



Sand Dune and Shingle Network

Sixteenth newsletter, March 2013

Linking science and management



European Dune Network
Sharing experience across borders


**Liverpool Hope
University** EST. 1844



Introduction



Paul Rooney

Director – Sand Dune and Shingle Network

Welcome to sixteenth newsletter of the UK Sand Dune and Shingle Network. We are very pleased to have secured the support of Mark Whitfield, through our Graduate Intern Programme, to update the membership database, re-launch the website and prepare this newsletter. Mark will be with us until the end of June 2013.

We have resolved some internal issues relating to our website which will be re-launched soon at a new address www.coast.hope.ac.uk. We will let you know when it is ready.

The dune scrub and woodland conference held in September 2012 was a great success and has helped to stimulate a discussion about these habitats in a UK context. A short report is included here and we are working on a full report of the meeting.

In October 2012 we were pleased to host a visit by Professor Norb Psuty from Rutgers University, New Jersey. Norb returned home just before Superstorm Sandy struck the East Coast of America, the results of which remind us of the incredible power of nature when factors combine in the 'perfect storm'. In the UK, the 60th anniversary of the 1953 East Coast floods was a reminder of the devastation that flooding can cause. Lord Chris Smith, Chairman of the Environment Agency, said recently "*since 1953 huge improvements have been made in flood forecasting and prevention, but 1.3 million people are at risk of coastal flooding in England and Wales, and this is set to increase with a changing climate and rising sea levels. The extra protection and reassurance that flood defences give to many communities should not be under-estimated but nor should the reality that tidal surges along the coast still happen regularly*". This pragmatic statement supports the sound management of sand dunes, saltmarshes and shingle coasts for their role in coastal flood risk management. Increasingly our work is addressing the 'flood risk management' function of these habitats.

2012 will also be remembered for the rainfall making it the wettest year on record in some parts of the country. Dune watertables have reached record heights in places and the landscapes of flooded slacks highlight the importance of dunes for these special habitats. Several items in the newsletter focus on ongoing studies of dune hydrology.

The European Dune Network newsletter looks to the future. In 2014 the European Union will adopt a new multi-annual framework setting the scene for its activity from 2014-2020. So, if priorities for nature conservation are not highlighted in 2013 there is a high risk that the necessary funds will not be secured.

We therefore urge the UK nature conservation authorities to ensure that coastal habitats (including sand dunes and shingle coasts) feature in the Prioritised Action Frameworks (PAFs) which Member States must submit to the European Commission by early 2013 in line with Article 8 of the Habitats Directive.

Please keep in touch on dunes@hope.ac.uk

Network News



Mark Whitfield

Network Assistant

I would like to wish Charlotte Durkin the best of luck with her new job in the Environment Agency and well done to Ffion Redmond on successfully completing her MSc. I've joined the Network as part of an internship programme run by Liverpool Hope University and I'm looking forward to continuing their work. I graduated in July 2012 with a BSc (Hons) in Geography and Environmental Management. My academic and working background is in environmental conservation and countryside management. I studied environmental conservation at Reaseheath College and have volunteered with the Cheshire Wildlife Trust and BTCV.

The Sand Dune and Shingle Network has had a busy few months with staff changes and departmental changes. We have been particularly busy following the successful international Dune Scrub and Woodland conference in September 2012.

During the next couple of months I shall be updating the membership database and overseeing the re-launch of the new Sand Dune and Shingle Network website www.coast.hope.ac.uk. As part of the Network update I shall be asking members to complete a short online survey. The Sand Dune and Shingle Network is always trying to improve and keep up to date with current events including what its members think and would like from the Network.

Whilst not dunes or shingle, you or your colleagues may be interested in a future event looking at the geomorphology, geology and nature conservation value of coastal cliffs. This international symposium will consider the management of these habitats and their importance to biodiversity. It will be held on the 17th and 18th September 2013 in Llandudno, North Wales. Further details are available at www.hope.ac.uk/cliffs.

Of course we haven't forgotten about dunes and shingle, and over the coming months we will be looking to put together relevant events.

All suggestions are welcome at dunes@hope.ac.uk

Dune Scrub and Woodland Conference

Report of the network conference September 2012

The place of spontaneous native scrub and woodland on dunes, and the consequences of native and non-native plantations, was discussed in a two day event held at Liverpool Hope University and on the Sefton Coast.



Excursion to the Sefton Coast © Sally Edmondson

In his keynote address Professor John Rodwell suggested that our narrow view of dune woodland stems from an inability to understand what dune woodlands are, what should they be like and what might they be like.

Although several types of 'dune scrub and woodland' are included in the Habitats Directive only dunes with sea buckthorn (Habitat type 2160) and dunes with creeping willow (Habitat type 2170) are 'recognised' in the UK. There are no examples of wooded dunes (Habitat type 2180) in the UK.

In terms of nature conservation value, there is nothing special about 'dune woodland' compared to the native woodlands of a region. This will vary from location, e.g. oak woods in the Netherlands, beech woods in Germany or pine woods in Latvia. Thus the term 'wooded dunes' can cover several woodland types.

However, according to John Rodwell "*dune woodlands are a fragmentary and diverse inheritance of nature and culture, which ought to meet uncertain and generalised definitions to ensure sustainability (room for manoeuvre) but might leave room for responsible experimentation, multiple objectives, imagination and surprise*".

Newborough Warren is one potential site for 'Atlantic dune woodland' but should this be a priority? John Ratcliffe of CCW suggests given that scrub, woodland and conifer plantations already occupy one third of the Welsh dune resource, that more is not necessary. There is little evidence for dune woodland in the past 1000 years and ancient woodlands are all some distance from dune systems.

