

Durham Biodiversity Partnership

Action for Wildlife in Gateshead, South Tyneside, Sunderland, Darlington & County Durham

Research Menu



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Background

Biodiversity Biological diversity, i.e. the variety of life - all wildlife and its habitats. The term embraces the full range of habitats, species, and the variation found within species (i.e. genetic variation) across those areas in which these species and habitats occur or would be expected to occur. Often used to refer to all of the wildlife found within a habitat or area.

Biodiversity Action Plan (BAP) A plan to conserve or re-create biodiversity. The term may be used to describe the whole process by which this happens, the biodiversity action planning process, or sometimes a document that sets out how this is to be achieved.

Durham Biodiversity Action Plan (DBAP) The local biodiversity action plan for County Durham, Gateshead, Darlington, South Tyneside and the City of Sunderland (i.e. most of Watsonian vice county 66 or the pre-1974 County Durham minus the northern part of the post-1974 Cleveland). The term is also used to describe the process by which action is taken locally to conserve wildlife, specifically those habitats and species for which our area has a special responsibility under the UKBAP.

Local Biodiversity Action Plan (LBAP) Local Biodiversity Action Plans are plans drawn up to prioritise and direct action for threatened species and habitats in the local context as well as to deliver the local element of the nationally identified targets. The Department of the Environment, Transport and the Regions (DETR) have determined that amongst the key functions of LBAPs are: ensuring that national targets for species and habitats, as specified in the UK Biodiversity Action Plan, are translated into effective local action and to raise awareness of the need for biodiversity conservation in the local context.

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Durham Biodiversity Action Plan - Student Research Project Menu

Introduction

Aims and Objectives of the 'Menu'

The purpose of the menu is to alert tutors and students to the potential for the development of research projects, in the ecological field, which will help students fulfil their course requirements and to meet some of the research and survey actions required in the species and habitat action plans of the Durham Biodiversity Action Plan.

The menu is intended to be used principally as a guide or stimulus to the development of full project synopses. The project ideas listed could form the basis of undergraduate or postgraduate research projects depending on the scope of each to be adapted. Some project ideas require research over more than one year and will only suit part time students who are able to accommodate a longer-term research project, others could be fitted into a few months. Some projects require field work at particular times of the year, others are more desk based. A few of the projects listed are unlikely to be achieved through student research, but may be fulfilled through the work of specialist volunteers.

Support and Facilitation

In order to facilitate the effective gathering of ecological data relevant to target species and habitats, the Durham Biodiversity Partnership is happy to advise on the development of projects formulated from the topics list enclosed. In many cases the Partnership will be able to advise students on background reading, the availability of other data, previous work, local experts and potential study sites. In some situations the Partnership might be able to assist with the development of a course of study and in exceptional cases might be able to assist directly with the 'broad' supervision of students during the project periods.

It should be borne in mind that the Partnership is not able to secure access to private land, although it may be able to provide contact details of individuals or representatives with whom access can be negotiated. In some instances, as a result of statutory protection, the species involved in some of the suggested research topics would require the formal licensing of surveyors or fieldworkers studying the species. Again, the Partnership can not secure such licensing but might offer its support for individuals seeking it from the licensing authorities, for approved and appropriate research projects.

A wide range of local experts and specialist organisations may be able to assist with elements of the proposed research topics and many of these would need to be consulted for relevant information and data. Amongst these are: Butterfly Conservation, Durham Badger Group, Durham Bat Group, Durham Bird Club, Durham Wildlife Trust, English Nature, the Northern Naturalists' Union, RSPB and the North East Reptile and Amphibian Group.

The Partnership cannot guarantee access for any students to confidential or sensitive material. However, for appropriate programmes of research, assuming the status of the study species/habitat was not compromised by the course of study (and that all guarantees required of the specialist organisation were properly met by the student), then the Partnership would be prepared to act as a supporting advocate to the student, with regards their access to data relevant to the research.

