Environmental education in relation to ecology: the use of field study centres by secondary schools

Wisse, W. N.

ENVIRONMENTAL EDUCATION IN RELATION TO ECOLOGY: THE USE OF FIELD STUDY CENTRES BY SECONDARY SCHOOLS

W.N. WISSE

A dissertation submitted in accordance with the requirements of the University of Durham for the degree of Master of Science in ecology.

Department of Botany and Zoology. September, 1986.

ACKNOWLEDGEMENTS

I wish to thank my supervisor, Dr. P.R. Evans for his guidance and support throughout this study.

Thanks are also due to Dr. R. Hudson of the Geography department of the University of Durham, who helped me to avoid "leading questions" in the questionnaire, and Mr. J. Steele in the computer unit, who advised me on the coding and analysis of the results of the questionnaire.

Drs. B. Huntley and V. Standen supported me during the complete course of the study, for which I am very grateful.

CONTENTS

SUMMARY

Two rather different types of day field centres (Teesmouth Field Centre in Teesmouth and Benwell Field Centre in Newcastle upon Tyne) were visited. Their modes of operation are described and compared.

A questionnaire was despatched to all the secondary schools within a reasonable distance from the fieldcentres. The questionnaire examined whether these schools used the fieldcentres or not, and the reasons for this. The questionnaire also investigated what ideas the teachers had about environmental education, what environmental activities, other than visiting field centres, were followed and what species and habitats need more attention in environmental education.

An important conclusion from the questionnaire was that almost no systematic differences could be found between the answers from different types of school, different types of teacher, teachers with different qualifications or from schools taking different examination levels. There is a reasonable continuity in environmental education from school year to school year at the moment. Many types of day field centres were visited by schools. The surrounding environment and the facilities and equipment a centre can offer were found to be the most important reasons for choosing a certain centre and only a few schools chose a centre because it is the nearest to their school. It appears that all species and habitats are covered in a certain degree. However, many schools which have taught environmental topics will stop this when the new examination level (G.C.S.E.) is introduced.

PREFACE

The topic of this dissertation, namely the use of day field centres in Great Britain, was suggested to me by Heiko Pentenga, advisor for the Institute for Nature Education in the Netherlands. The Netherlands have little tradition of field work of the type offered in countries like the United Kingdom, where the number of field centres has grown enormously since the second world war (Herbert et.al.,1972). During the 1970's fieldwork with pupils and students of primary and secondary schools in the Netherlands was done only incidentally and only by a part of the more enthusiastic teachers. There was hardly any uniformity in approach, methodology or coordination. People concerned about nature education looked for ways of stimulating experience and interest in nature and landscape amongst young people, as well as providing education outside the formal educational system (Stichting Veldstudiecentra, 1985a).

It was for this reason that the Committee for Nature Education advised the responsible Minister in the Dutch Government in 1975 to start the development of field centres. The "Stichting Veldstudiecentra"(Foundation for Field Study Centres) was founded in 1978 and started operating its first field centre in 1981 in Orvelte. At present this is the only "real" field centre in the Netherlands,although other facilities for nature education and environmental education are available. It is a residential field centre which offers mainly courses of more than one day to secondary schools (Stichting Veldstudiecentra, 1985a).

Although field course of only one day are available in the Netherlands -e.g. those run by natural history societies, environmental organisations and the forestry commission- there is no field centre specialized in such short courses. Henk Lindeman -manager of the field centre Orvelte- suggested to me that it would be valuable to study British day field centres without accommoda-

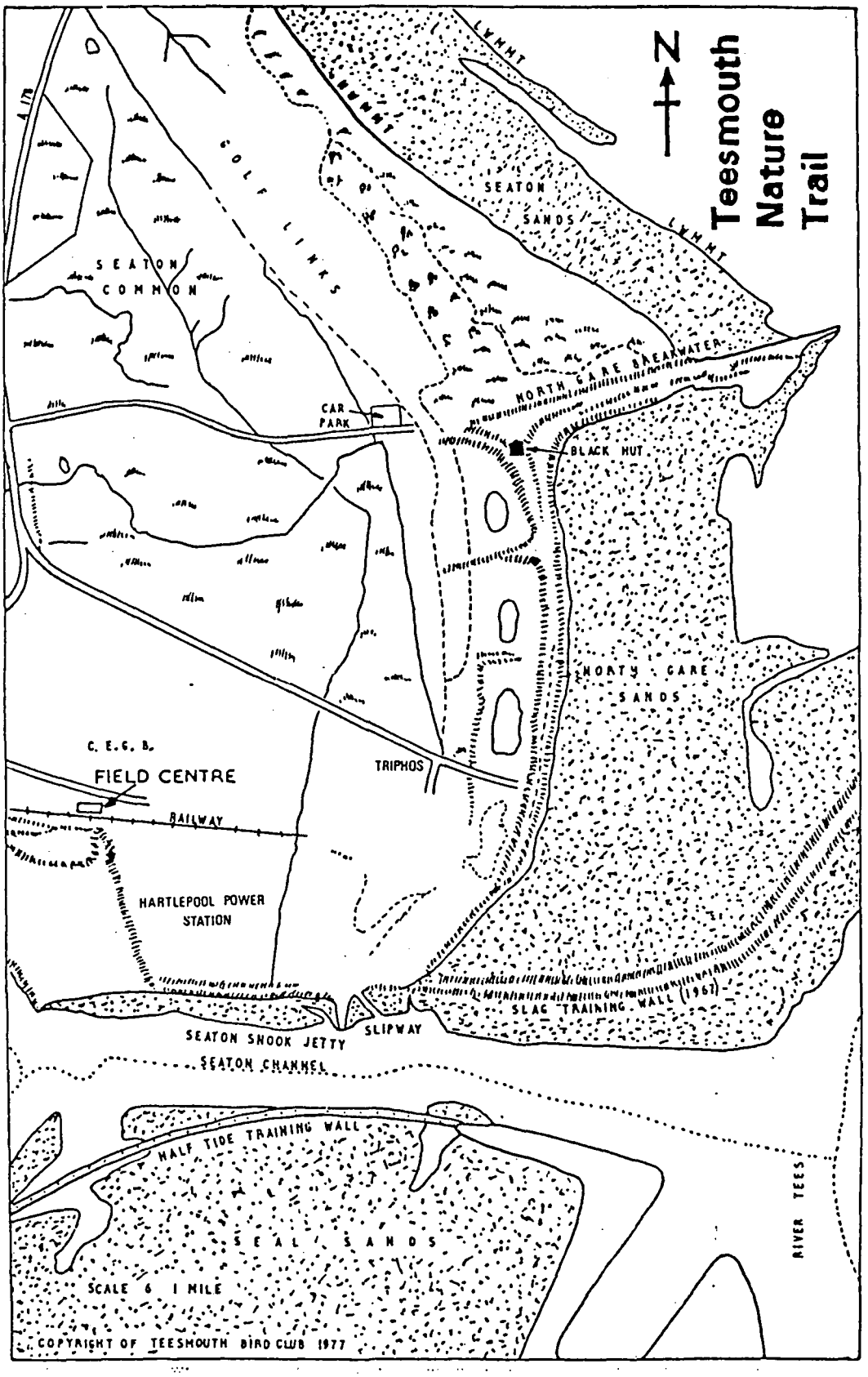
tion, to find out what sort of groups visit these centres, why they chose to visit them rather than going to those with accommodation, how these centres were financed and equipped, what problems they faced, etc. He himself had visited field centres with accommodation in the U.K. in 1984, an experience which he found informative and stimulating (Stichting Veldstudiecentra, 1985b).

INTRODUCTION

To examine the factors determining the use of British field centres (without accommodation), I visited two "day" field centres with different facilities in, or close to, an urban area. I then sought the views of the secondary schools in the two counties closest to each of these centres on their requirements for the study of environmental education, to determine how far the field centres provided for the needs perceived by the schools.

I expected various factors to determine whether a school would use a field centre. Internal factors, within the schools (such as the importance attached to ecology in the curriculum; educational targets; or preferences of the teachers) could play an important role in deciding whether they would plan a course at a field centre. The same factors might also affect any preferences for the type of centre, the educational methods to be used or the scenery or habitats to be studied. However, I also expected that technical factors, e.g. the distance from the school to the field centre and costs of use, might influence the choice of centre to be visited.

The second chapter of this dissertation provides descriptions of the two field centres I visited. The third chapter accounts for the methods and the specific questions asked. The fourth chapter describes the answers to the questionnaire, and the last one evaluates the results.


Teesmouth Nature Trail
N
A19
GOLF LINKS
SEATON COMMON
SEATON SANDS
LYNNT
LYNNT
CAR PARK
NORTH GARE BREAKWATER
BLACK HUT
NORTH GARE SANDS
C. E. G. B.
FIELD CENTRE
TRIPHOS
RAILWAY
HARTLEPOOL POWER STATION
SLAG TRAINING WALL (1967)
SEATON SNOOK JETTY
SLIPWAY
SEATON CHANNEL
HALF TIDE TRAINING WALL
SEAL SANDS
SCALE 6 1 MILE
RIVER TEES
COPYRIGHT OF TEESMOUTH BIRD CLUB 1977

Teesmouth Field Centre

The Central Electricity Generating Board
Hartlepool Power Station, Tees Road, Hartlepool
Tel: Hartlepool 265841

in conjunction with **The Teesmouth Field Centre,**
Mrs. A. L. Cooper, (Secretary),
Wass Bank, Wass, York YO6 4AX
Tel: Coxwold 451

For more information apply to: **Mrs. L. Burn**
(Warden/Tutor), Teesmouth Field Centre
Tel: Hartlepool 264912

Published by **The Central Electricity Generating Board**
Beckwith Knowle, Otley Road, Harrogate

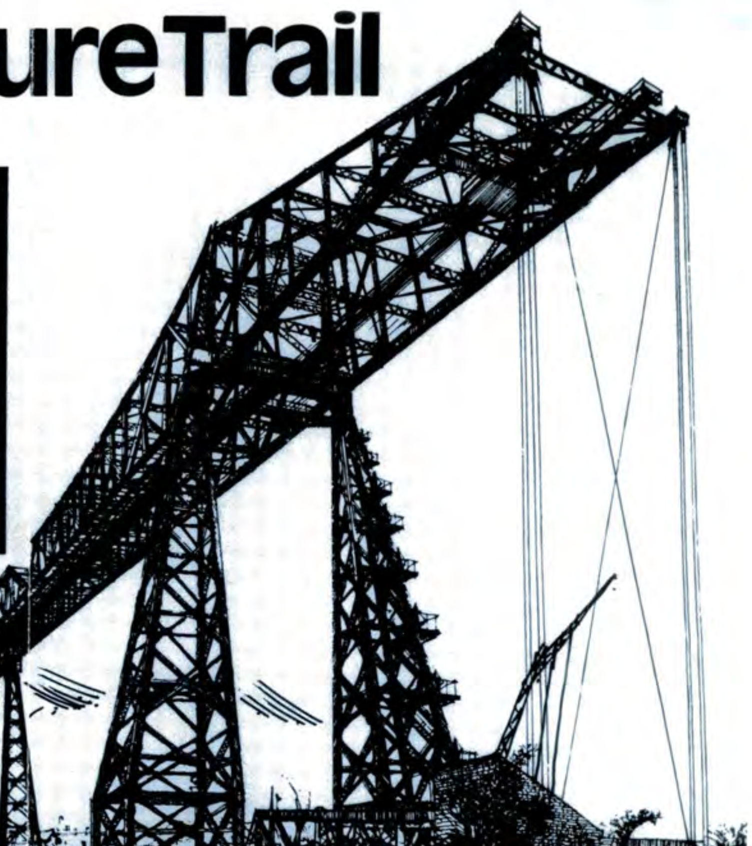
Preparing for the nature trail.

The Teesmouth Tour and Nature Trail

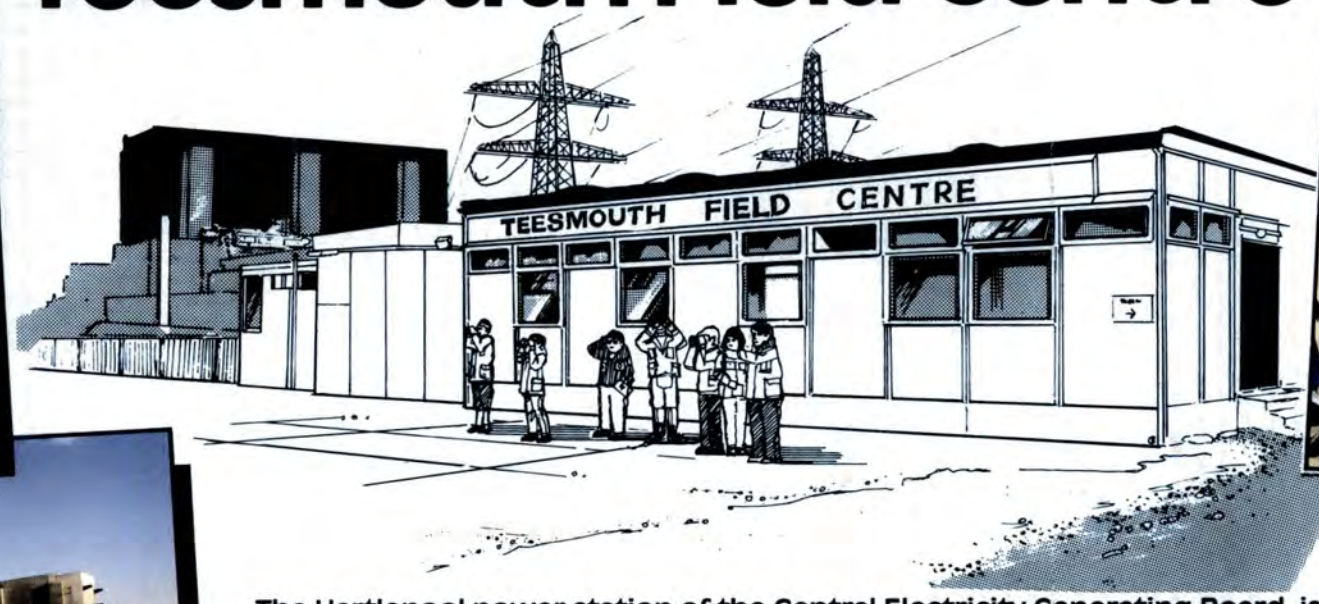
Teesmouth is the obvious and only coastal area for the thousands of Tees-siders who want, indeed need, an area rich in natural history for outdoor relaxation, recreation and study. To schools and naturalists it is indispensable. Wild creatures need it too, for among other things it is a bird 'airport' on the east coast migration route, and contains the only real salt-marsh left along the 200 mile stretch between the Humber and Fenham Flats. Migrant birds of many kinds stop here for shelter, rest and food – including specialised feeders which depend on salt-marsh, brackish pools or mudflats for their very existence. Teesmouth is host also to countless waders and wildfowl which come every winter from the Arctic.

