General Certificate of Education
June 2006
Advanced Level Examination

GEOGRAPHY (SPECIFICATION B) **GGB5/PM**
Unit 5 The Synoptic Unit
Advance Information Booklet

To be issued to candidates on 1 May prior to the examination

In addition to this booklet you must have:
- **The Ordnance Survey map extract (enclosed).**

Instructions

- This Advance Information booklet will be issued on 1 May 2006 in advance of the examination for Unit 5. You should make yourself familiar with the information in the booklet.
- This material must be kept **unmarked** for use in the forthcoming examination.
- You will also be issued with an OS map extract.
- The OS map extract must be kept **unmarked** for use in the forthcoming examination.
- In order to demonstrate your synoptic ability and your issue evaluation skills, you should, in each of your answers, wherever possible, use a range of information, ideas and examples from other modules you have studied to show your understanding of the connections between different aspects of your course and the topic in question.

STUDY ALL THE INFORMATION IN THIS BOOKLET

This exercise is based on Sections 13.1 and 13.2 of the Specification.
The information in this booklet comprises the following:

Item 1 **Extracts from Druridge Bay Coastal Management Plan 1997–2002 Northumberland County Council**

Item 2 **Northumberland Wildlife Trust and the former East Chevington opencast site**

Item 3 **The Environment Agency and the development of the East Chevington Nature Reserve (notes of author's conversation with EA representative)**

Item 4 **Notes of an Interview with local farmer (October 2004)**

Item 5 **Comments from a Northumberland Wildlife Trust volunteer**

OS map extract Explorer 325 (1 : 25 000)

Item 1 Extracts from Druridge Bay Coastal Management Plan 1997–2002 Northumberland County Council

Druridge Bay occupies a key location on the Northumberland coast between the more developed and industrialised area to the south, and the wilder area to the north. It is the most accessible part of undeveloped coast in the county for the population concentrations of southeast Northumberland and Tyneside, and is a very popular day visitor destination. The landscape has been improved over recent decades as a result of the restoration of former opencast coal mining areas. Restoration has also, in places, improved recreation opportunities and created new habitats to complement the more natural dune and foreshore areas. There remains, however, plenty of scope for work to 'mature' the relatively young restored landscape. **Map 1** (page 5) shows the location and boundary of the Management Plan area with conservation areas marked. This plan considers the 'coastal zone', extending approximately a mile inland and a mile offshore, since the hinterland and marine areas are of great importance to the landscape, to wildlife and to recreation on the coastal fringe itself.

Central to the conservation and amenity value of the bay is the 8 miles of sand dunes, beach and rocky foreshore between Amble and Snab Point. The wetlands and geological and archaeological features of the bay are also of great conservation importance. Many of these features are protected by statutory conservation designations, which have implications for the management of particular areas. In October 1995, Druridge Bay was awarded 'Heritage Coast' status by the Countryside Commission, acknowledging it as among the finest of undeveloped coastlines in England. This designation has the primary aim of conserving and enhancing natural beauty, and balancing various interests and pressures, especially those relating to recreation. This plan explains how this will be carried out.

(Overall Objectives for Coastal Management on Druridge Bay)

Recreation
To facilitate and enhance the enjoyment, understanding and appreciation of Druridge Bay by the public, by improving and extending opportunities for recreational, educational, sporting and tourist activities that draw on, and are consistent with, the conservation of its natural beauty . . . . . .

Environmental Quality
To maintain and improve the quality of inshore waters, inland waters and beaches in Druridge Bay through appropriate works and management measures.

Local Community
To take account of the needs of agriculture, forestry and fishing, and of the economic and social needs of the small communities on the coast, in the implementation of management proposals.

Landscape and Nature Conservancy

It is the broad curve of beach and dunes sweeping north to the low platform of Coquet Island, which probably provides the most striking impression of Druridge to most visitors. The main elements in the landscape are the wide beach with inter-tidal rock platforms at the north and south ends of the bay, the narrow dune ridge backed by dune grassland, and a hinterland of low, coastal plain, farmland with conifer shelter belts and relatively few hedges, supplemented by lakes and ponds with semi-natural vegetation.

