

Studland Overview

	Coastal processes and ecosystems - Studland Bay
Introduction	<ul style="list-style-type: none"> ▪ Why is Studland a SSSI and National Nature Reserve? ▪ What natural processes affect the beach and dunes? ▪ What are the interactions between humans and the natural ecology ▪ Does tourism have a detrimental effect on the dunes? ▪ What management strategies are in place? ▪ Are management/conservation measures effective?
Project / hypothesis ideas	<ul style="list-style-type: none"> ▪ How does the vegetation change from the shore? ▪ How does the soil compaction rates changes throughout the dune ecosystem ▪ Do the guided footpaths have a detrimental/positive affect on species, erosion and compaction? ▪ Do the unofficial footpaths have a detrimental/positive affect on species, erosion and compaction? ▪ Does the soil humidity change throughout the ecosystem ▪ How do some of the activities in the Studland NNR impact upon the management issues dealt with by the National Trust?
Tips / pitfalls	<ul style="list-style-type: none"> ▪ Ensure that all staff and students take care of the delicate dunes and its inhabitants when sampling ▪ Make sure that all sites are labelled and site descriptions made, especially if sharing data. ▪ Make sure that all groups measuring profiles start from the same distance from the water edge. ▪ When measuring species cover using quadrats ensure that students look underneath vegetation canopy to get full species cover, remember plant coverage can be over 100%
Data collection	<p>Measure:</p> <ul style="list-style-type: none"> ▪ Dune profiles (vegetation, PH, wind speed etc.) footpath erosion (ridges and slacks); quadrats (Managed and unmanaged); path quadrat transects and compaction. ▪ Tourist activity - litter, people numbers, environmental quality. Conditions - soil ph with distance from the sea. <p>Calculate:</p> <ul style="list-style-type: none"> ▪ Dune cross section, species distribution, variance in pH, humidity ▪ People counts compare secondary/primary data
Review - Statistical	<p>Measuring the strength of the association (7-30 samples) - Spearman's Rank correlation coefficient.</p> <p>Measuring the categorical association X^2 test</p>
Review - Presentation	<ul style="list-style-type: none"> ▪ Dune profiles/cross section ▪ Kite diagrams ▪ Path profiles ▪ Bi polar analysis

Studland Bay and Old Harry Rocks - Coastal Processes and Ecosystems

Links to KS3 Curriculum

Geographical enquiry and skills

1 Undertaking geographical enquiry:

1b - suggest appropriate sequences of investigation (gathering views and factual evidence about a local issue)

1c - Collect, record and present evidence

1d - Analyse and evaluate evidence and draw and justify conclusions

1e - Appreciate how people's values and attitudes affect issues.

2 Developing geographical skills:

2a - to use an extended geographical vocabulary

2b - to select appropriate fieldwork techniques and instruments

Knowledge and understanding of places

3c - Describe physical and human features that give rise to the distinctive character of places

3d - explain how and why changes happen in places, and the issues that arise from these changes.

Knowledge and understanding of patterns and processes

4a - describe and explain patterns of physical and human features

4b - identify, describe and explain physical and human processes and their impact on places and environments.

Breadth of study

6c - geomorphological processes

6e - ecosystems

6j - environmental issues and management

7c - carry out fieldwork investigations outside the classroom

Links to GCSE Specifications

AQA-A, Natural Environment Topics (Short Course)

- 9.4 Coastal landscapes and processes (The Earth's crust is modified by coastal processes which result in distinctive landforms)

AQA-A, People and Natural Environments

- 9.5 Coastal landscapes and processes (The Earth's crust is modified by coastal processes which result in distinctive landforms. The interaction between people and coastal environments)

AQA-A, People and Natural Environments

- 9.6 Weather and Climate (The interaction between people and ecosystems)

AQA-C, Managing the Physical Environment

- 9.8 Pressures on the Physical Environment (How can physical environments be managed to preserve their character yet meet people's needs for recreation).

AQA-C, Managing the Physical Environment (Short Course)

- 9.4 Pressures on the Physical Environment (How can physical environments be managed to preserve their character yet meet people's need for recreation).