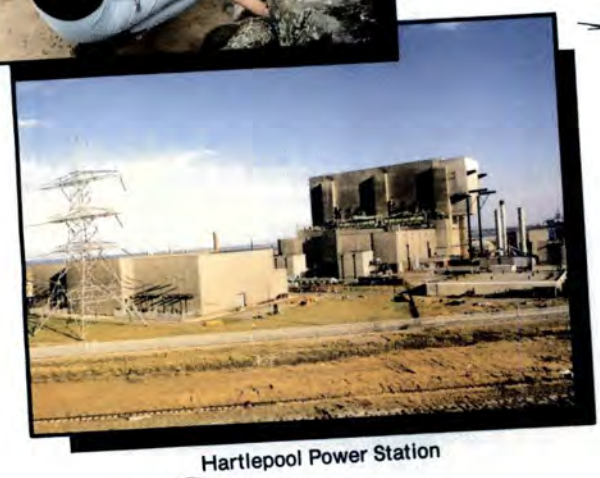
During the last hundred years over ninety per cent of the estuary of the River Tees, originally stretching nearly four miles from bank to bank at its widest point, has been reclaimed, and much of the land has been industrialised. Inevitably feeding grounds for birds have been lost, but the building of slag retaining walls, terminating at the North and South Gare breakwaters has created, in addition to a 'harbour of refuge', new foundations or habitats for plants and other forms of animal life, and also for sand dunes and all that they bring. The area has become of such scientific interest that by 1971, 2,100 acres of mudflats, marshland, dunes and foreshore at Teesmouth were scheduled as Sites of Special Scientific Interest by the Nature Conservancy. In 1969, part of Cowpen Marsh became the first Royal Society for the Protection of Birds reserve in this part of the country. This Reserve is now looked after by the Cleveland Nature Conservation Trust.

To introduce people of all ages to Teesmouth and its ecology a nature trail is followed where the various component habitats of a sand dune system are examined, discussed and recorded. It starts at the Field Centre and takes half a day.
Also undertaken is a tour of Teesmouth starting at the Transporter Bridge and ending at the Field Centre. Stops are made en route at which the present use, reclamation, industrialisation and conservation of the River Tees and land at Teesmouth are examined and discussed.



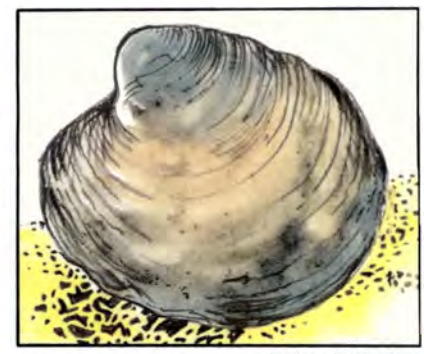
Teesmouth Field Centre



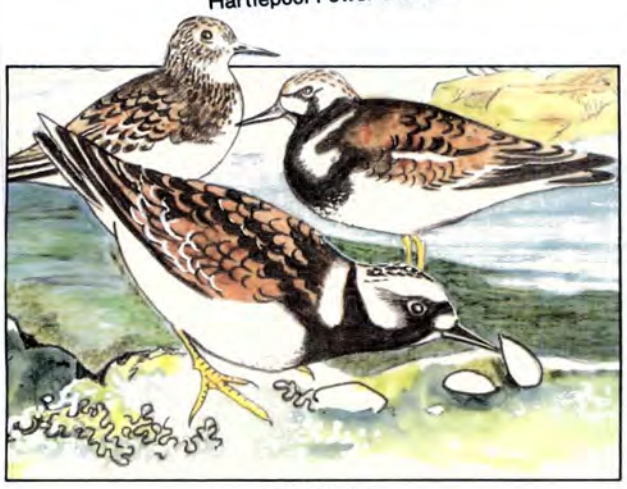


Hartlepool Power Station

The Hartlepool power station of the Central Electricity Generating Board, is bounded on three sides by Sites of Special Scientific Interest. Appreciating the educational value to be derived from studying the effects of building and operating a power station in such an area – which lies within easy reach of thousands of schoolchildren from Teesside and Hartlepool – the Board offered to provide accommodation to be used as a centre for field studies. The Teesmouth Bird Club agreed to help to form a group of seven schools from Hartlepool and Teesside, and they were invited to assist in the creation of the field centre in consultation with the Nature Conservancy and Her Majesty's Inspectors. The Teesmouth Field Centre was opened in October, 1970 by Mr. W. R. van Straubenzee, then Permanent Under-Secretary to the Department of Education Science, and was moved to new larger premises in 1984.



Iceland Cyprina



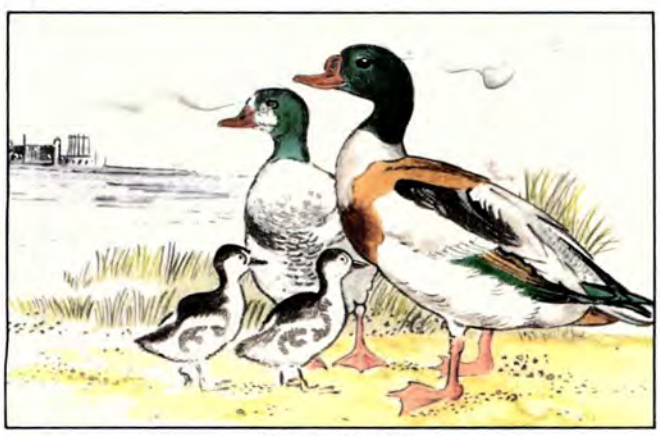
Turnstones

Rock pool finds

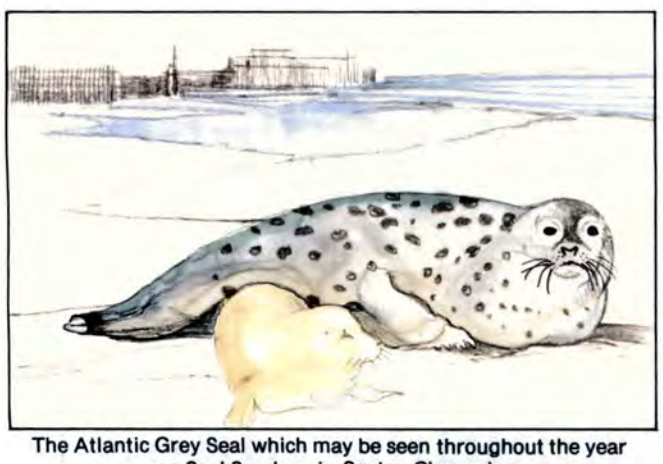
Tide Wrack

Looking at exhibits in the Field Centre.

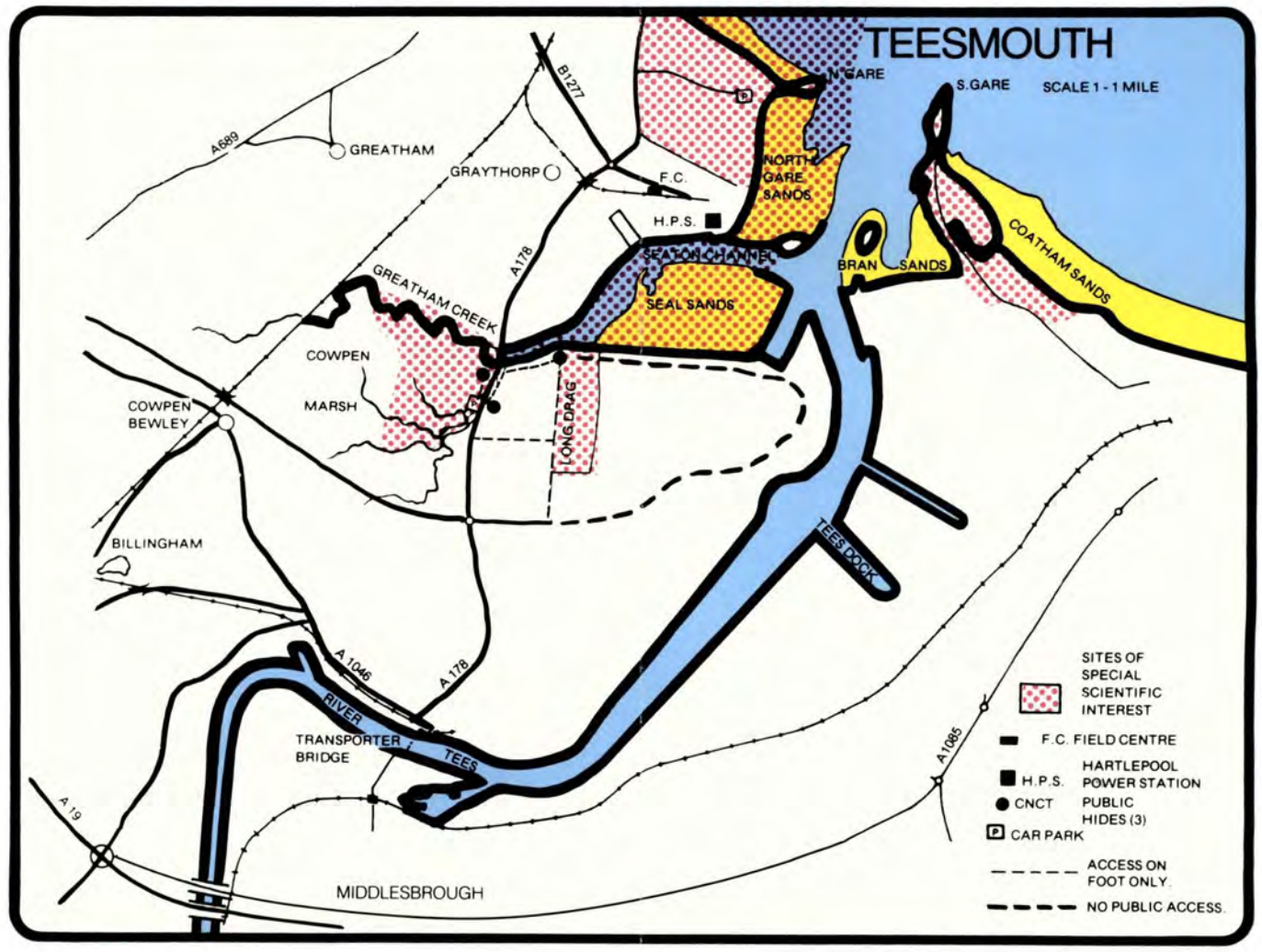
The establishment of this field centre is a stimulus to the interchange of ideas and information. Now fully developed it is visited each year by over 4,000 schoolchildren and members of the general public. It not only introduces people to the area and makes them aware of the need to conserve it, but shows what can be achieved by the working together of representatives of industry, local schools and other organisations – each playing their part – who appreciate the value of their surroundings and the educational opportunities of studying the local impact of industrial change, all in the general context of their responsibility to conserve. It was appropriate that in European Conservation Year the Centre received a "Countryside Award" under the scheme inaugurated by the sponsors of "The Countryside in 1970". The Field Centre is now leased to the Cleveland Nature Conservation Trust by the CEGB and grants to equip and run the centre are provided by County of Cleveland Education Authority. Assistance is also given by the Nature Conservancy Council, and local industry.
Mrs. L. Burn was appointed full time Warden/ Tutor of the Centre in 1977.



Shelduck family



The Atlantic Grey Seal which may be seen throughout the year on Seal Sands or in Seaton Channel.



THE FIELD STUDY CENTRES

THE TEESMOUTH FIELD CENTRE (FOR LOCATION SEE FIG. 1)

The Teesmouth Field Centre is situated in the grounds of the Hartlepool nuclear power station of the Central Electricity Generating Board (C.E.G.B.), which is bounded on three sides by Sites of Special Scientific Interest. Near the field centre are found sand dune systems, sand beaches, rocky shores, intertidal mud flats, marshland and freshwater-ecosystems. The area lies within easy reach of thousands of schoolchildren from Teesside and Hartlepool. Because of this unique position and the educational value this can have, the C.E.G.B. offered accommodation to start a field studies centre. The Teesmouth Bird Club agreed to help to form a group of seven schools from Hartlepool and Teesside, and they were invited to assist in the creation of the field centre in consultation with the Nature Conservancy Coucil and Her Majesty's Inspectors of schools. The Teesmouth Field Centre was opened in October 1970 and moved to new larger premises in 1984. It now consists of a two-room prefabricated classroom building (personal communication, Mrs L. Burn (Field Centre Warden);Teesmouth Field-Centre leaflet).

The aims of the Teesmouth Field Centre are:

1) to encourage and develop the use of Teesmouth for field study and creative endeavour.
2) to create an awareness of man's relationship with his environment and the need for its wise management; in particular, to foster understanding of and concern for conservation.
3) to provide a centre for interchange or relevant information and ideas.

