

Kenfig National Nature Reserve Further & Higher Education Pack



Bridgend Outdoor Schools
Ysgolion Awyr agored
Pen-y-Bont ar Ogwr



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Introduction

The Kenfig National Nature Reserve (Kenfig NNR) offers good opportunities for a wide range of practical field study activities in biology at all levels. There is a large car park adjacent to the reserve. The Reserve Centre has a field-study classroom and equipment that can be hired by contacting the Reserve Manager on 01656 743386.

The reserve is a Site of Special Scientific Interest and is actively managed to maintain the different habitats it contains, including seashore, sand dunes of national importance, and the largest freshwater lake in South Wales. The key characteristics of the site include: both sandy and rocky shoreline, dune grassland, slack, scrub and woodland, wetland and open water.

The Kenfig National Nature Reserve blog is a useful starting point before a visit. It includes news, a map, and notes on habitats, management and ecology of the reserve. You can find it here: <http://kenfignnr.blogspot.co.uk/> .

The suggested activities focus on sampling habitats, plant and animal species, visitor-use and management at Kenfig NNR. They appear under discrete headings, but in practice, there are significant areas of overlap between them. For example, the questions and activities presented discretely in the section 'Introducing and practising ecological sampling techniques' could equally well be first introduced through investigative work in other sections.



1. Introducing and practising ecological sampling techniques

Overview

The area close to the car park and Reserve Centre has very easy access. It offers a good range of habitats, e.g. grassland, scrub, wetland and freshwater, that can be used to introduce and to practise sampling techniques. Further away from the car park, within Kenfig Burrows and Kenfig Sands and Sker Rocks, the range of habitats is extended to include typical sand dune environments such as slacks, fixed dunes, wet flushes, embryo dunes, rock pools and sandy beaches.

Resources

These two websites include useful introductions to sampling and details about ecological sampling techniques and their uses.

www.countrysideinfo.co.uk/biol_sampl_cont.htm

www.wsfcs.k12.nc.us/cms/lib/NC01001395/.../Ecological_Sampling.pp

The two websites below are useful resources for sampling butterflies using transect counts, modified from Pollard (1977).

http://faculty.wvu.edu/jmcl/Methods/bfly_walk.pdf

www.bc-europe.eu/upload/Manual_Butterfly_Monitoring.pdf

The monograph below describes the results of a bird survey, and methods used, at Morfa Harlech dunes. It includes a useful illustration of extending the Pollard Walk method to a bird study. www.tandfonline.com/doi/pdf/10.1080/00063657309476366

The SAPS (Science and Plants for Schools) website includes three detailed online ecology activities that give students the opportunity to practise random sampling, systematic sampling and introduces topics and key fieldwork skills including random sampling, measuring abundance, diversity and plant identification. In addition, they allow students to consider the effects of land management strategies on plant diversity. You can find them by selecting the criteria Post-16 and Activity in the filter at:

www.saps.org.uk/secondary/teaching-resources .

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Key Questions, with suggestions for activities

Which sampling technique shall I use?

Students can use, or be allocated, specific sampling methods to familiarise themselves with their use and with different apparatus and recording methods. For example, online activities, such as the SAPS resources above, may have been used before visiting the reserve, with groups of students now using different sampling techniques practically on the reserve. At the end of the session, students might report back and provide a tutorial about the technique they have used for the whole group.

Is abundant the same as dominant?

Using data collected in the activity above, students can investigate the meaning and use of specific biological vocabulary.

What species are typical of a habitat/environment?

Students might be allocated different habitats/environments within the reserve, to decide the best sampling methods to use to investigate their composition, and to be able to describe to others which species are typical.



2. Exploring sand dune succession

Overview

The seaward edge of the sand dunes lies along the strand line at Kenfig Sands, which can be reached by following signposted paths from the Reserve Centre car park (approximately 1.5km). From Kenfig Sands, the developing structure of the sand dunes, and the vegetation succession, can be studied by choosing a suitable route back inland to demonstrate the key features, or by setting up a transect. The dunes are sufficiently extensive and accessible for several routes to be chosen, so that students can work in separate groups.

Resources

These websites have clear information about the successional sequence (psammosere) in a sand dune environment.

www.biology-fieldwork.org/seashore/sand-dunes/

www.macaulay.ac.uk/soilquality/Dune%20Succession.pdf

www.first-nature.com/waleswildlife/wales-dunes.php

Key Questions, with suggestions for activities

How can we record and represent the sand dune succession we have seen at Kenfig so that others could use our information to see it, too?

Students may choose which sampling method to use (for example, following on from (1) above), or be allocated sampling methods, to construct a profile of the sand dunes. Different groups might be allocated to specific areas of the dunes to contrast with areas showing typical succession: for example, areas with high visitor-use, overgrown dune, or newly scraped slacks.

How closely does the sand dune succession at Kenfig NNR match the stylised descriptions of textbooks and websites? What are the biotic and abiotic factors that might be responsible?

Following on from the activities above, students might report back and compare the data they have collected and their assessment of the key factors that affected the nature of the profiles they have constructed, and why they are different from one another.

Are all the stages of sand dune succession equally well represented at Kenfig NNR? Why might this be?

Pooling all the information from the activities above, students could discuss whether all of the stages in sand dune succession are equally well represented at Kenfig. For example, if large areas of the dunes have become stabilised are there relatively few blow-outs to provide new areas of semi-fixed dune that can be re-colonised by species typical of earlier stages in the succession?



3. Rocky Shore studies

Overview

Zonation can be investigated in the intertidal zone at Sker Rocks in the extreme south west corner of the NNR. A study of the rocky shore offers a good opportunity for students to experience for themselves the superficial similarities and distinct differences between the separate processes of zonation and succession.

