Dynamic Dunes 2015

Daring solutions for Natura 2000 challenges

Zandvoort – Rockanje,
the Netherlands,
October 7-9, 2015

October 7-9, 2015, PWN, Natuurmonumenten and Waternet organised an international conference on rejuvenation of dynamic dunes and restoration of the dune habitats. The congress was held in the framework of EU Life-projects Dutch Dune Revival (LIFE 09 NAT/NL/418) and Amsterdam Dunes, Source for Nature (LIFE 11 NAT/NL/776). The Congress and the reports were drawn up with a financial contribution of the financial instrument LIFE + Nature of the European Union

Contents

Summary

October 7-9, 2015, an international conference was held on the rejuvenation of dynamic dunes and restoration of the dune habitats. The conference was organised by PWN, Natuurmonumenten and Waternet.

The value of dune habitats is widely recognised, and conservation projects are underway throughout Europe, overall the condition of European dunes is still grave. This is the conclusion of the EU 'State of Nature' report published in 2015 using information submitted by Member States through the Habitats Directive Article 17 process. The conference presented the positive and innovative results of EU Life-projects Dutch Dune Revival (LIFE 09 NAT/NL/418) and Amsterdam Dunes, Source for Nature (LIFE 11 NAT/NL/776). This is also why special attention was given to dune habitat challenges in a European context.

During the three days conference five key topics for dune and coastal management were addressed during keynote presentations, workshops and field visits (see box).

Key topics of the conference

Dynamics in dunes and coasts exist! The examples showed and reviewed during the conference have shown that the Birds and Habitat Directives are not standing in the way of dynamics but can support it. The LIFE instrument is supportive to the recovery of dynamic habitats.

Good protection does not exclude sustainable shared use. Natura 2000 sites support a multi-functional use. This is convincingly shown by PWN and Waternet. These water companies, in keeping with their own sustainable source management, have actively committed to conservation of the habitats of the coastal dunes. The stronger our dune nature the more so called ecosystems services the system can deliver.

Nitrogen overload in Natura 2000 areas is a big challenge in NW-Europe. All our efforts to reach our conservation goals will be in vain, if the sources of pollution are not effectively addressed. There is a flaw in our policy coherency. Other policies such as the agricultural policy will have to contribute in a positive way to the biodiversity challenge we are facing.

Invasive Alien Species are a severe problem that needs to be dealt with on a daily basis. It is clear that the exchange of best practices, networking, and early warning systems could help us counteract this problem. But these will not be enough. We need help from governments. The EU Commission want to designate only 37 animal and plant species as invasive alien species that have to be destroyed for the entire EU. For dune habitats a number of invasive alien species should be added to the list, including for example American black cherry (Prunus serotina).

Daring solutions to Natura2000 challenges. For the Dutch dunes themselves, the starting observation is not different from the rest of NW-Europe: since 1990 we are rapidly losing our biodiversity by expanding dense vegetation (thickets and forests). Several factors were responsible for this including loss of dynamics, the collapse of rabbit populations, atmospheric nitrogen deposition and Invasive Alien Species. To restore the biodiversity of dune environments and recover the vegetation mosaic that characterizes them, a consensus has emerged in favour of connecting the foreshore beach and the dunes. This is done by the creation of transverse corridors for the transport of sand and salt more land inward. Farther from the beach smaller scale rejuvenation works are carried out to give back space to the grey dunes. It is precise small scale mosaic work, taking into account the presence of relict populations. The approach is daring and in the meantime very pragmatic, "learning by doing". The main message is: LIFE projects deliver results, it works!

The conference triggered an active participation in the workshops and in field discussions. The main conclusions are summarised here.

Main Conference Conclusions

1. It is clear that the overall target of favourable conservation status can only be achieved by concerted efforts. 75% of the area of dune habitat across the region should be in favourable conservation status to meet the targets. Because of their worrying state, dune habitats should be higher on the political agenda of the European Commission.

2. Dunes should also be higher on the European research agenda (e.g. in Horizon 2020). European research priorities to reach favourable conservation status of all dune habitats must be assessed and agreed upon between the dune habitat expert community and government agencies.

3. The experience connected to the positive trend with regard to dune habitats, management and restoration in the Netherlands should be disseminated to the whole Atlantic region. This can be done by the European Dune Network and the EUCC in cooperation with the Dutch water companies and other nature management organisations like Natuurmonumenten.

Day 1, October 7th, 2015

Coastal Dune Dynamics

Presentations

Ms. Sjakel van Wesemael (PWN)

Welcome

Ms. van Wesemael welcomed the participants from the Netherlands and various other European countries: Wales, England, Belgium and France. She is responsible for the management of the 7400 hectares of dune area of PWN, including the Noordhollands Duinreservaat (North Holland Dune Reserve) and part of the National Park Zuid-Kennemerland. Ms. van Wesemael and her colleagues run a management and development programme which triggers the dune sand to shift again, the natural variety and biodiversity to return, and to reinforce the coastal landscape without dikes:
“The challenge we face together is to explore through open discussion how we want to move forward with the characteristic dune landscape on the one hand, and recreation, environmental factors such as climate change, sea level rise, and nitrogen deposition on the other.”

Mr. Joost Veer, Hoogheemraadschap van Rijnland (regional water board)

Coastal Management in the Netherlands: for decades of learning

As Mr. Veer illustrated in a nice way, coastal protection in the Netherlands has been a mix of (dike) failures and successes for many hundreds of years. Focusing on the sand dune coast in the 20th century, coastal management has mainly been guided by sea defence objectives, from time to time accommodating retreat, and accepting a narrow beach in combination with an engineered and intensively managed fore dune ridge, that did not have the look of a natural system. All this changed in 1990, when the Dutch authorities adopted a new coastal policy (‘dynamic coastal maintenance’), based upon a couple of new pillars: the strict maintenance of a reference coastline, to be supported by a shallow underwater zone (the ‘coastal foundation’, down to the minus 20 m contour line in the North Sea), and beach and foreshore nourishments with sand from outside this -20 m zone. In this way a lot of sand was added to achieve a dynamic equilibrium, coastline retreat was stopped, and further loss of land prevented. This new policy allowed for more flexibility and dynamics, both on the beach and in the fore dune area. Whilst the reference coastline is relatively easy to manage from an engineering point of view, this is less the case with beach and dune morphodynamics.







Mr. Bas Arens (Arens Beach and Dune Research)

Dynamic front dune management in the Netherlands

As the Dutch coastal defence policy changed from defensive to offensive, the coastline retreat was stopped, but this changed the sand supply to the dunes, and it changed the fore dunes. The amount of regressive fore dunes (along ca. 40% of the coastline until 1990) has become insignificant. In many places we now find embryonic dunes in front of the fore dunes.
Coastal dune managers had been controlling dynamics until the 1980s, and marram grass was planted after each storm season. Since then dune management has dramatically changed in response to grass encroachment. Measures were taken to get the dunes moving again. The new coastal protection policy also caused major changes. Erosion features can hardly be seen anymore, and instead, fore dunes have been prograding considerably since 1997. In many places new fore dune ridges developed in front of the previous ridges that started to stabilise. Sand exchange between both appeared to be very limited. The majority of the Dutch fore dunes appear to be not dynamic: there is no sharing of sand. Measurements of sediment budgets in fore dunes show that the amount of sand stored in the dunes was comparable to only 25% of the nourishment volume.
Fore dunes can respond in different ways. In the first case, new dunes form in front of the old fore dunes, which stabilises completely; dynamics are limited to this narrow zone; there is hardly any connection between the shoreface-beach system and the dunes. An example of this can be found in the Zandmotor (' Sand Engine'), a rather extreme example of offensive management. In front of the old fore dune, embryonic dunes are developing, and the zone with active dune development is spreading rapidly. And although there is a huge amount of bare sand present at the Zandmotor itself, only a minor amount of sand is blown inland. Most is trapped at the edge of the old fore dunes. Transfer of sand inland is very limited. This is problematic for nature managers, who like fresh sand in their system, but also for coastal defence, because the dunes do not grow with the sea level.
Another type of fore dune response can be found (e.g. in Schouwen), where sand in the fore dunes is remobilised, but the volume of erosion at the front is about the same at the volume of deposition at the back of the fore dune.
Along the Dutch coast still more than 50% of the fore dunes are non-dynamic, so not allowing sand sharing between beach and dunes.
A completely different type of intervention compared to the Sand Engine, is what was done in the PWN-project area Noordwest Natuurkern (Northwest Nature Core), where a number of notches were cut through the fore dunes, allowing sand to move from the beach inland. In addition, parabolic dunes were reactivated by removing vegetation and soil. In this way a sand sharing system was created, resulting into a long gradient of transport, and enabling a release of sand from the fore dunes. This is ensuring a link between the beach-shoreface system, the fore dunes and the dunes further inland, in which the fore dunes act as a transfer zone.
Arens concluded that landward sand transport is an important ecological factor in fore dunes with restored dynamics, improving possibilities to maintain vegetation succession stages that need a little sand. Input of sand can help mitigate the acidification of soils, and dunes can grow with sea level rise.

The current offensive coastal strategy in the Netherlands creates the risk of blocking sand transfer, a reason why nature goals might not be achieved. And secondly, there are still a number of questions about the long term effects on dunes, especially on Grey dunes, for which the long-term effects of our offensive coastal strategy are still unclear.

Mr. Gerben Ruessink (University of Utrecht)

Beach-dune interaction for dynamic coastal management

Professor "in sand and water" Ruessink studied beach-dune interaction in field situations, and like the previous speaker he showed his concern about the lack of sand sharing in fore dune systems. The implications of a lack of sand sharing are: (a) a loss in geomorphological dynamics, (b) a loss in biodiversity, and (c) no vertical growth with sea-level rise.

Dr. Ruessink presented three remarkable cases.
(1) South to the coast of The Hague, an artificial nearshore beach plain was created through a mass nourishment of 20,000,000 m^3 sand from the sea (as much as the annual amount of shore nourishment in the Netherlands): the Zandmotor. The Zandmotor prevented any further dune erosion in a wider area, but it did not lead to an increase of fore dune growth. The Zandmotor can be seen as an example of 'building with nature' project for coastal defence.
(2) The 'building for nature' project in the Noordwest Natuurkern included the artificial creation of V-shaped notches in the fore dunes, requiring the removal of 90,000 m^3 of sand. Erosion in the fore dune area continued, and both sides of the trenches became active erosion zones, leading to U-shaped trenches.
(3) In front of a major sea defence dike along the North Holland Sea coast, the Hondsbossche Zeewering, an artificial dune area was created with 40,000,000 m^3 of sand from the sea, the largest dune experiment to date, with a combined objective: coastal protection, nature and recreation. A good example of building with and for nature!