USE

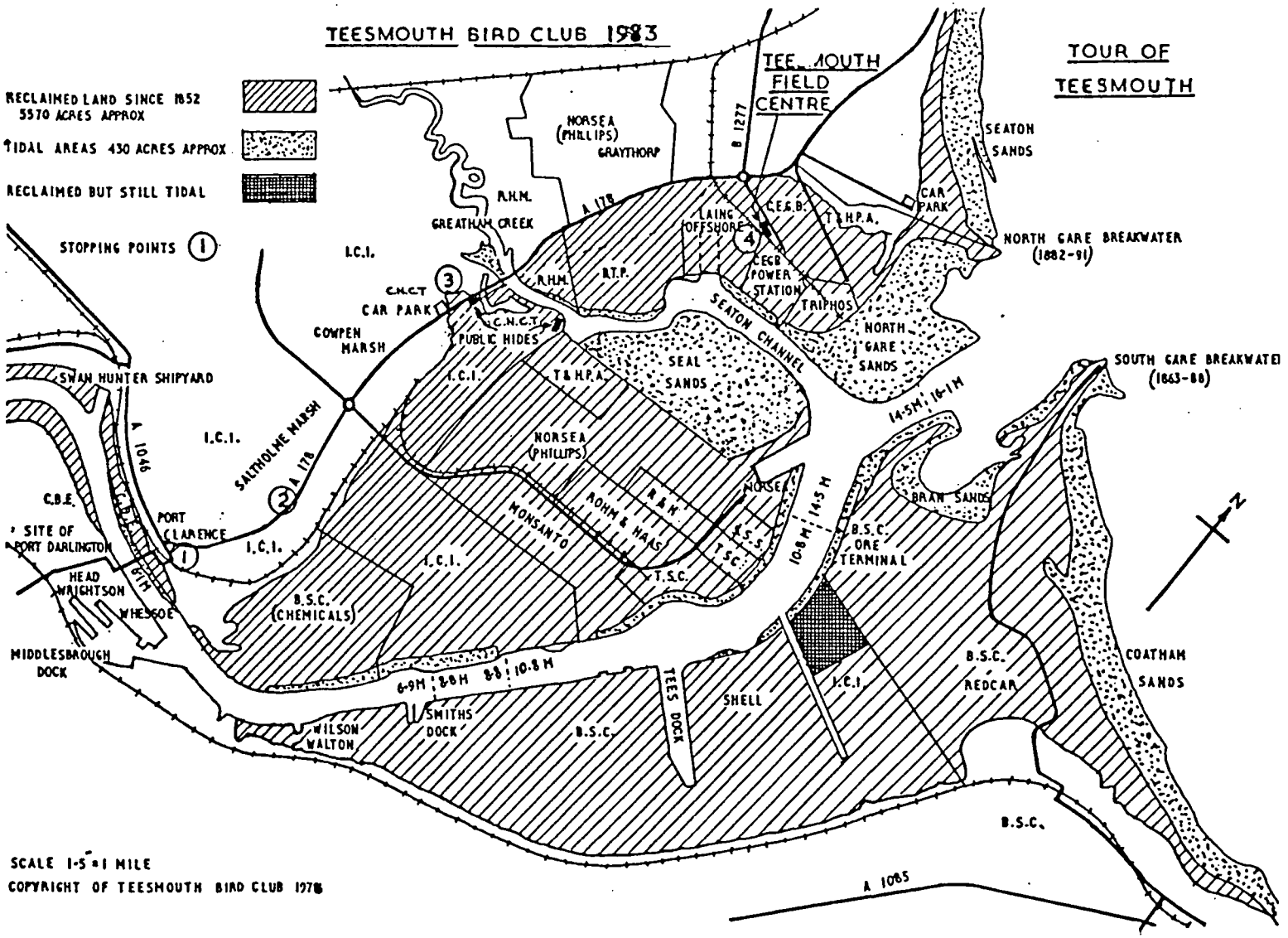
Now fully developed, the centre is visited each year by over 4000 schoolchildren and members of the general public. People of almost all ages visit the centre, from 6 to 90. The main users are the schools, which visit the centre during the week. At the

week-end, the centre is used by recreational groups, scouts, women's institutes and even groups like "winemakers". Traditionally the centre has been used more by primary schools but now this pattern is changing; secondary schools are coming much more often. Nowadays ±60% of the visitors are between 7 and 11 years of age and about 25% are from secondary schools.

The centre provides teachers' courses. These are also a key element in public relations. When the centre started the organizers used advertising to make the centre better known, but now this is not necessary. Courses for head teachers are especially important. When the head teacher is interested in the work done at the centre, it is easier for the rest to persuade him or her to let the school attend a course at the centre. The maximum size of the groups that the centre can accommodate is 60. With large groups it is expected that teachers help the staff of the centre. The maximum groupsize is dictated by the vulnerability of the habitat (the group size is limited to less than 60 when working in the sand dunes) and the behaviour of the pupils! Most school groups come from within 20 miles (30 km) of the centre (80% from Co. Cleveland, 10% from Co. Durham, 10% from Co. North Yorkshire), mostly by bus. (personal communication, Mrs L. Burn).

COURSES

Different programmes of study are available. After discussin with the teacher, an appropriate programme is selected for each course, which consists of one or more day visits. Most courses start with an introductory visit. This cosists of a Tour of Teesmouth (using the same bus that the group used to come to the centre) and a Nature Trail. Both the Nature Trail and the Tour aim at introducing pupils to the techniques of observing in the field and making deductions and also, in the case of the Nature Trail, to the basic principles of ecology.


TEESMOUTH BIRD CLUB 1983
TOUR OF TEESMOUTH
TEESMOUTH FIELD CENTRE
RECLAIMED LAND SINCE 1852 5570 ACRES APPROX
TIDAL AREAS 430 ACRES APPROX
RECLAIMED BUT STILL TIDAL
STOPPING POINTS
NORSEA (PHILLIPS) GRAYTHORP
B 1277
SEATON SANDS
CAR PARK
NORTH GARE BREAKWATER (1882-91)
R.H.M.
GREATHAM CREEK
A 178
LAING OFFSHORE
C.E.G.B.
T & H.P.A.
I.C.I.
C.N.C.T CAR PARK
R.T.P.
CEGB POWER STATION
TRIPHOS
COWPEN MARSH
PUBLIC HIDES
SEATON CHANNEL
NORTH GARE SANDS
SOUTH GARE BREAKWATER (1863-88)
SEAL SANDS
SWAN HUNTER SHIPYARD
A 1046
SALTHOLME MARSH
NORSEA (PHILLIPS)
14-5M 16-1M
C.B.E.
PORT CLARENCE
AOHM & HAAS
MONSANTO
R.A.H.
NORSEA
BRAN SANDS
SITE OF PORT DARLINGTON
B.S.C. ORE TERMINAL
HEAD WRIGHTSON
WHESSOE
B.S.C. (CHEMICALS)
T.S.C.
10-8M 14-5M
MIDDLESBROUGH DOCK
6-9M 8-8M 8-8 10-8M
B.S.C. REDCAR
COATHAM SANDS
WILSON WALTON
SMITHS DOCK
TEES DOCK
SHELL
A 1085
SCALE 1·5" = 1 MILE
COPYRIGHT OF TEESMOUTH BIRD CLUB 1978

The Tour of Teesmouth (Fig. 2) starts at Port Clarence and ends at the field centre. Three stops are made en route. At each, the past and present land use, reclamation and conservation and surrounding areas are examined and discussed. The pupils / students get out of the bus at some stops. This Tour takes approximately half a day.

The Nature Trail (Fig. 1) is an ecological trail, in which the various component habitats are examined, discussed and recorded. It starts at Teesmouth Field Centre with an introductionary talk and takes half a day. During summer and autumn Junior and Secondary pupils follow this with a Nature Trail booklet provided by the field centre. Both the Nature Trail and the Tour of Teesmouth follow a fixed and standardized programme. However the levels of explanation and discussion can be adapted to the scientific level of the students, a decision which has to be taken by the teacher involved. Specific topics that can be studied in more depth are, e.g. the co-existance of wildlife and industry, the river, water pollution, or the seashore (personal communication; mrs 1. Burn).

After the visit to the Nature Trail and the Tour of Teesmouth, follow-up and specialist visits are often made by secondary schools with 'O' and 'A' level students. These visits enable teachers to expand upon the introductory experience. Different schemes can be followed depending on the school's syllabus. Students can record field data and process these data into meaningful ecological or environmental deductions. They can learn techniques to be used to study habitats by means of Line Transacts, Belt Transects and quadrats, and so quantify ecological succesion in different areas, e.g. sand dunes and salt marshes. Other techniques to be learned include species identification in ornotholo-gy, botany, freshwater biology and marine life on a rocky shore. Beside these possibilities, some 'O' and 'A' level teachers have particular projects in mind and use the field centre as a base, often employing one or more of the above study schemes in their work.

EQUIPMENT

The centre has the following equipment available for use by schools; binoculars, binocular microscopes, thermometers, hydrometers, magnifying glasses, sieves,beakers, trays, quadrats, rulers, pH paper, etc. Most of the equipment is for use in the follow-up visits and it is an important fact that for most fieldwork (especially for the primary schools) very little equipment is needed, so that the costs of equipment are of a minor importance when a centre is started (personal communication Mrs L. Burn).

ORGANIZATION

The buidings of the Teesmouth Field Centre are owned by the C.E.G.B. but the organisation is in the hands of the Teesmouth Fieldcentre Management Committee. This Management Committee consists of local teachers from primary and seconary schools, and representatives of the C.E.G.B. and the Teesmouth Bird Club. The educational sub-committe produces the worksheets. The fieldcentre does not charge the visiting schools for tuition or facilities; the only costs for the schools are the transport costs. The County of Cleveland Educational Department provides a grant for equipment but the salary for the only paid staff member is paid by local industries.

Benwell Nature Park

Benwell Nature Park is an exciting new concept in environmental education; it is a 5 acre pocket of countryside within the heart of the city of Newcastle!

The Nature park is not a typical park – it is simply an area in which a variety of natural habitats have been created : a pond, marsh, meadow and hedgerows, varied woodland areas, limestone and sandstone outcrops which the wildlife of the area has begun to colonise. There is also a tree nursery and a herb garden beside the Park's building.

These varied habitats provide opportunities for acclimatisation and first hand learning experiences without expensive and time consuming long distance travel. Thousands of schoolchildren have already visited the Park for practical planting and maintenance work and for lessons on the environment they have created.

The Park is unique – it has been created by the local community, groups of volunteers and mainly the city's schoolchildren. More than 15,000 young trees and shrubs have been planted, the meadow sown with grass and wild flowers and the pond stocked with plants and animals.

The Nature Park is run by a teacher and a field officer, together with a long term volunteer who also runs the Nature Club. The teacher has overall responsibility for the Park and is developing its educational potential for the schools, colleges and people of the city. The field officer is responsible for the planting and outside maintenance and the organisation of practical activities such as tool repairs and boardwalk construction.

Benwell Nature Club meets at the Park each week, youngsters from 6 years upwards are involved in many practical conservation projects within the Park, the neighbourhood and the surrounding countryside. The club is run by local volunteers.

Conservation Volunteers field officers, each funded for 12 months by Manpower Services Commission finance, supervised planting and maintenance operations in the early years.

◀ *Benwell Nature Club clearing a stream near Haltwhistle.*

▲ *Mike and Graham putting their bird table in the Park's herb garden.*

◀ *Nature Club leaders Paul, Mick (also the field officer and John working at Newburn).*

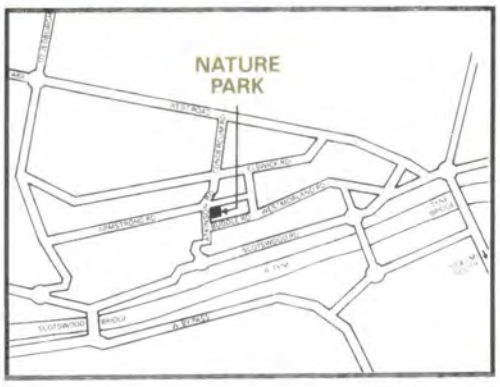
Benwell Nature Park is run by the Education Department of City of Newcastle upon Tyne.

Further information:

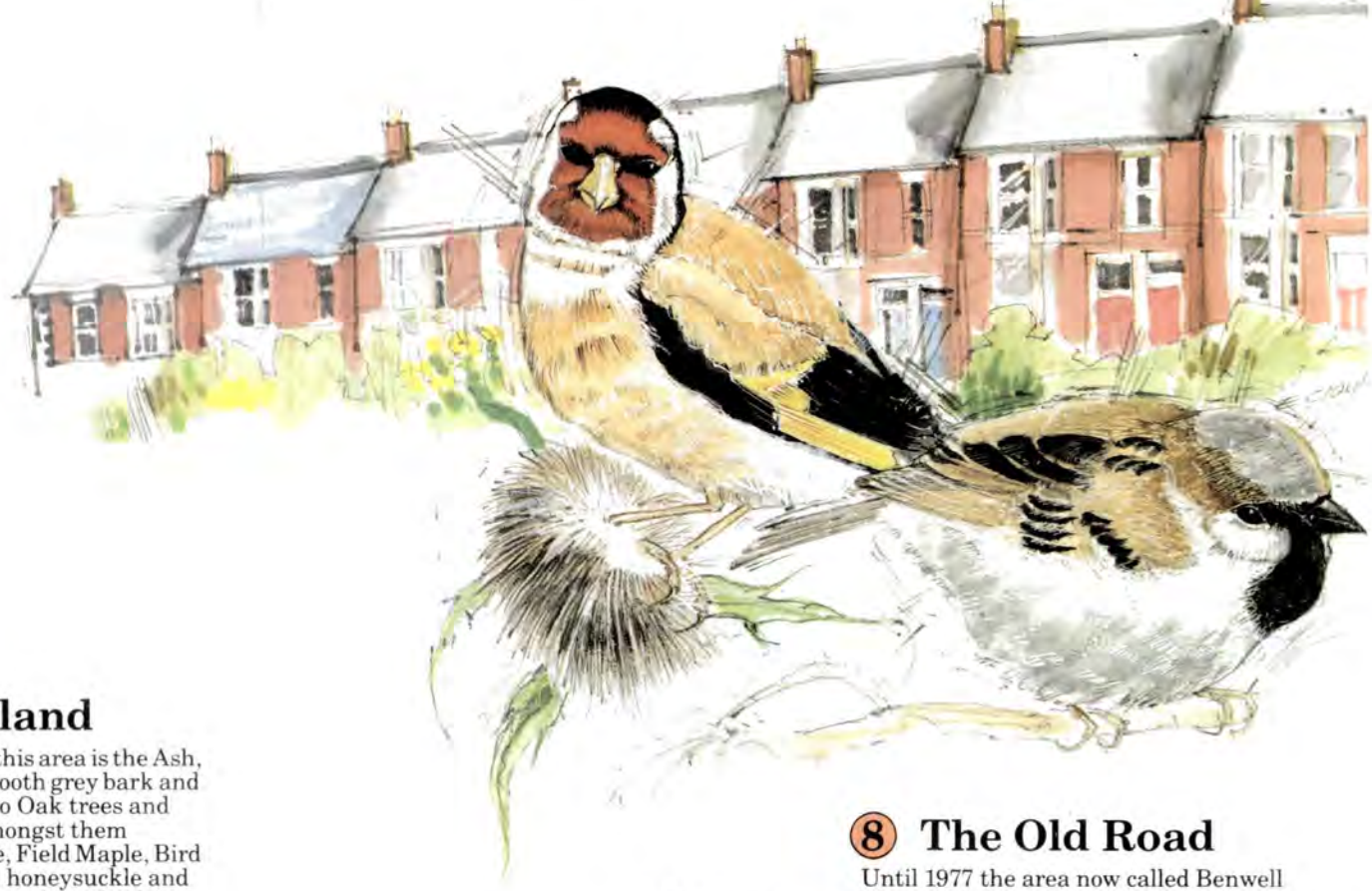
Benwell Nature Park &
Benwell Nature Club Atkinson Road,
Benwell, Newcastle upon Tyne NE4

Tyneside 273 2983

We look forward to seeing you at the Nature Park!