Links to A-Level Specifications

AQA - A, Module 1: Core Concepts in Physical Geography

- 13.1 Coast Processes and Problems (Marine Erosional Processes and Landforms, Marine Depositional Processes and Landforms, Coastal Problems and Coastal Management Strategies)

AQA - A, Module 1: Core Concepts in Physical Geography

- 14.3 Recreation and Tourism (Tourism and the Environment, Tourism and development)

AQA - B, Module 2: The Physical Options

- 11.2 Coastal Environments (The interaction of marine and sub-aerial processes and other factors can produce distinctive coastal landforms)

Edexcel Geography A Unit 1: Physical Environments

- 1.3 Coastal environments (Analysis of changes in vegetation across a sand dune complex, Impact of human activity on vegetation across a sand dune complex, Interrelationships between vegetation, soils & microclimate on a shingle bar or a narrow sand dune system)

Edexcel Geography A, Unit 4: Physical systems, processes & patterns

- 4.3 Ecosystems - Soils, vegetation & climate (Factors affecting changes in soil characteristics down a slope)

Edexcel Geography B, Unit 1: Changing Landforms & their Management Coastal Environments

- 1.7 What physical factors & processes influence coastal landforms?
What processes lead to change in coastal ecosystems?
- 1.10 In what ways does the management of coastal environments pose a continuing challenge for people?

OCR - A: The Physical Environment

- 5.1.2 Ecosystems (Sand dune succession [xerosere])

OCR - B: Physical Systems & their Management

- 5.1.3 Coastal systems & people (What are the conditions & processes responsible for distinctive coastal landforms & ecosystems? How do people interact with these processes & systems? What issues & management strategies arise from this?)

Studland Background Information

The National Nature Reserve

The south east Purbeck National Nature Reserve (NNR) covers an area of 631 hectares and comprises of a variety of habitats which include 5km of beach, dunes, woodland, bogs and lowland heath. In fact this is one of the largest tracts of heathland in southern Britain with all six species of British reptiles present with nightjars and Dartford warblers as well as the carnivorous plant the sundew and the globally rare masonry wasp.

The Studland slacks contain some of the richest population of dragonflies and damselflies in Britain. These are some of the attributes among many affords Studland and Godlingston Heath status of NNR and Site of Special Scientific Interest (SSSI). The area is owned and managed by the National Trust's Purbeck Estate with assistance in the management of habitat and monitoring of species by Natural England.

The Natural Processes

The geology of South Haven Point is a combination of Oakdale clays to the north which lie against the Ferrung sandstone which constitutes the geology of the shore to west of the peninsula in Poole harbour. It is against this that the formation of Studland heath and sand dunes had a base to create itself.



Studland's Knoll Beach looking north towards Bournemouth with Zero dune to the left. Its name of Zero dune refers to mapping of the Victorian of First and Second dunes to the west, this dune was not formed at the time

The area of Studland heath has only been present during the last 600 hundred years where the accumulation of sand started to build up along the coast of south haven point. This process extended the expanse of dunes due mainly to

marram grass stabilising the dunes enriching the soil and facilitating the area for the succession of heaths and woodland.



Looking westward over Studland's dune and heathland ecosystem to the Little Sea in the mid ground. This area was burnt by a discarded cigarette in 2001 the heather is now starting to re-establish the area.

Human Impact

Studland beaches are one of the most popular beaches in Britain at any one time in summer there can be as many as 25,000 people on the beach a day, evidently there is an impact.

The impacts include;

- Dune erosion and destabilisation
- Footpath erosion
- Litter and dog mess
- Fire
- Species disturbance

Strategies to combat these include;

Board walks on the dune ridges and routed paths

Dog mess bags and bins

Fenced off dune regeneration areas

Sited barbeque areas near visitor centre

The effectiveness of these strategies is one that can be investigated as part of student's studies.

As Studland is a SSSI and a NNR it is therefore a very sensitive area, the dune and heath land are easily eroded by humans, the plants and animals too are also sensitive. It is important that when sampling through the dunes care is taken to lessen the impact of students in the environment.

