

Sustainable, Proactive Dune Erosion Management of Sand Dunes in Norfolk

Pilot Results

Dune loss from erosion caused by uncontrolled and/or poorly managed public access is an area of concern in Norfolk, like many coastal sand dune sites. Management can often be absent, out of date, installed without considering dune use or why erosion occurs. Past coastal flooding damage is thought to have cost 1.4 billion EUR.

Through the ENDURE project, we have **piloted new approaches to access-based erosion across 3 sites¹** (850ha). Instead of expensive, reactive hard infrastructure installed after damage has already occurred, we have:

- Identified priority erosion sites through engagement of local site managers, landowners and key stakeholders.
- Applied cutting-edge techniques such as pressure data counters to deliver a **strategic data management** offering. Combined with existing data on proposed housing, green infrastructure, planning policy & recreational impact for informed, strategic, proactive approach
- Use best practice & innovation to design & apply **tailored 'soft' ecosystem-based solutions at vulnerable sites** before significant erosion damage (strategic signage, visitor management plans and dune site management plans).
- Underpinned actions with a communication campaign to encourage positive behaviour patterns in visitors to dune sites.

See A1.4 Methodology for a full method of approach.

¹ A fourth site was initially discussed however due to COVID implications, this was not able to be fulfilled. See Annexe 1 for more information.

Pilot Solution 1; Managing visitor access with a Management Plan

Site tested at: Holme-next-the-Sea

- Met with site owner and key stakeholders to discuss the challenges faced at Holme-next-the-Sea from growing visitor pressures.
- Appointed an expert consultancy to develop plan in collaboration with the site managers, Norfolk Wildlife Trust.
- **An innovative new Visitor Management Plan and supporting set of actions developed**, believed to be the first of its kind in England, but definitely an innovative approach for Norfolk and the Norfolk Wildlife Trust.
- **Also innovative in its approach to being 'accessible for all'**, allowing any other dune sites across the world to utilise the approach, its templates and outcomes.
- Although the Visitor Management Plan has yet to be replicated at a coastal sand dune site, the **approach has been adopted by another sensitive site** in Norfolk. It has also been shared with networks and made available online.

Pilot Solution 2; Managing visitor access through management planning

Site tested at: Holkham

- Met with site owner and managers to discuss the challenges faced at Holkham from growing visitor pressures. This has also been worked on collaboratively with the Norfolk Trails team in order to ascertain feasibility of these plans.
- The dunes at the NNR do not have a specific set of management prescriptions within the management plan, and therefore have always been secondary and part of experimental management. It was decided that ENDURE would create a management plan in liaison with Natural England

experts and the Dynamic Dunescapes project, providing an external implementation site for that project.

- **A new dune management plan has been developed** and will be implemented for the next 5 years and be regularly monitored throughout this time. The management plan includes options around dune dynamics: how to restore dynamics in dunes which have been planted with pines: new experiment for Norfolk, or encouraging dune trampling in areas with too much vegetation – idea of using visitors as dune maintenance. As an early action, chestnut paling was installed to divert footfall as required.
- **Sand trapping as a result of chestnut paling has been very good (see figure 1).**

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ENDURE

European Regional Development Fund

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← Tweet



Jake Fiennes @jake_fiennes · 12h

Applying nature based solutions to dynamic dunes on the [@HolkhamEstate](#) National Nature Reserve. Following the tidal surge of 2013 and damage to the dunes. A simple short fence has rebuilt the dune by 2 feet in six weeks.



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Alex Larter @Alexanderlarter · 9h

Replying to [@jake_fiennes](#) and [@HolkhamEstate](#)

Looks really good ! More examples of the great work being done by your team at Holkham !