BENWELL NATURE PARK



1 The Tree Nursery

The tree nursery was laid out over the summer of 1983. Volunteers constructed the fence and hung the gate and local helpers prepared the beds using granite kerbstones from the former Joan and Helen Streets.

Each bed contains topsoil ideal for the growth of young plants. Tree and wildflower seeds collected locally are germinated and grown on in the nursery. Here they are weeded and watered until they are ready to be transplanted out into the Nature Park or other similar projects.

2 The Meadow

This area is being developed into a diverse and colourful meadow with many different types of grasses and wildflowers such as poppies, cowslips and meadowsweet. It will be cut once or twice each year after the plants have flowered and produced seed. Subsoil has been used since this hinders growth of aggressive plants like thistles and nettles which might otherwise smother the more vulnerable wild flowers.

When mature, the meadow will support a wide range of fauna such as butterflies, snails and beetles which will in turn provide food for hedgehogs, moles, woodmice and frogs.

3 The Rockery

The boulders of Magnesian Limestone were brought in from a quarry at Marsden Bay. The limestone was formed over 200 million years ago when the region (including Benwell) was covered in a warm sub-tropical sea! Strange rounded nodules can be seen on some of the boulders which give it the name 'Cannonball Limestone'.

The rockery will contain wild plants like Rockrose and Scabious which prefer a sunny position and a well-drained alkaline soil. In the shady nooks and crannies ferns and mosses will grow and small creatures like beetles, ants and snails will find a home.

The sandstone has been salvaged from the foundations of the old Redheugh Bridge.

4 Scot's Pine Woodland

All the plants used are native to the British Isles, i.e. they grow here naturally and have not been brought in from other countries by man. Native plants support a greater variety of our wildlife than introduced species.

This woodland area consists of Scots Pine, Silver Birch, Rowan, Broom, Gorse, Juniper and Bilberry which occur together in the wild. This type of woodland is found in the highland forests of Scotland and Northern England.

5 Ash Woodland

The predominant tree in this area is the Ash, with its characteristic smooth grey bark and black buds. There are also Oak trees and many native shrubs – amongst them Guelder Rose, Crab Apple, Field Maple, Bird Cherry and the climbers, honeysuckle and ivy. The taller staked trees or 'standards' are invaluable bird perches but will soon be outgrown by the smaller 'whips'.

As in natural woodlands there are decaying logs housing a profusion of life, e.g. mosses, fungi, and many small animals. In the piles of dead branches some birds, including Reed Buntings have nested.

6 The Hazel Coppice

Coppice comes from the french word **couper** to cut – coppicing being a traditional form of woodland management. Coppices are woodlands cut on a short rotation and the wood harvested. The cut wood or 'underwood' was used for charcoal burning, wattles for building and fencing, thatching spars, and tool handles. The trees respond to cutting by sending up multiple stems from the stool. Coppicing increases the wildlife value of the woodland by maintaining a structural diversity.

It is intended to manage this area as a hazel coppice by cutting on a 12–15 year rotation and using the wood for some of the traditional crafts named above.

7 Wasteland Plants

A fascinating variety of Plants can be found below the pond, an area left untouched so that the contrast between this and the carefully managed meadow can be studied over the years.

Plants include Pineapple weed, Teasel, Scentless Mayweed, Scarlet Pimpernel, Weld, Sun Spurge, and Speedwell. There are also garden 'escapees' like Opium Poppies.

Hundreds of Large White Butterfly caterpillars have been found on a single Hedge Mustard plant and the brilliant red spotted Burnet moth is common in summer as are the popular and beautiful Ladybirds and Goldfinches.

8 The Old Road

Until 1977 the area now called Benwell Nature Park was covered with terrace housing. The only remnant is this part of the former back lane between Atkinson Road and Helen Street, built around 1905. It is gradually being colonised by Red Clover, Dandelion, Shepherds Purse, Groundsel and Plantains and makes a fascinating study of how plants colonise man made landscapes.

PLAN OF THE PARK

9 Oak Woodland

Up until two thousand years ago the whole of the Tyne Valley may well have been covered in mixed oak woodland.

Both native oak trees are present here – the English and the Sessile oak. There are also Ash trees and the Wild Cherry with its attractive Spring flowers.

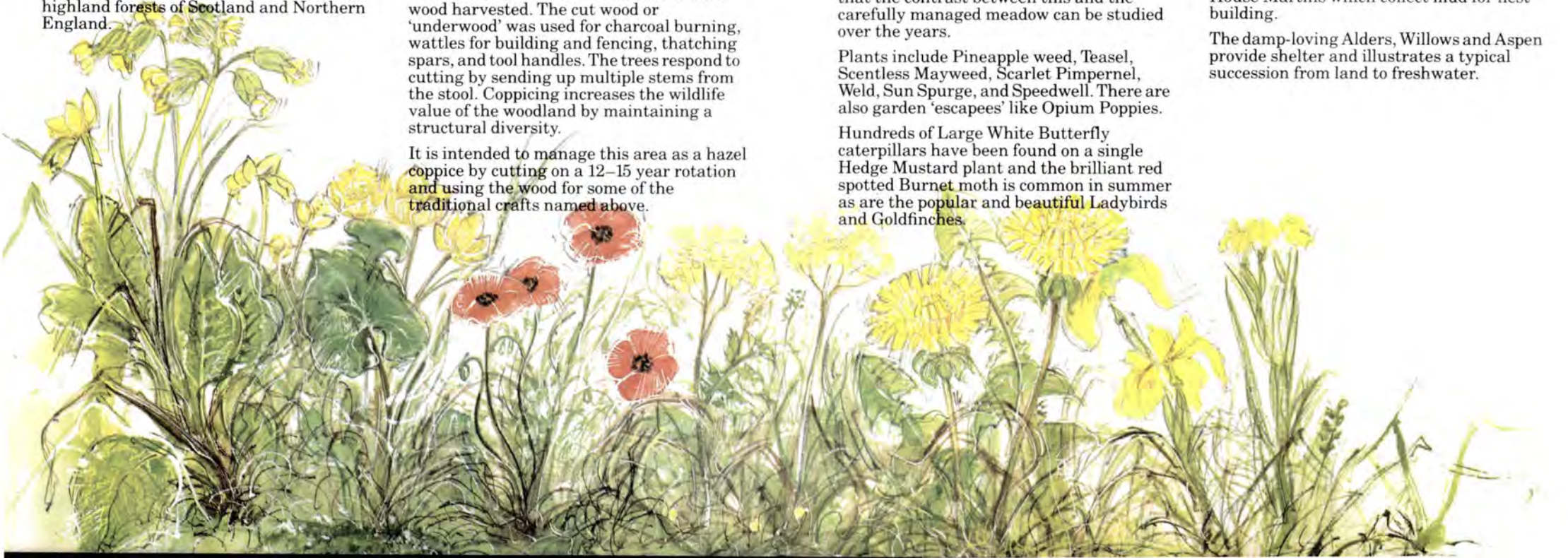
Around the woodland edge are shrubs like Blackthorn, Dog Rose and Brambles all of which produce flowers and fruits highly valuable to wildlife. They also form dense spiny thickets which provide protection from predators.

10 The Pond

Formed by earth moving machinery in the summer of 1982, the pond rapidly filled with rainwater and the clay soil has formed a natural waterproof lining.

A great variety of plants have been brought in from surrounding ponds by local children – amongst them Marsh Marigolds, Yellow Irises, Purple Loosestrife and various aquatic plants. Many different pond animals have established themselves and frogs have been introduced. In the summer many birds visit the pond to bathe and drink including House Martins which collect mud for nest building.

The damp-loving Alders, Willows and Aspen provide shelter and illustrates a typical succession from land to freshwater.



BENWELL NATURE PARK FIELD CENTRE

The Benwell Nature Park was created in 1982 on a 2 ha site formerly occupied by terraced housing in the Benwell district of Newcastle upon Tyne. With help from the City Council, the British Trust for Coservation Volunteers and the Nature Conservacy council, children from Newcastle and adults from all over Tyneside have developed the park. After replacement of the top soil over 16,000 trees have been planted, and a pond built and stocked. Paths, rockeries, flower beds, herb gardens, a tree nursery, a dry stone wall and a meadow have also been made. A prefabricated building has been erected and the area around it paved (Nature Conservancy Coucil, 1986). The building consists of one large classroom and another large room for equipment storage (for the maintenance of the park, etc.).

The aims of the Bennwell Nature Park Field Centre are:

1) to use the child's environment as a learning medium and to provide as many different habitats for wildlife as possible within the city.
2) to use the existing urban environment around the park as well as the habitats within the park as learning tools for envronmental education.
3) to provide opportunities for work experience for people older than 15 (personal communication, Mrs J. Mc.Carthy).

USE AND COURSES PROVIDED

During the summer terms, between 250 and 300 children a week visit for a morning or an afternoon sessions or lessons. Some groups come only once, others visit the centre regularly during school term, on one morning or afternoon each week. The youngest groups consist of four and five year olds. They explore and discover the colour, shape, texture and smell of plants. This is done by means of handicraft and drawing lessons. Older, primary

schoolchildren learn about the functions of plants, simple aspects of the ecosystem, food chains and webs, and about the history and functions of the surrounding urban area. Apart from using and observing plants and animals and studying the local buildings and traffic movements, they are also provided with prepared identification sheets, work sheets, maps, town plans, aerial photographs and textbooks. All these pupils are also involved in practical work like planting trees, sowing seeds, pricking out seedlings, and other activities. Because they feel the park is theirs, there is little vandalism in the park itself (Nature Conservancy Council, 1986). For the primary schools the centre is used not only for fieldstudies but also for language lessons, calculations and other activities strongly linked with the field study work. Mostly the visiting group size is the size of the whole class, 20-30 pupils, but occasionally groups of 60 children visit the centre. The pupils' own teacher is always present at the lessons and is normally supposed to help with them. The programme / topic that is to be taught during a session is discussed by the Centre staff with the teachers beforehand. It is important to note that the programme is not standardized so that a special course is made for each visiting class. This is possible because most classes are from local schools and are often visited beforehand by the staff in charge of the Centre. When this is not the case, at least the teacher is asked to visit the the Centre to discuss the programme. Because the Centre is in the city itself, most children come to the Centre themselves or by public transport (personal communication, mrs J. Mc Carthy).

The majority of the children visiting are of primary age, but the Centre can make a contribution to Integrated Studies for 12-13 years olds from comprehensive schools as well. The main problem with provision for secondary schools is their fixed timetables. This is the main reason why they do not visit the Centre as often as primary schools. The Centre provides the opportunities for 4^{th} and 5^{th} years olds to develop rural skills on work experience. This has been developed in conjunction with the local Careers Office and with staff of the Training and Vocational Education Initiative Projects. Others attend as part of the Certificate of Secondary Education Community Service (Nature Conservancy Council, 1986).

In-service courses, aimed at teachers of primary and middle school age groups, have been held each summer term. These meetings are also very important for the recruitment of new groups. The sessions are practical, aimed to give the teachers more experience so that they feel confident when they bring their own classes for lessons. In the future much wider-ranging courses are planned in conjunction with local conservation organisations and others working in the field of environmental education (personal communication Mrs J. Mc Carthy; Nature Conservancy Council, 1986).

The centre also provides adult course which include afternoon workshop sessions for the community. The subjects covered range from tool repairs, maintenance to herb growing and wild flower trails. Another important aspect of the Centre is the Benwell Nature Club, a group of about 40 children between 6 and 15 who are actively engaged in practical conservation projects within the park and the surrounding countryside (Nature Conservancy Council, 1986).

EQUIPMENT

The equipment of the Centre and Park can be devided into equipment for maintenance of the park, like spades, forks, wheelbarrows and wellingtons, and equipment for educational use. That for primary schools is very simple and cheap, in fact wellingtons are enough for most of the work! For secondary schools, however, quadrats, squares, pond nets, magnifying glsses, white trays, identification keys, soil testing kits, sieves and some microscopes are used (personal communication Mrs J. Mc Carthy).

ORGANIZATION

The Centre is led by a teacher in charge (Mrs J. Mc Carthy), who is responsible for educational matters, and a field officer, responsible for the maintenance of the park. A large contribution is also made by a group of volunteers from the surrounding district. Decisions are made after discussion between staff and volunteers. The Centre and the Park, which were set up by the Educa-

tion Department of Newcastle upon Tyne, in partnership with the British Trust for Conservation Volunteers and the N.C.C., is funded by inner city parnership schemes and a reclamation grant. The running costs are about £5000 annually (£2500 til 1985). Newcastle Education Department pays two staff and the costs of the Centre, allowing students and visiting groups to visit the Centre free of charge (personal communication Mrs J. Mc Carthy).

