

More and more Information

Knowledge Exchange Report (2022) *Reinhardt Strubbe, Jeppe Pilgaard, Luc Geelen, Marc van Til, Kathryn Hewitt, Isabelle Spall* On the 28th and 29th of October 2022, a knowledge exchange event concerning coastal dunes ecology took place in the Netherlands (with representatives of 3 ongoing LIFE projects, the administration board of the National park and a lot of dune experts from the Netherlands). The report with most interesting discussion points and terrain facts you will find as [pdf-file](#).

Report on Invasive Alien Species in Great Britain and Ireland (2023) *John Houston, GB*. "This review of dune management looks back 50 years or more to the concerns in the 1960s and 1970s about the impacts of non-native conifers and the development of dune scrub, to the present day concerns about invasive native and non-native plant species, and to the future by looking at what recently arrived non-native species, or yet to arrive species, might also become invasive. The Convention on Biological Diversity defines invasive alien species as species whose introduction and/or spread outside their natural past or present distribution threatens biological diversity. Within Europe, coastal dune habitats are particularly impacted by invasive alien species and the Atlantic biogeographical region (which includes the UK and Ireland) is considered the worst affected. Against this background dune managers across northwest Europe have been calling for the development of a regional 'black list' of invasive alien species and for greater sharing of experience across the Atlantic region." [Download pdf](#)

Dutch Fore-dune Dynamisation (2023) *Luc Geelen, NL*. In more and more places along the Dutch coast, dynamic processes are given a chance or active efforts are being made to make the coastal dunes more dynamic. When you start projects in the fore-dunes, you have to think about many things. During the Living Dunes symposium last November on Texel, Albert Oost from "Staatsbosbeheer" and Sonja van der Graaf from "Programma naar een Rijke Waddenzee" gave a preview of the *Fore-dune Dynamisation Manual*. This guide has been created by dune managers and experts and is designed to be used as a guide for all the project-steps required. There is also a checklist with the most important points for attention. The manual starts with this checklist where you can easily click through for each item to the substantiating text in the manual so that you do not always have to go through the entire manual. It's in Dutch and written for the Dutch over stabilized dunes, but with some help of Google Translate the theory behind this management is interesting for dune managers in whole NW-Europe! Links to the manual and checklist: [Checklist en Handleiding voor Dynamiseren Zeereep](#)

Field Guide Woody Invasive Species (in Dutch) (2023) *Luc Geelen, NL*, NVWA, The Netherlands Food and Consumer Product Safety Authority, presented a field guide for woody invasive species <https://www.nvwa.nl/documenten/plant/planten-in-de-natuur/exoten/publicaties/veldgids-invasieve-houtige-planten-in-nederland>

Littoral22 - Book of Abstracts (2022) *Cláudio Duarte, Jose Ferreira, Renato Monteiro, Catarina Jóia* The Book of Abstracts contains the abstracts of every presentation made during the Conference. It is divided by session, therefore being organized in chronological order of presentation. [pdf-download](#)

Dunes in Motion (2023) *Sonja van der Graaf, NL*. More and more attention is being paid to dynamics in the dunes. Not only because of the positive impact on the natural values, but also because of the contribution to water safety. Dunes can potentially grow with the sea level if sand is allowed to drift from the beach into the dunes. The Programme towards a Rich

Wadden Sea, together with the Province of Noord-Holland, Staatsbosbeheer and Rijkswaterstaat, prepared a short animation about the importance of dune dynamics.
See: [Dunes in Motion](#)

Driftlines: Brochure about the life in and on drift lines (in Dutch) (2022) The beach: a large, empty stretch of sand between the sea and dunes, or a spectacular habitat? The latter of course! Because if you look closely, you will see that there is a lot to discover and experience in driftlines and on the beach. Jumping beach fleas, running birds or a crab that quickly crawls under the sand. With this booklet you will discover the wonderful nature. The brochure was commissioned by a Groene Strand project and is available in The Netherlands from the <https://www.duinbehoud.nl/het-groene-strand-wat-is-het/>

Restoration of mobile dunes: Westhoek nature reserve (2022) The - in this [rapport](#) mentioned works in the Sahara- are part of the Flemish and French Interreg project "Vedette" for the cross-border dune belt between Dunkerque and Westende. Together with Belgian and French partners, ANB wants to restore the Flemish Dunes and make it more attractive and varied for people and nature! Further information: Provoost S., Arens B., Bovend'aerde L., Strubbe R. (2019) Interreg V VEDETTE - Studie 'best practices' omtrent het herstel van de dynamiek van stuifduinen, 105 p.

