SITE

Name: River Lyn

Parish: Lynton

Local Authority: Exmoor National Park

National Grid Ref: SS 702 442 and SS 7235 4920

OS Sheets: 1:50K, 180, **1:10K**, SS74 SE & SS74 NE

Locality Description: Sections of River Lyn at Butter Hill on Exmoor and near Exmoor coast at Lynmouth.

Nature and Status of Site: Two contrasting sections of river set within gently sloping moorland and steep-sided gorge, showing geomorphological landforms as a result of floods. The site is a designated Site of Special Scientific Interest (SSSI).

Summary of Geological / Geomorphological Interest: The River Lyn was the scene of major flooding disaster in August 1952 following a period of heavy rainfall. The large volume of water and sediment carried in the floods left behind a whole host of geomorphological landforms. The area can be divided into an upper and lower section. The upper reaches show both erosional and depositional features. The lower reaches, which flow through a gorge now displays a river bed of large boulders, which are clearly as a result of a greater water flow than that seen today.

Safety Considerations: The southern section of the site along the eastern bank of the River Lyn requires crossing several fences, some of which are electrified. Examination of the river is hazardous during floods or bad weather.

Educational Groups: Secondary, College/6th Form, University.

Parking and Access: The northern area is accessed via Lynmouth, where a nature trail (providing excellent views) allows access to the eastern bank – there is a small charge. The southern area is accessed from a track leading south of Shallowford Farm, and permission should be obtained prior to any visit. A number of bus services are available from nearby towns, including Barnstaple, Ilfracombe and Combe Martin, which travel to Lynton. For timetable details, visit www.traveline.org.uk. Additionally the South West Coast Path runs through Lynton.

References

Anderson, M. G. & Calver, A., 1977. On the Persistence of Landscape Features Formed by a Large Flood. Transactions of the Institute of British Geographers, **2,** 243-254

Delderfield, E.R. 1981. The Lynmouth Flood Disaster, Exmoor, 10th edition. ERD Publications, Exmouth, 160pp.

Kidson, C., 1953. The Exmoor Storm and the Lynmouth Floods. Geography, **38**, 1-9

Edmonds, E.A., Whittaker, A. and Williams, B.J. (1985). Geology of the Country around Ilfracombe and Barnstaple. *Memoir of the British Geological Survey*, Sheets 277 and 293, 97pp., HMSO.

Gregory, K. J. (ed.) (1998). Fluvial Geomorphology of Great Britain. *Geological Conservation Review Series* 13 (Joint Nature Conservation Committee, Peterborough, and Chapman and Hall)

Keene, P & Elmson, D (1997). Lyn in Flood; Watersmeet to Lynmouth. Thematic Trail Guides. School of Social Sciences. Oxford Brookes University.

Simpson, S., 1953. The Development of the Lyn Drainage System and its Relation to the Origin of the Combe Martin and Porlock. Proceedings of the Geol. Assoc., **64**, 14-23

For further description of the solid geology of the area see Edmonds et al. (1985) and for the features associated with the 1952 flood event see Keene and Elmson (1998) and Gregory (1998) (the latter also available from www.jncc.gov.uk/).

Detailed Geology: [The following has been adapted from Gregory et al. 1998]

'The Lyn catchment was the scene of a unique combination of a storm rainfall sequence subsequent flood event, which demonstrated the effects of short-term processes and long-term changes in sea level on river development. The Lyn is able to show the response to a catastrophic event and the recovery of the landscape afterwards. The drainage area of the East and West Lyn together is 95km^2 (71km^2 and 24km^2 respectively). This drainage area consists of gently sloping moors draining into narrow steep-sided valleys.