A COMPARISON BETWEEN THE TWO DAY CENTRES

Major differences can be seen between the two centres in situation, distance from centres of populations, function, users, types of courses, finances and equipment. The Benwell Field Centre is situated close to the centre of a city, while the Teesmouth Field Centre is situated a few miles away from the nearest town. This has some important implications for the functions and the ways in which the centres work.

The Benwell Field Centre has a strong local function, while the Teesmouth Field Centre has more of a regional function. The local function of the Benwell Field Centre makes it possible for the schools to return to the Centre regularly. The Centre is more or less a part of the schoolgrounds and also has an important social function for the local community. Because it is situated in the centre of a city and almost all the visitors come from neighbouring areas of the city (i.e. they are visitors who do not often come in contact with the "green" aspects of the environment) the Centre also puts much emphasis on the less academic aspects of environmental education, like planting trees, sowing seeds and other rural skills.

The Teesmouth Field Centre is situated between 3 Sites of Special Scientific Interest which are relatively stable and unmodified compared with the Benwell Park site, which has only recently been established on grounds that were until recently terraced housing areas. The different surroundings of the two centres have implications for the type of work that can be undertaken by

the groups that use them. Because the vegetation on the Benwell park areas has only recently been planted or established, the Benwell Nature park is relatively less interesting for ecological or biological studies at the secondary school level (although ofcourse not impossible!). In contrast, the Teesmouth Field Centre is extremely useful for academic work in ecology or field biology because of the many different habitats surrounding it. However, the fragile nature of some of the habitats at Teesmouth also makes it necessary to control the type of work that is done. Another disadvantage of Teesmouth is that there are restrictions imposed by landownership on where the schools may go. Benwell Park does not have these disavantages, all their habitats are on their own grounds and accessible via pathways.

Courses of Teesmouth Field Centre often work with standardized worksheets, although a variety of less standardized follow-up projects can be chosen. In contrast the Benwell Field Centre creates a special course for each visiting class. This is possible because the classes and schools visit the centre very regularly and the staff of the centre come to know the level and abilities of the pupils very well. Both methods are valuable. The Teesmouth approach is indeed very necessary for visiting school classes whose academic level is unknown, and the material used can be sent to the schoolteacher beforehand so that he can prepare the class for the visit to the centre. Because the classes using the Benwell Field Centre are known to the staff of the field centre and they also know exactly what the needs of the children are, their method is better in their situation.

The organization of the Teesmouth Field Centre is in the hands of a very broad committee, consisting of local teachers and people from the C.E.G.B. and the Teesmouth Bird Club, whereas the decision-taking in the Benwell Field Centre is done by the staff only (after discussion). Both approaches are valuable. The Benwell approach is less time consuming but the Teesmouth approach creates possibilities for introduction of teaching material from people in industry, natural history and conservation, with more

specialized knowledge.

The Teesmouth Field Centre has more equipment than the Benwell Field Centre. This can be explained partly by historical reasons: it is older and has had more time to collect equipment. Besides this, however, it was started in an economically flourishing period - the early 1970's. Because the Teesmouth Field Centre has a more academic approach and gets more secondary schools it also needs more equipment, which the staff has been stimulated to aquire. However, both centres stress that field centres can be operated without necessarily possessing a lot of expensive equipment.

In both centres the users do not have to pay. The Benwell Park is owned by the city of Newcastle, and funded by a reclamation grant and city partnership schemes, while the staff is paid by the Newcastle Education Department. The buidings of the Teesmouth Field centre are provided by the C.E.G.B. and the staff paid by local industries. Both systems have benefits and disadvantages. Because the staff of Teesmouth Field Centre are dependent on funding by local industries, it could be difficult for those staff to be really critical of the industries. However in a time of financial cuts by local education departments, The Teesmouth Field Centre might in the long term be in safer hands than the Benwell Field Centre.

Summarizing, we can say that both centres are of great value, the Benwell Field Centre mainly because it provides a "green spot" in a "grey" environment and gives people opportunities to explore this environmental island, the Teesmouth Field Centre because it gives people opportunities to look more closely at environments that they would not otherwise be able to study in depth fairly close to their homes.

METHODS AND REASONS FOR ASKING THE QUESTIONS

The questionnaire has been designed in cooperation with the staff of both visited field centres. For several reasons, I chose to produce a questionnaire for teachers of environmental topics rather than a questionnaire for visitors (students) of field centres, which might have seemed the most logical choice. A questionnaire for students would have taken much more time and funding to organize and it also would have been more difficult to persuade teachers to contribute to the project, as they would have lost time at the centre that they otherwise could have spent teaching. Designing a questionnaire for students would also have posed considerable problems, because environmental education only produces its' benefits after long and regular attention. This makes it hard to find out what effects single events, like visits to field centres, really have. (However, an Australian study indicated that schools with no environmental programme could benefit from a programme developed by a field centre in cooperation with the school (Mc Intosh, 1981)). Another problem with questionnaires is that students are likely to give biased answers, answers they expect the questioner wants -or does not want- to have!

Many schools might choose not to use field centres, despite the fact that they pay attention to environmental topics and nature education. For this reason my questionnaire also investigated what other environmental activities are done in these schools. I chose this broader approach because:

1) Schools that pay much attention to environmental education could for this very reason decide not to visit a field centre.
2) It provides more starting points to increase the use of field centres since more can be discovered about the actual situations and desires of their users.
3) A high degree of concern about environmental education by the teachers can lead to a reasonable quality and quantity of environmental education.

The questionnaire forms were dispatched during the second half of June 1986. They were sent out to all secondary schools at a reasonable distance from the two field centres, covering all sorts of secondary schools in County Cleveland and the city of Newcastle upon Tyne. To get a complete picture of environmental education in secondary schools, special schools were not excluded from the questionnaire. The forms were addressed to the Head Teacher of the schools and included two covering letters -one for the Head Teacher and one for the teacher involved in environmental education- and a stamped and addressed envelope for return of the questionnaire. A total of 131 letters were dispatched. For financial reasons and because of lack of time -the holidays were coming up- no reminders were sent.

The questionnaire opened with a number of inventory questions. The aim of these questions was to define whether the following parameters are related to or affect the answers given later in the questionnaire. The parameters were:

- the type of school.
- the age group of the teachers.
- the age group of the students who receive environmental education.
- the qualification of the teacher.
- the examination level taken by the students.
- if the school is planning to teach environmental education at G.C.S.E. level (to be introduced shortly after this investigation).

Through the questionnaire, I tried to find out if different school or teaching backgrounds led to different needs, if if they determined whether a school would visit a field centre or not and if different backgrounds led to different opinions and approaches in environmental education. To look more closely at the relationships between these parameters and the rest of the answers of the questionnaire, I used the crosstabulation SPSSX programme of the Durham University computer.

The next set of questions asked for the teachers' ideas on the teaching of environmental topics. Although not all of these questions are related directly to the use of field centres, the answers can be used to define the needs of visitors to the field centres and to compare these with the programmes that are offered by both field centres I visited. This makes it possible to look more carefully in what ways and to what degrees these centres can offer solutions for possible problems of their users, in this case secondary schools. The questions asked:

- what are the most important aspects of teaching about the environment (to check whether these are covered by the field centres) and whether these aspects are taught well enough in the schools (since field centres could complete possible shortcomings).
- whether environmental education should be presented as integrated with other school subjects or as special topic and, if integrated, with what other subjects this should be. (Both field centres I visited opted for an integrated approach with an combination of biology, geography and history, while the Benwell centre also used handicrafts, drawing and language lessons. I wanted to examine whether this agreed with the teachers' ideas).
- what environmental activities are organized by the schools to take place outdoors.
- whether the teachers have enough knowledge to teach about the natural environment (both field centres I visited provide teacher courses; I wanted to check whether they were thought necessary by the teachers).
- whether help provided from outside a school was thought to be desirable and, if so, what would be the most suitable ways to provide it (I wanted to examine whether field centres could play a role in meeting any needs identified).

Several questions were asked to find out what factors determined whether a school visited a field centre or not, and if so, what type of centre would be used. Beside time and costs factors (both related to distance) many other factors might determine

whether a school would visit a particular field centre or not. To look at these factors in more detail, the total "population" of schools that answered the questionnaire were split up in three groups:

(i) those that had visited a field centre last year.
(ii) those that had not visited a field centre last year but did so in a previous year.
(iii) those that had never visited a field centre.

The first group was asked:

- with what age groups the schools visited the centre.
- the name and address of the centre (so that I could ascertain the distance from the school and find out whether one of the fieldcentres I visited has been used).
- whether the centre visited had accommodation and, if so, if the class had stayed overnight (if this was not the case in a residential centre, I wanted to know why not).
- reasons for using fieldcentres in general.
- reasons for using this specific centre.
- who was teaching in this centre (schoolteacher, staff of the centre, or both?).
- what type of work was done with their class at the centre.
- whether and how field centres could be improved.

Schools that had not visited a centre last year and the schools that had never used a field centre were asked for their reasons for not using them.

The last set of questions was designed to find out if certain habitats or species need more attention in (ecological) environmental education and if the schools teach about the physical and chemical properties of soil and water, as well as about plants and animals. The idea behind these questions was that a

teacher might well put more emphasis during his or her lessons on species and habitats that form his or her particular interests. If known, species and habitats that are popular with the teachers could be used to stimulate interest in the use of field centres in nature education. On the other hand, it should be a task of the field centres to show that the existence of these species depends on the combination of the complete biotic and abiotic environment. My first question asked which habitats the teacher used for environmental education and the next two questions asked what plant and animal species interest the teachers particularly. Two other questions asked what species and habitats the teachers thought need more attention, followed by a question about the teaching of physical and chemical aspects of the environment.

The last question asked whether the teachers had any comments about the questionnaire, to find out if some questions were unclear to the teachers or whether any errors had been made in the design of the questionnaire.

THE QUESTIONNAIRE

The results of the questionnaire are discussed in this chapter. It must be stressed that -because of the relatively small sample size- most findings are descriptions of trends rather than statistically valid generalizations, even for the geographical area studied. The findings are supported statistically only when this is mentioned explicitly. During the crosstabulation tests the "other" schools are excluded for X^2calculations because this group is very diverse. Answers to the open questions are listed in the Appendix.

INVENTORY QUESTIONS (QUESTIONS 1a - 1g)

Table 1 shows that answers were provided by a reasonable cross-section of all the possible secondary school types. "Other" important school types mentioned are the "Sixth Form College (5x) and the Middle School (6x). The answers from both types of Comprehensive Schools (a and b) are taken together during crosstabulation calculations. The group "other" was excluded during the crosstabulations because this group is very diverse.

Table 1 (Answers to questionnaire Q. 1a)

What type of school is your school?

	No of valid answers	*%*
a. comprehensive school, 11 - 16 years	*22*	*37,9*
b. comprehensive school, 11 - 18 years	*7*	*12,1*
c. special school	*15*	*25,9*
d. other (please specify)	*14*	*24,1*

Table 2 (Answers to questionnaire Q. 1b)

Which age group(s) do you teach? (More than one answer possible)

	No of valid anwers	valid %
a. 11 - 12 years	42	72,4
b. 12 - 13 years	44	75,9
c. 13 - 14 years	38	65,5
d. 14 - 15 years	41	70,7
e. 15 - 16 years	39	67,2
f. 16 and older	19	32,8

Table 3 (Answers to questionnaire Q. 1c)

What is your age?

	No of valid answers	Valid %
a. 20 - 29 years	2	3,4
b. 30 - 39 years	29	50,0
c. 40 - 49 years	18	31,0
d. 50+	9	15,5

Table 4 (Answers to questionnaire Q. 1d)

What type of teacher specification do you have?
(More answers possible.)

	No. of valid answers	Valid %
a. B. Ed.	10	17,2
b. D.G.C.E.	15	25,9
c. Teacher Certificate	35	60,3
d. Other (please specify)	19	32,8

Table 5 (Answers to questionnaire Q. 1e)

In which age group do you teach environmental topics?
(More than one answer possible.)

	No of valid answers	Valid %
a. 11 - 12 years	32	55,2
b. 12 - 13 years	30	51,7
c. 13 - 14 years	31	53,4
d. 14 - 15 years	34	58,6
e. 15 - 16 years	37	63,8
f. we don't teach environmental topics	6	10,3

Table 2 shows that answers were received from teachers covering a reasonably even distribution of the students' age groups.

Table 3 shows that the teacher age groups 20-29 and 50+ are in the minority of the respondents. For this reason the teacher age groups are split into two groups during crosstabulation calculations (under 40's and over 40's).

Most of the teachers involved in environmental education who replied to the questionnaire had a Teacher Cerficate but some teachers have more than one degree. Four teachers have a B.A. degree, 3 a B.Phil. degree and 2 a B.Sc. One of the teachers has an Advanced Diploma in Environmental Education. Ten of the teachers replying "other" did not specify what degree this was.

A comparison of the frequencies of table 2 with the frequencies of table 5 makes clear that there is a reasonable continuity of Environmental Education between the different age groups. It is striking that most of the older age groups receive Environmental Education, as well as the younger groups. Not too much weight should be given to the teachers who answered that they do <u>not</u> teach environmental topics. They have probably misunderstood the question and probably mean that they do not teach environmental topics themselves or thought of "environmental topics" as an independent separate course. Most of these teachers -except one- answered later in the questionnaire that environmental topics are taught in their school during the biology or geography lessons.

Table 6 (Answers to questionnaire Q. 1f)

At what level does your school teach environmental topics at present? (More answers possible.)

	No of valid answers	Valid %
a. at C.S.E. or lower level (no examination level included)	37	72,1
b. G.C.E. level	20	41,7
c. we don't teach environmental topics	6	12,5

Some schools prepare pupils for both existing examination levels and also teach environmental topics at both levels, as shown in table 6. The same comments can be made as in the previous table about the 6 teachers answering that they do not teach environmental topics.

Table 7 shows that many schools do not plan to teach environmental topics at the new G.C.S.E. level. To make the drawing of conclusions easier, this table has been rearranged to table 8 which provides much more information.

Table 7 (Answers to questionnaire 1g)

Does your school plan to teach environmental topics at G.C.S.E. level?

	No of valid answers	Valid %
a. yes	24	43,6
b. no	24	43,6
c. don't know	7	12,7

Table 8.