Blow-Out, Notch Development (2022) An article from the research group of Gerben Ruessink (Utrecht University), this time about the development of blowouts in the fore dune based on satellite observations. He had a student work on this a while ago, and his MSc thesis has been converted into an article. One of the sites they looked at is the Northwest Nature Core. Other sites include Skodbjerg in Denmark and Padre Island in Texas. The main result for the NNWN Core is Figure 7, where you see the development (in square meters) of the area "sand". If you divide by 10,000, you have the number of acres. You see a rapid increase in 2012/2013, which is of course the construction of the notches. After that, the number of hectares of sand increases over the years, expansion of the lobes, but with large seasonal variations. These variations have to do with vegetation that "recaptures" parts of the area in the summer, but dies back in the winter. This means, among other things, that you should always use images from the same part of the growing season when interpreting aerial photos or satellite images.

Van Kuik, N., De Vries, J., Schwarz, C., Ruessink, G. 2022 Surface-area development of fortune trough blowouts and associated parabolic dunes quantified from time series of satellite imagery. *Aeolian Research*, 57, 100812 <https://doi.org/10.1016/j.aeolia.2022.100812>
Moreover there is another detailed study about dune blow-outs / notch development: Nijenhuis, M. 2022 Evolutie van de kerf: Een onderzoek naar succes- en faalfactoren van kerven in de zeereep. [pdf](#)

LITTORAL 2022: Short notes from the Session Coastal dunes and beaches. *Luc Geelen, Costa Caparica, Lisbon, Portugal, 20 September 2022* The workshop was organised by Luc Geelen (Waternet, Netherlands) and Frank van der Meulen (formerly Deltares, Netherlands). The workshop was a plenary session in the conference program and attended by almost all participants, which was a very positive sign of the importance of the subject. It was an open discussion in which everyone could participate. **Aim** of the workshop was to discuss past and future of European dune and beach habitats. What have we gained in the years since the start of EUCC (starting as EUDC in 1987) and what are the main items (still) standing out for the future? Create an opportunity to strengthen the European dune network (EUCC-EDN) The

EUCC can facilitate the exchange of ideas between policy-makers, researchers and managers. The European Dune Network is a relatively loose network, very useful for contacts between colleagues. [Read the Short Notes](#)

Dutch dunes lack natural management of the rabbit (2022) Despite the reduction of nitrogen deposition, longer periods of drought and grazing with livestock, a viable population of rabbits in the dunes remains a great loss. This is the conclusion of PhD research at Wageningen University [&] Research (WUR) by ecologist Harrie van der Hagen on a research financed by Dunea. The vegetation in the Dutch coastal dunes has changed over the past five decades due to various causes, including too much nitrogen deposition. Open, sandy dunes and species-rich grasslands became tall grasses, shrubs and forest, resulting in loss of local biodiversity. As a measure, grazing with large grazers has been introduced in many areas. This is also the case in Meijndel, the valuable dune and water extraction area between The Hague and Wassenaar. From 1990 onward, cows and ponies were used all year round. After 20 years, nature manager Dunea wanted this very common policy choice among nature managers to be scientifically substantiated.

Cattle less effective than expected.

Dr. Harrie van der Hagen, ecologist at Dunea, studied the development of the vegetation in Meijndel since the introduction of livestock and, after years of research, came to a striking conclusion: the decline in the rabbit population, the decrease in nitrogen deposition since 1990 and possibly changes in the climate, were found to be more important for the partial restoration of biodiversity than the effect of livestock grazing. “The dunes mainly lack the natural management of rabbits,” explains Van der Hagen. “Whereas cattle accidentally eat seedlings from trees and shrubs, rabbits systematically seek out these protein-rich sources of food. We also miss the positive effect of the rabbits digging activities.”