Student Requirements

A number of the study topic areas may require students to possess particular skills or to have access to specialised support facilities, above and beyond the usual academic and research criteria typical for ecological studies, for example the possession of a driving licence or access to transport.

A Request

Academic research on any aspects of the species and habitats listed below, and developed by any of the local educational establishments, is warmly welcomed by the Durham Biodiversity Partnership as a contribution to the delivery of the broad-based agenda of the Durham BAP.

The Durham Biodiversity Partnership requests that, should any of the listed topics be used to formulate student projects, the results of the project work (i.e. the project write-up or, if this is not possible, a project summary detailing results, recommendations and any conservation sensitive data) are made available so that they might be used by the Partnership to further the conservation of the target species/habitats listed in the Durham Biodiversity Action Plan. The Partnership particularly welcomes species records in database or GIS format.

SECTION 1 - RESEARCH TOPICS - SPECIES ACTION PLANS

Mammals

Bats

Undertake a review of all known bat roost locations in the Durham BAP area (or constituent parts of) and relate the distribution of these to significant landscape/habitat features, using GIS. Determine areas with potential for bats (appropriate feeding, roosting areas) but which don't have records. Suggest areas to target for survey work or habitat creation.

Brown Hare

Formulate a mapped distribution of the brown hare in the DBAP area by drawing together all existing records and reports. Identify gaps in distribution and the reasons for these gaps – under recording, observer bias lack of habitat etc.

Establish brown hare monitoring stations at four sites in the Durham BAP area (at a minimum resolution of the tetrad level - i.e. 2 x2 km square). The objective - to determine baseline population status details and then subsequently (through monitoring) to calculate an index of change between years.

Undertake detailed survey of at least three 10km squares, in lowland, mid-altitude and upland locations (and habitats) to determine brown hare status and habitat usage at the landscape level.

Harbour Porpoise

Undertake a review of all local sightings and strandings and collate this information into a detailed report.

Undertake research into mechanisms for reducing by-catch and ghost-fishing of harbour porpoise.

Otter

Undertake detailed survey of all coastal streams and waterways to establish the coastal status of the otter in the DBAP area. Undertake an analysis of habitat, water quality and so on in these streams and compare with data from Northumberland and North Yorkshire coastal streams containing otters.

Water Vole

Undertake detailed survey of an upland area known to hold water voles, to determine status and habitat usage (e.g. the Barningham Moor area or the Rookhope Burn at Rookhope Village), compare and contrast population structure and habitat utilisation with that of lowland populations.

Undertake a mark and recapture trial along length of watercourse known to contain water voles in order to describe movement around a small catchment. Choose a length with barriers such as road and roads with culverts to investigate the ease (or not) with which water voles traverse such barriers.

Birds

Bullfinch

Develop a monitoring scheme/protocol for breeding bullfinch in the Durham BAP area's woodlands.

Undertake a detailed survey/mapping (e.g. territorial mapping and cluster analysis) project to look at habitat utilisation by bullfinch in local woodlands (the object being to determine how woodland management might be changed to produce better bullfinch habitat).

Corn Bunting

Undertake detailed survey/mapping (e.g. territorial mapping and cluster analysis) project to determine local status, produce an accurately mapped distribution (at a high resolution) and provide a greater understanding of habitat utilisation in the District of Easington (or part of).

Curlew

Undertake review/survey of curlew breeding distribution (and breeding density) in both lowland and upland locations of the DBAP area.

Undertake/co-ordinate a survey of curlew numbers at wintering sites at both inland and coastal localities of the DBAP area.

Golden Plover

Develop a monitoring scheme for breeding golden plover in the DBAP area.

Undertake a co-ordinated survey of all key golden plover wintering sites – in order to make an estimate of the local wintering population.

Conduct a baseline survey of breeding golden plover in a sample set of upland breeding areas, in order to establish a long term population monitoring programme.