In applying models, water transport models appeared to be more clear and predictive than wind transport models. In reality there was less sand input into the artificial dune system than expected. It seems we are facing a limitation of supply of sand in dune systems. With the twice daily tides, large parts of the beaches are wet; and moisture is effectively limiting sand saltation. Most aeolian sand transport is along the shore, when winds are moderate. This is because when wind speed from western directions is really high, the beach is flooded by the sea. And a heavy one-day storm can take away a volume of sand that is equal to what wind can bring back in three years.
In conclusion, we have to move from preventing dune erosion to focusing on beach-dune interaction. We have to build with, and for nature. Our questions and scientific ideas should be inspired by practical experiences in the coast. Through experiments we should learn-by-doing in combination with a long-term monitoring effort, until we can eventually understand and predict. Only then we will be ready for the challenges of the decades to come.

Mr. Duncan Ludlow (Natural Resources Wales)

Dune rejuvenation management in Wales

Mr. Ludlow presented the dune rejuvenation project at Merthyr Mawr Warren National Nature Reserve (NNR), part of Kenfig SAC, in South Wales. This dune system is one of three sites in Wales selected by Natural Resources Wales (NRW, formerly Countryside Council for Wales) as suitable for dune rejuvenation. The project aims to create suitable habitats for pioneer invertebrate and plant species which are currently threatened by the stability of dune systems. Merthyr Mawr was one of the selected sites, because only 4% was bare sand, which was seen as problematic for dune ecology, and because sand input from the beach was very limited. The site still contained slacks thanks to a favourable groundwater table. Management works included the creation of new dune slack habitat and of bare sand habitats by digging out a dry dune slack, and by restoring a stabilised parabolic dune. The 2nd phase included an extension towards the sea, a second excavation and creating notches connected to the beach. The works went well, but remaining problems include vegetation regrowth and presence of shingle, which may develop into a shingle crust which will stop mobility in the future.
NRW also carried out dune restoration and rejuvenation in Kenfig: widening notches and mobilising the area behind them; unfortunately the coastal footpath is preventing further dynamisation.
Also at Newborough Warren (NW-Wales) efforts were made to create more bare sand habitats by the creation of notches, the removal of scrubs and trees, and by the introduction of grazing.

View the presentations:

Keynote - Joost Veer - Coastal Management in the Netherlands

Keynote - Bas Arens - Dynamic frontdune management in the Netherlands

Keynote - Duncan Ludlow - Dune rejuvenation management in Wales

Keynote - Gerben Ruessink - Beach-dune interaction for dynamic coastal management

Workshop

Dynamic coastal management: The best way forward?

This workshop was moderated by Luc Geelen (Waternet), Joost Veer (Hoogheemraadschap van Rijnland), and prof. Gerben Ruessink (University of Utrecht).

Main issues of discussion

- With state-of-the-art observation methods much more is possible than the “yearly check-up” as done by JARKUS (the highly appreciated Dutch monitoring programme to assess the evolution of the nearshore zone along the coast on a yearly basis, since the 1960s). New observation methods are important to assess the sensitivity level of measures taken. Dynamic coastal management demands a more dynamic and integrated assessment tool: from a safe coast to a healthy coast.

- Grain size is very important for beach-dune interaction. However, current selection methods for the marine nourishment materials seem to be sufficient. Best practice is to allow the sorting processes to take place in the sea, and not from the beach. Hence, Dutch Rijkswaterstaat adopted foreshore nourishments instead of beach nourishments. This allows the forces of wave and wind in the foreshore (and later on the beach) to do the job of sorting. Remember that the Dutch coastline has been straight already for thousands of years, and has been eroding only over the past 1000 years with average grain sizes gradually coarsening.

- Concerns were expressed about the quality of the sand used for nourishment in relation to lime-poor dune areas. There may be a need to check the nutrient content of the sand.
- The position of nourishments is crucial. A lot of experience was gained over the past 10-15 years, let’s use it! It was suggested that it could be better to customise measures, e.g. by combining (smaller) nourishments with fore dune trenches; this could stimulate dune remobilisation.

- There are choices to be made: combinations of functions vs. type of coast and vs. creation of space. Much more is now possible because of the availability of sand for nourishment.

- The Dutch already moved from managing coastal retreat (until 1990) to “holding the line in a dynamic way”, and since 2005 to an offensive strategy, by strengthening weak elements in the coast and buying massive nourishments (“Zandmotor”). This was made possible by the advance of technology in handling very large quantities of sand in a cheap fashion (scale enlargement). Too much sand however can lead to an unhealthy, “obese” coast, so effect on natural values have to be monitored carefully.

- With the current deposition in fore dunes, the sand input (via nourishments) into the system does not reach its full potential. From a safety point of view the sand deposited in fore dunes is mostly sufficient, but deposition further inland would be just as good or even better. This is the same from an nature point of view. However, the current storms and erosion patterns do not stimulate a redistribution of sand further inland. We need to physically help the system to start those processes; waiting for a storm that makes it happen is not a good idea because of the unpredictability of storms. Reducing nourishment might facilitate some erosion but because of continuation of nourishments at nearby seaside towns, a high input of sand is guaranteed, thus we need to manually induce “erosion”.

- An increased sand influx from the beach into the dunes - by wind - would be beneficial. The shells fraction of the beach is probably not limiting to mobility, it is much more the moisture, as we can see in the Sand Engine. Another problem is in the lower part of the beach (subject to tides) sand is compacted by car traffic. Hence, car traffic on beaches should be reduced as much as possible, not only in the intertidal part of the beach, but also in the higher and dryer zone of the beach, because embryonic dunes and dune vegetation can play a role in beach-dune interaction.

- A different perspective on the amount and frequency of nourishments (grain size, frequency, volume) and beach management might help the sand transport processes from beach to dunes. Right behind beach pavilions and cottages there seems to be no fore dune development, and sand transport in summer seems equally important to winter transport; in the workshop this is seen a major impact, but research into this issue is in progress (by the water board Noord-Hollands Noorderkwartier). The implication of this could be that the pressure of recreation promotion organisations and municipalities for ever wider beaches to enable more and more developments (beach pavilions and cottages) should be ignored, and that municipalities in the Netherlands should not allow or promote further developments. The dynamic processes could then be the main attraction on itself. It was suggested that these principles should be embedded in the guidance for “sustainable coastal towns” (QualityCoast): optimisation, not maximisation of beach width; limitations to our beach pavilions and cottages; limitations to car use.

- The best way forward is to integrate nature, safety and socio-economy - strike the balance! In the Netherlands many water boards, nature managers and drinking water companies learned to find each other and create potential for joint development of coastal projects where safety is guaranteed and nature is given space for development.
  Also in nature rejuvenation serious mistakes can be made, and have been made, by ignoring the importance of rich and well developed grey dune habitats and the seed banks that they hold; and by not carefully selecting the position of new notches and large scale mobility in the outer fore dune. Field surveys and evaluation of existing natural values are needed to prevent unnecessary losses right behind the fore dunes.

- Coastal safety goals lead to: building with nature; Nature restoration goals lead to: building for nature. The best way forward may be to combine both in a strategic way : we have to build with and for nature !

Remarkable

The Scheldt estuary assessment system could be interesting as a dynamic assessment system for soft coasts. It adopted an integrated approach, as described in “Evaluatiemethodiek Schelde estuarium” (http://www.vliz.be/imisdocs/publications/276665.pdf). More information is available in: www.scheldemonitor.org/nl/evaluatie-indicatoren.

View the workshop presentation:
Workshop - Management in white dunes - Gerben Ruessink & Joost Veer

Workshop

Creating blowouts: what to expect?

This workshop was moderated by Camiel Aggenbach (KWR) & Dick Groenendijk (PWN), and Tycho Hoogstrate (PWN).

Main issues of discussion

Participants exchanged experiences with blowout creation. More and more dune managers are actively promoting blowouts: PWN artificially reactivated 1000 m2 blowouts, and also Waternet and Natuurmonumenten have successful programmes.

PWN is still unsure about effects of European Bison on blowout creation. The question was raised what we can learn from spontaneous activation of blowouts. During the last decade, Waternet found a spontaneous increase of blowouts in fore dunes of the Amsterdam Dunes . At the same time an increase of the rabbit population occurred. It seems that blowouts often start at dune slopes with southwestern exposition in years with a dry spring and summer.

Experience with blowouts is also increasing at the Dutch Wadden islands. Small scale sand mobility can be triggered by goats, like shown at Landerum heath on the Dutch island of Terschelling. At Schiermonnikoog, the middle part of the dunes still holds active blowouts, but it remains unclear which factor plays the most important role.

Why should we create blowouts? Because they are vital to maintain and improve Grey dunes! So can small scale aeolian activity become a cure for deteriorated Grey dunes? And if so , how can we manage blowouts?

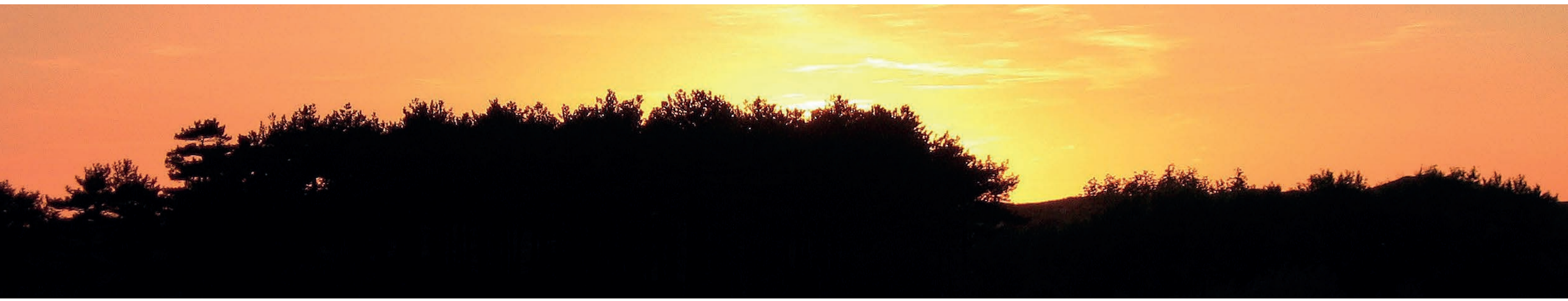
What are the main clues to create successful blowouts?
- The effect on soil chemistry is a key factor.
- Make secondary succession possible.

What are the dimensions of blowouts to be created (size, density)?
- Better more small than a few big ones, because the small ones give small scale gradients.
- There is no (natural) baseline for density.
- Density of blowout creation has to be based on ecological goals.
- There is no easy correlation between the size of the blowout and aeolian durability.