Returning to the cultural aspects, Professor Helen Rendell used the example of tree planting on Lord Palmerstone's estates in Ireland in the mid-nineteenth century as a reminder that the afforestation of mobile dunes was a refinement of earlier attempts to control sand drift. It is estimated that 'sand floods' affected 250,000 ha across Europe. Lord Palmerstone considered that the pinewoods would be 'an object of considerable attraction'.

Plans to remove plantation woodlands have been controversial at several sites. It is not just an issue about the value of plantations but also their function. Professor Helen Rendell argues that the removal of pinewoods, coupled with intentional destabilisation, may be unwise given future predicted increases in storminess. This is debatable opinion amongst many involved in coastal dunes. Several comments were made that if dune afforestation was rational (at that time) then it is equally rational today, based on the rarity of dune habitats, to seek its removal.

On large dune sites there may be pressure to conserve native woodland and plantation woodland. Are there ways to include both interests? Richard Loxton, in studies of invertebrates at Newborough Warren, compared diversity in dunes and slack habitats within pine plantations, plantation clearings, and areas of open dune. He found that clearings in the pinewoods are warmer, and more sheltered than the open dunes but slacks within the pinewoods are drier with fewer species associated with damp ground. Invertebrate diversity would be enhanced by areas of dune within the plantation, maintained by cycles of clear felling.

Dune plantations have an effect on the natural groundwater level. Studies by Dr Derek Clarke indicate that pine plantations may depress the level by c. 60cm under current climatic conditions. However, although possible future climate scenarios could see, by the end of the 21st century, lower water table levels (-1m on average) the trees may intercept less water than at present.

The presence and spread of Sea Buckthorn (*Hippophae rhamnoides*) is a concern in the UK, especially the c.400 ha of scrub outside its native range. Graham Weaver of Natural England outlined the need for a national strategy for Sea Buckthorn and other potentially problematic species such as Japanese Rose (*Rosa rugosa*). Outside its native range eradication of sea buckthorn is probably achievable, with reduction in other areas. Within its natural range there is a need to provide conditions for succession so that all stages of growth are present.

Rounding up a fascinating conference there was a reminder that dune scrub and woodland is just one part of the bigger picture of conserving dune forming processes. On many sites in North West Europe *laissez-faire* approaches since the 1960s had led to a domination of scrub and woodland habitats and current efforts are now reducing this cover to maintain fixed dune and dune slack habitats.

We would like to thank Charlotte Durkin, Ffion Redmond and Jamie Helliwell for their help in organising the conference, Mersey Forest and Sefton Coast Partnership for supporting the programme and Sally Edmondson, Phil Smith and the Sefton Coast land managers for leading the excursions to the Sefton Coast.

A record of the event will be produced as an Occasional Paper, published by Liverpool Hope University.

Hydrological Research in UK Dunes

Update Report from the Sand Dune Hydrology Group: February 2013

During the three years since the first Sand Dune Hydrology workshop the core focus group, which includes representatives from BGS, CEH, University of Southampton, Natural England, Ecological Surveys (Bangor) and University of Groningen, have continued to develop their research.

Understanding the hydrological processes in the dunes at both the large and small scales, and their implications for the plant and animal species that depend on them, is our main objective and a variety of approaches are being employed.



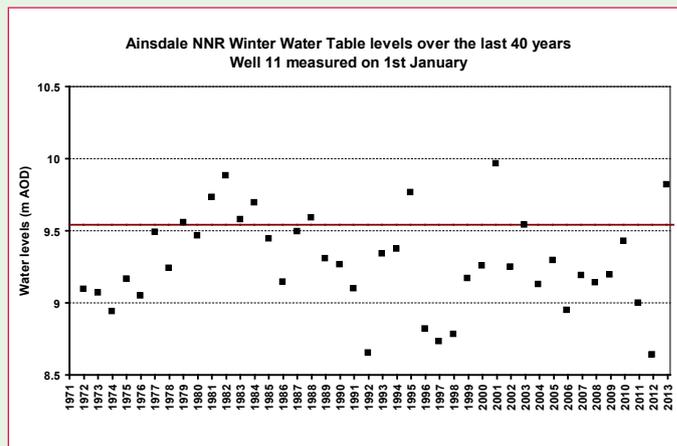
Ravenmeols Dunes, Sefton Coast, 18 February 2013 © P H Smith

Current hydrological work includes predictive modelling of climate change scenarios at Ainsdale in Merseyside, quantitative analysis of change, groundwater flow modelling (using the BGS Zoom model), moisture profile monitoring and analysis in the unsaturated zone in dune slacks at both Branton Burrows in Devon and Whiteford Burrows on Gower, physical property, chemical and isotope profiling beneath high dunes in the unsaturated zone at Branton Burrows, salinity monitoring of an embryo slack at Whiteford Burrows and high frequency water level monitoring at Branton, Whiteford, Ainsdale, Newborough Warren in Anglesey and Sandscale in Furness. We have also developed conceptual groundwater flow models for three east coast UK sites.

Relating hydrological changes to vegetation communities has included recent work funded by Natural England in which the main dune slack systems in England were re-surveyed. Analysis of the data is ongoing to identify how vegetation in slacks has changed since ~1990, and what the causes of those changes might be. We have recently published ecohydrological guidelines based on thorough analysis of the vegetation and hydrology at four key sites. Refining the existing guidelines for dune wetland species is an on-going priority, so if you think you can contribute useful hydrology or vegetation data to this, please get in touch.