Plans for future teaching by schools that teach environmental topics at present.

	total	*planning*	*not planning*	*don't know*
Comprehensive schools	26	18 (69%)	6 (23%)	2 (7%)
Special schools	13	3 (23%)	9 (69%)	1 (8%)
Sixth Form	5	3 (60%)	2 (40%)	- -

The more detailed comparison of these figures in table 8 shows that of the 26 comprehensive schools that teach environmental topics at present, 6 do not plan to teach it in the future. This development is even more marked at the special schools where only 23% plan to teach environmental topics (although these results might be biased because these answers include some from special schools which do not teach environmental topics at examination level at present, simply because they do not take examinations). The number of replies is to small to draw conclusions for Sixth Form Colleges, but the trend is the same.

QUESTIONS ABOUT THE TEACHERS' IDEAS AND HOW THEY TEACH ENVIRONMENTAL EDUCATION (QUESTIONS 2 - 10)

Question 2: "Do you think that pupils who live in urban areas should be taught about the natural environment?" was answered with "yes" by all the 58 teachers who replied to the questionnaire.

Table 9 summarizes the teachers' opinions of the most important aspect of teaching about the environment (answers to question 3a).

Table 9 (Answers to questionnaire Q . 3a)

In your opinion, which is the most important aspect of teaching about the natural environment? (Only one answer)

	No of valid answers	Valid %
a. imparting knowledge	0	0
b. arousing interest	18	35,9
c. forming attitudes	5	9,8
d. influencing behaviour	2	3,9
e. stimulating responsibility	9	17,6
f. arousing consciousness	15	29,4
g. other (please specify)	1	2,0
h. don't know	1	2,0

Arousing interest and arousing conciousness scored highly as the most important aspects of teaching about the natural environment. There was no significant difference amongst answers of the different agegroups of teachers (X^2_6=10.926, P=0.10) or the schooltype in which they are teaching (X^2_4=2.324, P=0.7), although 29% of the teachers younger than 40 as against 4% over 40 answered that stimulating responsibility is the most important aspect. In contrast 44% of the teachers over 40 as against 18% younger than 40 answered that arousing consciousness is the most important aspect. The person who answered "other" suggested that teaching about the unity of the natural world is the most important aspect of teaching about the natural environment. I found no significant relationship between what the teacher suggested as the most important aspect and whether the school was planning to teach environmental topics at G.C.S.E.level (X^2_{12}=12.867, P=0.4), or the teachers qualifications (X^2_{12}=12.568, P=0.4)(see the Appendix for examples of print-outs).

When asked if all aspects of Environmental Education are taught well enough in their school (question 3b) 54% of the teachers answered "no". Table 10 shows which aspects they think should receive more attention.

Table 10 (*Answers to questionnaire Q. 4*)

If you answered that aspects of environmental education are not taught well enough in your school, which aspects do you think should receive more attention? (*More than one answer possible.*)

	No of valid answers	*Valid %*
a. imparting knowledge	9	29,0
b. arousing interest	15	48,4
c. forming attitudes	14	45,2
d. influencing behaviour	17	54,8
e. stimulating responsibility	19	61,3
f. arousing consciousness	16	51,6
g. other (please specify)	1	3,2

Most teachers suggested that "stimulating responsibility" should get more attention at their school, followed by "influencing behaviour". It is surprising that "influencing behaviour" scored so high here, but not in answers to question 3a; perhaps because the teachers were only allowed to chose one answer in question 3a but several here. "Imparting knowledge" scored relatively poorly here, and not at all in question 3a. It is clear that "knowledge" is not seen as an important aspect of teaching about the natural environment.

When asked if environmental topics should be presented integrated with other subjects (question 5a) or as a special topic, 91% of the teachers answered integrated. Table 11 shows the most important topics with which -according to the teachers answering "integrated"- it should be integrated.

Table 11 (Answers to questionnaire Q. 5b)

Subjects with which environmental topics - according to the teachers - should be integrated.

	No of valid answers	Valid %
Biology (only)	3	5,6
Geography (only)	8	14,8
Geography and biology	35	64,8
Other	28	51,9

Clearly most of the teachers preferred integration with both geography and biology. That the teachers take this form of integration serious becomes clear when one considers with what other topics they considered it was possible to integrate environmental topics. In total 16 others -beside geography and biology- were mentioned (see the Appendix). History scored relatively highly; 16% of the teachers answered that environmental topics should be integrated with this subject. Other subjects included: English, Mathematics and General Studies.

When asked if help provided from outside the school is desirable for teaching about the natural environment (question 6a) 96% answered "yes". Table 12 shows what the teachers suggested as the most suitable ways / organisations to provide this help.

Clearly, someone from a national environmental organisation was favoured by a majority of the teachers, while a specialist teacher also scored relatively highly. No significant difference was found between answers from different school types (X^2_3=1.80, P=±0.65) or teachers qualification (X^2_8=9.50, P=±0.3) on answers to this question.

Table 12 (Answers to questionnaire Q. 6b)

What do you think is the most suitable way to provide help in teaching about the natural environment?

	No of valid answers	Valid %
a. a specialist teacher	7	26,9
b. volunteers from a natural history society or club	3	11,5
c. someone from a national environmental organisation (e.g. R.S.P.B. or R.S.N.C.)	14	58,8
d. someone from a specialized government body (e.g. N.C.C.)	0	0
e. other (specify)	1	3,8
f. don't know	1	3,8

Table 13 (Answers to questionnaire Q. 7)

What sort of help or information that could be given by experts would you like to have? (More than one answer possible.)

	No of valid answers	Valid %
a. information about the environment nationwide	18	32,1
b. information about the local environment	43	76,8
c. suggestions for classroom lessons	21	37,5
d. suggestions for outdoor lessons	21	37,5
e. suggestions for outdoor practical projects	35	62,5
f. help with activities in the school (exhibitions, films etc.)	25	44,6
g. extra booklets, leaflets etc.	17	30,4
h. other (specify)	7	12,5

The total number answering this question validly was low. This was due to the fact that 25 teachers did not read the question carefully and gave more than one answer! Of the latter group most thought that it does not matter who provides the extra help; all mentioned answer c (100%) and most b (84%) and d (80%). Help from a specialist teacher was suggested by 68% but it is not clear if a teacher answering "anyone" also wants to include a specialist teacher.

The sort of help or information that could be given by experts that the teachers would like to see is listed in table 13 (question 7). Only two topics found general favour: 77% asked for information about the local environment, and 63% for suggestions for outdoor practical projects. The help or information that the teachers said they would like to have is not dependent on the type of school in which they are teaching ($X^2_7=4.275$, $P=\pm0.75$), their age ($X^2_7=3.20$, $P=\pm0.85$) or qualification ($X^2_{14}=14.44$, $P=\pm0.4$).

Table 14 (*Answers to questionnaire Q. 8*)

How was environmental education taught in your school last year? (*More than one answer possible.*)

	No of valid answers	*Valid %*
a. we gave no attention to the subject	3	5,2
b. as a separate topic	14	24,1
c. as part of geography	22	37,9
d. as part of biology	22	37,9
e. as part of integrated studies	24	41,4
f. in other ways (please specify)	10	17,2

Table 14 shows how environmental education was taught in the schools in the academic year 1985-1986 (question 8). The approaches were almost equally divided between part of integrated studies, part of geography and part of biology. This time only 3 answered that they did not give any attention to the topic (compared with 6 in tables 1e and 1f).

Excursions score highest of the outdoor activities organized by schools (56%) as can be seen in table 15. Many schools visit museums, exhibitions and nature trails as well. All special schools organized outdoor activities; the schools answering "none" were mainly comprehensive schools (27% of all the comprehensive schools), 2 of the 6 middle schools and other schools (such as the child psychiatry department and an Employment Rehabilitation Centre). The popularity of all outdoors activities is very similar, no matter what the teacher' age or qualifications.

Table 15 (Answers to questionnaire Q. 9)

What environmental activities did your school organize outdoors last year? (More than one answer possible.)

	No of valid answers	*Valid %*
a. none	9	15,8
b. excursions	32	56,1
c. visiting museums and exhibitions	26	45,6
d. visiting nature trails	24	42,1
e. taking care of gardens, parks etc.	16	28,1
f. other (specify)	13	22,8

A majority of the teachers thought that they have enough knowledge about the environment (55%)(question 10). This did not depend on the type of school in which they are teaching (X^2_2=0.30, P=±0.9) or their age (X^2_1=0.04, P=±0.9), but teachers with a B.Ed. qualification answered more often that they have enough knowledge (90%) than did teachers with a P.G.C.E. or Teachers Certificate.

Table 16 (Answers to questionnaire Q. 10)

Do you think you have enough knowledge to teach about the environment?

	B.Ed.	P.G.C.E.	Teachers Certificate
yes	9	8	17
no	1	7	18

A listing of assistance required or courses that are needed by the teachers who think that they do not have enough knowledge to teach about the environment is given in the appendix.

FIELD CENTRES AND THEIR USE BY SECONDARY SCHOOLS (QUESTION 11 - 12)

A majority of the schools answering the questionnaire had visited a field centre in the last year (54.5%)(question 11a). Table 17 shows which age groups were taken. Field centres were visited by all age groups, even the oldest. Whetter a school visited a field centre or not did not depend on the school type (X^2_1=0.043 with yates correction, P>0.95) or the age of the teacher. (X^2_1= 0.005 with yates correction, P>0.95).

Table 17 (Answers to questionnaire Q. 11b)

With what age group did you visit a field centre last year? (More than one answer possible)

	No of valid answers	Valid %
a. 11 - 12 years	9	23,1
b. 12 - 13 years	8	20,5
c. 13 - 14 years	5	12,8
d. 14 - 15 years	14	35,9
e. 15 - 16 years	9	23,1
f. 16 and older	8	20,5

Question 12a asked for the name and address of the field centre visited. The aim was to look at the distance between the field centres and the schools. A majority of the schools visited field centres within a distance of 20-30 miles, although some make very long journeys. Two schools went to Arran in Schotland, one to a field centre in Cornwall, one to a field centre in Northern France and one answered in a later question that they made a field trip to the Veluwe National Park in the Netherlands!

67% of the schools visiting a field centre used a field centre which offered accommodation (question 12b) though they did not necessarily stay overnight (see below). Fifty percent of the comprehensive schools used centres with accommodation, against 71% of the special schools. Table 18 shows the type of courses offered by these field centres.

Table 18 (Answers to questionnaire Q. 12c)

What type of courses does this centre offer?

	No of valid answers	Valid %
a. courses of a day of part of a day	5	18,5
b. courses of more than one day	12	44,4
c. courses of a day or a part of a day as well as courses of more than one day	7	25,9
d. other (please specifiy)	3	11,1

Question 12d shows that 8 of the 19 schools visiting a residential field centre (=42%) stayed there for only one day; all these were comprehensive schools and all their teachers were under 40. Reasons for this were: one day was enough for this course (1 case), financial problems with a longer stay (3 cases), problems with the timetables for other subjects (3 cases), or other reasons (1 case, "difficulties in providing cover for absent members of staff in school time").

Table 19 summarizes the reasons given by the teachers for using these centres. The most important are the surrounding environment (67%) and the facilities and equipment provided (57%).

It might have been expected that more of the teachers who answered earlier in the questionnaire that they did not have enough knowledge to teach about the environment would have answered in question 13 "because of the trained staff", but this was not the case. Indeed 5 out of the 9 teachers who answered in this way were teachers who had answered earlier that they had enough knowledge to teach environmental topics!

In most centres teaching is done by the staff of the centre alongside the schoolteacher (63%)(question 14a). In 20% of the cases the teaching was done by the schoolteacher alone and in 17% of the cases it was the staff of the centre alone. There was

a slight tendency that teachers with a P.G.C.E. degree taught more often themselves, rather than teachers with other qualifications doing so.

Table 19 (*Answers to questionnaire Q. 13*)

Why did you use this centre? (*More than one answer possible.*)

	No of valid answers	*Valid %*
a. it is the nearest centre to our school	5	16,7
b. it offered accomodation	10	33,3
c. because of the surrounding environment	20	66,7
d. because of the facilities and the equipment	17	56,7
e. because of the trained staff	9	30,0
f. other reasons (please specify)	8	26,7

Teachers disclosed many reasons for visiting field centres, as can be seen from their replies when asked why they think it is important to visit a field centre (question 15). They often mentioned that it is important for the pupils to get first-hand information through experience. Social aspects also play an important role, as does practical experience in different environments. "Experience of the countryside" is often mentioned as an important aspect, especially for children residing in urban areas who seldom have a chance to leave the town. One of the teachers who works with handicapped students mentioned that field centres make it possible for his students to do the same activities as the "able bodied". A full listing of all the reasons mentioned by individual teachers is given in the appendix.

The type of work most classes do varies from academic to informal "days-out" (question 16). However, most schools used the centres for geography and biology fieldwork. Geography fieldwork included the collection of geographical data, sketching, map reading and sampling. Biological work often included Marine Biology and freshwater studies (see the appendix for more information).

Eightyfive percent of all the teachers who visited the field centres thought that they can be improved. They often made comments about equipment and facilities but also asked for more specialist staff. Some mentioned that the centres should integrate more with the schools. Schools that work with children with special needs commented that the centres should be better able to cope with such children (see the appendix for more information).

Table 20 (*Answers to questionnaire Q. 19*)

Can you tell us why you did not visit a field centre last year?

	camp school	special school	other
a. because I think the quality is not good enough	0	0	0
b. because we can give the same sort of courses ourselves	0	1	0
c. because of reasons concerned with school organisation and timetables	3	1	0
d. because of change in the syllabus	0	0	0
e. financial reasons	0	0	0
f. because of lack of time	0	0	0
g. because of the teachers dispute	3	0	3
h. other reasons (specify)	2	0	0

67% of the schools that did not visit a field centre with their class last year (1985-1986) had visited a field centre with a class from their present school in previous years, although most of them did not say when (question 18). Table 20 gives the reasons for not visiting a field centre last year, but some of the schools did not give a reason.