Open and dynamic

The original population of rabbits in the dunes virtually disappeared when the disease myxomatosis reached the Netherlands in 1954 and later again in 1989 with the RHD virus. “Eating seedlings and digging burrows are two characteristics that rabbits, as original managers, have ahead of the introduced livestock,” said the ecologist, who obtained his PhD this week at Wageningen University [&] Research (WUR) based on his research. “Rabbits ensure that, [nbsp] tall grasses, forests and shrubs do not have a chance in the dune grasslands. As a result, the dunes remain open and dynamic, so that herbs and other small species do not have to compete with tall species for air and light.”

Rabbits Rule

“The number of rabbits must be increased to allow them to once again rule over the calcareous coastal dunes of Meijndel,” concludes Van der Hagen. However, this is easier said than done and requires further research. “Moving rabbits from places where they are still numerous is obvious. Preferably, this should be from a natural dune environment, so that the young rabbits also learn to stay out of the clutches of, for example, birds of prey and foxes. Catching experienced rabbits away from sports grounds and introducing them into our dunes would then be a win-win situation, because their activities on the sports grounds are experienced as a nuisance. With an inoculation and a safe shelter, we can help rabbits to grow back to a viable population within a few years.”

Internationally relevant

Van der Hagen indicates that his findings apply to all calcareous dunes, between Bergen-aan-Zee and northern France. [nbsp] “As long as rabbits are not back yet, we can vary the grazing

with livestock more in numbers and types of animals, instead of year-round grazing with 1 cow or pony per 15 hectares as practiced in Meijendel."

Download link for the thesis: <https://www.dunea.nl/algemeen/-/media/bestanden/nieuws/proefschrift-harrie-van-der-hagen-dunea.ashx>

DUNE MANAGER'S HANDBOOK The Dynamic Dunescapes partners have developed a comprehensive handbook discussing the wide range of dune management options available to address the issues faced by coastal sand dune systems, including overstabilisation and invasive species. Management interventions detailed include notches, grazing, turf-stripping and scrub clearance. This handbook is designed to be a useful, in-depth resource for sand dune site managers, and aims to keep our management techniques up to date for the needs of dune conservation in a variety of situations.

Jones, L., Rooney, P., Rhymes, J. and Dynamic Dunescapes partners (2021). The Sand Dune Managers Handbook. Version 1, June 2021. Produced for the Dynamic Dunescapes (DuneLIFE) project: LIFE17 NAT/UK/000570; HG-16-086436 [DOWNLOAD](#)

NITROGEN DEPOSITION in DUTCH DUNES (NL) DUNEA has been fighting the effects of nitrogen deposition in the areas managed for over 30 years. We do this with nature restoration projects and nitrogen-related management activities, such as: turf cutting, mowing and grazing. This has cost about 4 million euros in the past 10 years. The research into the effects of grazing did not prove that too much measures were taken. That is why we have switched to summer and winter grazing, for example. So you cannot 'manage away' the effects of nitrogen indefinitely. Reducing emissions is the only sustainable path to natural recovery. [Further information](#) (in Dutch)

COAST for KIDS (ES) A series of educational videos about the coast, for children, and also adults! Led by Irene Delgado-Fernandez, coastal geomorphologist, this series has resulted in a wonderful contribution to environmental education on the coast. 'Coasts for Kids is a collaborative experience between children and their parents, coastal scientists, community artists, teachers, animators and coastal managers. The series is aimed at kids aged 6 and over. It includes important concepts in coastal processes and coastal evolution in Episodes 1, 2 and 3, followed up by analyses of human impacts in Episode 4 and management actions in Episode 5. The series (trailer + 5 episodes) will be ready for free download shortly, and this will be communicated in our Youtube Channel (<https://www.youtube.com/playlist?list=PLXgQva8tPStrhJCl3AiaayBAwMCh2x-xL>) and via twitter/online networks (@IreneDelgadoFe2). Public videos available at (and **ready to share**). [Play-list](#) -- [Trailer](#) -- [Episode 1](#) -- [Episode 2](#) -- [Episode 3](#) -- [Episode 4](#) -- [Episode 5](#) --

MANAGEMENT DEVELOPMENT in FRANCE (FR) Jean Favennec published about the [management strategy of the coastal strip in France](#). This manuscript traces the development of management strategies since the 1960s (in French).