Where to create blowouts?
- Wind force is a must for blowout activity, so give way for wind. Create blowouts in short vegetation and open landscape, or make it more open.
- Only (re)activate blowouts in dune zones where it is needed.
- Balance geomorphological and ecological arguments.
- Geomorphodynamics: there are good prospects for blowouts in places where they were active in the past.
- Ecology: no blowouts should be created on valuable spots with well-developed Grey dunes. Stabilized blowouts often contain valuable grey dune.

Remarkable:
Stabilization of blowout is not a failure, it can be an ecological success for decades. Apply it in a longer time scale.

View the presentations:
Workshop - Creating blowouts - Camiel Aggenbach
Workshop - Creating blowouts - Dick Groenendijk



Workshop

Management in White dunes: the answer is blowing in the wind?

This workshop was moderated by Paul Rooney (Liverpool Hope University), Maaike Veer (Waternet), and Leon Terlouw (PWN).

Workshop introductions

Mr Terlouw stated that since the mid 1990ies an era of new management started: dynamic dune management. Several large scale experimental projects were implemented in the middle and inner dunes. There are several lessons to be learned from these projects. Large scale projects are active for at least 10 years. Stabilisation occurs by remains and from sprouting from roots, e.g. regrowth of Rubus caesius from old roots. Thus follow up management is necessary to remove the remnants of former management. Especially new formation of wet dune slacks is successful. But also the conclusion was that “living dunes” start at the seaside, because there is a gradient of dynamics (wind, salt, sand) from the sea towards the inner dunes. And sand mobility delivers a shower of lime to decalcified inner dunes. Dynamics are necessary for the conservation of both grey and white dunes!
Ms. Veer introduced us to project Noordvoort, initiated by Waternet in the white dunes, in cooperation with Staatsbosbeheer, regional water board Rijnland, the national water board Rijkswaterstaat, and the municipalities of Noordwijk and Zandvoort. Goals were to restore dune dynamics, to reinforce nature values, to create a quiet zone and to develop possibilities for people to enjoy and experience nature, processes and landscape. First discussions already started in 2000, but it took until January 2013 to really execute the project. On six locations vegetation and soil were removed, and trenches were created in the fore dune sand dike. Follow up management is necessary, and several methods are applied to this end. The next stap in the process is to work out - with the help of local nature and birds organisations - a plan for the creation of a quiet zone on the beach.
Main question for discussion
What are the success factors and measures in the rejuvenation of dunes and in attempts to connect the beach and dune systems?

Observations and conclusions

Do it !

- Go for an approach based upon geomorphological processes, but do also apply the re-cautionary principle to existing natural values.
- Consider issues of scale: there are constraints, so be realistic; small can be beautiful.
- We are still learning, especially in applying our assumption that nature needs some help.

Which measures?

- Consider the creation of dynamic features (e.g. parabolic dunes), but always combine measures based upon geomorphological processes, with measures promoting biodiversity, and by involving people.
- Clearly clarify to people why dune mobility is so important, and why the dune manager loves it; do address people’s concerns and fear; people can also be helpful in management.

Urgency

- Measures to enhance dune mobility are urgent because of climate change impacts and the need for adaptation.
- We need to work together, we need ‘dune heroes’ (be bold!), and we need to work with nature.

Remarkable

For too long we have reduced, limited or even completely stopped dune dynamics, which has been quite disturbing for dunes as an ecosystem. Many issues are related to this, but we need to take urgent action, act quickly, and focus on ‘high impact’ actions considering the relative influence of dune processes, and be as close to nature / natural as is possible under local circumstances.

View the presentations:
Workshop - Management in white dunes - Leon Terlouw
Workshop - Management in white dunes - Maaike Veer

Workshop

Research and monitoring dynamic dunes: State of the art

This workshop was moderated by Bas Arens (Bureau Arens), Hubert Kivit (PWN), Wouter van Steenis (Natuurmonumenten).

Main issues of discussion

Research and monitoring is a very broad topic. After introductions by Bas Arens (monitoring of abiotic parameters) and Hubert Kivit (monitoring of biotic parameters) an inventory of relevant topics on monitoring and, to a lesser extent, research was made. These topics ranged from monitoring of species, vegetation communities, ecological interactions between species to abiotic parameters, and monitoring in an international context.
The last topic was selected as the most appropriate subject for discussion at this international conference. One of the participants was struggling with making a monitoring plan for Natura 2000 dune areas in Flanders. The possibilities to achieve some sort of international standard for comparable Natura 2000 monitoring were discussed . This appeared to be as broad and complex as monitoring as a whole. Some highlights of the discussion included:

- For some species groups there is a well-developed international methodology for monitoring (i.e. butterflies). For other groups (e.g. breeding birds, vegetation) several methods exist with quite different backgrounds. Quality targets for habitats and monitoring methods are not well defined.
- Whilst in some countries all monitoring is coordinated to a very specific and detailed level, in other countries the site manager has more freedom and responsibility. Species composition and vegetation types differ highly between sites and countries . So this makes it difficult to compare sites and countries. An International standard for comparable Natura 2000 monitoring is lacking.
- There is a big difference between monitoring for the Natura 2000 quality assessment and monitoring the effectiveness of restoration measurements.

Remarkable

Ecological data often is not freely available.
Large differences exist in monitoring culture between countries

View the presentations:
Workshop - Research and monitoring - Bas Arens
Workshop - Research and monitoring - Hubert Kivit

Field visit

A field visit was organised in the Northwest Nature Core of the National Park Zuid-Kennemerland, where the conference participants – in several groups - could see and discuss recent management activities of PWN (project LIFE09 NAT/NL/418).

Noordwest Natuurkern (Northwest Nature Core): Restoring the dynamic dunes

For centuries, the most important role of the coastal dunes of the Netherlands has been to protect the low-lying Holland from the sea. And now, against all tradition, five gigantic 100-150-metre wide holes have been dug to once again give the wind free rein and allow the dunes to drift. By also setting five dune complexes further inland free on the wind, a large-scale, dynamic dune landscape has been created with characteristic habitats of White dunes, Grey dunes and wet dune slacks.
Through centuries of restriction and the recent nitrogen-rich precipitation, the calcareous dunes had become overgrown and acidified at a rapid rate. Characteristic types of grey dunes disappeared and white dunes were lost.

This nature restoration project is unique in the world. It was commenced by PWN and Natuurmonumenten and realized in 2012-2013, together with Hoogheemraadschap van Rijnland, responsible for sea defence. The plan was elaborated with scientists and fine-tuned in consultation with municipalities, nature groups, cultural historians and other interested parties.

The project was financed by the European LIFE+ Regulation and the province of North-Holland. Some 220,000 m3 of sand was excavated and reused for the shoaling of a lake. The developments were monitored in detail, and after the storm season of 2013 it can be seen that the dynamics in the coastal dunes are superlative.

Impressions by participants

The visit to the Northwest Nature Core was an eye opener to participants, especially to the (international) participants who had not seen this area for the last 10 years. The project approach of making several fore dune trenches, connecting the dynamics on the beach and in a series of blow-outs, was thought to be excellent. It was easy to see the approach had already worked and was promising for the future. Participants agreed it was a great pity to having to leave the concrete cycle path intact, and suggested to try and make it a more natural sandy track that adapts to the moving dunes. Participants thought that it should be possible to convince the Dutch cycle club (who has so far rejected an ecological solution to the cycle path) that this is not a cycle path through a static Park landscape but through a living natural system; and that it would add to the nature and landscape experience of all visitors if the cycle path would be adapted to the natural processes, rather than the other way round. This cycle path is only used for recreational cycling, and the question should be why it is problematic to get off your bike for a few minutes, or to test your all-terrain bike skills.

The landscape resulting from the management works, a combination of the original vegetated dune ridges, various and not dominating the aspect of the trenches, the blowouts and the mobile dunes, and dune slacks and plains, was highly appreciated. This is the way Dutch coastal dunes could have looked like one or two thousand years ago.

A slightly annoying feature remaining from the management works is still the large number of root remnants, that are potential sources of new scrub development, which can already be seen in quite a few places. Blackberry (Rubus caesius) looks like one of the most persisting survivors. Participants recommended the dune manager in intensive ‘after-care’ management like the removal of stumps and roots when these would be a major obstacle to ongoing sand mobility.
“Art became reality” - The artist impression is real now!

Day 2, October 8th, 2015

Restoration of Dune Habitats

Presentations

Mr. Ed Cousin (Waternet)

Welcome

Mr. Cousin, the responsible officer for the management of the Amsterdam Dunes, welcomed the audience on behalf of its management body Waternet, a public service with a great variety of tasks related to water, and one of the organisers of the conference. He reminded us to the first European Dune conference in Leiden, in 1987, and to how much has changed in the field of dune management during the last 20 years. Also in our region many changes took place, for example large-scale restoration projects and three eco-ducts connecting dune systems of “Nationaal park Zuid Kennemerland” to the Amsterdam Dunes, thus creating a connected dune system of over 7,000 ha .
The Amsterdam Dunes, a green oasis of peace and quiet in the hectic metropolitan region, have also seen major changes. One of them was due to the rapid development of the introduced Fallow deer population, giving the Amsterdam dunes the look of an overgrazed area.

Dr. Annemieke Kooijman (University of Amsterdam)

What is the problem with our dune grasslands?

Ms. Kooijman described the interactions between high nitrogen deposition, geology and soil organic matter content, and the loss of natural regeneration capacity. Especially atmospheric nitrogen deposition is highly problematic, whilst nitrogen is less of a problem in the sandy dune soil (there is not something like a nitrogen time bomb in the dune soil). On the other hand, phosphate plays an important role in the lime-rich soil, where it is fixed as calcium phosphate.
The increase of nitrogen deposition from the air (largely from England) in the 20th century, and peaking around 1990, had a huge impact on the dune vegetation of the Wadden district. In the absence of chemical phosphate-fixation of soils (due to the lime-poor and iron-poor character of the Wadden sand, originally coming from Scandinavia), there was grass encroachment everywhere.
In the Reno-dunal district grass encroachment occurred more locally because phosphate fixation was enabled by the higher lime and iron content of the sand (originally brought by the river Rhine).
The project areas of this conference are in the Reno-dunal district, and here grass encroachment in the fore dunes decreased since 1990, probably due to the phosphate fixation in the lime rich soils, a relatively high natural regeneration capacity and natural dynamics (rabbits and wind) . But the danger is still the ongoing acidification, which is about 50% higher than in the natural situation.
In the middle and hinter dunes dense grass cover increased from 20-40% (in 1990) to ca. 80% (in 2008), in spite of a considerable fall in nitrogen deposition. This is apparently the result of the decreasing lime content with the distance from the sea, and a lack of dynamic processes bringing lime-rich sand into the top-soils in these zones.
The middle dunes have been very unfortunate due to dissolution of calcium phosphate and increased nitrogen mineralisation. The lime-poor hinter dunes have been less unfortunate, but they have a much lower regeneration capacity (less rabbits, less wind). And they face an additional problem: the invasive alien Campylopus introflexus moss fields gradually turned into dense grass.
In spite of decreasing nitrogen deposition since 1990, Ms. Kooijman does not expect major improvement until 2030, because nitrogen deposition still remains too high. Lime-rich dunes are relatively fortunate, but it is important to keep soils lime-rich. Lime-poor dunes are even more problematic, but restoration measures are possible; grazing will help, but it is key to promote dune dynamics, to keep soils ‘young’.

