



Research Information Note

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Development of eco-hydrological guidelines for dune habitats – Phase 1

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Introduction

Many European Sites and Sites of Special Scientific Interest support habitat types which have some dependency on water resources, although our understanding of the specific eco-hydrological requirements of these habitats is often limited. A collaboration between English Nature, the Countryside Council for Wales and the Environment Agency is progressing a programme of work to further our understanding of the eco-hydrology of a range of such habitats. Work initially focussed on mire and wet grassland habitats and developed an approach to conceptualising water requirements termed the 'Wetland Framework'. Having recognised the value of this approach for other wet habitats, this report presents the results of a review of the eco-hydrological requirements of dune slack habitats, and where possible gives 'interim' advice for establishing eco-hydrological guidelines to assist casework.

What was done

English Nature commissioned a review and evaluation of information on the eco-hydrology of dune slack habitats in Britain in order to assess how far it is currently possible to identify their water supply mechanisms and preferred regimes for water and nutrients. There were three main elements of the work:

- 1 A review of published and unpublished eco-hydrological information on dune slack habitats and species.
- 2 A critical evaluation of the reviewed information.
- 3 Development of a preliminary conceptual framework for 'how dune slack habitats work' and interim recommendations for ecological target setting.

The report also considers the influences of climate, water supply mechanism, nutrient regime and management and draws heavily on work conducted in the Wadden Sea area of Europe.

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Results and conclusions

The first part of the report reviews current understanding of the interactions between vegetational succession, sand buffering capacity (calcium carbonate content) and hydrology. As there has been relatively little scientific work in Britain, the review draws heavily on extensive work carried out in the Wadden Sea area, along the coasts of The Netherlands, Germany and Denmark.

The second part of the report concentrates on critical evaluation and the identification of research needs. Information on the hydrological conditions in a range of European dune slack habitats is used to develop a new conceptual model for dune-slack hydrology, based on a water balance approach. The conceptual model can be used to assess the hydrological sensitivity and hydrochemical consequences of, for example, groundwater abstraction. Field measurements and quantitative modelling studies in Britain are required to validate this model and refine its predictive capability.

Extrapolating experience from the Netherlands suggests that dune slacks may be irreversibly sensitive to water abstraction, recharge variation and changes in water quality. Recommended interim targets would be for minimal impact until the small area of British dune slacks is much better understood.

English Nature's viewpoint

The review represents the first step in establishing robust eco-hydrological guidelines for dune slack habitats. Further work is needed to give confidence in the conceptual models suggested but in the short-term, the information presented will guide thinking about the eco-hydrological requirements of dune slack habitats, for the purposes of casework and the development of future research.

Selected references

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