💬 1 ↻ 5 ➦



Andy Bloomfield

@NHarnser

Replying to [@Alexanderlarter](#) [@jake_fiennes](#) and [@HolkhamEstate](#)

with help from Endure

Tweet your reply



Figure 1; @jake_fiennes

Pilot Solution 3; Managing visitor access through Strategic multi-messaging signage supported by Strategic Data Management

Site tested at: Horsey to Winterton

- Met with site managers and key stakeholders to discuss the challenges faced at Winterton (to Horsey) from growing visitor pressures, particularly during seal pupping season.
- **Multi-agency, multi-messaging signage was developed** to provide the various but similar messages currently given to visitors to manage their behaviour on site appropriately and with the aim of protecting eroding dune cliffs and directing people to appropriate beach access. This was supported by rope and post cordoning.
- **People counters were installed to assist in visitor management** and to support the information gathered through our visitor surveys (see supporting comms campaign for more information) and better understand behaviour and movements of people in in our sand dune reserves, **sensors were installed to see determine the effectiveness of interventions.**
- UnioTech were appointed to develop **bespoke people counting devices** and deployed the Low power wide area network. These were installed at locations, Horsey Gap and Winterton.
- As part of the work UnioTech tested various design and testing processes, but the result is a system that has **now been rolled out across the Norfolk trails network.** They also developed a low-level firmware to transmit and store the data so they have a real-time update.
- **Immediate impacts were seen after signage and rope and post were installed.** The data before installation there were 192 activations which dropped on the same day the following week to 31. This is an 83% decrease. All other counters in proximity didn't decrease, reaffirming it was indeed these interventions.
- These sensors are working as directional people counters, connecting back to a central platform publishing data in near real time for site managers. The

platform will be managed by the Norfolk trails team and offers both improved understanding of visitor pressures and behaviours on sites and cost savings. **Counters are being rolled out across county with more low frequency points being installed.**

- **Natural England have been given access to live data.** This will provide a good monitoring tool so that they can see the evolution of blowouts depending on annual visitors and can inform further management in future.
- Development of multi-agency signage has always been challenging however Natural England have requested the template so they might replicate this at other sites around Norfolk.

Pilot Solution 4; Managing visitor access through on-site warden

Site tested at: Holme-next-the-Sea

Norfolk Wildlife Trust (NWT), site managers of the Holme Dunes **appointed a 9-month warden** to actively engage with the visitors to the sand dunes and wider site with focus on protecting the nesting colonies. In collaboration with ENDURE, these duties were extended to include the following responsibilities.

- Communicate the messages of ENDURE, taking them beyond nesting birds to a wider context of protecting the sand dunes, offering resilience against future sea level rise.
- Raising awareness of the negative impacts of some recreational activities on the dunes.
- Supporting ENDURE at community and citizen science events held in and around Holme (unfortunately this was unable to take place due to COVID restrictions)
- To look at how to sustain such a role going forward, without grant aid to continue to protect the dune ecosystem for the future.
- **The Seasonal Warden post has been a crucial element of NWT's approach** to protecting beach nesting birds at Holme Dunes by maintaining cordoned off areas, monitoring breeding success and visitor numbers, raising

awareness among the public, and working with volunteers, among other areas of work.

- **By fencing off large areas of the beach and wardening, NWT created unspoilt areas for embryo dune vegetation** such as Sea Rocket, Frosted Orache and Prickly Saltwort amongst others. Due to the rather wet and relatively warm summer this vegetation had an excellent growing year, with carpets in various locations, especially at Thornham inside the electric fence where it was completely inaccessible to people. A visiting botanist commented: “This is what foredunes should look like in the UK: a dense tangle of sea rocket (*Cakile maritima*), frosted orache (*Atriplex laciniata*) and prickly saltwort (*Salsola kali*) protected from human disturbance. I’ve never seen so much of these plants growing in one place in the British Isles.”
- **The presence of the Seasonal Warden on the beach in general and at cordoned areas raised public awareness about nesting birds and changed behaviour**, e.g. through engaging with the public, responding to incidents, and delivering visitor engagement activities (low tide sweep netting sessions, high tide wader roost experiences and beach birding walks).
- A longer-term contract for the post, and making it full time, would mean more continuity within the service delivery, allow the post-holder to develop more meaningful links with the local community and stakeholders, and be a more attractive proposition for the right candidate.