Beware of the incoming tide. The coast can be a dangerous place. It is easy to fall on slippery seaweed and when crossing difficult terrain.

Resources

These two websites are useful introductions to zonation and include links to other useful sites.

www.theseashore.org.uk/theseashore/rocky%20shores.html

www.glaucus.org.uk/Zones.htm

This PowerPoint presentation summarises the zones on a rocky shore and contains photographs of common rocky shore species. www.mba.ac.uk/shore_thing/.../rocky%20shore%20ecology.ppt

The paper below is a detailed study of the zonation of plants and animals on rocky shores around Dale in Pembrokeshire. As well as containing a useful description of methods, it includes exhaustive distribution diagrams of species - http://fsj.field-studies-council.org/media/350749/vol1.5_28.pdf

This link to SEWBReC (South East Wales Biodiversity Records Centre) opens up an interactive tool for finding grid references, using Google maps. The application can deal with grid references from 10K down to 10m and so, using the satellite image option, it can be useful for tagging quite precise locations within the NNR.

<http://www2.sewbrec.org.uk/Maps/Mono.htm>

Key Questions, with suggestions for activities

What is the distribution of species within the intertidal zone?

As in (2), students can sample the environment using a transect to build up a profile of the habitat and its species. Different aspects and topography can be included, to investigate their influence on species distribution within the intertidal zone.

What biotic and abiotic factors affect the range of species in the intertidal zone?

Using the resources above students could identify a number of factors to investigate in more detail, e.g. exposure, pollution, geology, tidal range, predation, density of algae, human impact.

How are species in the intertidal zone adapted to survive in the niche that they occupy?

Students can investigate how specific organisms are adapted to survival in the zone where they are found.

4. Management for biodiversity

Overview

Kenfig is a National Nature Reserve that attracts a large number of visitors in pursuit of a wide range of leisure activities, from dog-walking to bird-watching. At the same time, the reserve contains nationally important habitats and species. Managing the reserve to maintain its biodiversity is a balance between encouraging public interest, creating and conserving habitats and public education. While students will need to exercise care and sensitivity when exploring these aspects of the NNR's environment, there are several possibilities for investigating the impact of visitors and reserve management.

Resources

This document is a landscape character assessment carried out for Bridgend Borough Council. Pages 13 – 17 refer to Kenfig Dunes and the neighbouring coastline. They include a description of landscape characteristics, forces for landscape change, key sensitivities, and guidelines for protection and conservation of the key characteristics.

[Landscape Character Assessment for Bridgend County Borough.](#)

The document below contains a core biodiversity map for the NNR and a brief analysis of the reserve's contribution to different aspects of resource management.

[Kenfig Biodiversity Pages](#)

The report below includes a summary of the 5-year management plan for the Kenfig NNR.

[Kenfig National Nature Reserve Management Plan, report to Cabinet, BCBC, May, 2015](#)

This website, aimed at informing the general public, includes a link to the detailed management plan for sand dunes at Fylde, in Lancashire. Sections 3 – 5 of the management plan, covering evaluation of influencing factors and management actions, are a useful starting point for comparing pressures and priorities with Kenfig. <http://m.fylde.gov.uk/resident/leisure/sand-dunes/>

This is an exhaustive visitor monitoring manual, produced by Scottish Natural Heritage. The resources section includes links to a number of useful visitor-survey tools, e.g. prompts, survey questions etc.

<http://archive.snh.gov.uk/vmm/aims.html>

Amongst detailed lists of species, this report contains useful references to management techniques used in sand dunes in Wales, to maintain biodiversity.

www.biodiversitywales.org.uk/File/241/en-GB

The [Handbook for Phase One Habitat Survey](#) is published by the JNCC (Joint Nature Conservation Committee). It is very detailed, covering all aspects of carrying out a Phase One Habitat Survey. Part two, the Field Manual, is a particularly useful resource for practical survey work in the field.

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Key Questions, with suggestions for activities

What habitats are represented on/in this part of the reserve?

Students could plan and carry out a Phase One Habitat Survey on part of the reserve. The JNCC handbook above contains detailed information about methods, habitat definitions and the standardised codes and colours used to represent them. Using the habitat maps produced for different parts of the reserve, students could investigate questions around sensitivity of visitor access, threats from colonisation by invasive species, and ecological management techniques.

What do visitors want from the reserve?

Planning a survey of visitors' expectations and activities can help to encourage students to form questions for themselves about issues around balancing the management of the reserve to address the often conflicting priorities of different groups of users. Students could begin by using the Scottish Natural Heritage manual in the resources section to inform themselves about survey methods and formulating questions.

How do visitors affect the reserve?

Students could carry out ecological surveys of different areas inside the reserve, e.g. undisturbed and eroded dunes, slacks and paths, to formulate their own hypotheses about the extent to which differences between them are caused by the impact of visitors. These can then be tested by carrying out visitor-surveys. Alternatively, following visitor-surveys, students could investigate the impact of the visitor-use they have already identified.

How is the reserve managed to maintain/improve their biodiversity?

Students can be asked to notice examples of active habitat management during their field work at Kenfig, and their findings and impressions could be discussed, to build a picture of the range of practices that they have seen. The two management plans in the resources section above could be used to extend their ideas, and students might then actively look for examples of different management practices themselves and begin to explore the extent to which they are having a desired effect.

Taking things further

The activities above are intended to be a starting point. Once they have begun to familiarise themselves with the reserve and developed some confidence using biological sampling techniques, students can be asked to present their own questions and their own methods to investigate them.