Major Overall Management Issues

Mineral Extraction

Following the decline of deep mining of coal in the area, a generation of opencast mining since the 1970s has had a profound effect on the landscape, with some positive effects as well as negative. The 84 hectares of reclaimed land in Druridge Bay Country Park was the amount of land within two opencast sites, which had previously been derelict from earlier deep mining. The landscape of Druridge Bay, whilst still having potential for improvement, is probably of greater quality now than over most of the last 100 years. Opencast mining is continuing inland of the A1068 but planning policies vigorously oppose further mining in the coastal fringe.

The quality of restoration has improved greatly as experience within the industry has grown. The stark rectilinear field and woodland patterns of the old sites contrast markedly with the varied sweeps and curves of East Chevington (see **Map 1**). Further improvements are needed to the earlier restored landscapes, but it is hoped that land to be restored to the south of the Country Park will be of very high landscape quality . . . . . .

Involvement of People in Conservation

. . . . . The aim of the Northumberland Wildlife Trust's 'Druridge Bay Project', in partnership with British Coal, has been to develop a series of relatively robust nature reserves on the Bay, which can attract and cater for visitors.

Landscape Ecology

. . . . . Much of the conservation value of the Bay derives from the diversity of its habitats, each of which has its own pressures and management needs. The habitats are not isolated from one another, however, and would occur naturally on the coast in an ecological zonation moving inland (i.e. marine, foreshore, dunes, wetland/scrub, farmland/woodland). The boundaries between one habitat and another are often of particular value to wildlife. The ecology of the landscape is also important with regard to the connection of habitats through linear features such as field boundaries and watercourses, which can act as wildlife corridors. Efforts should be made to restore these zonations and corridors where they have been disrupted or destroyed by opencast mining or other changes . . . . . .

Wetlands and Watercourses

Druridge Bay is a low-lying plain where water is never far away. Mining has profoundly altered the natural hydrology and ecology of watercourses and wetlands, and has created new wetlands through subsidence and restoration. The wetland areas in the coastal fringe form a very valuable refuge for breeding and migratory birds as well as for plants, invertebrates and amphibians. In addition to open water habitats there are wet meadows, reed bed and swamp communities, mudflats and carr woodland. Many of the wetland areas are also surrounded by important areas of drier semi-natural habitat such as woodland, scrub and rough grassland.

. . . . . = material cut by editor

Map 1 – Druridge Bay Coastal Management Plan area

Map 1 of Druridge Bay Coastal Management plan has not been reproduced here due to third-party copyright constraints.

Item 2 Northumberland Wildlife Trust and the former East Chevington opencast site

Two years ago, the former opencast mine site at East Chevington was handed over to the Northumberland Wildlife Trust (NWT). The Trust's mission is to conserve wildlife, promote nature conservation and provide means by which everyone can become involved. With 66 nature reserves, nearly 10 000 members and more than 500 active volunteers, the Trust is fulfilling its mission.

Ten of the Trust's reserves are on the coast, where they form a most valuable resource, attracting a wide variety of resident and migrant birds. The coastal reserves form an important link in the whole ecosystem of Northern England, of Britain and of Europe as a whole. Four of the coastal reserves are situated on Druridge Bay. These are Hauxley, Druridge Pools, Cresswell Ponds and, most recently acquired, East Chevington.

The Trust's reserves link with sites owned by the Royal Society for the Protection of Birds (RSPB) and by Alnwick District Council (ADC) and with a number of Sites of Special Scientific Interest (SSSIs) and Scheduled Ancient Monuments (SAMs) to ensure that the area as a whole will be conserved and developed for the present and for future generations. (See **Map 1**)

When the NWT took over the East Chevington site it had been restored and landscaped by the mining company. The company's brief had included the following:

- to contour the land to bring it back as close as possible to the pre-working shape
- to restore drainage, to ensure that Chevington Burn and Lady Burn (see **Map 2**) continue to flow efficiently to remove water from their drainage basins, without undue flooding or alteration to the water table
- to create two lakes – Hadston Lake and Chibburn Lake (see **Map 2**) – with a number of small ponds, with reed beds around them to form a variety of wildlife habitats
- to restore the land by replacing top soil to allow agriculture on the area inland from the lakes.

There are two major issues facing the Trust as it plans for the future of the site. The first is how to manage the farmland over the next few years, and the second is how to manage the lakes and associated reed beds.