Simpson (1953) proposed that the drainage was superimposed on a Mesolithic surface in Tertiary times. Falling sea levels then initiated a new coastline and caused successive stream captures. The resulting topography now falls from 450m to the Bristol Channel in 6.4km, which contributed to the power of the Lyn during the flood event of 1952. The rainfall on the 15th and 16th August 1952 was the third highest on record and followed a period of heavy rain on 13 of the previous 14 days. The amount of rain caused sheet flow over extensive areas and eyewitnesses described field slopes being 150-200mm deep with surface runoff during torrential periods. The resulting features produced by the floods can still be seen in the upper reaches, near Upper Canon Hill Valley (Anderson and Calver, 1977). Over 50,000 tonnes of boulders (kidson, 1953), some being more than 10 tonnes each (Delderfield, 1981) were moved by a volume of water in the order of twice the average daily discharge of the Thames (Kidson, 1953). If measured according to the power expenditure per unit area of channel (W.m^{-2}), then the event had a greater unit power than the Mississippi or the Amazon in flood. Debris dams giving rise to even larger flood flows when they burst exasperated the event.

The upper valley, once a large flat valley, well-vegetated and containing small channels, suffered widespread flooding over most of the valley floor when the channels overflowed. The vegetation helped prevent erosion, although, two shallow slides occurred, which are still in evidence. The middle reach is surrounded by grits, which produce steeper valley slopes (30-35° slope). The event formed a flood

channel, removing quantities of bed material, which left continuous small bank-side scars. Today, vegetation below the scars reveals the reduced dimensions of the present channel. The erosion left little channel debris and bedrock now forms part of the channel bed in places. The downstream reach is similar to the upper reach, having a wide shallow appearance. This allowed the flood to disperse giving rise to widespread deposition and the formation of boulder field deposits. Now covered with vegetation, they still outline the former water courses, which have suffered some measure of subsequent infill by downhill movement of material and small scale slumping of the banks'.

Suggested Questions

1. What geomorphic features can be seen to demonstrate that the area has suffered from a flood event?

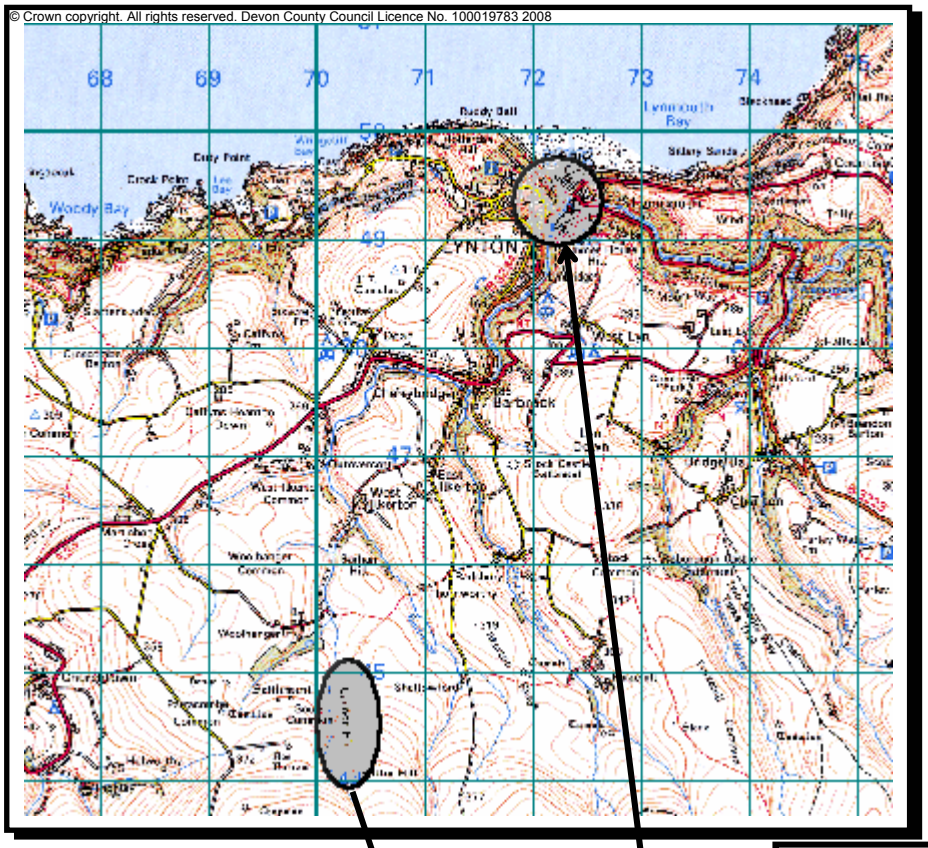
2. Do any of these features give evidence to the size of the event?