Causing considerable interest at the moment are the very wet conditions seen through the autumn and winter of

2012-2013; widely reported as one of the wettest periods on record. Was this also a record year for groundwater levels in dune systems? Derek Clarke began observing water table levels in the dunes in Sefton in 1972 and since then the staff of Natural England have continued to make monthly water level measurements – an unbroken set of records that is now 40 years long.



The graph shows the water levels in a typical dune slack floor measured at the start of January. The solid line shows the ground level, so we see that there are 10 winters out of the 40 when the water table is at or above the ground level in this slack. Interestingly 2013 is not the “wettest” at this sampling point - it is the 3rd highest January on record with 2000 and 1982 being even higher.

Overall we cannot see any clear pattern or trend in the data, although it is interesting to note that if you only had 10 years of data then in the 1970's you would say “maximum water table levels are definitely rising”, whereas in the 1980's you would say “maximum water table levels were certainly falling”. Since the 1990's the pattern seems less organised with bigger ranges of water levels between years. January 2012 to January 2013 shows the largest year to year difference. 2012 was a drought winter and 2013 a record wet summer/autumn/winter. Perhaps we are seeing more uncertainty in our weather patterns? This is an important lesson to learn – we really do need long term records (30 years or more) to detect any long term changes and to not get distracted by year to year variability. We also need a greater understanding of how quickly plant species and NVC vegetation communities respond to changes in water levels. This summer we plan to repeat those vegetation quadrats recently surveyed, to see if we can pick up changes in plant communities due to the wet conditions of the last 9 months.

Charlie Stratford, CEH cstr@ceh.ac.uk

Curreli, A., Wallace, H., Freeman, C., Hollingham, M., Stratford, C., Johnson, H. and Jones, L. (2013) Ecohydrological requirements of dune slack vegetation and the implications of climate change, *Science of The Total Environment*, **443**, pp. 910-919



European Dune Network

Sharing experience across borders

Newsletter Number 4: March 2013

Welcome to our fourth European Dune Network update. The European Dune Network as we refer to it has no formal structure although its value is recognised and supported by The Coastal Union-EUCC. We know that we have colleagues across Europe who share our concerns about the threats to dune habitats and, like us, are working hard to raise awareness about issues affecting dunes through national groups, networking and lobbying. Over the last two years several of us have tried, unsuccessfully, to secure funding from the EU Interreg programme for networking activities. The process of bid development, with The Coastal Union –EUCC and others, was useful in itself as it reconfirmed the broad interest in using networking projects to achieve more direct conservation activity.

Wherever possible, in your work, we would encourage you to refer to the 'European Dune Network', especially when organising dissemination events and submitting bids for funding. LIFE+ projects, for example, have a mandatory element of networking and the European Commission recognises the value of sharing experience and good practice.

As we are a habitat network we would primarily be looking to European funds linked to Natura 2000 and we would like to encourage you to also seek out regional and EU funds which could be used to support networking activity. In this update we include some information on the high level discussions on funding the Natura 2000 network currently being addressed by Member States and report on new projects and other activity from the Netherlands, France and Italy. Thank you to our contributors.

Re-assessing the conservation status of European habitats

By next year we should have an up to date account of the conservation status of sand dune and shingle habitats across Europe. Article 17 of the EU Habitats Directive requires all Member States to make an assessment of the conservation status of Annex I habitats and Annex II, IV and V species every six years. The first assessment to December 2000 (see <http://jncc.defra.gov.uk/page-3051> for the UK) was more of a national stocktake of the main pressures and threats. The second assessment (see <http://jncc.defra.gov.uk/page-4063>

for the UK), however, set out a standard methodology across the EU and, for the first time, this allowed comparison between Member States within the biogeographical regions.

The assessments are combined by the European Topic Centre on Biological Diversity (<http://bd.eionet.europa.eu/article17>). The information can be searched, e.g. to compare all results for 'H2190 humid dune slacks'. The second assessment concluded that "*Dune habitats are under severe pressure throughout the EU with almost no favourable assessments. Member States identify coastal, tourism development as the main threat.*" (Composite Commission Report available at http://ec.europa.eu/environment/nature/knowledge/rep_habitats/index_en.htm).

Member States are now in the process of re-assessing the conservation status of species and habitats following the same methodology. This will provide the first assessment of **change in status** between 2006 and 2012 as a measure, in part, of the effectiveness of the Habitats Directive. The timetable is for national reports to be completed and submitted to the European Commission in 2013 and for the EU synthesis report to be published by 2014-2015.

But already the process is underway in the Member States and we will be able to see the results soon. In some cases new knowledge will improve the quality of the assessment, in other cases management interventions may have improved conservation status and in others there may be either no change or deterioration, including habitat loss.

The Article 17 process is a tool for maintaining the momentum of the Habitats Directive. Unfavourable conservation assessments need to be followed by actions to halt or reverse the problems causing deterioration.

Whilst a number of large scale restoration projects for dunes are underway we would be most surprised to see a significant change in the conservation status of dunes in Europe in the second EU synthesis report. Sand dunes remain threatened and we should be ready to lobby for more resources to see a real improvement in the situation by the third assessment.



Cabin Hill National Nature Reserve, Merseyside, UK: 8th February 2013 © P H Smith

The LIFE-Nature in the Netherlands

The LIFE-Nature programme is the only dedicated fund for nature in the EU. In recent years Dutch nature conservation organisations have made full use of the fund with a 4,700 ha project completed by the State Forestry Service in 2010 and with three ongoing projects led by Natuurmonumenten (Dutch dune revival), Landschap Noord-Holland (Revitalising Noord-duinen) and Waternet (Amsterdam Dunes - source for nature).