10 years of SAND MOTOR (NL) In 2011 started a pilot project: the Sand Motor. An artificial sandbank, a significant boost for innovative coastline maintenance and a perfect example of Building with Nature. Thanks to the influence of the wind and the sea currents, the Sand Motor has now grown into a beautiful nature reserve and recreational area. Its development is being closely followed and is receiving a great deal of international attention. Ten years of research and special collaborations have resulted in an innovative way to

maintain the coastal area, new possibilities for the surroundings and a wealth of knowledge. A unique connection between nature, science and society. [Further information](#)

ENDURE - Ensuring Dune Resilience Against Climate Change an INTERREG Two Seas project 2014-2020. [Further information](#)

SAND DUNES, MOBILITY, and CULTURAL HERITAGE Research about sand dunes, their mobility (past, present, and future), and impacts on cultural heritage from the Atlantic coast of South West France, to the Low Countries, around the UK and the island of Ireland. The research theme centred on the idea that dune landscapes are rich in cultural heritage, yet their inherent dynamism and potentially increased future mobility, driven by climate change, may present new challenges for dune managers and dune stakeholders - challenges that need to be better understood. In addition to cataloguing the cultural heritage interests, also researched is the topic of physical dune mobility based on historic, contemporary, and projected future dune behaviour. To this end offering the following recommendations: 1. Recognise that cultural heritage features associated with sand dunes are of significant value in providing a tangible way to better understand shoreline change and engage with stakeholders. 2. Pursue a proactive programme of monitoring coastal change on sand dune sites in partnership with relevant agencies and research establishments with a specific emphasis on historic environment interests, adopting the SCAPE model from Scotland, and as appropriate linking to region and country Coastal Monitoring Observatories. 3. Put in place a more fleet-of-foot approach to achieving preservation by record that can be rapidly mobilised by having in place 'call-out contracts' to enable additional external expert help to be deployed in response to a storm event. 4. Review Trust sand dune locations to determine where, through acquisition or partnership working, it is possible to provide accommodation space for dune evolution inland or along the shoreline. 5. Contribute to the Dynamic Dunescapes project workstream 'Sand dune management handbook' to develop contemporary guidance for site managers that includes geomorphological, historic, and natural environment interests, climate change impacts and access issues. 6. Maintain and/or establish broad ranging sand dune management research partnerships with Universities and other research bodies for key Trust sand dune locations. The entire report: Dyke, P. (2020) [Sand dunes, mobility and cultural heritage](#). National Trust. 125 pp - *In memoriam to Phil Dyke* -

DEFINITION of FAVOURABLE CONSERVATION STATUS for COASTAL SAND DUNES (GB) This document sets out Natural England's view on Favourable Conservation Status (FCS) for coastal sand dunes in England. FCS is defined in terms of three parameters: natural range and distribution, area, and structure and function attributes. Section 2 provides the summary definition of FCS. Section 3 covers contextual information, Section 4 the metrics used and Section 5 describes the evidence considered when defining FCS for each of the three parameters. Section 6 sets out the conclusions on favourable values for each of the three parameters. Annex 3 lists the references. This document does not include any action planning, or describe actions, to achieve or maintain FCS. These will be presented separately, for example within strategy documents. The guidance document *Defining Favourable Conservation Status in England* describes the Natural England approach to defining FCS. [Report as pdf download](#)

COASTAL CHANGE and GOLF (GB) The 'Coastal Change and Golf Links Research Project' is established to identify current levels of coastal management understanding and engagement across links and cliff top golf courses. [Further Information](#)

LITTORAL 2017 Conference 'Change, Naturalness and People' Proceedings [Further Information](#)

RESTORING GREY DUNES by REACTIVATING SMALL-SCALE DYNAMICS

(NL) In the context of Natura 2000, rare species and vegetation types in the Netherlands are protected in a European perspective. This report focuses on the H2130 Grey dunes Habitat type, for which the Netherlands has great responsibility within the EU. [REPORT](#) Further information on this issue (in Dutch) on the website www.natuurkennis.nl, e.g. [Background report](#)

SALT SPRAY DISTRIBUTION: a REVIEW Jianhui Du [&] Patrick Hesp published a review article on Salt Spray Distribution and Its Impact on Vegetation Zonation on Coastal Dunes. Salt spray is, after sand deposition, often considered the second dominant factor contributing to vegetation zonation in coastal dunes. Salt Spray mainly originates from the bursting of bubbles in breaking waves, is carried by wind, intercepted by coastal dunes and plants, and redistributed in the sand/soil after precipitation. In this paper, the literature on salt spray distribution and impact on dune plants are reviewed. [SEE: Estuaries and Coasts](#)