Look at the exploitation of 'off breeding site' fields by birds pre, during and post breeding. Examine the use of such fields for feeding, day-roosting and determine the nature of the habitat features which attract birds to particular fields (invertebrate prey availability, aspect, distance from breeding site, sward composition etc.).

Grey Partridge

Undertake a co-ordinated survey of the grey partridge in lowland Durham – liaising with landowners and rough shoot managers (using 'bag' information cross-referenced to shooting effort to indicate status) to determine any change in status over recent years.

Undertake a survey of the grey partridge in Durham (or part of) determining breeding distribution, i.e. presence/absence by 1km square or tetrad (2 x 2km).

Monitor grey partridge numbers in the DBAP area, to establish whether the population remains stable, relate this to factors such as agricultural change or 'rough shoot' management (e.g. utilisation of game crops).

Hen Harrier

Review historical and current status via a literature review and liaison with local experts; relate status to the availability of suitable habitat in the DBAP area (research habitat requirements from literature and use GIS/Phase 1 information to determine scale of habitat availability to hen harrier).

Lapwing

Undertake a comparative survey of lowland and upland breeding populations (integrating, for example, breeding density and habitat choice) in the DBAP area (at the 10km level).

Linnet

Look at the ecological requirements of breeding lowland linnet in the DBAP area, relate this to habitat type, as well as landscape and agricultural features (such as crop types grown).

Undertake a survey of breeding linnet to determine mean breeding density and population size within a 'typical' lowland farming tetrad (2 x 2km) of the DBAP area.

Little Tern (ref: Jeff Barber – INCA)

Document the historical status of the little tern in Durham and compare this to the recent breeding successes. Review available data from long term ringing and colour-ringing studies by the Tees Ringing Group and wardens of the local protection schemes. Formulate colony management recommendations from this review.

Merlin

Examine the habitat utilisation and distribution of wintering merlin in lowland habitats in the DBAP area (review of published information, plus field research in key wintering areas).

Nightjar

Undertake detailed survey of the County's main breeding location – examine territorial spacing, habitat utilisation and between year site fidelity (relate these factors to site management and development of management guidelines for the species).

Purple Sandpiper

Assess the impact of the cessation of colliery waste despoilment on purple sandpipers and their habitat along the Durham coast - utilise historical and recently generated data to predict trends in future habitat utilisation and distribution as the marine erosive processes alter the substrate composition overlying local rock outcroppings.

Reed Bunting

Document the current status of the species through the work of DBC, local ringing groups, BBS (Breeding Bird Survey) and other surveys – review any recent changes and identify trends.

Undertake a countywide survey of reed bunting to determine broad distribution and status; compare results to previous information - at a 10km or tetrad level (according to level of detail available).

Undertake a detailed survey of the reed bunting's breeding distribution in Easington District and relate this to habitat availability and how this is utilised.

Rock Pipit

According to published habitat criteria and requirements, identify areas suitable for 'improving' the quality of habitat for breeding rock pipit in the Sunderland/Whitburn area – this work should include the production of plans to minimise impact on breeding birds from disturbance/recreation impact along the coastal strip (e.g. recreational zonation maps).

Undertake a detailed survey of the Tyne-Tees coastline to determine the current status, detailed distribution and habitat usage, of breeding rock pipit.

Undertake a survey of autumn passage and wintering rock pipit numbers at locations along the Durham coast in an attempt to determine the scale of autumn passage and size of wintering population. Relate the presence of wintering birds to the presence of habitat features at key wintering sites (via habitat assessment and recording of recreational pressure/disturbance).

Disturbance to breeding/overwintering birds on coast

Undertake a survey of a breeding birds and or overwintering birds at locations along the Durham coast in an attempt to determine the effects of human disturbance on numbers.

Sanderling

Determine the effect of the sewage treatment improvement programme on sanderling numbers along the Durham and south Tyne & Wear coastline – utilise published data, existing and ongoing research as well as novel observations.