3. What steps do you think should be taken to prevent this type of disaster happening again? Can you see any evidence of such works or procedures?

LOCATION PLAN

RIVER LYNN, SSSI
LYNTON, EXMOOR NATIONAL PARK

National Grid Ref: SS 702 442 - 7235 4920



Scale 1: 70,000

Site locality

Parking and Access

- The northern area is accessed via Lynmouth, where a nature trail allows access to the eastern bank
- The southern area is accessed from a track leading south of Shallowford Farm and permission should be obtained prior to any visit.
- Regular bus services from neighbouring towns to Lynton.

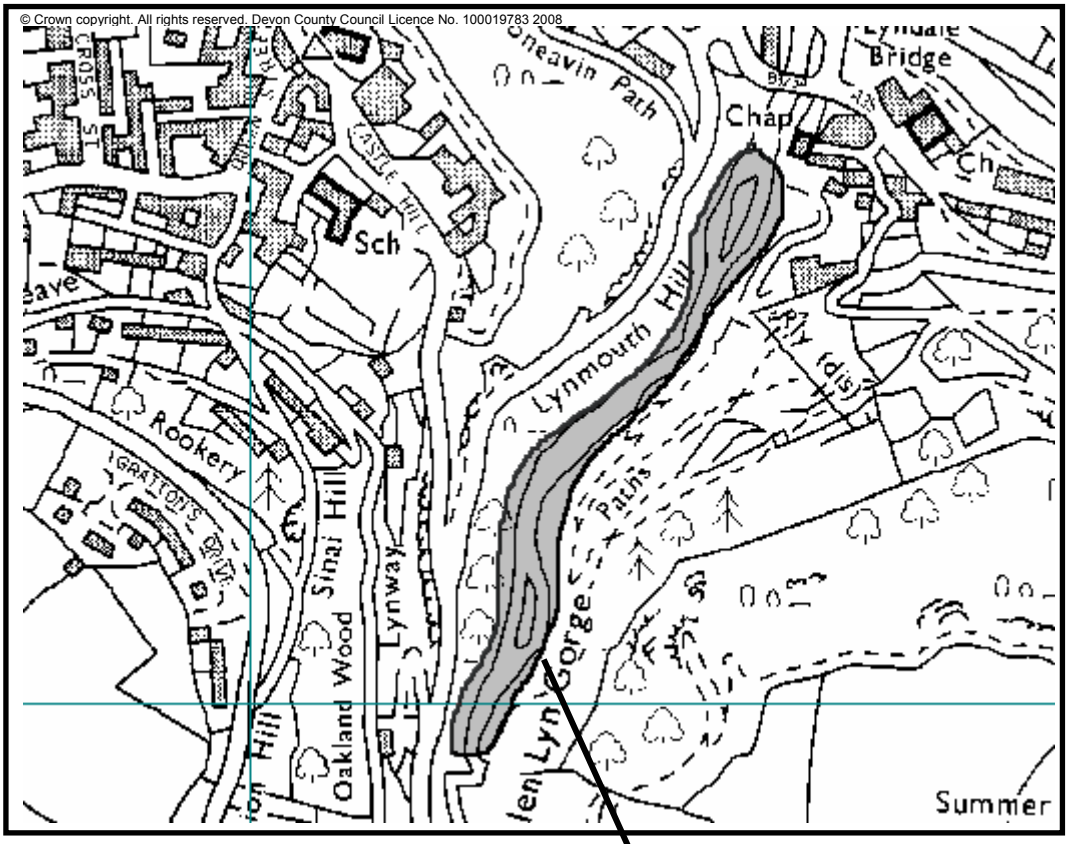
SITE PLAN

RIVER LYN

LYNTON, EXMOOR NATIONAL PARK

Location 1

National Grid Ref: SS 7235 4920



Boundary is 5metres either side of the river bank

Approx. SSSI Boundary

Scale 1 : 5,000

Main Points of Interest:

- The river flows through a gorge at Lynmouth, where a suite of large boulders now occupies the river bed.
- This site demonstrates very well the effects of high magnitude, low frequency flood events.