The number of respondents of this question are very low but some reasons seem to be more important than others for not visiting a field centre last year. The teachers' dispute was an obvious reason why a proportion of the schools did not do so. Reasons concerned with school organisation and time tables also seem to be a problem, more often for comprehensive schools than for types of other schools. Other reasons mentioned by the teachers were "restrictions imposed by the syllabus" and "to give another teacher the chance to go out with his students."

Table 21 (Answers to questionnaire Q. 20)

You have never visited a field centre with a class from your present school. Can you tell us why not? (More than one answer possible)

	camp school	special school	other	total valid %
a. *I think that environmental education is not a task for schools.*	0	0	0	0
b. *our own methods of environmental teaching have at least the same quality as those provided with a field centre.*	0	3	0	21,4
c. *financial reasons*	3	0	0	21,4
d. *for reasons concerned with organisation and time tables*	4	1	2	50,0
e. *lack of time*	2	1	0	21,4
f. *other reasons*	1	3	0	28,6

Table 21 lists the reasons given for not visiting field centres by the teachers who have never done so (question 20). Reasons concerned with organisation and timetables were the most common (50% mentions this as one of the reasons). Amongst the "other reasons" (29%), 3 out of the 4 teachers answering this said that field centres are not suitable for their type of pupils ("unsafe or slow learners").

When we look at the distribution of the small numbers of answers we see some striking differences between the different schooltypes. An important reason for special schools not visiting field centres is that they can provide similar courses themselves, while financial reasons more often have limited the visits by comprehensive schools. Comprehensive schools also tended to have more problems with organisation and time tables.

ENVIRONMENTAL EDUCATION AND HABITATS, SPECIES AND THE ABIOTIC ENVIRONMENT (QUESTION 21 - 26)

Questions 21 to 26 were designed to find out if certain habitats or species needed more attention in environmental education. Answers to the first question in this set (question 21, table 22) indicate that all habitats are being used regularly in environmental education and that no habitat is really neglected. The "others" were mainly urban areas.

Question 22 and 23 asked what species interest the teachers particularly. The idea behind these questions was that a teacher might well put more emphasis during his or her lessons on species that interest him or her. Unsurprisingly, birds and mammals were the most popular animal groups (table 23) but groups like worms lowest.

When asked about interests in groups of plants, almost all teachers were interested in flowering plants (92%), while the other groups were of considerably less interest to the teachers (table 24).

Table 22 (Answers to questionnaire Q. 21

Which habitats do you use for environmental education?
(More than one answer possible.)

	No of valid answers	Valid %
a. broad-leaved woodlands	27	49,1
b. coniferous plantations	23	41,8
c. grasslands	16	29,1
d. coastal environments	43	78,2
e. freshwater	28	50,9
f. moorlands	31	56,4
g. other (specify)	15	27,3

Table 23 (Answers to questionnaire Q. 22)

Which groups of animal species interest you particularly?
(More than one answer possible.)

	No of valid answers	Valid %
a. birds	37	78,7
b. mammals	28	59,6
c. fishes	23	48,9
d. reptiles and amphibians	20	42,6
e. insects	18	38,3
f. worms	8	17,0
g. molluscs	14	29,8
h. other (specify)	3	6,4

Table 24 (Answers to questionnaire Q. 23)

Which groups of plants interest you particularly? (More than one answer possible.)

	No of valid answers	Valid %
a. flowering plants	44	91,7
b. mosses	10	10,8
c. fungi	15	31,3
d. algae	10	20,8
e. other (specify)	4	8,3

The questions 24 and 25 ask what species and habitats the teachers think need more attention in environmental education. A variety of plant and animal species were mentioned but only a few were mentioned more than once. This in contrast with answers to the habitats question. Most teachers suggested that urban and other man-made environments need more attention (complete listings are given in the appendix).

When asked if they teach about the physical and chemical properties of soil and water as well as the living organisms, only 59% answered "yes", however, there is a highly significant difference between comprehensive schools (which usually did) and special schools (which tended not to)($X^2_1=15.02$, $P<0.005$).

Table 25 (Answers to questionnaire Q. 26)

Do you teach about the physical and chemical properties of soil and water, as well as about plants and animals in a particular habitat?

	yes	no
comprehensive schools	20	3
special schools	2	11

The last question asked if the teachers had any comments about the questionnaire. Many teachers showed a lot of concern about the subject, some thought that their school types should not have been included in questionnaires like this, but as explained earlier, to make certain differences clear (or to make clear that there are no differences) I decided to do so. Their comments are not very relevant to the rest of the dissertation and are excluded from further discussion.

DISCUSSION AND EVALUATION

It is hard to say how representative the answers to this questionnaire would be for Great-Britain as a whole. Although a considerable number of questionnaires were returned (44%) it must be kept in mind that the questionnaire refers to only two small areas in the North-East of England. For a truly representative questionnaire it is necessary that each element -that means each environmental teacher in Great-Britain- should have had a similar chance to receive the questionnaire, a requirement that was not met here. It is for this reason that the qualitative value of the responses to this questionnaire is much more important than the quantitative value.

An important conclusion from the questionnaire is that almost no systematic differences could be found in answers from different types of school, different ages of teacher, teachers with different qualifications or from schools taking different examination levels. It appears therefore, that there is a reasonable continuity of environmental education between different groups of students at present. However many schools which, until now, have taught environmental topics will stop this when the new G.C.S.E. examination level is introduced. This is especially true for special schools. This is in contrast with the widely accepted view that environmental education should be a "common core" in the subjects of tomorrow's people. People have to understand that we have a finite amount of fossil fuels and mineral resources and that without conservation Man's future is bleak (Carson, 1978). It is also in contrast with a statement of the British Government Department of Education and Science saying: "There is no respectable reason to deny that education must be explicitly concerned with ways of keeping the life-support systems of the earth in healty working order" (Department of Education and Science, 1981). In 1975 H.M. Inspectors of Schools stated that:

1) Every school should have adequate arrangements for planning and implementing a programme of environmental education.

2) pupils and young people should be introduced to environmental concepts and values, given practice in decision making and afforded opportunities for personal involvement; and
3) pupils and young people should be trained to assess critically the many views being expressed today on current environmental issues.

It also contrasts with the teachers' view that pupils who live in urban areas should also be taught about the natural environment (which was the answer given by all the teachers); it is reasonable to suppose that they would have given a similar response when asked about the rural environment.

A majority of the teachers thought that arousing interest is the most important aspect of environmental education. This is reasonable, because without interest none of the other aims can be reached! (Field centres should therefore contribute to the proces of arousing interest). Also a majority thought that "stimulating responsibility" or "influencing behaviour" should receive more attention in their schools. These are in fact the final and most important aims of environmental education in the view of H.M. Inspectors (1975) "the ultimate aims.....are the creation of responsible attitudes and development of an environmental ethic. (These two aims are harder to achieve. They will develop only after long and regular attention, in which field centres can help. However, they cannot be more than just a part of a long process of environmental education).

91% of the teachers thought that environmental education should be presented integrated with other subjects and only 9% thougt that it should be a special topic. In 1977 H.M. Inspectors of schools stated that environmental education is to be regarded as a function of the whole curriculum, formal and informal, while earlier (in 1975) they had stated that "to make environmental education a separate subject is neighter desirable nor possible." However it cannot be denied that teaching environmental topics as a separate subject has certain benefits, e.g. it can never be neglected when it has a fixed place in the curriculum and can

In this context, it is worth noting that both field centres I visited used an integrated approach of mainly biology and geography. Both centres also paid some attention to historical and social aspects of the local environment, and this catered for teachers' requirements.

Almost all the teachers thought that help provided from outside the school was desirable for teaching about the environment. Help from national environmental organisations like the R.S.P.B. and R.S.N.C. were favoured above a specialist teacher or volunteers. No one considered that a specialist government body was the most suitable way to provide help. In this prestructured question the choice of help from a field centre was not offered. This was done on purpose, to avoid a leading question. It is striking that no teacher thought of the possibility that a field centre could provide this help although such an answer could have been included as an "other" way.

There were strong requests for information about the local environment and suggestions for practical projects. However, relatively few teachers asked for extra booklets, leaflets, etc. and it is for this reason that organisations involved in environmental education must look for other possible ways in which to provide information. Local or regional field centres are very suitable ways to provide this information about the local environment. They also have the experience of organizing practical projects. This indicates opportunities for extended use of field centres.

When we examine the outdoor activities that were organized last year by the teachers who replied to the questionnaire and we make the assumption that the most frequently organized activities are also the most popular with the teachers, it appears that exhibitions, excursions and nature trails are the most suitable ways to provide information about the local environment. However, most of the outdoor activities organized by schools in 1985/1986 are rather passive forms of education and it would be advisable to combine them with practical projects. (Again, field centres have the experience of organizing these activities).

A danger in using activities like visiting museums, exhibitions, etc. is that environmental education can become dependent on them. This can lead to a lack of environmental education if no one takes an initiative to organize exhibitions or excursions to such places. A minority of the schools did not organize any outside school activities in 1985/1986 and thus did not follow the advice given by H.M. Inspectors in 1975. However, an explanation might be found in the teachers dispute.

Although a majority of the teachers replied that they had enough knowledge to teach about the environment, many replied that they had not so (45%). Many field centres organize courses to give the teachers more knowledge and experience in teaching about the environment. Indeed both field centres described organized such courses.

A majority of the schools which replied had visited a field study centre last year. This is a good sign because "sound learning about the environment has to be rooted in direct experience" (Department of Education and Science, 1981). Field study centres were visited by all age groups of students. A majority of the schools visiting a field study centre used a centre which could provide accommodation. However, the overall picture is that most visits to field study centres were only one day visits so that a substantial part of the schools did not use this accommodation. Reasons for one day stays in a residential field study centre were mostly financial or arose from problems with integration of field studies with the timetables for other subjects. The fact that most visits were only for one day might also explain why a majority of the field centres visited were within distances of 20-30 miles from the schools. Most schools chose the field study centres visited because of the surrounding environments and the facilities and equipment that were offered by them, which might be the reason why none of the responding schools had visited the Benwell Nature

Park field centre last year (although some secondary schools do use this centre; personal communication, Mrs. J. Mc Carthy). This centre does not have the variety of interesting types of habitats and facilities that the Teesmouth field centre can offer. Only 16.7% of the teachers answered that one of the reasons for visiting the centre of their choice is that it is the nearest centre to their school. That distance is not important also becomes clear when we look at the list of field centres visited. Many of the schools could easily have chosen a centre closer to the school and some make very long journeys for their field trips (to Scotland, Cornwall, France and the Netherlands, for example).

The method of teaching adopted in the centres was mostly by the school teacher and one of the centre staff, or (less often) by the school teacher on his/her own. It is encouraging to find that the schoolteacher is involved so often in the work, for it gives him/her confidence and experience in practical work. An earlier study however,(Benyon, 1983) came to the conclusion that the schoolchildren find a change of teacher refreshing!

Most teachers that did not visit a field study centre last year (1985-1986) had visited a field study centre with their present school in a previous year. The most important reason for not doing so last year was the teachers' dispute, followed by reasons concerned with school organisation and timetables. These latter reasons appear to be more important for comprehensive schools than for other school types.(These were also the most important reasons given by the schools which have never used a field study centre). Only a few schools which had never visited field centres mentioned financial reasons (21.4%) or lack of time (21.4%), both aspects connected with distance, as reasons for not doing so.

All types of habitats are regularly used for environmental education and all animal groups interest a reasonable proportion of the teachers. This might indicate that no animal group is neglected. However, it must be stressed that some groups are easier to study than others (e.g. most mammals are nocturnal, reptiles are relatively rare) and a relatively unpopular group like

worms is easy to study (it might be an idea to develop some experiments with worms!). Not surprisingly, flowering plants and trees are the most popular plant groups. Other plant groups may well be neglected and field centres could stimulate interest in these groups by teaching more often about interesting aspects of these groups.

Teachers mentioned many species and habitats that -according to them- need more attention in environmental education. An interesting comment is that "the species that children come in contact with every day" should be studied. Urban habitats and man-made habitats are often mentioned as habitats that need more attention.

A striking difference exists between comprehensive schools and special schools when we examine whether they teach about the physical and chemical properties of soil and water. Most comprehensive schools do, but almost no special school does. Organisations and people involved in environmental education should develop simple experiments that can be used especially by special schools (e.g. experiments with plants grown in different soils, simple pollution experiments, etc.).

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APPENDIX

Answers to open questions

Q. 1a 'Other' types of schools:

Middle School (6x)
Sixth Form College (5x)
Child Psychiatry Department (1x)
Education Unit (1)
Post School Assesment Unit (pre Y.T.S.) for young people with special needs (1x)

Q. 1d 'Other' teacher qualifications:

B.A. degree (4x)
B.Phil. degree (3x)
B.Sc. degree
Advanced Diploma in Environmental Education (1x)
Unspecified (10x)

Q. 3a Most important aspect of teaching about the natural environment:

'The unity of the natural world'.

Q. 4 'Other' aspects that should get more attention:

Creating a more positive attitude to the subject.

Q. 5b 'Other' topics to integrate environmental education in:

History (9x), Science (4x), English (4x), Mathematics (3x), All other topics (3x), Art (2x), General studies (2x), Humanities (1x), Personal and social development (1x), Geology (1x), Sociology (1x), Drama (1x), Integrated studies (1x), Computing (1x), Chemistry (1x), Life skills (1x).

Q. 6b 'Other' organisation that is most suitable to provide help in environmental education:

A warden of a nature reserve or an organisation that can provide guided tours of conservation-problem areas.

Q. 7 'Other' sort of help or information that the teachers would like to have:

Resources for practical studies - centrally supplied (2x)
Help with outside activities.
Video programmes.
More funding to visit and see the different environments and to do fieldwork.
More funding for books and video.
Information of the wardens of the reserves.
Collation of written information.

Q. 8 'Other' ways in which environmental education was taught last year :

As part of integrated/combined science (1st and 2nd years).
As part of an environmental studies course.
As part of history.
As part of science.
Personal and social education.
In short course option and as part of city and guilde courses.
As fieldcourse.
Environmental studies (in years 4 and 5)
Separate specialist Mode 3 CSE Environmental biology - Choice activities lessons.

Q. 9 'Other' environmental activities organiazed outdoors:

Field trips (4x), Surveys (4x), Residential course (1x), Projects (1x), Fieldweek (1x), Open days (1x), Speakers from a Natural History Club (outside) 1x.