<u>Managing the Farm Land</u>
Since NWT took over the land, most of the farmland has been let to two local farmers, on short leases. They have used it for grazing stock but are negotiating with the Trust to be allowed to produce arable crops on the land for a few years. This would help to improve the soil, which was left in very poor condition after the opencast mining. However, they could only do this profitably if they had extended leases, say for five years. (See **Map 2**)

An alternative plan would be to use at least part of the farmland to develop wildflower-rich pasture. This would involve the NWT farming the land, delaying cutting the grass until wild flowers had seeded, and thereby building up a more traditional pasture that would be attractive to the public and to a wide range of birds and mammals. Unfortunately, the poor quality of the soil would mean such pasture would take a long time to reach maturity. Meanwhile it would mean there was a reduced income for the Trust, so a reduction in the money available for investment in the reserve ..... and in the Trust's other properties.

There is one fortunate accident that would favour this plan. During the working of the mine, one small triangular field was left untouched. It formed a sort of traffic island around which lorries turned, but which they rarely drove across. This has left a relic grassland, where over 170 species of plant have been recorded including a large proportion of the country's Lesser Butterfly Orchid. This field could provide a source from which wild flowers would spread naturally onto neighbouring fields, allowing natural progression of plant assemblies to take place, albeit slowly.[1]

The third plan is for the NWT to use at least one of the fields to plant a crop of 'wild flower' seeds. This would allow the Trust to build up its seed bank, for use on other fields, and also to sell 'wild flower seed mix' to other farmers and gardeners. This is unlikely to be profitable . . . . . but losses would be reduced if NWT could use volunteer labour for some of the more intensive work of harvesting and packing the seed.

Managing the Lakes and Reed Beds

One measure of success of the reserve would be to attract bitterns to breed in the reed beds. This would be a major contribution to national efforts to re-establish the bird. It had become almost extinct in this country but, over the last few decades, its decline has been reversed, largely as a result of conservation work in The Broads in East Anglia. Occasional sightings of bitterns have been made on the Northumberland coast in the last few years, but none has bred here.

A pair of these secretive birds needs about 25 hectares of reed bed to breed successfully. Development of an area of reed bed of this size was planned when the mining company landscaped the area before handing it over to the NWT. Most of the reed bed was to be around the edges of Hadston Lake.