Supporting comms campaign

At the start of the project ENDURE hosted a workshop inviting local stakeholder to discuss the pressures along the coast and the communications surrounding them. This was facilitated by the Open University. We explored the language around the sand dunes, like protecting and respecting, which are at the heart of the countryside code. The result of this workshop was as follows, and was used as the basis for our communications campaign:

“Protect, Respect, Enjoy – Protect and respect your dunes, enjoy them responsibly”

This has since also been adopted by several communications across Norfolk including the [Wild Recreation Guide](#) developed by the Wash and North Norfolk Marine Partnership.

Working with the Norfolk County Council Comms team, we looked at how to influence behaviours using invasive social media marketing trends. This approach targets those who were talking about visiting the Norfolk coast or had done so previously. **We produced a white-labelled, social-media-friendly, 30 second, non-aggressive film.** It was white labelled so it can be used by others. It was also translated in French and used in France. This film was pushed through our social media. Over **67,000 people were reached** through this push which took place in 2019 and 2021.

To ensure we made an impact, we produced a survey before and after the campaign monitoring key behaviours. The initial survey had 372 responses, and the final survey had 640, showing an increase in awareness. The conversion rate was 83%.

There was a 17% increase in awareness of the issue of BBQs in dune environments, with 20% becoming aware of the special nature of these sites. **Over 40% of respondents had heard of the ENDURE Protect, Respect Enjoy campaign.** There was also a 3% increase in awareness of dogs off leads in dunes after the campaign.

This comms campaign was supported by guided walks at Holkham and the development of three podcasts, one for each pilot site.

COVID-19 Impacts

The COVID-19 pandemic impacted our ability to deliver 1 of the pilots as originally planned. Government restrictions prevented baseline data from being collected and severely limited the on-site meetings and options analysis work

essential to informing further actions. Local Authority staff were also re-deployed to frontline services, creating further limits on capacity.

COVID-19 also caused issues with the delivery timelines for sensors and people counters due to impact of restrictions on the manufacturing of electronics for products.

It became impossible to hold planned face-to-face events, such as guided walks. Outreach and communications events planned to support project interventions and pilots had to be cancelled. However, we were able to reassess and instead developed three podcasts which are available on the ENDURE website, YouTube and at Holkham National Nature Reserve.

Conclusions & Recommendations

- **Active engagement with local site managers, landowners and stakeholders is vital** to ensure innovative and appropriate solutions, which are fully implemented on site and remain supported for a number of years.
- **Soft solutions are just as impactful as hard solutions** but need to be understood by communities living, visiting and working around them. They **must be accompanied by effective communications**.
- **It should not be assumed a multi-faceted management plan is in place.** Documents are often siloed and do not combine visitor management with nature or land management.
- There are commonalities across dune sites despite different host nations. ENDURE has only been able to explore the 'tip of the iceberg'. There is **a lot of potential for co-developed or shared solutions to shared problems**.
- **Communications should be based on a peer to peer approach** rather than parent-child (sense of being told off) to achieve greatest impacts.

- **Don't underestimate power of online communications.** We recommend combination with face-to-face for greatest impacts.
- **Data counters provide strong sound information** on visitor behaviour to inform management and **create data-based approaches.**

Annexe 1

Draft Pilot Solution: Managing visitor access through infrastructure provisions
Site: Brancaster

Summary of proposed works:

Development of a flexible/transferable access point at Brancaster dunes. Carry out a feasibility study to scope options for temporary access point which could be placed at high pressure points where required. This should be transferable to

another location as visitor pressures evolve and management of the site requires.

The access point would also need to be collapsible for storage at times of tidal surges to avoid loss of the access point. ENDURE offers the opportunity for the successful contractor to network with Dutch and other partners who use similar technologies.