FOREDUNES: GEOMORPHOLOGY related to MANAGEMENT In their article “Geomorphologic characteristics and evolution of managed dunes on the South West Coast of France” Victor Bossard and Alexandre Nicolae Lerma describe a geomorphologic classification of foredunes along the Aquitaine coast and analyze relations between dune management actions and marine and aeolian driven processes. Summing up management strategies conducted on the Aquitaine coast, three scenarios are generally considered to face the consequences of severe marine erosion. In the light of chronic erosion and relatively low sediment availability dynamics, these scenarios integrate into a stable to receding coast. With further sea level rise over the next decades probably requires extensive new management strategies. And authors promote so-called “controlled dynamic strategy” or guided remobilisation in order to adapt these environments to actual and future pressures. [SEE: Geomorphology](#)

RESTORATION of COASTAL DUNES (NL) Coastal sand dunes are home to stunning, species-rich ecosystems and provide numerous services to mankind, such as storm protection, opportunities for tourism and production of drinking water. Most coastal sand dunes across Northwest Europe currently experience denser vegetation cover and geomorphological stabilisation, resulting in a rapid decline in biodiversity and loss of important services. Nature managers are therefore increasingly implementing pragmatic nature-based solutions to restore static dunes into dynamic ecosystems. Within the Aeolus meets Poseidon project (2014-2019), Utrecht University pioneered into landscape-scale dune restoration research with drinking water companies, water authorities and other Dutch public and private partners. [Further information](#)

DUNE MANAGEMENT to SUPPORT NATURAL DYNAMIC A discussion about the publication [Delgado-Fernandez et al. \(2019\)](#) "Is 're-mobilisation' nature restoration or nature destruction?" *Journal of Coastal Conservation* 23: 1093-1103 Comments are available: Creer, Ratcliffe, Rees, Thomas, Smith (2020) *Journal of Coastal Conservation* 24 <https://doi.org/10.1007/s11852-020-00745-9>.
Pye [&] Blott (2020) *Journal of Coastal Conservation* 24 <https://rdcu.be/blyYf>
Arens et al. (2020) *Journal of Coastal Conservation* 24 <https://rdcu.be/b1Z40>

Rabbits: Lessons from the past and abroad (2020) The OBN Research project "Restoring Rabbit populations in coastal dunes" is halfway through. Some first results are published in a newsletter (OBN, 2019). Restocking is a commonly used practice in wildlife management, and particularly for European wild rabbit (*Oryctolagus cuniculus*) in France, Portugal and Spain. Many populations are declining, primarily because of habitat destruction and both myxomatosis and rabbit haemorrhagic disease.

Now that the rabbit is not doing well in many coastal dune areas, there are proposals to move rabbits from populations with good density. When the rabbits have completely disappeared, reintroduction may be an option. But improving existing populations with low density earlier may be a better strategy. There are some small experiments in the Netherlands with local reintroduction or addition of rabbits. In addition to a discussion of Dutch projects the OBN project will also deal with a literature study. Experience from management by dune farmers in the 17th century, and the experiences in France and Spain are gathered.

Rabbit breeding sites in the Netherlands: It is instructive to see how the dune farmers ("Duinmeiers") in former days promoted rabbit populations. In the Netherlands in the 14th century already a system was created in the dunes of open warren "warandes" (breeding and hunting grounds), for commercial keeping of wild rabbits for their meat and fur. Information about their activities we owe Prof. Swaen for the translation of one of the oldest known manuscripts in the Dutch language, dealing with hunting and falconry from ± 1635. [nbsp]In sparsely populated areas of the dune warren the duinmeier made artificial caves with a special drill. He fed the rabbits in the winter with hay, oats and bran or willow prunings. The "Duinmeier" fought predators and birds of prey; which led even to the eradication of the fox in the Dutch dunes.