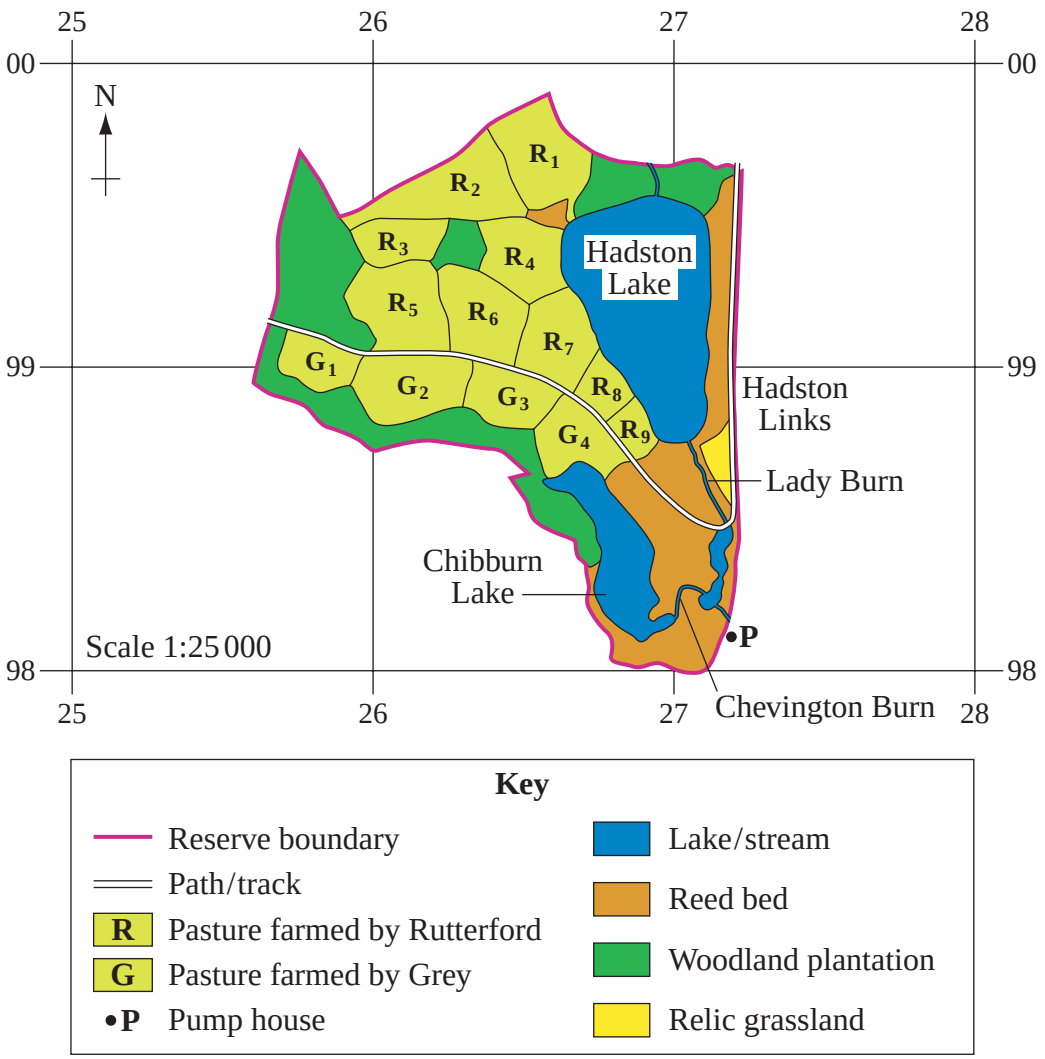
Unfortunately, it has turned out that the outfall of the stream from Hadston Lake was not suitable for the development of reed beds. The contouring of the land and the position of the outfall means that the lake has become much bigger than planned, with the area of reed bed being much smaller. (Compare the OS map extract with the more up-to-date map in **Map 2**).

However, the desired area of reed bed could be created on the field (G4) to the north of Chibburn Lake. The loss of this farmland would be relatively unimportant. It is difficult to access, being the most isolated of Grey's fields, and is rather damp already.

. . . . . = material cut by editor

[1] In autumn 2004, it was recorded that the Lesser Butterfly Orchid had spread onto new ground around the relic grassland.

Map 2 – East Chevington Nature Reserve
(based on data provided by NWT in November 2004)



Item 3 The Environment Agency and the development of East Chevington Nature Reserve (notes of author's conversation with EA representative)

The East Chevington Nature Reserve lies between the A1068 road and Druridge Bay. The coastal plain is separated from the bay by a narrow dune system, called Hadston Links in this locality. As the dune system is a very dynamic landscape, subject to constant change, it is necessary for an elaborate system of drains and culverts, sometimes with pumps and sometimes with sluice gates, to control the flow of water off the land and through or beneath the dunes.

Mining has seriously affected the natural drainage pattern for most of the twentieth century. At first, the problem was caused by subsidence of the land, due to underground, and undersea, working. More recently opencast mining has replaced the deep mining. The opencast contractors have to restore their sites after working them. We keep them to strict criteria, but the restored drainage may take many years to become completely re-established.

If students look at the OS 1 : 25 000 map they will immediately see our major area of concern. The northern part of the site, in grid square 2699, is shown with few contours and very obvious gaps. There are two short blue lines, which represent streams running down from drains in the restored land . . . . . but then these lines stop! When the OS surveyed the area, the whole area was undergoing restoration and the stream courses had not become fully established. The surface was still being landscaped by the contractors.

The southern part of the site, in grid square 2698, also lacks contours, but it is a lot easier to see the drainage pattern. Chevington Burn had been maintained, more or less *in situ*, throughout the mining period. It flows into Chibburn Lake, and the nearby pools, and from there it is pumped through a culvert into the sea. There is a problem of sand blocking the outlet after a storm, but the flooding that causes is confined to the nature reserve and it will not harm the reed beds. The outlet has to be cleared, when necessary.