Dune habitat restoration in the Amsterdam Dunes



Luc Geelen

Following a successful application to the EU LIFE+ programme a new project has been launched by the Waternet Foundation (Amsterdam Watersupply Dunes). The aim of the 'Amsterdam Dune-source for nature' project is to restore and improve the priority habitat types which form part of the Kennemerland Zuid Natura 2000 site. Habitat recovery will be encouraged by actions targeting the effects of desiccation and eutrophication, such as the removal of nitrogen-rich soils and invasive species, restoration of ponds, and mowing, grazing, and other nature management measures.

Specific aims are the expansion and improvement in quality for the dune habitat types 'grey dunes H2130', 'thickets of sea buckthorn H2160' and 'humid dune slacks H2190'. Targeted species include the whorl snail (H1014 *Vertigo angustior*), mottled white-faced darter (H1042 *Leucorrhinia dubia*) and fen orchid (H1903 *Liparis loeselii*).

The 3400 ha area is owned by the Municipality of Amsterdam. The main land uses are nature conservation, drinking water supply and recreation. Since 1850 the habitats deteriorated in size and quality by desiccation from water extraction and by acidification and eutrophication from air pollution. This led to grass and shrub encroachment and accumulation of nitrogen-rich organic matter in the topsoil. In recent decades, these negative environmental impacts have decreased but to stimulate the recovery of nature it is necessary to remove the nitrogen-rich top layer of soil and carry out other nature management measures, such as tackling the recent expansion of invasive black cherry (*Prunus serotina*). Project implementation will focus on the removal of vegetation and soil organic matter to begin the process of recovery.

The actions will include:

- the mowing of vegetation and the removal of organic material in the dune valleys
- turf stripping to remove the organic top soil layer in dune slacks and dune grassland
- excavation of old blow-outs
- grubbing up and removal of shrubs and trees, especially black cherry
- turving over former thickets of black cherry including the seed bank

- rehabilitation of ponds by cutting bank vegetation and by dredging and removing mud

These measures will require follow-up management including the use of additional sheep grazing and a monitoring programme to record the baseline situation and the situation after completion of the measures.

The overall result will be the rehabilitation of 235 ha of priority fixed dune habitat, 98 of dunes with sea buckthorn and 17 ha of dune slacks. Project details (in Dutch) can be found at:

<https://www.waternet.nl/projecten/%2fprojecten%2flife-project-waterleidingduinen%2f>



Amsterdam Watersupply Dunes



Removal of soil and vegetation



Restoration of ponds

A scientific meeting is being held on 19th April 2013 and we will include a full report in a future newsletter.

Impact of dog walking in dunes: impression from the 'Zuidduinen' near Zandvoort, the Netherlands

Luc Geelen



The Zuidduinen: Photo courtesy of © Harm Bothman

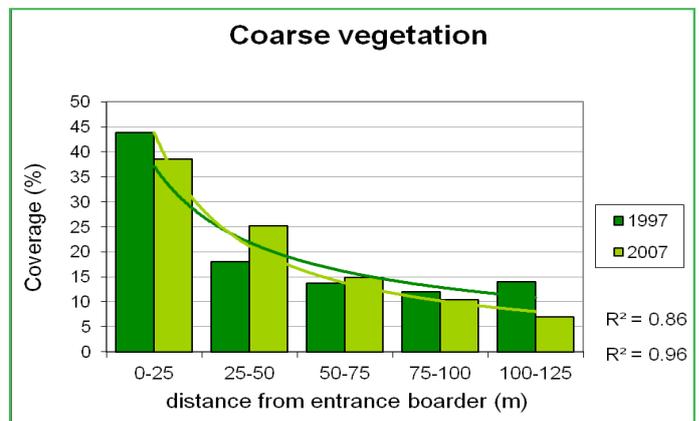
The 35 ha area of grey dunes known as de 'Zuidduinen' has open access. Dogs are also allowed and we would expect that the visitor pressure should have kept the dunes open. However, we noticed that scrub and coarse vegetation increased and so we asked Leandra Kuipers, an intern from the VU University Amsterdam, to investigate this.

In about 1920 a fence was erected between the main Amsterdam Watersupply Dunes and the Zuidduinen, ending traditional use for most of the site but retaining the old custom of the villagers in the Zuidduinen. Some fields are still in use, but where these are abandoned thickets of sea buckthorn and willow have grown. In 1994, the ownership of the Zuidduinen passed from the municipality of Zandvoort to the City of Amsterdam and since then the area has been managed by Waternet.

The faeces of dogs contain nitrogen and phosphorus which can cause additional stress on top of the background nutrient deposition from the air. This background Nitrogen deposition in the Zuidduinen is at least 15 kg/ha/yr. To estimate the contribution by dogs, Leandra's first task was to count them. She estimated that there were about 590 dog visits per day, providing about 22,000 kg of excrement and 50,000 litres of urine per year! This equates to an additional nitrogen load of 29.3kg/ha/yr and a phosphorus load of 3kg/ha/yr. The critical load for nitrogen for calcareous dune grassland (H2130) is 17.4 kg N/ha/yr and so the input considerably exceeds this.

In a comparison between 'Zeeveld', a comparable area in the AWD, and the 'Zuidduinen' no direct link between shrub encroachment and presence of dogs was found. The area overgrown by dense vegetation in the Zuidduinen in maps from 1997 was only slightly higher than in the control area without dogs, and in maps from 2007 no difference was found. However, there appears to be a stronger effect at the edges where dogs and visitors enter the area than deeper into the area (see figure).

Between 1997 and 2007, a transition from open herb moss vegetation to a denser type occurred. As well as the effect of eutrophication the vegetation along the edges is also influenced by trampling and digging.