Ir. Mark van Til (Waternet) and Dr. Dick Groenendijk (PWN)

Restoration of Grey dunes: a matter of scale?

Mr. van Til summarised the decline of the grey dunes that already began with scrub encroachment in the 1950s due to myxomatosis affecting the rabbit population, and leading to dune stabilisation. The grass encroachment since the 1980s (as a result of the nitrogen deposition described in the previous presentation) was quickly followed by a new phase of scrub encroachment by invasive alien species like black cherry. As a result, biodiversity of dune grasslands decreased, and is still decreasing.

Projects aimed at the restoration of dune grasslands have been undertaken by PWN, Waternet and Dunea, both on a large scale (focusing on the process) and on a small scale (focusing on the pattern and biodiversity). Interestingly, they discovered that the development of soil as well as the development of a rich great dune vegetation takes between 40 and 60 years. Where the biodiversity in lime rich grey dunes remains high, it declines in lime poor soils due to acidification.
Excellent successes have been shown in various small-scale restoration management in terms of both flora and fauna. Small scale measures include mosaic management of mowing, sod cutting and small blowout reactivation, resulting into a quick recovery of species, for example of the insect fauna. This was implemented mainly in the middle and hinter dunes, with grazing as a useful follow-up.
Grey dune restoration management is a lower priority in the fore dunes, which tends to be seen as self-supporting. Here and in the frontal dune, with its strong wind dynamics, large scale restoration management is given more attention, which may give more long-term results in the recovery of grey dunes. In the Amsterdam Dunes also disturbed landscapes have been restored at a large-scale, and very successfully.

Mr. Sam Provoost (Research Institutes Nature and Forest, Belgium)

Restoration of dune grassland in Belgium.

In terms of vegetation types, ecological and soil processes, the Grey dune is a complex concept. Mr Provoost elaborated this for the Flemish dunes, where ca. 670 ha of grey dunes remain, mostly in a very unfavourable condition. The number of threats has been and is remaining overwhelming. The dune scrub coverage increased from a few percent in 1948 to about 50% in 2010 leading to a serious loss of biodiversity. Restoration management was undertaken through a number of LIFE projects, aimed at the removal of scrub and woodland, the reduction of tall grass, and the restoration of dune grassland and slacks. Livestock grazing was introduced (since 1996), and to a lesser extent mowing and sod cutting. The results of the management were evaluated with flora and vegetation monitoring. Scrub cover decreased more rapidly in managed areas compared to areas without management, but sometimes to situation is complex. Sea buckthorn for example may collapse naturally after several decades, whilst grazing might stimulate Sea buckthorn rejuvenation; it may be possible to solve this with a higher grazing pressure. The location and the level of protection of grassland plants relic populations were seen as very important for the success of restoration.

View the presentations:

Keynote - Annemieke Kooijman - What is the problem with our dune grasslands

Keynote - Mark van Til & Dick Groenendijk - Restoration of Grey dunes a matter of scale

Keynote - Sam Provoost - Restoration of dune grasslands in Belgium

Workshop

Dune Grasslands and Fauna

We've renovated the film set, but where are the actors?

This workshop was moderated by Vincent van der Spek (Waternet), Dick Groenendijk (PWN), and Marijn Nijssen (Stichting Bargerveen).

Workshop introductions

Mr. Nijssen introduced the function of variation and dynamics, and explained the importance of dune grasslands for fauna. By taking the declining dune grassland birds, that are near the top of the food chain in the dunes, as a starting point, research provided a good image of what happens lower down in the food chain. Old dune grasslands are more biodiverse than younger ones, but invertebrate diversity is highest in mosaics of pioneer and old grasslands. Not only the abundance and size of invertebrates are of vital importance for birds that predate on them, but also their availability: can prey items be found and reached? Mosaics are therefore crucial, with short grasses and patches of bare sand, but also with patches of taller grasses; around 30 % of an area is ideal. Variation is the key! So especially in the hinterlands, small scale restoration has a more positive effect on fauna than large scale projects.

Mr. Groenendijk introduced dune grassland and fauna at dune sites and projects of PWN, which manages over 7000 ha of dunes in Noord-Holland. How does PWN deal with fauna in grasslands? Through surveys he now knows that newly created, small scale blowouts have higher insect densities than old, natural ones. However, the older natural blowouts have most rare species, the 'true' specialists. Mr. Groenendijk has also reasons for concern. There are so many projects in our dunes. Doesn't our fauna need a rest? And he wonders if we are up against external factors like nitrogen deposition, toxics (like dioxins), and climate change.

Observations and conclusions

We need more attention for fauna in monitoring

Fauna is a very strong marker to measure the quality of grey dunes. Over the past two decades site managers restored a great deal of habitat, but it seems like many fauna species, apart from the pioneers, have not benefited. A general conclusion is that policymakers strongly focus on habitat and vegetation (the film set), but that they have less attention for the actors that turn the movie into a blockbuster. A stronger focus on fauna offers a great opportunity to improve the way we monitor the quality of our grasslands!

Site management: do we act too fast?

Shouldn't we wait for habitats to recover from restoration projects? Don't we expect results too quickly? It takes several decades before grasslands are fully developed. And let's never forget that dunes are dynamic – even the so called fixed ones. There is an autonomous process going on in several parts in Holland, where bare sand is increasing. Aren't we being too impatient by creating hundreds of blowouts in the PAS-project? Restoration on a small scale in the hinterlands is crucial for fauna. Therefore there are some concerns that all the past and future projects combined form a large scale project, with (on a short term) a negative impact on fauna. The planned small scale blowouts might be an important management measure for fauna though, although we cannot predict the precise effects. Blowouts that are stabilising are probably crucial for specialist fauna species, so beware not to reactivate them (all) in the same area. They might very well be important refugia! If newly created blowouts die out within a few years: don't panic. If they have worked for a few years, a positive effect can last for decades to come. And if one never worked, it wasn't meant to be at that place.

Monitoring

Monitoring the small invertebrates that are so important for the grasslands is not easy, as there are few people with enough knowledge of these groups. Representative flagship species are mentioned as an option. These species might be combined with an interesting indirect method: if gradients and mosaics are so important for fauna, we can measure the length of transition zones between bare sand and vegetation with remote sensing, so we can monitor the changes in suitability for flagship species over the years.

Site managers: learning organizations?

Mr. Nijssen concluded this workshop by outlining that Dutch site managers take fauna seriously and that they are up to date with the most recent scientific findings on the matter

Remarkable

Innovative monitoring can help us further: the possible use of remote sensing to measure bare sand - vegetation gradients in dune grasslands can indicate fauna hotspots. Because these are the most important for high insect densities and diversity.
Attention for fauna is growing on a conservation management level, but in nature policy systems (like N2000, PAS) there is much room for improvement.
View the presentations:
Workshop – Dune grasslands and fauna - Dick Groenendijk
Workshop – Dune grasslands and fauna - Marijn Nijssen

Workshop

Grazing the dunes: are the goals & effects clear?

This workshop was moderated by Hubert Kivit (PWN) and Harrie van der Hagen (Dunea; Wageningen UR).

Introduction

Mr. Van der Hagen (nature policy adviser, Dunea; PhD on livestock grazing Wageningen UR) showed the first conclusions of a research into the effects of grazing in Meijendel (1990-2009). Due to marram planting, viral diseases in rabbits and a high nitrogen load, coastal sand dunes were largely stabilised. Livestock was introduced to replace the beneficial work of rabbit populations in opening up the system (stimulating blow-outs) and in reducing or at least slowing down the shrub encroachment. The first main conclusions in Meijendel were that the introduced livestock did not have any effect on the amount of sand in the system. Climate and/or climate change probably is the main driving force. whilst an increase of shrub was expected (mainly Hippophae rhamnoides), the amount of shrub decreased, due to the lifespan of this species: around 35 years. The decline started around 1990, which is around 35 years after the outbreak of myxomatosis.
Mr. Kivit (nature policy adviser, PWN) focused on various monitoring aspects, especially on the changes in flora and insect life as a result of livestock introduction. His conclusions on the effect of grazing on different aspects can be summarized as follows :

aspect	effect
Soil fauna abundance	--?
Thermophilous invertebrates	++/-
Nectar & pollen	0
Butterflies	+
Birds	--
Rabbits	++
Sand lizard	0

Effects of grazing on fauna highly dependent on grazing conditions, species/species group and dune zone. Much is still unknown!

Main questions discussed

1. Are we better off without large grazers?
2. Should we start rabbit farming?
3. Should we make a choice between grazing or mowing?
4. Can grazing management be dynamic?

Conclusions

1. Don’t stop where you started grazing. The moment you introduce livestock you introduce a new factor of disturbance. Taking the livestock out again creates instability. Adapt the management based on what you see, which is also more in line with traditional farming in coastal dunes in former times. When you start grazing, continue for at least 50 years, because the system needs time to adapt. Don’t graze for the government (e.g. obligatory measures counteracting a to high nitrogen input), but graze because of a necessity for the site (e.g. insect populations: workshop Dune grasslands and Fauna)!
2. Where to get information from old practices? Rabbit farming or transporting rabbits from nearby nutrient rich areas used to be quite common, but most of the knowledge is lost. Other important questions: Is a denser rabbit population possible with the current predator community? And, how is the development of the viral diseases?
3. Choose for an extensive mixed agricultural use with variable numbers (change in space but especially in time). Dune slacks are better off with mowing.
4. We need experiments to learn more about different grazing regimes, like OBN-Texel (NL) and older experiments like those of Ranwell (in the UK).

Remarkable: Rabbit farming. There was much more common ground for rabbit farming than expected. On November 24th 2015 this will be discussed further in an expert meeting in the Netherlands (OBN Veldwerkplaats).

Poster: Alternative stable states of rabbit populations

Four possible triggers of a stable ‘low population density’ of rabbits were presented in a poster by Marijke Drees and Jasja Dekker.

View the presentations and poster:
Workshop - Grazing the dunes - Harrie van der Hagen
Workshop - Grazing the dunes - Hubert Kivit
Workshop - Grazing the dunes - Statements
Poster - Alternative stable states of rabbit populations - Marijke Drees & Jasja Dekker

Workshop

Invasive Alien Species

This workshop was moderated by Henk Siebel (NM), Ruud Luntz (NM), Leon Terlouw (PWN), and Willem Stuulen (Waternet).