The northern part of the site has poor soil structure, with poor infiltration, and because of the immature stream system, surface run-off is slow. This leads to a potential flood risk for the A1068 around 257997, and for part of the housing estate just to the west of that point. We are working with the Wildlife Trust, and with the tenants who farm the land, to try to improve the situation. Improvement of the soil structure on the main farmed area will help to improve matters. We are also keen that free drainage through Hadston Lake is maintained.

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Item 4 Notes of an Interview with local farmer (October 2004)

Since NWT took over the land in 2002, most of the land has been leased to two local farmers; Mr Rutterford and Mr Grey. They have held the land on short-term leases, one year at first and now for two further years.

They have used it for grazing stock; cattle, with some sheep in winter, brought down from upland farms in the Cheviots.

They have been disappointed by the outputs from the land. They feel that the soil structure and fertility are poor, even when compared with the usual soil after opencast restoration.

From their point of view, they wish to grow arable crops, probably mostly barley, for a few years to help to improve the soil by adding fertiliser and organic matter. Ploughing stubble into the soil would also benefit the soil structure. This would make it more productive in the long run. However, they could only do this profitably if they had extended leases, probably for about ten years.

They are well aware that the land must be farmed with conservation values in mind. They realise that, even if they went over to arable crops, they would need to:

- reduce inputs of pesticides compared to the economic optimum
- leave stubble unploughed over winter to provide a feeding area for birds
- leave unploughed 'bug strips' around the edge of arable fields to encourage bio-diversity and to provide 'corridors' for wildlife to move through the area
- ensure that fertiliser usage was strictly controlled to cut excess being washed off the fields or through the soil into the drainage system.

Even if they follow these principles they realise that, in the short-term, the value of the land for birds, insects and small mammals will be reduced.

They are aware that all this will be taken into account in setting the rental cost of the fields. They are also convinced that it is in the long-term interest of bio-diversity to improve on the soil left on the site by the mining company.

The change in the way that EU subsidies are paid has a big effect on them though. In 2003, they were paid what is called a 'historical sum' – that is, they were paid the same as they had been paid the year before, when the subsidy was based on the number of stock kept on the land.

Over the next ten years, the 'historical sum' will be reduced by 10% each year. Meanwhile, an 'area' payment will be brought in, proportional to the area of land farmed, and gradually increasing over the ten-year period until it replaces the 'historical' payment.

Matters are even more complicated. The 'historical' payment can only be paid to the farmer who was farming the land in 2003. If the land is handed over to someone else, the 'historical' payment ceases to be paid. In effect, this means that if all the land were taken back by the NWT, there would be a total loss of about £2000 in subsidies in 2006, gradually reducing until there was no net loss in 2013. If, or rather, when the NWT takes over the land, they will be entitled to receive all the 'area' payment, but the way transition is organised there is a strong incentive to leave the land, or most of it, with the farmers at least until about 2008/9 or 2010.

Item 5 Comments from a Northumberland Wildlife Trust volunteer

I'm a student at Northumbria University, studying land management and conservation. I regularly spend weekends working as a volunteer for the NWT. It is fun, I meet people, it gives me a practical experience, which is a valuable supplement to my course . . . . . and it will look good on my CV when I apply for land management jobs later.

I have done quite a lot of work on reed beds. Their ecology is fascinating. They form naturally as part of seral progression in shallow water round the edges of lakes. A stream flows into a shallow lake or pond. It deposits sediment in the pond, and enriches the water with nutrients. Algae and mosses start to grow in the water, then water lilies, pond weed and submerged plants start to grow in the shallow water. As these die, they enrich the organic content on the bed of the pond, so that bulrushes, sedges and weeds can grow around the edge of the water.

It is this reed bed community, which is particularly attractive to a wide range of insects and birds . . . . . forming an interesting but fragile ecosystem. As the reeds thicken they trap more sediment and the pond shrinks in size. Shrubs and trees, such as alder and willow, start to colonise the beds. Their roots help to create new soil, and litter fall speeds up creating conditions where oak and ash can come in and colonise the land, creating a climatic climax community.

So what do the land management volunteers do to alter this progression? That's a good question. Essentially, we interfere with the progression to maintain a plagio-climax community, which suits the needs of the area's management plan. Geographers can probably work out for themselves what we will need to do to East Chevington.

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