Braunton Burrows, North Devon

Fieldwork

Investigation Title(s):

Studies of sand dune succession and management appropriate for all levels from KS3 to A level NEA investigations

Location:

Braunton Burrows is one of the largest sand dune systems in the British Isles and sits at the centre of North Devon's Area of Outstanding Natural Beauty (AONB), and forms the heart of the UNESCO designated Biosphere Reserve.

Target Audience:

All levels, but especially GCSE and A level NEA investigations

Logistics (access, parking, toilets etc):

Sandy Lane car park is large and usually very quiet, which makes accommodating a full-size coach or a fleet of minibuses fairly easy. There is a small booth which is irregularly inhabited by cheerful operators, who will happily supply a tired Geography tutor with a complimentary cup of tea or coffee to accompany a ticket.

In addition to the useful interpretation boards (truly amazing secondary data resource; dune cross-sections, references, diagrams, recommended transects) there is also a surprisingly well-maintained and clean 'portaloo' nearby, which is the sole example of a loo any fieldworker will see all day. Cattle graze the dunes throughout the year, but their zoned whereabouts is well-advertised in the car park and the Burrow's Facebook page.

Saunton Sands car park allows more immediate access to the beach which is reflected in parking rates. The Saunton Beach Shop does offer the use of 'Beach Wheelchairs' for a reasonable rental fee if needed.

On occasion, I have been engaged by a curious Warden representing the interests of the Christie Devon Estate. Similarly, officials from the MOD on a training exercise may benefit from a brief explanation of your fieldwork intentions. These friendly stakeholders have never been a problem. Beware Braunton Burrows at the height of the tourist season.

Geographical Concepts Underpinning Investigation):

The headline fieldwork opportunity on the dunes is to explore the full stages of succession at a psammosere, though students studying dune formation as part of coastal processes will be well-treated also. Embryo dunes at the beach form after an accumulation of strandline debris material traps onshore windblown sand, gradually becoming more fixed as vegetation colonises the ground and changing the dynamic.

Starting at the beach and ending in the forest, walk students through a timeline—the centuries of vegetation succession. Students can investigate abiotic/biotic aspects of the sand dune ecosystem as well as management issues associated with conservation and use of the area by the MOD.

Reviewer:

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geography southwest

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Data Collection Opportunities:

Biotic factors. Students can use a quadrat to estimate vegetation cover , using the Domin scale or counting squares.

Abiotic factors. These include wind speed, temperature, light abundance, soil pH and humidity. Anemometers and soil probes are usually all you need, and should be collected as close to the quadrat as possible to pair the data for analysis.

Soil smears. Students can collect a soil smear in situ or take a photo. Use the Munsell colour chart for analysis.

Infiltration. A good indication of compaction (trampling) but will require transportation of water.

Field sketches and photos. Fantastic at every significant change of habitat or to capture unique features not well-represented in quantitative data (e.g. path erosion, management examples).

Dune profiles. Using ranging poles, clinometers, and measuring tape, sample profiles from the embryo dunes to the yellow dunes. The size of the dunes prohibits sensible attempts at scaling this traditional technique to capture features 30m in height.

Data Presentation, Analysis, Statistical Applications:

Abiotic data lends itself to traditional scatter graphing, for example, distance against soil temperature, or peak/slack variation expressed against soil moisture or wind speed.

Biotic data on species abundance (percentages) can be presented using a pie chart.

Due to the sheer size of some of the dunes, the tried and tested method of pencil on paper to create cross section profiles can occasionally be a withering experience. Unless critical to a student's investigation, I suggest using an abstracted profile which is not to scale if simply wishing to present abiotic/biotic data on a profile.

Chi squared is usually appropriate for exploring the significance for abiotics vs biotics. Spearman's is good to explore a relationship between distance and a selected plant species (e.g. marram percentage vs distance from the beach).

Evaluative Issues:

Geographers can be forgiven for mistakenly identifying one plant as another, and there is seasonal variance in plant abundance with certain species easier to identify than others at key times of year (e.g. bright yellow Dandelions in the Spring).

Other strange patterns arise through the microclimates attributed to the ridge to slack variation across a transect. Abiotics can fluctuate across a distance rather than follow a linear increase or decrease (e.g. soil moisture will be greatest in the slacks, wind speed will be greatest at the ridges), with trends regressing a stage due to a return to a previous habitat category. Confused data will frustratingly elude statistical relevance. Savvy students may wish to split their data into two and analyse the ridges and slacks separately.

The end site sees students exploring climax vegetation; oaks, willow, birch. These sizeable trees resist all attempts for sampling with quadrats, so students will need to pragmatically adapt their sampling strategy at this point (e.g photos, sketches, tape measure quadrats).

Abiotic variables such as temperature and soil moisture change throughout a fieldwork day, which may affect results. Students can consider whether simultaneous data collection is feasible/desirable.