Main questions for discussion

Which invasive alien species are establishing in the dunes?
Which species are really problematic?
Can we manage it or can we do nothing about it?
What are best practices to manage them?

Conclusions

An Invasive Alien Species black list for Atlantic dunes should at least include:

Prunus serotina
Rosa rugosa
Cotoneaster spp.
Berberis aquifolium
(=Mahonia aquifolium)

Fallopia spp.
Crassula helmsii
Solanum rostratum
Ailanthus altissima
Ludwigia grandiflora

Impatiens glandulifera
Symphoricarpus albus
Robinia pseudoacacia
Pinus spp.
Populus spp.

We can manage it. The three golden rules for invasive alien species control:
1. Early detection & eradication saves a lot of money:
• an early alert system is needed, both at European and local level
• know what the potential invasive alien species are
• identify these species in time in your area
• monitor potential invasive alien species
• encourage the reporting of unknown alien species by volunteers

2. Consistent and rigorous management is essential:
• make a strategic plan, and a checklist for the management
• make sure you have regular budgets to prevent and control invasive species
• invest everything to eliminate the invasive species
• involve volunteers but never become dependent on them
• no compromises: compromise leads to regret
• “after-care” management is necessary after removal; directed grazing can help
• keep checking your area systematically (33% of your area every year)
• never think you are ready – always stay alert.

3. Public support is very important: communicate about management measures in advance with the media, inhabitants, visitors, and your neighbours.

Remarkable

Volunteers like to saw.

View the presentations:
Workshop - Invasive Alien Species - Ruud Luntz & Leon Terlouw & Willem Stuulen

Workshop

Large scale versus mosaic management in dune grasslands

This workshop was moderated by Anton van Haperen (OBN), Marten Annema (Evides), Peter Spierenburg, and Mark van Til (Waternet).

Main questions for discussion

What are the essentials of Grey dunes and what are their favourable conditions?

Grey dunes are a broad concept. They differ depending on geology, geographical position and history. As a consequence, they also differ in flora and fauna. These differences may demand for different approaches in management strategies: a site specific tailor maid approach.

Observations and conclusions

Grey dunes are always part of an open dynamic landscape, where pioneer situations and short vegetation (grassland, dwarf shrub, heathland) are dominant. Wind and grazing are essential ecological factors. In many situations bioturbation by rabbits stimulates the role of aeolian dynamics (blowouts) and contributes to maintaining the buffering capacity of the soil. Grazing by large herbivores can only partly compensate the absence of rabbits (no bioturbation). Additional management measures are then necessary. In the same way mowing can only partly replace grazing by herbivores.

The presence of an organic soil layer in combination with rejuvenation is an essential condition.

There should be no large scale dynamic management approach in well-developed Grey dunes. Large scale management should only be considered in strongly disturbed situations and in situations with serious Grey dune degradation. Important factors to consider then, are the presence of lime rich sub-soils and relic populations of typical grey dune species. In Dutch dunes we have seen large scale restoration projects in strongly disturbed situations with removal of water catchment infrastructure and invasive alien species.

Remarkable

Human impact is almost always present in Grey dunes. In many (historical) situations man has played a vital role in keeping the balance between vegetation development and small scale dynamics.

View the presentations:

Workshop - Large scale vs mosaic management - Marten Annema

Workshop - Large scale vs mosaic management - Mark van Til

Workshop - Large scale vs mosaic management - Peter Spierenburg

Workshop

Dune challenges in a European context

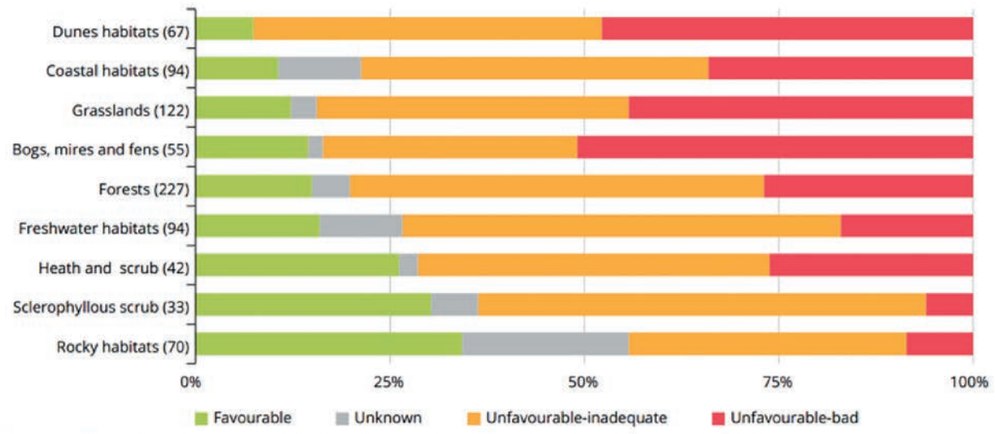
This workshop was moderated by John Houston (Dune and Single Network), John Janssen (Alterra), Luc Geelen (Waternet) en Sjakel van Wesemael (PWN).

Workshop introductions

A focus for workshop discussion is where do we, as managers and scientists, go from here in increasing our efforts to secure habitat quality and in getting our message out to policy makers, funding bodies and the wider public? What tools and opportunities can we use and how can we strengthen our networks?

Whilst the value of dune habitats is widely recognised, and conservation projects are underway throughout Europe, overall the condition of European dunes is still grave. This is the conclusion of the EU 'State of Nature' report[1] published in 2015 using information submitted by Member States through the Habitats Directive Article 17 process.

Since the start of the reporting by the European Environmental Agency on the conservation status of habitats, dune habitats continued to show the lowest percentage with a favourable conservation status (fig. EU HABITATS) of all habitat groups. Whilst 75% of all habitats (even within each biogeographical region) should be in favourable conservation status, for dune habitats this is still less than 8%. In this doubtful top position dunes are followed by coastal habitats in general.

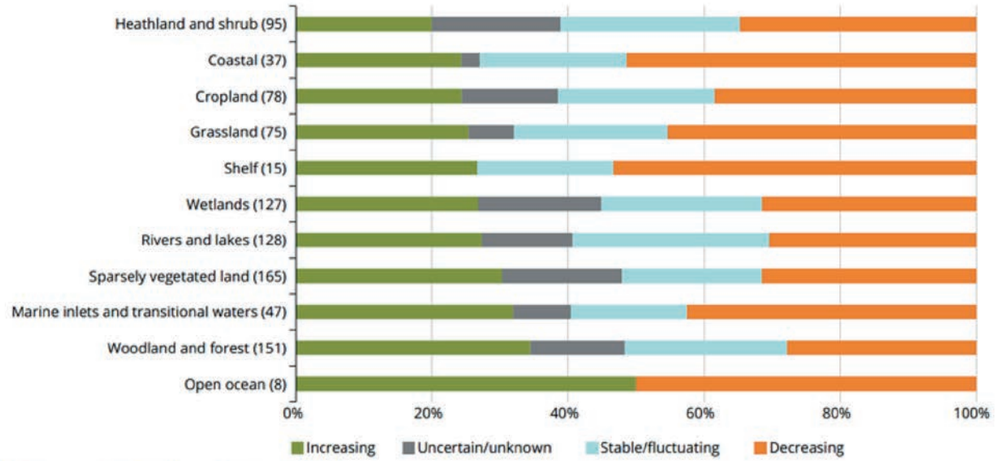


Notes: The number of assessments is indicated in parentheses. The total number of assessments is 804.
Source: EEA, 2015b, Article 17 reports and assessments.

Figure (EU HABITATS). Conservation status of habitats in the European Union, published as figure 3.11 in the EEA Report "State of Nature in the EU", 2015.

This worrying conservation status of European dune and coastal habitats is the continuation of a trend that is ongoing for more than a century. The European Commission concludes in its recent mid-term review of the European Biodiversity Strategy: "Between 1900 and the mid-1980s Europe had already lost two thirds of its wetlands , and almost three-quarters of its sand dunes and heaths, through a combination of land-use change, infrastructure developments, pollution and urban expansion."

The severe pressure on the quality of our coastal ecosystems is not only reflected in the declining amount of dune systems (that is still subject to decrease according to EUCC France[3]) and in their unfavourable conservation status, but for example also by negative trends in coastal bird species (fig. EU BIRDS).



Notes: The total number of assessments is 926.
Source: EEA, 2015a, Article 12 reports and assessments.

Figure (EU BIRDS) . Short-term population trend of BIRD species groups in the European Union, published as figure 4.3 in the EEA Report "State of Nature in the EU", 2015[4].

Observations made at the workshop

Whilst each Member State is responsible for the management of its Natura 2000 network, there is also a responsibility to contribute to the target of achieving favourable conservation status for habitat and species at the biogeographical level. There is a need for a cooperative approach and there is a need to continue to link science and management.

Presentations and discussions focused on national and international exchange of knowledge in the fields of (a) management and good practice, (b) methodologies, and (c) social approaches. An important question was how to finance this highly necessary knowledge exchange, next to “applied fundamental” research.

The discussion focused on the Atlantic Dunes with ample reference to the situation in the British Isles, the Netherlands, Belgium and France. In the Netherlands, there is an apparent motivation and availability of funding to implement measures for improvement. In Belgium this is also the case and a new initiatives are expected in 2016. In Ireland and the United Kingdom, the situation is less favourable in this respect. It was remarkable to note that in France restoration is not the main issue, but conservation against ongoing urban development. Another remarkable finding for France was that there appears to be a need for more attention to the language issue, as relevant managers and politicians in France published in French and do not read the guidance that is produced in English. It was noted that local authorities usually do not (want to) understand the benefits of dynamic dune management, whilst the need of such management can not only be clarified from the ecological perspective, but also from the urgency of climate change adaptation. A number of Dutch delegates criticised recent developments in the Netherlands where economic and tourism agenda more and more prevail, leading to an increasing number of (permanent) beach pavilions and summer cottages, including several multi storey buildings. This increasing urbanisation pressure on beaches is thought to prevent the necessary beach and dune interaction, which is needed not only in winter but also in summer.

Conclusions

Dunes should be on the political agenda of the European Commission (as well as at DG-ENV) because of the worrying state of dune habitats. The EU Atlantic Biogeographical Seminar in 2016 , was identified as a very timely occasion to ask attention and bring experience together on dune habitats.

Dunes should be higher on the agenda for research (a.o. in Horizon 2020). The Dutch OBN network could communicate this by putting together research needs for the Atlantic Dunes.

The experience connected to the positive trend with regard to dune habitats, management and restoration in the Netherlands should be disseminated to the whole Atlantic region. This can be done by the European Dune Network and the EUCC. We aim to have follow-up the earlier meetings on dune habitats organised in the Hague and in the Biographical Seminar in 2012. A follow-up should be given to the conclusions of this seminar:

- restore sand drift by removal of infrastructure
- establish an Atlantic platform for information exchange
- create an expert network of government agencies.