Assess the impact of the cessation of coal waste spoil despoilment of the Durham coastline on the sanderling – utilise historical and recently generated data to predict trends in future habitat utilisation and distribution as the marine erosive processes alter the substrate composition of local beaches.

Skylark

Undertake research to determine distribution and breeding success of skylarks in relation to land-use, e.g. on farmland, industrial land, reclaimed grasslands, waste tips etc. in the DBAP area.

Song Thrush

Document the local status of the song thrush by reviewing the work of DBC, BTO fieldworkers, BBS results, special surveys and ringing data. Collate this and compare to the national situation.

Undertake a comparative study of three breeding populations of song thrush, in urban, suburban and rural locations of the DBAP area; in order to determine whether there are any differences in breeding density and breeding success. Look at issues such as food availability and the impact of predation.

Spotted Flycatcher

Monitor a sample population of spotted flycatchers in nest boxes (recent data also available), at a number of locations in a core area of the local distribution – in order to determine breeding success and outputs in the DBAP area.

Undertake a detailed survey of spotted flycatcher distribution, at the 1km level, in the District of Teesdale. From this, attempt to determine population density and spatial distribution in

relation to apparent habitat availability and actual habitat utilisation (try to relate this to habitat features, such as the presence of glades in woodland, the availability of nest sites etc.).

Tree Sparrow

Develop a monitoring scheme in a sample of nest boxes, at a number of locations in the core area of the species' local distribution – in order to determine breeding success and outputs.

Examine the breeding distribution of the species in lowland Durham (east of the A19) and, using GIS, relate this to habitat quality, combining features such as nest site availability, crop type and hedgerow condition.

Amphibians and Reptiles

Amphibia

Compare populations of a suite of amphibia in ponds with varying levels of fish stock and describe any patterns in the data.

Reptiles

Investigate historical and current distribution data of all reptiles in the Durham area and investigate the relationship between distribution and habitat types at a variety of scales using GIS.

Adder

Undertake a literature review supported by an extensive desktop survey (including the circulation of a questionnaire to land managers, gamekeepers etc) to determine the current status of adder in Durham. In 2005 this work will be supplemented by the launch of a public survey for grass snakes, adders and slow worms across the Durham area.

Identify key sites and habitats for the adder in the DBAP area as a result of collation of survey information.

Undertake a detailed investigation into population size and habitat utilisation by adder at a key site in the DBAP area.

Using known data on historic and current species' distribution and land use, attempt to relate the present known distribution to issues such as habitat loss and loss in habitat quality.

Common Lizard

Undertake a literature review supported by an extensive desktop survey (including the circulation of a questionnaire to land managers, gamekeepers etc) to determine the current status of the common lizard in Durham.

Undertake a survey of literature and sites, to determine the current status of the common lizard in the east Durham area (east of A1M).

Identify key sites for the common lizard in the DBAP area.

Using known data on historic and current species' distribution and land use, attempt to relate the present known distribution to issues such as habitat loss and loss in habitat quality.

Common Toad (ref: John Durkin)

Grass Snake

Using mark and recapture techniques, investigate the population size, structure and distribution (with aspects of habitat utilisation) of the species at the region's key breeding location. Investigate the use of artificially created habitat structures on the site.

Great Crested Newt

Undertake an analysis of habitat surrounding ponds with records of great crested newts (using GIS, aerial photographs and ground truthing). Relate habitat size, type and management with population estimates for each water body.

Slow Worm

Undertake a literature review supported by an extensive desktop survey (including the circulation of a questionnaire to land managers, farmers and gamekeepers etc.) to determine the current status of slow worm in Durham. In 2005 this work will be supplemented by the launch of a public survey for grass snakes, adders and slow worms across the Durham area.

Undertake a county wide survey of potential sites and a review of historical distributional information (input on to RECORDER database).

Reptiles

Investigate historical and current distribution data of all reptiles in the Durham area and investigate the relationship between distribution and habitat types at a variety of scales using GIS.