Q. 10 Helpful assistance or courses required to improve knowledge to teach about the environment:

Courses in special topics where I lack experience (6x) (mentionned are : coastal environments, freshwater ecosystems, identification courses and nuclear dumps).
Courses about the local environment (4x).
Methodology courses (4x) (how to cope with integrated approach, team teaching etc.)
Field work courses (4x).
Facilities and finance for nature-gardens.
Worksheets on specific areas and topics and teacher guides.
Visual aids for special schools.
Time and help to develop nature trails.
T.V. programmes with worksheets related to important environmental issues (worldwide and national.)
A course in how to set up a school-nature-reserve/ wildlife garden (3x)
Practicals from experienced teachers who know the pitfalls and practicalities or organizing pupils to go out on field courses.
Extra staff and volunteers to take classes out for visits.
Easy reading material for less able children.
Information on locally accessible areas for fieldwork.
Up to date facts and figures related to species in danger.
Workshop for producing materials to be used with different ages/abilities.
A loan service for expensive equipment e.g. binoculars (3x)

Q. 12a Names and adresses of field study centres visited by the schools:

Teesmouth field centre, Hartlepool (7x)
Dukes House Wood, Hexham (5x)
Stainsacre field centre, Whitby (3x)
Loch Ranza field centre, Arran (2x)
Low Craneclough field centre, Kielder (2x)

Catton Outdoor Education Centre, Hexham (2x)
Ormesly School Field Centre, Middleton (2x)
Danby Field Centre, Danby
Calvert Trust, Kielder
Featherstone Castle, Haltwistle
Castle Eden Dene Centre, Peterlee
Hawes Youth Hostal, Wensleydale
Churtown Farm, Bodmin
Carlton Outdoor Centre, Cleveland
School Cottage Ninebanks, Allendale
Cranedale Field Centre, Kirby
Hamsterly Forest Centre, Hamsterley
Washington Wildfowl Centre, Washington
Howtel Field Centre, Milfield
Ford Castle, Northumberland
Greenholme School, Tebay
Colonie Notre Dame Dufoyer, Dieppe (France)

Q. 12c Courses that this centre offers:

'Selforganized' (3x)

Q. 12d 'Other' reasons to stay for only one day in a centre with accomodation:

Difficulties in providing cover for absent members of staff in school-time.

Q. 13 'Other' reasons for using this centre:

Centre funded by our own Local Education Authority (3x).
It is our own centre.
'Good opportunities for social education too.'
Because of the possibilities for self catering and self organising.
Because of the contrast between the surrounding environment and our onw local area.
Because of the courses if offers.

Q. 15 Why is it important to visit a field centre.

First hand experience (5x) and social experience.
Concentrated study possibilities, 10-12 hours/day.(2x)
Field centres illustrate the concepts far better than second hand classroom information.
It is important to broaden the horizons of children by placing them in a different teaching environment.
It helps to focus attention and provides a good working environment.
Education through experience rather than through theory.
Because it is important to do fieldwork ecology.
To encourage a respect and responsibility for the country side and contrasting landscapes.
For social education and access to different types of environment, but also the facilities and laboratory conditions.
Our handicapped students can do the same activities as the 'ablebodied' and visit other environments and think for themselves.
To learn to work independently and gain from valuable new experiences.

Residential experience in a different environment.
Alternative experience for children residing in an urban area.
Added stimulation and interest from a source outside school.
It gives the children a rare change to leave the town.
Facilities to study the samples and return the specimen to their own environment.
To visit a known environment with trained staff.

Q. 16 The type of work doen in the field centre:

Recording information, descriptive work and individual work.
Observation.
Georgraphy fieldwork: descriptive, quantitative and qualitative.
Hypothesis testing,
general introduction to the area, nature trail, group-work.
Individual/groupwork, qualitative and quantitative elements.
A marine biology course, physical studies, qualitative and quantitative work.
Map reading and coastal fieldwork.
River studies, sampling water in different places, look at the distribution of species and environmental aspects.
River studies, vegetation, settlement studies, landuse, groupwork and individual studies, a range of activities and approaches are used.
Sailing and canoeing.
Collecting geographical data, sketching, sampling etc.
As holiday base with incidental work on natural history.
Specialised courses for children with learning difficulties.

Q. 17b The ways in what field study centres can be improved.

More integration with the schools.
A stronger function as resource centre.
They should be a part of the schools' system and provide in-service-training.
More funding (for more staff, equipment and resources.)
More specialist staff.
More resources and recreational facilities.
More facilities to follow-up investigations and e.g. mini-habitats kept indoors (for observation).
More field centres for the physically handicapped.
More updated equipment e.g. for weather recording and computing.
More help for children with special needs.
Providing teachers' guides to the surrounding area.
More integration with the specialisms of the teachers themselves.

Q. 18 The most recent years the teachers did visit a field centre (if they did not visit a field centre last year:

1984 (3x), 1980, 1979, 1964

Q. 19 'Other' reasons for not visiting a field centre last year (when they had visited a field centre before):

Restrictions of the syllabus, as environmental education is not offered as a pure subject at our school.
To give another teacher the chance to go out with his students.

Q. 20 'Other' reasons for never visiting a field centre with a class from (the teachers') present schools:

Our type of pupils are not worth taking out and some are unsafe.
Because of the minimal content of the syllabus, the theory can be covered without practical work and we can do this ourselves. Given the difficulties of teaching/controlling our disturbed children, constraints inherent in field centres can cause difficulties.
There is a lack of courses for the special needs of our pupils.

Q. 21 Other habitats that the teachers use for environmental education:

Urban wasteland (4x), urban environments (4x), limestone environment (2x), school grounds (2x), reclaimed land (1x), heathland (1x), farmland (1x), historical sites (1x)

Q. 22 'Other' animal groups that interest the teachers particularly :

Man (2x), all invertebrates (1x)

Q. 23 'Other' plant groups that interest the teachers particularly :

Grasses (2x), lichens

Q. 24 Species that - according to the teachers - need more attention in environmental education:

Endangered species (3x), insects (2x), trees (2x), birds (1x), species in towns (1x) indigenous species (1x), grasses 81x), reptiles and amphibians (1x), parasite organisms (esp. agents of biological control) (1x), species that children come in contact with every day (1x).

Q. 25 Habitats that - according to the teachers - need more attention in environmental education :

Urban habitat (6x), wasteland and derelict land (2x), wetlands and moorlands (2x), coastal environment (2x), woodlands (2x), reclaimed derelict urban environments (2x), backgardens (2x), endangered habitats, hedgerows (1x), sand dunes (1x), ponds (1x), parks (1x), grasslands (1x), refuse tips (1x), seas (1x), created habitats e.g. in towns, agricultural land in or out of production (1x).

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  3  0                /1 ID 1-3
  4  0                   Q1A 4
  5  0                   Q1BANS1 TO Q1BANS6 5-10
  6  0                   Q1C 11
  7  0                   Q1DANS1 TO Q1DANS4 12-15
  8  0                   Q1EANS1 TO Q1EANS6 16-21
  9  0                   Q1FANS1 TO Q1FANS3 22-24
 10  0                   Q1G 25
 11  0                   Q2 26
 12  0                   Q3A 27
 13  0                   Q3B 28
 14  0                   Q4ANS1 TO Q4ANS7 29-35
 15  0                   Q5A 36
 16  0                   Q5BANS1 TO Q5BANS3 37-39
 17  0                   Q6A 42
 18  0                   Q6B 43
 19  0                   Q7ANS1 TO Q7ANS6 44-49 Q7ANS7 TO Q7ANS8 51-52
 20  0                   Q8ANS1 TO Q8ANS6 53-58
 21  0                   Q9ANS1 TO Q9ANS6 59-64
 22  0                   Q10 65
 23  0                   Q11A 66
 24  0                   Q11BANS1 TO Q11BANS6 67-72
 25  0                /2 Q12BANS1 TO Q12BANS3 1-3
 26  0                   Q12C 4
 27  0                   Q12DANS1 TO Q12DANS4 5-8
 28  0                   Q13ANS1 TO Q13ANS6 9-14
 29  0                   Q14 15
 30  0                   Q17A 16
 31  0                   Q18ANS1 17 Q18ANS2 18-19
 32  0                   Q19 20
 33  0                   Q20ANS1 TO Q20ANS6 21-26
 34  0                   Q21ANS1 TO Q21ANS7 27-33
 35  0                   Q22ANS1 TO Q22ANS8 34-41
 36  0                   Q23ANS1 TO Q23ANS5 42-46
 37  0                   Q26 47
 38  0          RECODE Q1A(1,2=1)(3=3)(ELSE=SYSMIS )
 39  0          RECODE Q1C(1,2=1)(3,4=2)
 40  0          CROSSTABS TABLES=Q3A BY Q1A/Q3A BY Q1C
 41  0          STATISTICS 1
 42  0
```

```
THERE ARE    57680 BYTES OF SPSS MEMORY AVAILABLE.
THE LARGEST CONTIGUOUS AREA HAS    57680 BYTES.
SPSS IS USING    65536 BYTES OF SYSTEM MEMORY
THERE ARE AT LEAST  2031616 BYTES OF SYSTEM MEMORY AVAILABLE.

***** GIVEN WORKSPACE ALLOWS FOR  4107 CELLS WITH     2 DIMENSIONS FOR CROSSTAB PROBLEM *****
```

CROSSTABULATION OF Q3A BY Q1A

Q3A	COUNT \ Q1A 1	3	ROW TOTAL
2	9	4	13 33.3
3	1	2	3 7.7
5	6	2	8 20.5
6	9	5	14 35.9
8	1		1 2.6
COLUMN TOTAL	26 66.7	13 33.3	39 100.0

CHI-SQUARE	D.F.	SIGNIFICANCE	MIN E.F.	CELLS WITH E.F.< 5
2.32418	4	0.6764	0.333	7 OF 10 (70.0%)

NUMBER OF MISSING OBSERVATIONS = 19

CROSSTABULATION OF Q3A BY Q1C

Q3A \ Q1C	1	2	ROW TOTAL
2	9	9	18 35.3
3	3	2	5 9.8
4	2		2 3.9
5	8	1	9 17.6
6	5	10	15 29.4
7		1	1 2.0
8	1		1 2.0
COLUMN TOTAL	28 54.9	23 45.1	51 100.0

CHI-SQUARE	D.F.	SIGNIFICANCE	MIN E.F.	CELLS WITH E.F.< 5
10.92593	6	0.0907	0.451	10 OF 14 (71.4%)

NUMBER OF MISSING OBSERVATIONS = 7

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```
   1  0          FILE HANDLE     FIELD/ NAME='TABLE3'
   2  0          DATA LIST FILE=FIELD RECORDS=2 NOTABLE
   3  0               /1 ID 1-3
   4  0                  Q1A 4
   5  0                  Q1BANS1 TO Q1BANS6 5-10
   6  0                  Q1C 11
   7  0                  Q1DANS1 TO Q1DANS4 12-15
   8  0                  Q1EANS1 TO Q1EANS6 16-21
   9  0                  Q1FANS1 TO Q1FANS3 22-24
  10  0                  Q1G 25
  11  0                  Q2 26
  12  0                  Q3A 27
  13  0                  Q3B 28
  14  0                  Q4ANS1 TO Q4ANS7 29-35
  15  0                  Q5A 36
  16  0                  Q5BANS1 TO Q5BANS3 37-39
  17  0                  Q6A 42
  18  0                  Q6B 43
  19  0                  Q7ANS1 TO Q7ANS6 44-49 Q7ANS7 TO Q7ANS8 51-52
  20  0                  Q8ANS1 TO Q8ANS6 53-58
  21  0                  Q9ANS1 TO Q9ANS6 59-64
  22  0                  Q10 65
  23  0                  Q11A 66
  24  0                  Q11BANS1 TO Q11BANS6 67-72
  25  0                /2 Q12BANS1 TO Q12BANS3 1-3
  26  0                  Q12C 4
  27  0                  Q12DANS1 TO Q12DANS4 5-8
  28  0                  Q13ANS1 TO Q13ANS6 9-14
  29  0                  Q14 15
  30  0                  Q17A 16
  31  0                  Q18ANS1 17 Q18ANS2 18-19
  32  0                  Q19 20
  33  0                  Q20ANS1 TO Q20ANS6 21-26
  34  0                  Q21ANS1 TO Q21ANS7 27-33
  35  0                  Q22ANS1 TO Q22ANS8 34-41
  36  0                  Q23ANS1 TO Q23ANS5 42-46
  37  0                  Q26 47
  38  0          RECODE Q1A(1,2=1)(3=3)(ELSE=SYSMIS )
  39  0          RECODE Q1C(1,2=1)(3,4=2)
  40  0          MULT RESPONSE GROUPS=QUALIF (Q1DANS1 TO Q1DANS3(1))/
  41  0               VARIABLES=Q3A(1,8)/
  42  0               FREQUENCIES = QUALIF/TABLES=Q3A BY QUALIF

'MULT RESPONSE' PROBLEM REQUIRES      1128 BYTES OF MEMORY.
```

GROUP QUALIF
(VALUE TABULATED = 1)

DICHOTOMY LABEL	NAME	COUNT	PCT OF RESPONSES	PCT OF CASES
	Q1DANS1	10	16.7	18.2
	Q1DANS2	15	25.0	27.3
	Q1DANS3	35	58.3	63.6
	TOTAL RESPONSES	60	100.0	109.1

3 MISSING CASES 55 VALID CASES

* * * C R O S S T A B U L A T I O N * * *

Q3A
BY QUALIF (TABULATING 1)

Q3A	COUNT	QUALIF Q1DANS1	Q1DANS2	Q1DANS3	ROW TOTAL
	2	0	4	12	16 33.3
	3	1	2	2	5 10.4
	4	1	0	2	2 4.2
	5	3	3	4	9 18.8
	6	2	4	10	14 29.2
	7	0	1	0	1 2.1
	8	1	0	1	1 2.1
	COLUMN TOTAL	8 16.7	14 29.2	31 64.6	48 100.0

PERCENTS AND TOTALS BASED ON RESPONDENTS

48 VALID CASES 10 MISSING CASES