The delegates recognised that so far it has been too difficult to remove infrastructure in many situations. So they call upon the responsible government agencies to create an expert network (which can be created by DG ENV).

The delegates in the workshop expressed the wish to establish a platform for information exchange on Atlantic Dunes, as part of the European Dune Network, and support to this platform was expressed by the UK Sand and Shingle Network (led by Liverpool Hope University), the Coastal & Marine Union - EUCC, and the water companies PWN, Waternet and Dunea.

View the presentations and special discussion paper prepared for the workshop :
Workshop - Dune challenges in European context - John Houston

ANNEX Discussion paper

[1] http://www.eea.europa.eu/publications/state-of-nature-in-the-eu/at_download/file.
See also http://www.eea.europa.eu/highlights/state-of-nature-in-the

[2] Communication from the Commission to the Council and the European Parliament ‘Wise use and conservation of wetlands’- COM(1995) 189 final, 29.05.1995.

[3] Prof. Yvonne Battiau- Queney (President of EUCC-France), Personal communication on the situation of coastal dune habitats in France, expressed during the workshops at the conference Dynamic Dunes 2015.

[4] http://www.eea.europa.eu/publications/state-of-nature-in-the-eu/at_download/file. See also http://www.eea.europa.eu/highlights/state-of-nature-in-the

Field visit

Three parallel field visits were organised in the Amsterdam Dunes, offering the conference participants ample opportunities to see and discuss the results of the management activities in the various project implementation areas (Project LIFE 11 NAT/NL/776). Another field trip went to Koningshof where Natuurmonumenten presented results of project LIFE09 NAT/NL/418 in this specific area.

Amsterdam Dunes: project area

The aim of the LIFE+ project ” Amsterdam Dunes - Source for nature” (LIFE11 NAT/NL/776) is rehabilitation and improvement of 350 ha of characteristic and priority habitat types in the Amsterdam Dunes which are part of the Natura 2000 area “Kennemerland Zuid”.
The implementation of the project focused on the removal of disturbed vegetation and soil organic matter and subsequent aftercare management. Measures will be taken to avoid the risk of recurrence of American black cherry (Prunus serotina).
The main goals are: the expansion and quality improvement for the priority habitat type “Fixed coastal dunes with herbaceous vegetation” (H 2130, Grey Dunes); expansion and quality improvement for the habitat type “Dunes with Hippophae rhamnoides” (H2160, thickets of Sea buckthorn) and expansion and quality improvement for the habitat type “Humid dune slacks” (H2190); this will include habitat designed for narrow-mouthed whorl snail (H1014) and mottled white-faced darter (H1042).

Removal of pine plantation, at location Haasveld

The participants inspected the area were a pine plantation was removed. The management is appreciated by the participants. The removal of the last stumps has been an item of discussion. Remaining stumps can be negative to the landscape and to mobility, whilst leaving them leads to regrowth from the roots, so management has to be repeated every 3 to 4 years.
Sand mobility will be limited in this area, probably to some small blow-outs. Nevertheless, sand mobility may lead to partial covering of old agricultural fields. All this is not seen as a problem. Public communication and perception has been taken very serious. Every complaint has to be addressed, as much as possible through personal communication. This is time-consuming, but effective.

Small-scale blow-outs, at location Haasvelderduinen

The goal for this area is to promote and maintain more dune dynamics, leading to a mosaic landscape with blow-outs and grey dunes, and also natural scrub development (e.g. Sea buckthorn).
Blow-outs of different size and shape were visited, and conference participants were pleased to see that several were in good shape. There was a discussion about blow-out health, and when it is necessary to intensify the level of management, or to leave a blow-out area to develop. Albert Salman suggested four different ‘health indicators’ of blow-outs: (1) the presence of an active wind erosion (undercutting) profile, (2) freshly deposited bare sand, (3) vital marram grass, and (4) in case of moderately strong wind on a dry day: visible shifting sand.

The dilemma for the dune manager is what strategy to follow when blow-outs do not develop for a number of years. Just wait for storms to come (of which the results may be unpredictable), or keep a number of blow-outs (which?) active. But it was realised that there are probably thousands of small and medium-sized blow-outs in the Amsterdam Water Supply Dunes, so the manager can afford to do nothing for quite a large number of blow-outs, and wait (for a storm) and see.

Dune slack restoration, Middenduin Centraal

Scrub and trees have been removed from a number of wet dune slacks. These areas offer good opportunities for dune slack biodiversity. It can be seen that grazing is not sufficient to keep birch seedlings out. The question here is whether to remove the mature birch trees around the slacks, diminishing the seedling pressure. It was thought that this would only have a limited effect, because the distribution of birch trees continued also further from the slack. It is unlikely that seedlings can be entirely avoided in view of the seed bank and the easy distribution of birch seeds by wind, whilst a continued presence of birches would well fit in a natural situation, also in the future. Birch do not rejuvenate within a birch forest, so allowing some birch development was seen as acceptable by participants.

Mosaic management Grey Dunes at location Pollenberg

The main actions in this location were designed as a small mosaic of 15.4 hectares mowing of vegetation and organic top layer including removal of material, 5 hectares of sod cutting and removing the organic top soil layer in dune grassland (5 or 10 cm), excavation of one old blow-out and removal of 3880 m3 meter of turfed top soil. Very important aspect was to secure the remaining relic populations!

Black cherry removal and pond restoration at location Middenduinen Noord

This large scale project is realized in 2 phases: August 2014– March 2015 and 2015-2016. So we actually saw results of last year and active removal of the invasive Prunus serotina going on. The main actions here were:

- 89 ha lifting and removal of black cherry, including stumps and roots;
- 54 hectares of cutting black cherry;
- 40 hectares turf former thickets of black cherry including the seed bank (8 cm)
- removal of 52.000 m3 meter of turfed top soil and ;
- rehabilitation of 27 ponds by the removal of bank vegetation and dredging.

The large scale approach is appropriate in this zone because of the large scale disturbance.

Small scale restoration of Grey Dunes at location Vinkenveld

At the Vinkenveld, an older dune field in the inner dunes, small scale mosaic management restoration works were done: 1.1 ha turf stripping and sod cutting; 2.2 ha wood chopping and 0.35 ha grubbing mainly of Populus sp. and Pinus sp. Works were done in autumn 2015 and just finished a few days before the field visit. The participants noticed that the work was very nicely finished with little damage to the site. Special attention was paid to populations of narrow-mouthed whorl snail (Vertigo angustior). During the visit the effects of Fallow deer (Dama dama) grazing were clearly visible and judged as excessive grazing.

Hydrological restoration at location Schapenwei

At this location works had also been done in autumn 2015 and just finished. Here eco-hydrological restoration in former agricultural fields was the main topic and Waternet has been looking for ways to replace stagnant rainwater in the topsoil for dune water. Management of dominance of Soft Rush (Juncus effusus) was an issue here.

I.A.S. removal in Koningshof

Koningshof (200ha) is located in the inner edge 2 km from the coast and is part of the Natura 2000 area Kennemerland Zuid. The site is surrounded by villages Bloemendaal and Aerdenhout and exotic trees and shrubs have spread across Koningshof from neighbouring parks and large gardens. Not all species have an invasive character, mostly black cherry (Prunus serotine) and various kinds of Cotoneaster occur in large numbers in Koningshof.

The excursion explains the methods used in Koningshof to fight Prunus serotina and cotoneaster spp. In habitat type H2130 the situation before the LIFE-project was visualized with photographs. The participants were able to compare different ways of management, some more successfully than others. Invasive species clearly do not respect property boundaries and cooperation with neighbours is essential for effective control.

We showed how we addressed Cotoneaster in habitat type H2180 , the method whereby the top layer with cotoneaster is removed and the ground is buried is successful, but certainly not universally usable, archaeological and geological values and the presence of ammunition play a role.
Use of glyphosate is highly effective in combating adult Prunus serotina, but not in seedlings because of the small spreadable surface of the cut face. This also applies to Cotoneaster. The best solution here is pulling and elimination of seedlings.

The conclusion is that Prunus within the area is manageable now, but still germination from seed banks and supply of seeds from neighbouring private areas occurs. So management has to be continued.

Main message of the excursion are like the outcomes of the I.A.S. workshop ;

- Know what kinds of invasive species threaten your area (early warning)
- Pro-active management, do not wait and immediately take action.
- Collaboration with surroundings is essential

Day 3, October 9th, 2015

Presentations

Mr. Gert de Groot (Natuurmonumenten)

Welcome

Mr. De Groot, site manager of Naturmonumenten in the coastal dunes of the Dutch Delta area, welcomed the audience on behalf of Natuurmonumenten, a private nature management association with 700.000 members and more than 100.000 ha under management. In the Dutch Delta Natuurmonumenten manages almost 3.000 ha of dunes.

Mr. Wouter van Steenis (Natuurmonumenten)

Conference workshops results

Mr. van Steenis moderated the presentation of the conference workshops conclusions by the various rapporteurs. These conclusions are included in this conference report, for day 1 and day 2.

Mr. Matthijs Broere (Natuurmonumenten)

Dutch Dune Revival Voorne and Goeree

An overview was presented of the challenges in the nature areas Voornes Dune and Goeree Dunes: threats, management problems, possibilities to restore the dune grasslands and humid dune slacks, and the measures taken in the LIFE project Dutch Dune revival (LIFE 09 NAT /NL/418) in Voornes Duin, Duinen Goeree and in Kwade Hoek. The project areas are well-known Dutch dune complexes, and all part of the Natura 2000 network. The main objectives of this LIFE project are to enlarge and restore the habitats grey dunes, white dunes, humid dune slacks and dune forest, and to increase the presence of rare and characteristic species associated with these habitats.
Mr. Ted Sluiiter introduced the Natuurmonumenten approach to get public support and understanding for the project. Communication already started one year in advance! The communication strategy included a door to door newsletter in the villages in the vicinity, field excursions with interested locals, and lots of information panels in the field during the implementation of the project. All project communication included a telephone number and email address for questions and complaints.
The first results after carrying out the LIFE restoration project were discussed. In the dune areas the overall objective is the same: to set back the succession to an earlier stage in order to create good conditions for the development of species rich habitats. During the last decades we have seen the development of scrub, forest and grassy vegetation with a thick layer of litter and only fewer plant species. Removal of this vegetation (including exotic invasive species) was the most prominent part of the project. In wetter parts also top soil was removed to reset the vegetation succession. Depending on the speed of the succession after removal of the vegetation, aftercare takes place by e.g. mowing and grazing to secure the permanent recovery of targeted habitats. First results are promising and a fast return of target species has already been observed, red list species at the Waterbos location increased from 44 to 59 plant species, and species have expanded their distribution. A special video on the project gave participants a good impression of the communication effort, work preparation and implementation.