Invertebrates

Ash-black Slug (ref: Noel Jackson)

Undertake a desktop study, supported by field survey, to determine the current status (and distribution); this baseline data being used to design an ongoing monitoring programme for the species at key sites.

Cistus Forester Moth (ref: Butterfly Conservation)

Survey the current population in the DBAP area in order to establish baseline data (design a monitoring programme using the data collected from the survey as a baseline).

Undertake a feasibility study of the worth of a translocation exercise, which would see the introduction of cistus forester moths to inland Magnesian limestone grassland sites.

Dark Green Fritillary Butterfly (ref: Butterfly Conservation)

Undertake survey work to establish the current status of the butterfly in the DBAP area – by reviewing status (past records and previous occurrences) and undertaking new fieldwork.

Formulate design plans for habitat restoration at known and historical sites.

Dingy Skipper Butterfly (ref: Butterfly Conservation)

Undertake survey work to establish the current status of the butterfly in the DBAP area.

Undertake an assessment of the value of brown field sites for the dingy skipper in the DBAP area – relate this to the potential loss of such sites as a result of the information detailed in Planning Policy Guidance Note 3.

In collaboration with local experts, design a model dingy skipper habitat creation/management programme, which might subsequently be utilised by developers or habitat managers who wish to assist this species.

Glow Worm (ref: Val Standen)

Investigate the local ecological requirements of the glow worm, especially the interaction between the beetle and its host snail species (i.e. which species of snail can the beetle exploit, is this a limiting factor in terms of local distribution?) as well as issues such as habitat structure and mosaic pattern (for example, optimum balance of vegetation to bare ground cover).

Relate observations of glowing females to locations where females are found during the day and investigate any differences in habitat between these locations.

Investigate the effect of environmental cues such as air temperature, cloud cover, light intensity, humidity and moon phase on the glowing behaviour of a population of glow worms.

Investigate and identify habitat and management constraints which might impact upon the glow worm population at the Thrislington grassland NNR, list these and design recommendations by which any constraints might be overcome

Green Hairstreak Butterfly (ref: Butterfly Conservation)

Undertake survey work to establish the current status of the butterfly in the DBAP area – re-visit all known sites and attempt to determine the current status of known colonies in terms of habitat condition statements.

Investigate and identify habitat and management constraints which might impact upon green hairstreak populations at key sites, list these and design recommendations by which any constraints (habitat, financial or temporal) might be overcome – using existing or novel mechanisms.

Honey Bee

Survey the DBAP area for existing wild colonies.

Hellicella itala (ref: Malcolm Birtle)

Survey all known sites and other potentially suitable sites to assess the current status of the snail.

Leiostyla anglica

Continue to monitor known and potential sites, in order to determine current status of the snail.

Lemon Slug

Undertake a full review/survey of lemon slug occurrence in the Durham BAP area, produce a detailed report.

Resurvey and monitor all sites with historical records for this species.

Undertake detailed survey of a woodland site in an area known to be inhabited by the species, such as the Derwent Valley (e.g. Thornley Woods, Chopwell Woods), to determine more about distribution, habitat utilisation and its specific ecological requirements.

Carry out a survey of a sample of ancient woodland sites in Durham (selected as possible lemon slug sites, using habitat and other criteria derived from known occupied sites); the objective being to gain an understanding of how the species might be used as an indicator of ancient woodland status and condition.

Northern Brown Argus Butterfly (ref: Butterfly Conservation)

Undertake ecological research that examines metapopulation structure, a range of the butterfly's ecological requirements such as its relationship with ants, grazing management and mowing management impacts on habitat and food plant.

Assess population size using established monitoring methodologies and attempt to relate the butterfly's numbers to the implementation of management procedures on the habitats comprising the Thrislington Plantation NNR transect.

Round-mouthed Whorl Snail (ref: Northumbrian Water)

Carry out survey work to discover other populations within the broad distributional range of the species.

Small Pearl-bordered Fritillary Butterfly (ref: Butterfly Conservation)

Survey (monitor) population size at a key site in the DBAP area, relate this to management of the site and design a management protocol for creation of appropriate habitat for the species.