In the soil samples, there was no significant difference in the percentage of nitrogen in the soil between the Zuidduinen and control. But, for nitrogen, there was a difference between the samples taken within the first 125 m from the entrance and the samples taken beyond this area. The study gives only first impressions, but indicates that considerable impact is possible.

Further information: Luc Geelen luc.geelen@waternet.nl and Peter van Bodegom, VU University Amsterdam, p.m.van.bodegom@vu.nl

Dutch Dune Revival: LIFE+ project

Marten Annema



Natuurmonumenten manages 2,200 ha of dunes in the Dutch delta where the area of dune scrub and woodland has increased enormously over the last 50 years; from 10% cover in 1950 to 90% cover by 2005. At first the development of scrub was gradual and was of interest in terms of habitat succession but this *laissez-faire* approach has given rise to a significant conservation challenge. A new target has been set to reduce the scrub and woodland to 40% cover by 2018.

Plans for scrub removal prioritise the removal of scrub on white and grey dunes including tall Sea Buckthorn (*Hippophae rhamnoides*) scrub, removal of Aspen (*Populus tremula*), excavation of slacks and removal of humus and removal of young woods. The restoration plans, however, spare old woods, species rich scrub, Sea Buckthorn scrub in good condition, refuges for species such as Sand Lizard and the snail *Vertigo angustior*, vulnerable pioneer species and humus from dry habitats.

Techniques being employed include mowing (cut and collect), scrub cutting (flail mower on a tractor or tracked vehicle collecting arisings), clearing of woods (flail mower or Hymac), sod cutting (by Hymac and transporting soil outside site or burying it in the frontal dunes under 1-2 m of sand) and stimulating sand blow by removing seaward scrub and creating sand blow funnels. It is expected that the follow up with grazing and additional mowing will take 10 years to fulfil the aim of recreating grey dunes and white dunes.

Before 2012 93 ha of the area was treated for 1.7 m€ (18,280€/ha) and the plan for 2012-2016, as part of the LIFE+ project, is to treat 70ha for 1.2 m€ (17,143€/ha). These costs include follow up for c. 3 years with funding from local government and the EU LIFE+ programme. See www.natuurmonumenten.nl/content/english-summary-5

Ghyvelde dune in France: a fossil dune or an inland dune? That is the question

Guillaume Lemoine

Throughout the 20th century there have been different interpretations as to the age and origin of the decalcified Ghyvelde dune. Initially it was described as the remains of a long stretch of dunes between Adinkerke (Belgium) and Armbouts-Cappel (France), marking a stage in the receding coastline. Following the discovery by Bouly de Lesdain (1869-1965) in 1912 of unusual fossils, similar to those found in the Mediterranean area, it was considered that the dune was of Pleistocene age indicating a former shoreline position established before a sudden climatic cooling. This being the case, many of us were led to think that this was evidence for a "fossil" dune !



Nowadays, recent studies suggest that the Ghyvelde dune was, from the beginning, three kilometres from an

existing shoreline on the edge of a sandy platform, at a time when the climate was more or less the same as today. Recent inventories of the wildlife of the dune, both present and fossil, reveal different species (*Gagea bohemica*, *Vertigo angustior* ...) and patrimonial habitats which are of geological, historical and natural interest, but which do not confirm the hypothesis made a century ago. We never re-found the Mediterranean molluscs...and the term "fossil" dune is in itself inappropriate; the dune not being covered over by other deposits. It is just an inland

For more information:

Baeteman C., (2001). De Moeren and inland dunes, Holocene depositional history. Excursion guide, *Geologica Belgica*, June (2001), Belgian Geological Society, Brussels, 20 p.

Bouly de Lesdain, M., (1912). Les dunes pléistocènes de Ghyvelde (Nord), *La feuille des jeunes naturalistes*, 5ème série, 41 années, n°493 ; 1 janvier 1912.

Lemoine G., (2011). La datation de la dune interne de Ghyvelde (59) par la malacofaune, *Le Héron*, 2009, 43 (2), 143-152

Lemoine G., (2011). Sur l'âge et l'origine de la dune décalcifiée de Ghyvelde-Adinkerke (Nord-France). *Ann. Soc. Géol. Du Nord*. 18, 37-42

Correspondence: Guillaume Lemoine
ogmmm.lemoine@orange.fr

Italian Dune Network

Antonio Perfetti reports that the Italian Dune Network was officially launched in 2011. It is closely related to EUCC-Italy and is based in the San Rossore Estate, Tuscany. It is also part of the growing idea of European Dune Network and aims to provide an information exchange and learning environment for practitioners, managers, researchers and political decision-makers working with sand dune ecosystem management and conservation in the Mediterranean area. The Italian Network also has an objective to create and coordinate a lobby in relation to these themes linked to politics and the economy. The tools of the Network are i) a website with sections linked to the work of members, ii) a six monthly thematic newsletter, iii) coordination staff of three members, iv) a set of databases linked to the work of the network (events, professional workers, restoration projects, papers, research etc), v) professional training events and publications.

The Italian Dune Network is organising a conference on aspects of dune management including invasive alien species on 26-27 March 2013. For further information contact Antonio Perfetti, Ente Parco Regionale Migliarino San Rossore Massaciuccoli, Tenuta di San Rossore, località Cascine Vecchie, 56122 Pisa, Italy

conservazione@sanrossore.toscana.it

Information on the Italian Dune Network is published on www.itdunenetwork.net

Sand Dune Inventory of Europe

For an introduction to the sand dunes of Europe please visit the wiki pages at http://www.coastalwiki.org/coastalwiki/European_Sand_Dune_Distribution. The original sand dune inventory of Europe was prepared by Dr Pat Doody in 2001 and he updated the information and created the wiki pages in 2008. The information is an excellent starting point for information on European dunes and country reports. Country reports are generally authored by national experts.