View the presentations:
Keynote - Matthijs Broere - Dutch Dune Revival Voorne and Goeree
Workshop - Feedback results - Wouter van Steenis

Field trips

In the afternoon participants visited several of the project locations at Voornes Duin. The Stekelhoek area enabled a nice comparison between parts with and without restoration management (carried out in 2013-2014); at the Pan area restoration management carried out in 2005 could be seen, and it was surprising to see the undisturbed look of this area. At the Stekelhoek area several plant species already strongly expanded. The restoration of grey dunes without top soil removal was very promising in most areas. Some small parts still looked rather productive and disturbed. In time this is expected to develop into nice, more nutrient rich grey dune grasslands. The field visit to the Waterbos location focused on technical issues and communication. Here large areas have been cleared of shrubs and trees and turned into open dune slacks, grey dune grasslands and even some white dunes. Although this work was carried out in 2010-2012 the recovery is already evident. Many plant species of dune slacks and open dune landscape returned and expanded. LIFE is strong!

Conference Closing Statement

Mr. Teo Wams, director of Natuurmonumenten

On the 25 May 2015 the European Commission published “The State of Nature” report on the status of and trends for habitat types and species covered by the Birds and Habitats Directives.
For dune managers and researchers it was no surprise that coastal dunes are still in the habitat group with the lowest percentage of favourable scores. Only Sea buckthorn shrubs has any favourable scores! Also of key interest is the fact that the Netherlands has the lowest percentage for habitats in favourable condition (at 3.8%), the lowest percentage of all countries, in comparison to the UK at 6.9% and Belgium at 8.6%. Indeed, not a very pretty picture.
Now let me turn to the positive. I am proud that Natuurmonumenten PWN and Waternet could show you the two LIFE+ projects and the magnificent positive results of restored dynamics and rehabilitation of our vulnerable dune habitats - in the National Park of Zuid Kennemerland, the Amsterdam Dunes and at Voorne. It means that conservation works!

In the discussions and experiences shared over the past few days I recognize four major issues: (1) dynamics in dunes and coast; (2) multi-functionality of Natura 2000 areas; (3) nitrogen overload; and (4) invasive alien species.

1. Dynamics in Dunes and coast

Researcher and presenter Arens stated: ‘dynamic coastal management is the motto today’. Our friends from Wales are implementing projects in order to create suitable habitats for pioneer invertebrate and plant species; which are currently threatened by the stability of the dune system. The LIFE projects, Dutch Dune Revival and Source for Nature, all revolve, to a high degree, around dynamics. At times we hear rumblings that, ‘the EU’ and largely the Birds and Habitat Directives are standing in the way of dynamics. However, all the examples we have seen and reviewed during this conference happily have shown the exact opposite.

2. Multi-functionality

Multi-functionality is a second important issue. Good protection does not exclude sustainable shared use. This is convincingly shown by PWN and Waternet. These are drinking water companies that, in keeping with their own sustainable source management, have actively committed to conservation of the habitats of coastal dunes. Joost Veer, of the water board Rijnland asked himself the following question, “but how do we apply large masses of sand so that management is thoughtful and effective, and that opportunities are created for nature and recreation as well?” This question reveals the inherent strive for multi-functionality. Our sites are of such great value that they are being protected by EU laws. This does not mean that there can be no sustainable joint-use, on the contrary. I dare to assert, the stronger the nature the more so called ecosystems services she can deliver.

3. Nitrogen overload

Speaker Annemieke Kooijman of the University of Amsterdam said, 'coastal dune grasslands are under threat in many dune areas mainly due to grass and shrub encroachment. The surplus of nitrogen deposits is an important factor in this regard.' Mark van Til, Waternet and Dick Groenendijk, PWN, also see this as an important factor. We heard similar experiences from Sam Provoost of Belgium. All our efforts to reach our conservation goals will be in vain, if the root causes are not addressed effectively. There is a flaw in our policy coherency. Other policies such as the agricultural policy will have to contribute in a positive way to the biodiversity challenge we are facing.

4. Invasive Alien Species

An issue that was addressed in one of our workshops is the problem of invasive alien species. A problem our managers have to deal with daily. It is clear that the exchange of best practices, networking, and early warning systems could help us counteract this problem. But these will not be enough. We need help from governments. The EU Commission want to designate only 37 animal and plant species as invasive alien species that have to be destroyed for the entire EU. This is far too few; the American black cherry (Prunus serotina), is omitted, for example!

With two LIFE projects PWN, Waternet and Natuurmonumenten have made a start to address the challenges as written in the before mentioned State of Nature Report. We are at the start of some sort of 'road map' to achieve Favourable Conservation Status for Dune Habitats and Species. We can't walk this road alone, we need support from national governments and the EU to walk this road to ensure that future generations find our dunes in a better condition! The Birds and Habitats Directives and the LIFE+ instrument play an decisive role in achieving this goals.

What are our messages to 'Europe' and to national governments? For a start:

- Conservation and management do deliver results, it works!
- The Birds and Habitat directives and LIFE+ program are decisive tools.
- We are convinced that dynamics and multi-functionality are supported by the Birds and Habitats directives.
- Resolute implementation of the nature directives is crucial and addressing external pressures like nitrogen through other policies is critical.

ANNEX Discussion paper

Dune challenges in a European context

by John Houston (European Dune Network & UK Dune and Single Network)
A special paper was prepared for the workshop session “Dune challenges in a European context” on day 2 (8 October 2015). The paper was prepared by John Houston, Liverpool Hope University, on behalf of the European Dune Network and the UK Sand Dune and shingle Network.

A focus for workshop discussion is where do we, as managers and scientists, go from here in increasing our efforts to secure habitat quality and in getting our message out to policy makers, funding bodies and the wider public? What tools and opportunities can we use and how can we strengthen our networks?

Whilst each Member State is responsible for the management of its Natura 2000 network, there is also a responsibility to contribute to the target of achieving favourable conservation status for habitat and species at the biogeographical level. There is a need for a cooperative approach and there is a need to continue to link science and management.

This discussion paper is set out in three sections
1. Background
2. Challenges
3. Opportunities

1. Background

The conference celebrates the work of several Dutch projects providing daring solutions for Natura 2000 challenges. Over the last 15 years or so we have seen the scale of dune management projects increase coupled with a focus on scientific monitoring.

As our understanding of geomorphology, hydrology and ecology has developed since the 1970s and 1980s our approach to dune management has shifted from ‘fixation’ to ‘working with nature’. We have come a long way, and this is certainly true for the Netherlands, and this in itself is something to celebrate.

However, whilst the value of dune habitats is widely recognised, and conservation projects are underway throughout Europe, overall the condition of European dunes is still grave. This is the conclusion of the EU ‘State of Nature’ report[5] published in 2015 using information submitted by Member States through the Habitats Directive Article 17 process.

Similarly, the mid-term review of the EU Biodiversity Strategy to 2020, notes that there has been progress with Target 1 to fully implement the Birds and Habitats Directives but at an insufficient rate[6].

The Habitats Directive of 1992 introduced a common set of habitat types and a methodology for reporting on habitat quality at six year intervals (the Article 17 process). The dune habitats identified are a useful way of simplifying more complicated dune mosaics and allow comparison between sites within Member States and between Member States.

The Habitats Directive is the driver for the projects presented at the conference (i.e. LIFE funding is designed to support the establishment of the Natura 2000 network) and so the ‘challenge’ in the workshop title is associated primarily with improving the quality of EU habitats. The Habitats Directive brought a new way of looking at nature across Biogeographical regions and introduced a shared responsibility between Member States to work towards ‘favourable conservation status’ (FCS) of European habitats and species.

The Article 17 reports, submitted every six years, and analysed by the European Environment Agency provide a snapshot of progress towards the EU target of favourable conservation status.

What does the assessment for 2007-2012 show?

To simplify presentation we look at the trends noted in the key habitats 2120 shifting (mobile) dunes, 2130 grey (fixed) dunes and 2190 humid dune slacks.

2120 Shifting (mobile) dunes

Only for Germany is the situation reported as favourable. In Belgium, Denmark and the UK the structure and function of the habitat (probably the most important parameter) is unfavourable-bad with a negative trend reported for the UK. The Dutch situation is that the 'structure and function' whilst unfavourable-inadequate shows a positive trend leading to a favourable score for 'future prospects'. This more positive outlook for the Netherlands deserves some discussion.

Across the habitats the assessment for the Netherlands gives favourable scores under 'future prospects' for coastal dune habitats with the exception of 2130 fixed dunes (unfavourable –bad) and 2190 humid dune slacks (unfavourable-inadequate but with improving trend). This stands out from other Member States assessments and is perhaps a reflection of confidence in the Netherlands that there is a 'recipe for success', along with good prospects of national, regional and European funding. If the Dutch are getting it right other Member States should take note[7].

However, whilst most Member States report that the 'range' of the habitat is favourable (i.e. the area where the habitat can be expected to occur) in many cases the actual area is inadequate and in a few cases (e.g. Belgium) bad.

The quality of mobile dune habitats is linked to two key issues raised in the Atlantic biogeographical seminar in 2012 (more below); large scale loss of natural habitat and interference with natural dynamics. Solutions to both issues required engagement with shoreline management (sea defence and coast protection) agencies. This remains a major area for the exchange of knowledge and coordination of national policy.

2130 Fixed coastal dunes

Across the region this is the dry dune habitat requiring most attention. In Belgium, Denmark, Ireland, Netherlands and UK it is in unfavourable-bad condition. In Belgium there is a noted lack of total area of habitat (only 670 ha) although structure and function is unfavourable inadequate. The status of the habitat in the Netherlands shows no change (perhaps indicating that the situation has been stabilised- an increase in area is noted) whereas the trend in the UK is further decline. The main pressure on the habitat in the Netherlands is succession and the main measures to be applied are mowing and grazing with one-off restoration works (i.e. similar to the LIFE projects). For the UK a much wider set of pressures is identified.

2190 Humid dune slacks

Humid dune slacks are the wetland features requiring most attention. However, in Belgium and the Netherlands, despite being rated as 'bad' and 'inadequate' positive trends are noted. In the UK and Ireland, however, declines in structure and function are reported.

The Article 17 reports are perhaps rather crude snapshots of the status at Member State level and caution is necessary if trying to compare results country by country. Definitions of favourable conservation status and the rigour of assessment may vary from country to country. The success of LIFE projects is often masked because, compared to the total areas of habitat, they are small interventions. The value of LIFE projects, however, is in attracting additional funding for developing and disseminating best practice, for communication and for networking.

The (new) Biogeographical Process

A characteristic feature of the Atlantic region from northern Portugal to northern Denmark is the chain of dune systems and estuaries. In reinvigorating the delivery of the Habitats Directive through the New Biogeographical Process , dunes and estuaries were selected as a special topic for a workshop held in The Hague in 2012. The workshop was designed to identify common problems, potential solutions and opportunities for cooperation. For dunes the discussion focused on 2120 mobile dunes, 2130 fixed dunes and 2190 dune slacks.