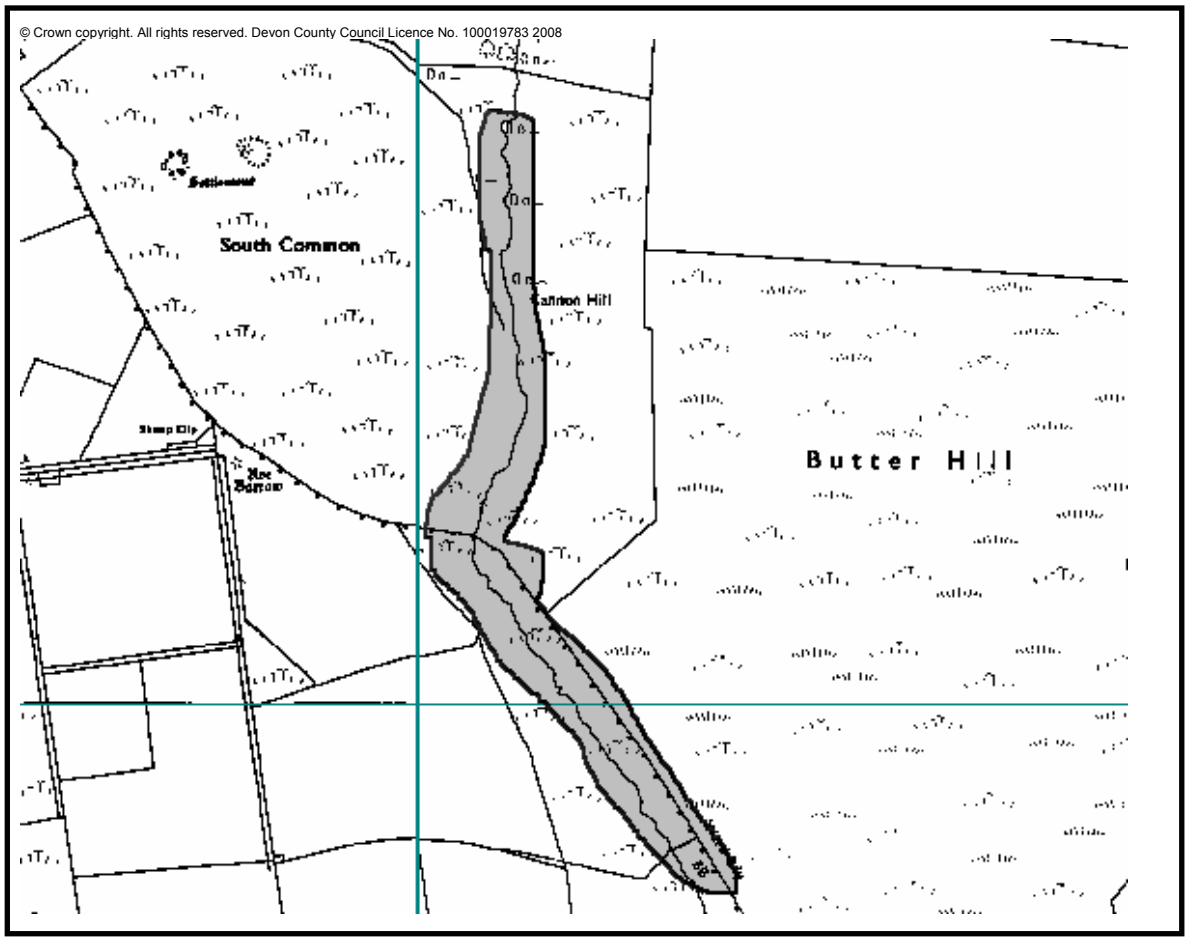
SITE PLAN

RIVER LYN

LYNTON, EXMOOR NATIONAL PARK

Location 2

National Grid Ref: SS 702 442



Approx. SSSI Boundary

Scale 1: 10,000

Main Points of Interest:

- Excellent examples of erosional and depositional landforms such as; erosional slope scars and depositional boulder deposits.

RIVER LYN

General view of Lynmouth from the mouth of the River Lynn. Note steep-sided and narrow Glen Lynn valley behind the town and river course engineered post-1952 to provide flood relief. Seaward of this channel lies a major coastal boulder fan (see below).