Please send us your news and information

As part of the re-launch of the Sand Dune and Shingle Network website we will be developing the European section with a special focus on LIFE projects. Please send us project news and announcement of events, publications and photographs. We will be producing a European Dune Network newsletter every 8 months.

Please send your news to dunes@hope.ac.uk

The European Dune Network newsletter has been compiled by John Houston, Mark Whitfield and Paul Rooney
Department of Geography, Liverpool Hope University, Liverpool, L16 9JD

The newsletter is produced in association with the Coastal and Marine Union-EUCC.

Please contact us on dunes@hope.ac.uk

Websites: www.hope.ac.uk/coast and www.eucc.net



2012: a record year of rainfall

Across much of the UK the summer of 2012 and the winter of 2012-2013 has been one of wettest periods on record. Reports from many dunes sites show that water tables which were extremely low in early 2012 rose throughout the summer months and continued to rise in the autumn to flood the full extent of dune slack habitat across all sites. Two additional reports from the Sefton Coast would suggest that, at least in some parts of the dune system, record high levels were recorded.

Recovery of the water-table on the Sefton Coast dunes

Philip H. Smith

After three years of relative drought, the wettest year in England since records began resulted in a spectacular recharge of the sand-dune water-table on the Sefton Coast, Merseyside. By January 2013, water levels in tube wells reached the highest seen since measurements began in 1972. The result was deep and extensive flooding of both dune-slacks and normally dry hollows throughout the dunes. As this dune system has over 35% of the slack area in England, the effect was visually dramatic.



*Dune slacks at Ainsdale Sandhills Local Nature Reserve
27th January 2013 © P H Smith*

Previous high water-levels occurred in 1977, 1981, 1995 and 2000., these coinciding with successful breeding seasons for the endangered Natterjack Toad (*Epidalea calamita*) which has one of its largest British populations in Sefton. As this species has experienced poor breeding success for several years, it is hoped that 2013 will mark a change in its fortunes.

One downside to the high water-table has been flooding and partial closure of the busy coastal road between Ainsdale and Birkdale, levels in slacks on the adjacent Birkdale Sandhills being about 1m higher than the road. Three ditches draining water from the road were cleaned out in December and January, care being taken to avoid unnecessary damage to rare habitats and plants in the SSSI/SAC. A search was needed in deep ice-covered water to locate a key drain pipe, this being followed by pumping to lower the water level, gain access to the pipe entrance and successfully clear a blockage. Finally, the road was reopened in March.

Recording ground water levels at Formby Golf Club

David Taylor

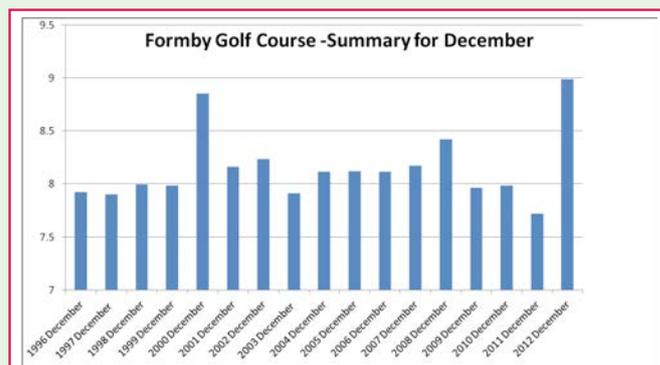
From March 1994/95 I was Green Chairman at Formby Golf Club on the Sefton Coast, and as such you are pressured into providing the best playing conditions possible. On a links course, water at the right time and amount is crucial i.e. not too much or too little. During my year of office I was fortunate, but the winter of 1995/96 was extremely wet with standing water in bunkers up until June 1996. Many of the older members, prompted by the new threat of global warming, talked about the days of extreme flooding and also drought, but they could not put forward figures to support their memories. As is known, memories tend towards the extremes of the truth.

It was in the summer of 1996 that I decided the only way forward was to gather precise information. Eight boreholes or dip wells were established evenly spread across the course, from the railway line in the east to the coast in the west. They were made from 2 metre lengths of 50mm diameter plastic pipe with holes drilled in the lower half and surrounded with geotechnic fabric to lessen sand penetration.

Since October 1996 I have recorded ground water levels on a monthly basis. As a way of showing the information to members I have put it in graph form and averaged the results (one graph rather than eight graphs, also averaging the ground level).

From the results the average ground water level has a gradient of 1 in 400 towards the sea. After heavy periods of rain this gradient tends to increase and the reverse in drought conditions.

As the graph shows Dec/Jan 2013 has produced the highest ground water levels over the 16 years of recording, and if national figures are considered, it may well be over a much longer period.