The workshop, co-chaired by Jean Louis Herrier of the Flemish Ministry of the Environment, identified, as priorities, the large scale loss of natural habitat, interference with natural dynamics and the lack of an integrated approach. These priorities were endorsed at the Atlantic Seminar held in Bergen in December 2012.
Several recommendations were set down as conclusions from the Atlantic workshop and seminar discussions on dunes. Communication and awareness raising activities were identified with a proposal to create a new expert network of government agencies responsible for conservation policy and management of dune sites in all EU Member States.

2. Challenges

The challenges in the workshop are linked at the high level to the EU Biodiversity Strategy 2020 Target 1 'full implementation of the nature directives to protect biodiversity'.

Whilst the situation in the Netherlands is looking more positive with biodiversity loss generally halted, an 18 year Integrated Approach to Nitrogen set to begin in 2015 and a €3 billion funding programme outlined for 2014-2021, the situation in other Member States continues to decline.

Meeting challenges for Science, Communication and Best Practice all depend on effective networking. What are the key issues we should address in the next 10 years?

Science

- There is a need for more cross-boundary exchange on Member State definitions of FCS, survey methodologies and N-thresholds. There seems to be little common knowledge between Member States, yet we are all bound together in the Atlantic region and at EU level.

- Conservation of dune habitats is challenging the rigid approach of habitat definition in the Habitats Directive. The need to ensure that Natura 2000 policy can accommodate change was highlighted in the Atlantic seminar. Interdisciplinary science can help to address some of the issues (link between coastal policy and encouraging dune growth, dune mobility, processes etc).

- We need to know whether large scale dune habitat recreation is feasible. Is it sustainable? The recommendations of the Atlantic seminar were to encourage the creation of new dune areas through beach feeding and to encourage sand drift by removal of obsolete infrastructure including forests.

Communication

- Managers need to 'sell' their approaches to dynamic dune management to politicians, land use and regulatory sectors and the wider public. Stressing ecosystem services and adaptation to climate change are important points in this communication.

- Communication is hampered by still well entrenched views about dune stabilisation. The 'new' approaches are far from accepted amongst dune managers. There is a need for communication within all dune management sectors (nature conservation, water companies, forestry, local authorities etc).

- A better understanding of impacts of recreation pressure is needed. In evaluating condition of sites some survey methodologies may still record bare sand as a negative feature whereas in many cases it should be a positive value.

- Dunes need champions. At present our voice seems relatively quiet. Whilst dunes feature as the habitat group with the lowest number of habitats in favourable condition the EU attention tends to focus on the larger issues, at least by surface area, of European wetlands and grasslands.

Best Practice

- There is a need to continue to share best practice through networks (e.g. the Natura 2000 platform) and through dissemination of case studies. As knowledge grows management guidance (e.g. the EC management models[10]) should be updated to maintain its relevance.

- Best practice should be used as a lever to demonstrate new approaches and solutions across the biogeographical region. A more directed approach to using best practice examples to argue for policy change could be adopted.

- Networking is essential to develop understanding and cooperation across the region. This will require a stepping up of existing networking activity to address issues which affect the overall target of Favourable Conservation Status at national and regional level. The goal remains valid (e.g. reiterated in the Dutch response to the REFIT consultation) but it may take a long time.

To give an example there is a need to develop greater networking with colleagues in France.

The overall target of favourable conservation status can only be achieved by concerted efforts. About 75% of the area of habitat across the region would have to be in favourable conservation status to meet the targets. In the calculations the contribution by each Member State matters.

For the habitats 2120, 2130 and 2190 France holds by far the greatest area and so efforts by, say Belgium and Netherlands, to reach favourable status would have little impact on the biogeographical region status unless matched by France and other Member States. The poor condition of these habitats in the UK, in particular, is a cause for concern. The table below shows how France has the greatest area of these habitat types. Discussions at the EUCC-France workshop in Merlimont in 2014 showed that there were quite significant differences in opinion about habitat management between France and the Netherlands, with, for example, much less concern about atmospheric nitrogen thresholds in France.

Member State	Area of 2120	Area of 2130	Area of 2190
Belgium	534 ha	670 ha	47 ha
France	10,000 ha	55,000 ha	6,200 ha
Ireland	333 ha	7,280 ha	283 ha
Netherlands	1,900 ha	16,300 ha	2,700 ha
UK	2,225 ha	22,400 ha	1,796 ha

A priority for work over the next decade would be to foster better understanding between Member States on the definition of favourable conservation status across the region and of the management approaches being employed. This was one of the actions proposed at the Atlantic seminar in 2102.

3. Opportunities

To address the challenges in working towards favourable conservation status for dune habitats there are several routes and opportunities.

Continue to engage with the biogeographic seminar process

This is the high level route through to the European Commission through the Atlantic region workshops and seminars. Dune habitats were selected for discussion at the first series of meetings in 2012. We need to ensure that dunes remain on the agenda for the next series of meetings in 2016. Whilst the Netherlands hosted the meetings in 2012 it will probably be another Member State in 2016.

For the seminars we need to engage with national authorities and to offer expertise and advice to the process. The recommendations and actions arising from the first meetings should be reviewed and an update report compiled. Would the Dutch and Belgian authorities be willing to lead on this?

Ensure that dune restoration and management is highlighted in the Prioritised Action Frameworks

All Member States have prepared and submitted Prioritised Action Frameworks for Natura 2000. PAFs are a tool to link the needs of Natura 2000 delivery to national operational programmes. They are a way to unlock EU funding to support national priorities for nature. The prioritised approach should help to attract funding for work on priority habitats (e.g. 2130) or habitats with an unfavourable bad and declining status.

The inclusion of dune habitats as priorities should be checked across all PAFs for the Atlantic region. This could help develop information programmes targeted at Member States.

Secure national and regional funding for conservation work

EU funding is an important contribution to restoration and management programmes but, to take the example of the Netherlands it is only expected to contribute c. 10% to the total resource requirement. The funding expected for nature conservation work in the Netherlands for the period 2014-2021 is estimated at c. €3 billion. Of this c. €2.17 billion is from the Dutch government, €455 million from the provinces and €280 million from EU sources.

Every effort should be made to secure funding from national and regional sources. National networks, site managers, NGOs etc should help to identify and cost actions. In England, for example, the 'Improvement Programme for England's Natura 2000 sites' estimates that £1.7 billion is required to deliver the Natura 2000 programme identified from Site Improvement Plans.

Develop an international scientific programme

Opportunities through Horizon 2020 will need to be checked[11] . Dune managers need to be guided by the work of dune scientists and it would be highly desirable for a Horizon 2020 project to be constructed to further develop joint research efforts on dune ecology, hydrology and rejuvenation projects. Are there already opportunities within the programme? There could perhaps be opportunities to develop projects within the climate change adaptation theme.

But to do this Horizon 2020 may need to be aware of the 'need'. How can the dune community put forward its case to help open the door for research funding? Do we already have a list of research needs?

Prepare a LIFE governance and information project

The need for knowledge exchange and communication within and between sectors and groups is highlighted in the report of the Atlantic seminar. LIFE projects in particular are expected to make efforts to disseminate experience and support the Natura 2000 communication platform. Going further, LIFE projects past and present could prepare a submission to the LIFE Governance and Information strand[12]. The various 'hooks' needed for such an application are already in place, i.e. the needs can be demonstrated, and this meeting could provide a first step.

Knowledge transfer was a cross cutting theme at the Atlantic seminar. Practitioners are encouraged to use the Natura 2000 Communication Platform[13] (this conference, for example, was advertised on the platform). LIFE projects have a special responsibility should be using the platform to communicate their results for the benefit of all involved in Natura 2000 management. If existing tools are not being used it could weaken any submission for additional funding through LIFE.

The Dutch, from the success of recent projects, would be well placed to take the lead in any knowledge transfer, information and advocacy project.

Continue to deliver large scale restoration projects

Traditional LIFE Nature projects should be encouraged where Member States have identified negative trends in habitat structure and function. With no new Dutch projects since 2011 has the run of LIFE projects dried up? The national position seems to be cooling off in relation to large scale restoration projects[14]. If so, it is important to report on the work already underway.

The four Dutch LIFE projects since 2005 have achieved a huge amount of work for a relatively small injection from the EU- €7.24 million.

Large scale projects have started in Wales and opportunities should be assessed throughout the UK. Other Member States should look to Dutch experience in considering rejuvenation and restoration projects. LIFE is likely to increasingly prioritise funding to habitats and species with negative trends so those Member States reporting 'unfavourable bad and declining 'may be at an advantage in the competition for scarce resources.

Further develop the European Dune Network

Liverpool Hope University, along with the Coastal & Marine Union (EUCC) has developed a website, newsletter and contact list for the European Dune Network . Networking is crucial to the issues addressed above and the current level of activity should be enhanced to develop a strong EU habitat network, in line with what the European Commission would encourage. Parties wishing to offer

resources to enable the network(s) to grow need to work together, perhaps through EUCC.

Whilst a pan-European network is a long term ambition, a first step might be to seek funding to establish the Atlantic network or the Atlantic/ Continental/ Boreal network (the ABC network) as suggested by Luc Geelen of Waternet.

The Atlantic seminar proposed the establishment of an Atlantic platform for information exchange and also an expert-network of governmental agencies competent for conservation policy and the management of dunes in all Member States. There is perhaps now an opportunity to put some LIFE into these ideas.

See link at

[5] http://www.eea.europa.eu/highlights/state-of-nature-in-the

[6] http://ec.europa.eu/environment/nature/biodiversity/comm2006/2020.htm

[7] Further information on the delivery of nature conservation in the Netherlands can be found in the response to the EU Fitness Check of the Directives. http://ec.europa.eu/environment/nature/legislation/fitness_check/index_en.htm

[8] http://ec.europa.eu/environment/nature/natura2000/seminars_en.htm

[9] http://ec.europa.eu/environment/nature/biodiversity/comm2006/2020.htm

[10] http://ec.europa.eu/environment/nature/natura2000/management/habitats/models_en.htm

[11] http://ec.europa.eu/programmes/horizon2020/

[12] http://ec.europa.eu/environment/life/funding/life2014/#governance

[13] http://ec.europa.eu/environment/nature/natura2000/platform/index_en.htm

[14] The Dutch report on REFIT makes the following observation "In 2011, the decision was made to set the objectives in the first generation of management plans to restoration and/or enlargement (if indicated in the designation decision) only if feasible, otherwise the objective should be restricted to conservation".
Existing networks www.eucc.net and http://coast.hope.ac.uk/

Colophon

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Waternet, december 2015