



## Nature: Coastal Erosion and Dune Repair – St Andrews Links

### THE CHALLENGE

When golf was first played in St Andrews over 600 years ago, the Links looked very different from how it does today. It was quite a wild and rugged place with thousands of acres of sand dunes that had been built up since the ice age. Today, the remaining dune system is quite narrow and susceptible to winds and tides and, particularly, to trampling. The dunes of the famous West Sands and the area at the far end of the Old, New and Jubilee courses, where the long beach meets the Eden Estuary, are popular visitor destinations.

The estuary, mudflats and sandbanks that lead up to the high water mark on the Pilmour Links and the Out Head sand dunes are in an area that enjoys international protection for its wintering birds through Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar Site designations.

The soft dunes along West Sands beach and the Out Head area have always protected the land from the forces of the sea but are becoming more vulnerable due to changing climatic conditions, future projected sea level rises and potential increases in extreme weather events. Over time, the dunes lose the vegetation that binds the sand. This makes them very susceptible to wind and wave action.

The historic, recreational and economic value of St Andrews Links means that there is a need to protect these areas. Following considerable research, St Andrews Links Trust in partnership with Fife Council, Scottish Natural Heritage and the Fife Coast and Countryside Trust has taken various coastal protection measures over the last decade. These have required permissions under the Environmental Impact (Scotland) Regulations and licenses under the Control of Pollution Act (COPA) and the Food and Environment Protection Act (FEPA), which are enforced by the Scottish Environment Protection Agency (SEPA).



*St Andrews Links*

## THE SOLUTION

### The Eden Estuary Project

In 2001, 100 metres of hard defences were constructed along the eroding dunes at the end of the Jubilee course. This consisted of a line of contoured sloping gabions, which are large metal baskets filled with rocks. These stabilise the dunes and stop the sand from being eroded away by absorbing the energy of the incoming sea.



***Construction of gabion baskets***

This was followed further along the coastline with a revised approach; sand recharge. This beach nourishment project buried the installed gabions and built a new 300 metre dune along the remaining soft dune system to the north of the new gabions. Sand was excavated from a part of the sand flats to the north and transported to the dunes by low ground pressure trucks, it was then shaped by bulldozers. These sand flats have been steadily growing in size over the past 20 years. The Environmental Impact Assessment (EIA) process ensured that mitigation measures were put in place so there was no significant disturbance to the breeding bird sites, mudflats, sand flat, sand dune and saltmarsh habitats and the common seals that visit the estuary and bask on the sand banks at low tide. Permission for further sand recharge work was given in 2008 to ensure the area continues to be effective in combating the dune erosion.



***Sand excavation from the estuary***

Further protection of the sand dunes and sand recharge area was achieved through a softer coastal engineering approach that included chestnut paling fences and marram and sea lyme grass planting. The grass acts as a natural dune stabiliser by trapping and binding sand with their roots and vegetative growth, which also reduces the loss of sand through wind erosion.



***Sand recharge area***

## West Sands Dune Restoration Project

The West Sands, made famous around the world in the film "Chariots of Fire" and as a spectacular backdrop to The Open, was the scene of a different sort of race in 2010.



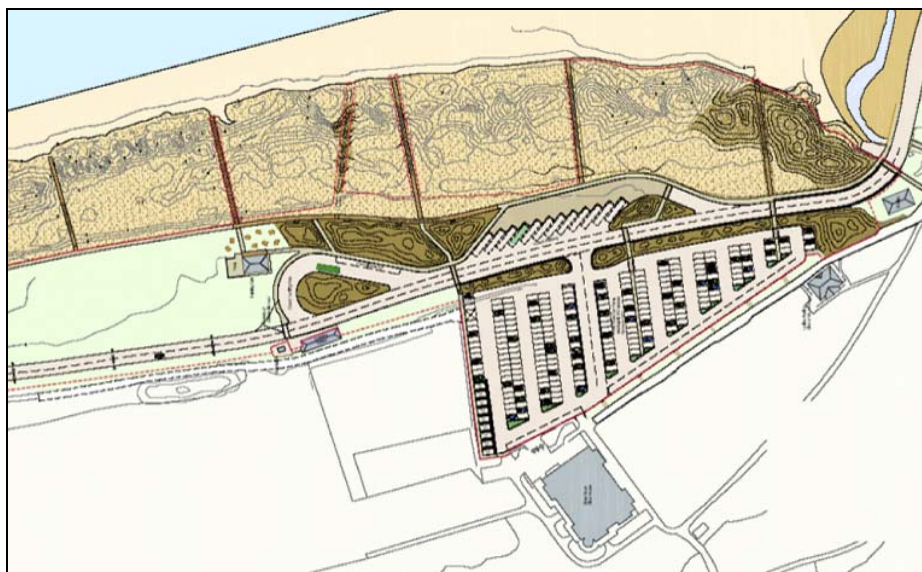
***Storm damage to the West Sands dunes March 2010***

Natural processes combined with a storm in March 2010 caused extensive erosion to portions of the ancient dune system at the West Sands. To restore the section at the Swilken Burn to its original form, Scottish Natural Heritage permitted the removal of sand from a site off Out Head but only until the end of April 2010 to avoid the potential for disturbance to wildlife, especially seals. The contractors had only about five hours to excavate the sand each day and a convoy of six huge dump trucks, hauled 14,000 tons of sand from one end of the West Sands to the other.

This first stage in the restoration of the entire stretch of dunes on the West Sands had financial support provided by Fife Coast and Countryside Trust, Fife Council, SNH, St Andrews Links Trust, the R&A and Fife Environment Trust.



***Sand excavation and haulage***



***Site of dune restoration project***

## THE OUTCOMES



***July 2010 - Dunes taken after restoration***

Jute matting and chesple fences were installed to stabilise the dune until vegetation was fully established.



***Sep 2011 –Lyme and marram grasses were transplanted from other areas of the dune***

The planting was done by many volunteers including staff of Fife Coast and Countryside Trust, St Andrews Links Trust, BT, BTCV, students from St Andrews University and Elmwood College and ECOS Countryside Services.

The work was guided by a management plan developed by a collaboration of local organisations, the West Sands Partnership, with the support of Fife Coast and Countryside Trust through its EU funded SUSCOD (Sustainable Coastal Development in Practice) project. The R&A, the Links Trust, Fife Council and Fife Environment Trust have contributed generously to the project.

The work on the West Sands will also be an opportunity to show people what can be done to restore a wonderful asset, to promote a better understanding of sand dunes and their many values, and to encourage the public to care for them.

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