References

Geomorphology

Costas, I. Reimann, T. Tsukamoto, S. Ludwig, J. Lindhorst, S. Frechen, M. Hass, C. H. Betzler, C. (2012) Comparison of OSL ages from young dune sediments with a high-resolution independent age model, *Quaternary Geochronology*, 10 pp. 16-23

de Winter, R, C. Sterl, A. de Vries, J. W. Weber, S. L. Ruessink, G. (2012) The effect of climate change on extreme waves in front of the Dutch coast, *Ocean Dynamics*, **62** (8): pp. 1139-1152

Pye, K. & Blott, S.J. (2011) Kenfig Sand Dunes –Potential for Dune Reactivation. External Investigation Report No. EX1227, Countryside Council for Wales, Bangor. <http://www.ccg.gov.uk/publications--research.aspx>

Pye, K. & Blott, S.J. (2012) *A Geomorphological Survey of Welsh Dune Systems to Determine Best Methods of Dune Rejuvenation*. CCW Contract Science Report No. 1002, Countryside Council for Wales, Bangor. <http://www.ccg.gov.uk/publications--research.aspx>

Ruinstien, Y. Groner, E. Yizhaq, H. Svoray, T. and P.B. Kutiel (2012) An eco-spatial index for evaluating stabilization state of sand dunes, *Aeolian Research*, *In press*, 10.1016/j.aeolia.2012.08.007

Vegetation

Bonte, D. Breyne, P. Brys, R. de la Pena, Eduardo. D'hondt, B. Ghyselen, C. Vandegheuchte, M.L. and Hoffman, M. (2012) Landscape Dynamics Determine the Small-Scale Genetic Structure of an Endangered Dune Slack Plant Species, *Journal of Coastal Research*, **28** (4): pp. 780-786

Ciccarelli, D. Bacaro, G. and Chiarucci, A. (2012) Coastline Dune Vegetation Dynamics: Evidence of No Stability, *Folia Geobotanica*, Mapping invasive woody species in coastal dunes in the Netherlands: a remote sensing approach using LIDAR and high-resolution aerial photographs (3): pp. 263-275

Ford, H. Garbutt, A. Jones, D.L. and Jones, L. (2012) Impacts of grazing abandonment on ecosystem service provision: coastal grassland as a model system. *Agriculture, Agriculture Ecosystems and Environment*, **162**, pp. 108-115

Ford, H. Rousk, J. Garbutt, A. Jones, L. and Jones, D.L. (2012) Grazing effects on microbial community composition, growth and nutrient cycling in salt marsh and sand dune grasslands. *Biology and Fertility of Soils*, **59** (1) pp. 89-98

Smith, P.H. & Lockwood, P.A. (2011). Grazing is the key to the conservation of *Gentianella campestris* (L.) Börner (Gentianaceae): evidence from the north Merseyside sand-dunes. *New Journal of Botany* **1**(2): 127-136

Smith, P.H. & Lockwood, P.A. (2012). Translocating Isle of Man Cabbage *Coincya monensis* ssp. *monensis* in the sand-dunes of the Sefton Coast, Merseyside, UK. *Conservation Evidence* **9**: 67-71.

Fauna

Costa, S. R. Kerry, B.R. Bardgett, R. D. and Davies, K.G. (2012) Interactions between nematodes and their microbial enemies in coastal sand dunes, *Oecologia*, **170** (4) pp. 1053-1066

Fartmann, T. Schirmel, J. and Wunsch, Y. (2012) Conservation management of coastal dunes for Orthoptera has to consider oviposition and nymphal preferences, *Journal of Insect Conservation*, **16** (4): pp. 501-510

Management Techniques

Carrasco, A. R. Ferreira, O. Matias, A. and Freire, P. (2012) Flood hazard assessment and management of fetch-limited coastal environments, *Ocean and Coastal Management*, **65** pp. 15-25

Kindermann, G. and Gormally, M. J. (2013) Stakeholder perceptions of recreational and management impacts on protected coastal dune systems: A comparison of three European countries, *Land Use Policy*, **31**, pp. 472-485

Monitoring

Davidson-Arnott, R. G. D. Bauer, B. O. Walker, I. J. Hesp, P. A. Ollerhead, J. and Chapman, C. (2012) High-frequency sediment transport responses on a vegetated foredune, *Earth Surface processes and Landforms*, **37** (11): pp. 1227-1241

Hantson, W. Kooistra, L. and Slim, P.A. (2012) Mapping invasive woody species in coastal dunes in the Netherlands: a remote sensing approach using LIDAR and high-resolution aerial photographs, *Applied Vegetation Science*, **15** (4): pp. 536-547

Other

Smith, P.H. (2012). Reserve Focus: Cabin Hill National Nature Reserve, Merseyside. *British Wildlife* **23** (5) 343-347.

Howe, M., Emmer, L. and Pye, K. (2012). Rejuvenating Welsh Dunes. *British Wildlife* **24**(2) 85-94.

Reviews

Nordstrom, K.F., Jackson, N.L., Freestone, A.L., Korotky, K.H. and Puleo, J.A. (2012) Effects of beach raking and sand fences on dune dimensions and morphology. *Geomorphology*. **179** (106-115)

Mechanical beach cleansing is a common management activity on beaches used for recreation, and foredunes on developed coasts are often also artificially formed using sand trapping fences. The authors report of an opportunity to compare managed shorelines and unmanaged shorelines along sections of the coastline in Avalon, New Jersey, USA after managers stopped beach raking and dune fencing on some sections of the coast whilst maintaining the management practices on other sections. However, along the coast as a whole, sand nourishment continued to be practised providing a continuous source of sand. The beach zoning policy allowed a comparison to be made over a 19 year period (1991-2010).

The findings are of interest to similar situations, especially where management has to find compromises between maintaining the flood protection function of dunes and the desire to allow natural dune growth. The study found that:

- Dunes on unmanaged sections of the coast were wider and had accumulated an additional dune ridge seaward of the 1991 crest, but the beach width was narrower
- Although the advancing dunes on unmanaged sections are prone to erosion the lack of beach cleansing allows natural recovery
- The dune volume was on average 1.6 times greater at unmanaged sites, although the differences were not significant at the 0.05 level
- The crests of dune at managed sites were higher than those at unmanaged sites (by between 0.7-1.7 m)
- Incipient dunes formed on the backshore on the unmanaged sites
- Unmanaged sites held 35% more species than managed dunes (35 and 26 respectively), mainly due to the presence of wider and more sheltered dune hollow (slacks or swales) habitat which developed on unmanaged dunes

The study has demonstrated the result of management policies. It recognises that both the managed and the unmanaged situations can be justified depending on location and that beach zoning practices can accommodate both nature and beach recreation.