White-clawed Crayfish (ref: Durham Wildlife Trust)

'Sample survey' all sites with historical records of the species, closely monitor all sites with verified records in the last 5 years.

Undertake an analysis of habitats in streams in the Balder catchment and relate differences to Crayfish records.

Undertake an intensive survey on the stretch of the river Tees between Cotherstone and Egglestone Abbey to determine presence/absence of crayfish, and ascertain some detail on population density and population dynamics, should animals be found.

White-letter Hairstreak Butterfly (ref: Butterfly Conservation)

Undertake detailed survey work recording ova and adults in some areas known to hold the species, with similar survey work in other suitable habitat at sites where the habitat is appropriate but no records are known – investigation of habitat requirements at occupied sites and using this as a model, postulate a 'potential distribution' for this species.

Undertake a detailed literature review, supported by targeted survey work, to establish the white-letter hairstreak's current status in the DBAP area.

Design a monitoring system to assess population size (e.g. using timed counts) against agreed criteria and established mechanisms, at known colonies so that this might be applied to new colonies and population estimates made.

Fish

Lampreys

Undertake a desktop survey and literature review to determine the current status of the lamprey species in the Durham area. This might be done through a process of liaison with game fishing clubs and fisheries managers (requesting data) to ascertain the status for all local lamprey species.

Formulate a monitoring protocol for lampreys in the Durham area based on the results of any survey work. Trial the survey process

Plants

Anomodon longifolios

Undertake surveys of the known site and other suitable habitat along the river Tees between Barnard Castle and Egglestone Abbey, to determine the extent of the local distribution of this rare moss.

Black Poplar

Study all known native black poplars in the Durham area; take samples for verification of identity (and work with relevant experts to establish this), establish the sex of individuals and establish the age and state of health of each tree.

Create a fully integrated database of verified records of native black poplars, relate this distribution to current and historical landscape features of the DBAP area.

Undertake "genetic fingerprinting" of the existing black poplar population to establish its variability and relationship to black poplars in other parts of the country (especially since Durham is at the northern limit of the range).

Green-winged Orchid (DBAP to consider research – Botanic gardens)

potential sites and conditions

Limestone Ferns (*Dryopteris submontana* & *Gymnocarpium robertianum*)

Monitor the remaining sites and attempt to locate other colonies, in appropriate habitats.

May Lily

Research historical sites – identify potential establishment sites - trial propagation.

Northern Buckler Fern

Survey potential sites for the species.

Royal Fern

Undertake a literature review to determine the full historical status of the species, prepare a database of all known previous locations.

Wood Barley

Undertake ecological research to determine the precise requirements of local plants to flourish *in situ*, determine whether historic sites will support sustainable populations if re-introduced, (by amending management to recreate these conditions).

Yellow Marsh Saxifrage

Undertake ecological research to determine the precise requirements of local plants to flourish *in situ*, determine whether historic sites will support sustainable populations if re-introduced, (by amending management to recreate these conditions).

SECTION 2 - RESEARCH TOPICS - HABITAT ACTION PLANS

Terrestrial & Freshwater Habitats

Hedgerows

By a process of survey, interrogation and literature review identify all ancient and species-rich hedgerows, as well as other hedgerows of high conservation value in the Durham BAP area. Incorporate this data into a GIS database of all hedgerows in the Durham Biodiversity Action Plan Area.

Undertake an audit of the extent and condition of all of the DBAP area's ancient and species-rich hedgerows.

Undertake a range of baseline studies of the flora and fauna of a sample of Durham hedgerows (with particular emphasis on a range of invertebrate taxa).

Undertake a DBAP area landscape assessment, in order to identify areas where the creation of new hedges could bring about significant wildlife conservation benefits (considering issues such as habitat de-fragmentation).

Juniper Scrub (BAP)

Revisit known or historic juniper sites in order to determine the regenerative success or otherwise of various stands. Relate this to environmental and management factors on each site.

