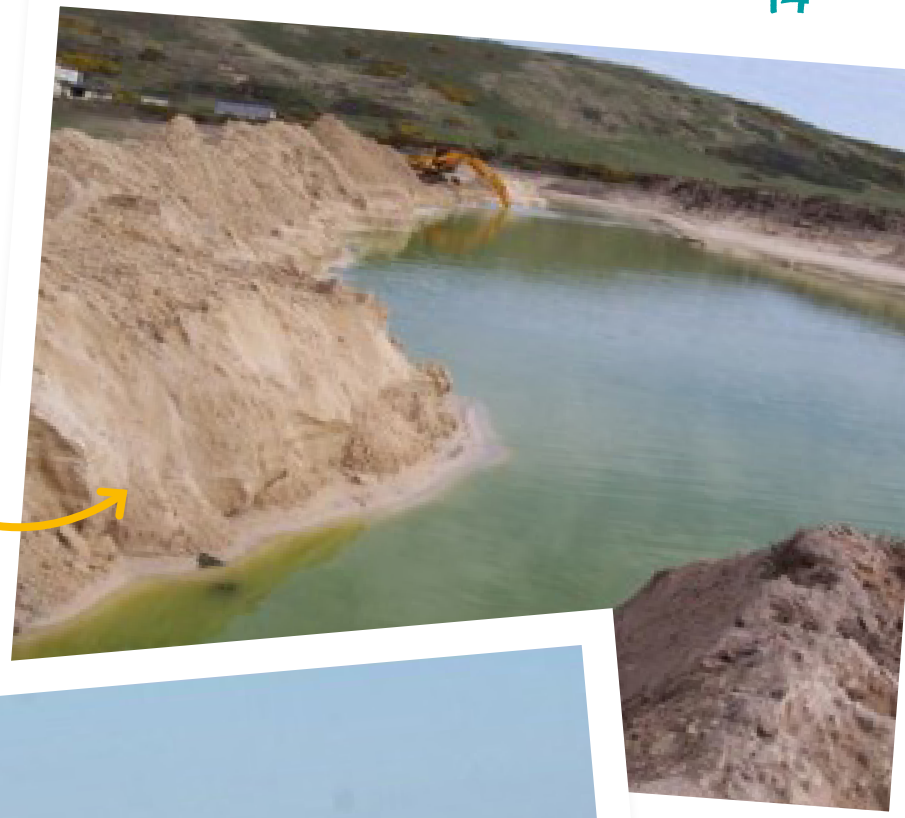
- The colour aerial photo shows the industrial site today.
- You can see evidence of the building foundations and the earthen safety enclosures (in the black and white photo) that were constructed around the buildings.
- This shows how the natural sand dunes have been modified by people.



Photos: Andrew Westcott 2003-2005
biggusbirdus@gmail.com

Reclaiming Gwithian Towans for nature

- In the late 1990s, local residents and environmental organisations successfully campaigned to reduce sand extraction.
- No quarrying was allowed on the higher dunes.
- By 2005, sand quarrying on the beach stopped.
- A lagoon was created on the site of sand extraction to promote nature.



Lagoon created in 2005



Lagoon today

Photos: Cornish Story, Dynamic Dunescapes

The lagoon at Gwithian Towans



Before (2001)

After (2008)



The natural wonders of Gwithian Towans

Today, the nature reserve is a haven for wildlife.

- Seals and dolphins can be seen from the beach.
- Rock pools create important miniature ecosystems.
- Sand dunes support a diverse range of plants and animals including sea holly, evening primrose, lizards, birds and butterflies.