**TOWNSEND CENTRE
HAZARD IDENTIFICATION AND RISK ASSESSMENT**



Activity: Studland Dune Study	No:	Assessor:	Date:	Location: Knoll Beach, Studland	Centre or school led: Centre
Hazard		Control Measures			Who's affected?
Adders	Safety brief. Stick to paths and board walks. Access to warden and visitor centre facilities.			P, CS, SS	
Naturists	Groups stay well away from the designated naturist area. If the person concerned is a persistent nuisance then call the beach warden or Swanage police - contact number and staff at visitor centre available.			P, CS, SS	
Unexploded shells	Safety brief about "foreign" looking objects. Contact wardens if in doubt and be able to give them precise location details. 07970595963 - "foreign object" hotline.			P, CS, SS	
Dune jumping	Should be discouraged as there have been a number of incidents involving broken limbs.			P	
Weaver fish	Centre are informed about recent incidents. Medical attention to be sought at knoll beach visitor centre.			P, CS, SS	
Sand in eyes	Safety brief. No throwing sand. Try to find shelter away from wind blown sand. First aid kits contain sterilised water. If problem persists consult medical services.			P, CS, SS	
Equipment causing injury or dune damage	Ranging poles can be hazardous in the dunes. Use correctly and sensibly. Brief students about delicate ecosystem to discourage damage of the dunes from ranging poles and trampling				
Pulling up marram grass / bracken	Warning: these plants can give nasty "paper cuts". Safety brief. First aid kits available.			P	
Weather	Studland is very exposed. See generic risk assessment			P, CS, SS	

Signature of Head of Centre/Staff:

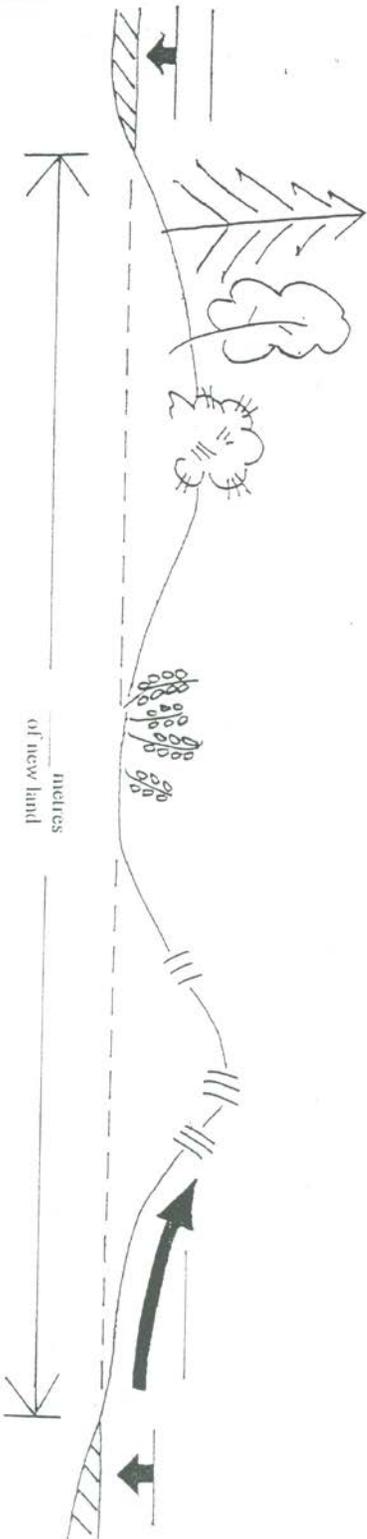
Date of Review:

Next Review:

This record sheet can be used with double sided tape at the bottom to collect the changing soil profiles at each of the stops

Studland's Sand Dunes

Stop: _____ Name: _____ Plants: _____ Conditions: _____ Evidence of people: _____ Animals: _____	Stop: _____ Name: _____ Plants: _____ Conditions: _____ Evidence of people: _____ Animals: _____	Stop: _____ Name: _____ Plants: _____ Conditions: _____ Evidence of people: _____ Animals: _____
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Ballard Down and "Old Harry Rocks"

The eastern edge of the World Heritage Site ends with Old Harry Rocks, where wave action and erosion has created stacks in the Chalk. The rocks were once a continuous link between Ballard Down (the western headland of Studland Bay) and the Isle of Wight to the east.