Magnesian Limestone Grassland

Undertake a desk top study, supported by supplementary fieldwork, to identify roadside verges that contain relict Magnesian limestone grassland flora. Using an existing GIS database of Magnesian Limestone sites determine a prioritised plan to improve management and species richness on these verges, the aim of which is to secure increased habitat connectivity between isolated Magnesian limestone grassland sites.

Upland Oak Woodland (EN)

By a process of survey, interrogation and literature review identify all semi natural ancient woodlands in the DBAP area that are under 2ha in extent and collate this into a format which would allow incorporation into the region's Ancient Woodland Inventories.

Carry out a range of surveys of key ancient woodland species e.g. plants such as herb-Paris, invertebrates such as lemon slug, as well as fungi and lichens.

Coastal & Marine Habitats

Kelp Beds

Survey the development of underwater plant communities along the coast of Durham as coal waste despoilment gradually clears.

Undertake a comparative study of the rate of kelp bed development in the parts of the DBAP coast that have been unaffected by the tipping of colliery waste e.g. Whitburn Steel and those

areas where development of the habitat has been previously constrained by the presence of coal waste.

Mudflats

By a process of site survey and literature review assess the wildlife importance of all mudflats in the DBAP area (this should include an estimation of both extent and condition – including water quality).

Examine how adjacent industrial developments have impacted upon mudflats in the DBAP area and assess the potential for future impact. Carry out further research into the effects of disturbance of adjacent development on mudflat communities and how this might be minimised.

Develop an assessment protocol for monitoring the wildlife and wildlife value of the mudflats in the DBAP area.

Rocky Shores

Survey the wildlife of the rocky shores along the coastline of the DBAP area; compare areas that have been affected by colliery waste despoilment with those areas that have not.

Identify and monitor the effects of recreation and visitor usage on the wildlife of rocky shores, particularly during the holiday season.

Saltmarshes

By a process of site survey and literature review assess the wildlife importance of all saltmarshes in the DBAP area (this should include an estimation of extent and condition).

Examine how adjacent industrial developments have impacted upon saltmarsh habitats in the DBAP area and assess the potential for future impact.

Sand Dunes

Collect baseline data on the vegetation of the DBAP area's sand dunes in order to undertake a comparative assessment of their condition and as a baseline for future monitoring work.

Undertake an assessment of the rate of dune re-establishment or destruction, and the causes of the latter, in the DBAP area.

Undertake a study of the development of sand dune systems along the Tyne-Tees coastline, with a particular emphasis on the South Shields area, in order to determine what local factors have constrained or assisted (or are constraining or assisting) dune development.

Using aerial photographs, Phase I survey information, archive materials and other available evidence (e.g. site surveillance, local interviews), identify the erosive processes impacting upon local dune systems e.g. those at South Shields. Map the erosion patterns and identify key causal factors. Develop strategies to minimise or mitigate the effects of these factors.

Strandline

Conduct a detailed ecological survey of the strandline which currently exists along the coast of Durham and South Tyneside, to determine its importance for a range of fauna (in particular, invertebrates and birds), examining seasonal variations and the effects of weather.

Sublittoral Sands and Gravels

Assess the ecological importance of local sand and gravel habitats and the requirements of long-lived species and their sensitivity to disturbance.

Determine criteria for identifying significant changes in biodiversity in sublittoral sands and gravels.

Monitor the development of *Sabellaria spinulosa* and horse mussel communities in sublittoral sands and gravels.

Vegetated Shingle

Survey the vegetation at Jackie's Beach (Whitburn) and other areas of vegetated shingle along the Durham coast, document plants present and monitor any change from previous work (literature review).

Wrecks & Reefs

Via a desktop study, undertake a review of the position and potential biodiversity value of all wrecks and reefs off the Durham coast (to 12 nautical miles). Collate this information into a database which might be accessed by, and contributed to, by diving clubs.

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