Experience from France and Spain: In France and Spain, many rabbits have been released or placed for hunting in the past, an estimated thousands per year. Nowadays also rabbits are managed for the conservation of native predators. We see the same management here as with the Dutch duinmeiers: sufficient food, making artificial nests and protection against predators. In Spain people make great efforts to preserve the rabbit as a prey animal for rare predators such as the Iberian Lynx (*Lynx pardinus*) and the Spanish Imperial Eagle (*Aquila adalberti*). Improving the habitat turned out to be one positive effect on the rabbit population. In this case was the reduction by burning low shrubs seemed to be effective. Various factors are studied in a large experiment: the season in which the introduction is made, the numbers that are added and the quality of the release area (nutrient-rich and nutrient-poor habitat). Success was measured by survival, the extent to which the rabbits remained in the area [nbsp] and the expected population growth. The highest success was achieved with a low number of released rabbits (40 on 15 ha) in a nutrient-rich habitat. Placing in the breeding season is unfavorable, because there are many conflicts about mating and nesting during this period, where animals chase or injure each other. But because of considerable lack of knowledge most of current rabbit management programs should be revised to optimize the use of available resources in the attainment of an effective rabbit density increase. Letty (2003) has done experiments in France with additions of rabbits. He found a high mortality in the first two weeks and strong dispersion (withdrawal) of the new rabbits. In a population that the researchers followed day by day in the first two days after release 41-51% of rabbits died from predation or stress. And also later predation led to a lower survival than in a population protected against predators. The rabbits settled up to 225 meters from the artificial nests in which they were released. Moreover, the surviving rabbits that were introduced did not take fully part in reproduction. **In summary preliminary results show:** Additional placement requires a lot of effort and is not always successful. A prerequisite for success is the suitability of the habitat. Protection against predators for a longer period is necessary.

Swaen, A.E.H.(red), 1948. *Jacht-Bedryff*. Brill, Leiden

Angulo, E., Calvete, C., Cabezas, S. [et al.]. Villafuerte, R. 2004: *Scrub management and rabbit*

translocations at Doñana National Park: long and short-term effectiveness. 2nd world lagomorph conference.

Letty, J., Aubineau, J., Marchandeu, S. [&] Clobert, J. 2003: Effect of translocation on survival in wild rabbit (*Oryctolagus cuniculus*). - *Mammalian Biology* 68: 250-255.

OBN, 2019. NEWSLETTER Recovery rabbit populations in the coastal dunes– oktober 2019 (In Dutch)

Calluna heath die-back on the island Hiddensee (DE) Project include the study of the annual rings of *Calluna vulgaris* from two heathlands of different age, with the aim to find out whether plants died after the 2018 drought or before, and whether the die-back is related to their age and/or the growth of previous years. In addition, an experiment with rain-out shelters have been built to simulate drought, and vegetation (mainly heather) has been clipped to simulate browsing. [Further information](#).

DUNES - Sea, Sand and People (PT) The project is an Environmental History project focused in the relation between people and coastal dunes. The team combines geologists, historians, geographers and biologists. Covering the last three centuries and using a transdisciplinary approach, our team will travel across borders and centuries to find out who were the pivotal actors that changed the course of history of coastal dunes. Further Information: <http://dunes.letras.ulisboa.pt/en/project/>

REDUCTION of NITROGEN INPUT by PRECIPITATION - an enthusiastic goal (NL) The Netherlands will allocate five billion euros 2020-2030 to tackle nitrogen precipitation. The Duinbehoud Foundation asks to invest primarily in the proper management of nature restoration projects and in the construction of buffers around the nature reserves. Originally, the Dutch dune area is nutrient-poor. For centuries, flora and fauna have established their survival strategies for this. Now nitrogen is seriously disrupting the ecosystem. In the Dutch dune areas, this is reflected in an excessive vegetation with shrubs and grasses. As a result, dunes hardly drift and the original species-rich vegetation, birds and insects disappear. Birds find less and less food in overgrown places in the dunes. [Further information](#) (in Dutch)

DUNE ROADMAP - ACTIONPLAN The action plan concerning knowledge exchange and networking during the period 2016-2020. The roadmap focus on the sustainable conservation and restoration of important habitats in dunes of the atlantic region. The roadmap will be reworked. [Further information](#)

Natterjack Toads on the island Sylt (DE) Natterjack Toads are threatened on the island of Sylt and their population declines. On the entire island management measure started, supporting in the short as well as in the long term the environmental conditions to maintain the Natterjack population. [Further information](#) (in German)