An Introduction to the Common Lizard

Stuart Graham, Bangor University

The common lizard *Zootoca vivipara vivipara* (formerly *Lacerta vivipara*) is the most familiar lizard in mainland Britain. With common lizards found across most dune systems, and often found on the same sites as sand lizards (*Lacerta agilis*), they can be distinguished by their smaller size, slimmer build and lack of the prominent 'eye-

spot' dorsal markings of the sand lizard. Male common lizards also lack the sand lizard's bright green colouration in the breeding season.

Common lizards occur in a wide range of colours, including shades of grey, reddish brown, gold, blue and olive green frequently observed, and unlike the sand lizard, melanistic (all black) individuals can also be found on dune systems in the UK. Adult male common lizards usually have an overall dark brown appearance with complex patterns of lighter or darker brown stripes and/or broken lines running the length of their body. Adult females usually appear paler, frequently having a continuous or broken dark stripe running down the centre of their back from head to the base of the tail. They also have a broader stripe on each side edged with yellow or white streaks above and below, turning to spots on the tail.

Common lizards are agile, fast-moving animals, with adult males growing to between 85 to 179mm in length from snout to tip of tail. In comparison to the body, the legs are relatively short and stocky, with five tapering toes on each foot, and [when intact] a long tapering tail that makes up approximately two-thirds of the total length. A high proportion of observed individuals, however, have a tail that has been lost and has re-grown (autotomy); initially shorter and darker, changing to something like the original colour pattern during full re-growth.



A female common lizard Zootoca vivipara vivipara

There is increasing concern that the species is suffering population decline across sites where it was once common. There could be a significant decline, in both numbers and range, from increased anthropogenic changes. Although it has been listed by the IUCN (2010) as being of 'least concern', if rates of development and habitat sterilisation continue, it is more than feasible that this conservation status will change. As a result, common lizards are protected under the *Wildlife and Countryside Act 1981* (as amended) as Schedule 5 species and also protected in the *Countryside and Rights of Way Act 2000* (CRoW, 2000) from any 'reckless' behaviour that might endanger their life.

I would therefore like to encourage members of the Network, if not doing so already, to record sightings of common lizards and to submit them to their local records centre, Amphibian and Reptile Conservation (ARC) or the 'Record pool' (ARG UK). Common lizards (and other reptile species) should also be a material consideration when undertaking any management works on dunes.

IEEM Best Practice Awards 2012

Congratulations to Dr Roland Randall CEnv FIEEM for receiving the Institute of Ecology and Environmental Management's Tony Bradshaw Award 2012 for 'outstanding knowledge exchange and promoting best practice' for 25 years of collaborative work between several bodies on the description of the UK's coastal vegetated shingle.

The collaborative programme started in 1987 between the Nature Conservancy Council and Girton College, Cambridge leading to the first comprehensive survey of the shingle structures of Great Britain (Sneddon and Randall 1993). The baseline survey has recently been updated using new technologies to improve the accuracy of recording and to measure change.



Penny Anderson presents Roland Randall with the Best Practice Award for Outstanding Knowledge Exchange and Promoting Best Practice (copyright IEEM) www.ieem.net



Conservation, Management and Restoration of Coastal Cliffs and Lake Bluffs

A symposium to be held from 16-19 September 2013 in Llandudno, North Wales

Please visit the website for information on the forthcoming international symposium on coastal cliffs. Submissions of abstracts are invited by March 31st and details of the venue and booking arrangements can be found on the website. There is a range of booking options available.

Preliminary Announcement Sand Dune Hydro-Ecology Meeting

**9th to 11th September 2013
South Wales**

Dealing with Dynamics and Extremes

The hydrology and ecology of coastal dune systems are influenced by both natural and anthropogenic factors such as dynamic coastal processes, development and management within the dune system and short- and long-term climatic patterns. In this meeting we aim to share management and research experience of these influences and discuss and develop the tools required to help us deal with them as effectively as possible.

If you are interested in presenting your work, please submit an abstract to Charlie Stratford (cstr@ceh.ac.uk) by 1st June 2013. More details of the meeting will be made available shortly.

Revitalising Noordoinderen LIFE+ Project

The project, led by Landschap Noord-Holland will be holding a final meeting in June 2013 to share experiences on the 'struggle' against Japanese Rose (*Rosa rugosa*) and other species. The meeting will address the management of woody invasive species in dune reserves. For more information please contact Martin Witteveldt at m.witteveldt@landschapnoordhoolland.nl. We hope to report on the achievements of this project in a future newsletter.

Management of European coasts

The European Commission has presented a new proposal for a Directive on Maritime Spatial Planning and Integrated Coastal Management. Information can be found online through the following links:

Europa Marine Environment : <http://ec.europa.eu/environment/iczm/home.htm>

Europa Maritime Affairs : http://ec.europa.eu/maritimeaffairs/policy/maritime_spatial_planning/index_en.htm

Press release : http://europa.eu/rapid/press-release_IP-13-222_en.htm

This newsletter has been compiled by John Houston and Mark Whitfield

Contact dunes@hope.ac.uk

Website www.hope.ac.uk/coast

Cover Photo: Devil's Hole blowout, Sefton Coast showing deep flooding January 2013 ©Philip H Smith

The Sand Dune and Shingle Network is based at Liverpool Hope University

