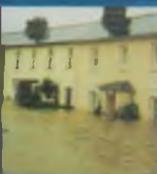


A South West Box 11



# BENEFITING BUDE



*A NEW SCHEME  
FOR A BETTER  
FUTURE*



ENVIRONMENT  
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# Benefiting Bude

**B**ude is one of Cornwall's best known tourist centres, set in the valley of the River Neet in the north-east of the county.

A small, traditional resort, Bude boasts Summerleaze Beach at the mouth of the Neet and the Bude Canal which flows alongside the river.

Bude's economy is based on agriculture and tourism. It is estimated that 50 per cent of employment in Bude provides services to visitors.



*Bude 1900*

Water - including the canal and beach - features prominently in Bude's popularity, but the town's association with the river has also meant a history of flooding.

One such flood, described by many as the worst in living memory - occurred during the start of the tourist season in 1993 - on June 12. This leaflet describes how the Environment Agency has given the town improved flood defences to

reduce the risk of any future flooding, but also secured European funding to conserve and enhance the area for local people, visitors and wildlife.

## **Background**

From its source near Kilkhampton, the River Neet flows south west to its confluence with the River Strat at Helebridge. The River Strat rises near Jacobstow.

The Neet Valley runs almost parallel with the North Cornwall coast. To the western side of Bude land rises steeply towards the sea cliffs. To the east, the slope is more gentle, and it is here that most development has taken place.

Bude has a population of around 7,000, boosted by many visitors during the summer months. The town developed during the 19th century due to its lime kilns, fish cellars and tidal mill.

EA-South West/99-8 ✓



▲ Schematic showing loc of improvement works  
 ◀ Bude, June 1993

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## History of Flooding

Notable flood events have been recorded at Bude and Helebridge in 1846, 1887, 1900, 1903, 1948, 1950, 1969, 1979, and most recently 12 June 1993.

A common feature of many of these events is that they occurred after a prolonged period of rain, when the catchment was saturated.

Following the floods of 1948 and 1950 the former Cornwall River Board set to work on building a flood defence scheme for the town.

### Original Flood Defences

In Bude these principally comprised embankments along the floodplain approach to the town centre and a combination of walls and embankments in the town centre.

Between Helebridge and the Crescent in Bude the River Neet channel was improved, widened and straightened. Flood embankments were built on either side of the river channel to contain high water levels. The embankments were designed to be overtopped during major flooding events - the excess water spilling into storage in the marshlands.

The original arched road bridge at Bencoolen Road was replaced as it obstructed flow. The centre section of the weir downstream of Nanny Moore's Bridge was removed and replaced with steel sluice gates. The hand railing on the right bank of the Strand between Bencoolen Bridge and Nanny Moore's Bridge was replaced with a masonry parapet.

Following the 1979 floods repairs were necessary to the banks of the Strat and in 1989 a length of river above Helebridge was cleared of obstructions and a potentially weak spot at Helebridge, where the River Neet and Bude Canal are close, was reinforced.

More recently work continued on strengthening river walls between Bencoolen Bridge and the town's car park at the mouth of the river.

### The June 1993 Event

The original 1950s scheme was designed to cope with a peak flow of 68 cubic metres per second at Bencoolen Bridge.

It was therefore not surprising that serious damage and destruction occurred on 12 June 1993 when 110 cubic metres per second tried to pass through Bude.

A total of 91 properties were flooded, 8 at Helebridge, 71 in Bude from the River Neet, and approximately 12 directly from the Bude Canal.

There was no loss of life, but several people had to be rescued by boat from their houses, both in Bude and Helebridge. Bude hit national television headlines when pictures of a wedding party having to travel by boat were transmitted.

Rain began in the early hours of Friday 11 June 1993 and continued for more than 24 hours. During a 48 hour period 69.3 millimetres was recorded at a local rainfall station.

At around 10.30am on the Saturday, at the peak of the flood, the river was flowing over the west bank defences of the Neet for practically the entire length between Bencoolen Bridge and the weir further downstream.

As water levels eventually receded water became trapped within the floodbanks and riverside walls in the Crescent area, and around 16 metres of wall collapsed.

The National Rivers Authority (NRA), the Environment Agency's predecessors, carried out emergency repairs following the floods and investigations immediately began into how improvements could be carried out.





12 June 1993

## The Options

Investigations showed that the weir on the River Neet, next to the Bude Haven recreation ground, impeded river flows and the crest boards were immediately removed. The paddles, or central sluice gates, were also raised.

But as a result of these measures, there was a drop in water levels in the River Neet, causing a significant environmental impact in Bude.

In dry periods, considerable lengths of the river bed were exposed which was considered to be visually unacceptable. This produced an odorous environment during hot sunny spells and impacted on the whole character of Bude.

Recreational opportunities on the river were reduced. Anglers and other users, in particular canoeists, were affected and the neighbouring canal became overcrowded.

Therefore when engineers were looking into long term flood defence options for the town, the effect on the town's environment, character and economy had to be given serious consideration.

An option had to be found which would bring the water level up to the previously accepted recreational summer level, if there was not to be a severe impact on Bude's tourist industry.

Twelve scheme improvement options were originally considered in a feasibility study undertaken by the NRA in April 1994. Of these 12, five were considered to merit further appraisal. The remaining options were considered unacceptable on economic, technical or environmental grounds.

The main feature of all five options was a new adjustable weir to replace the existing fixed weir, with various combinations of other elements. The proposals were inspected by members of the public during a four-day exhibition in the town.



*The original weir*

## **The Chosen Scheme**

The chosen scheme included a new adjustable weir and works to lower the river bed at Nanny Moore's Bridge.

The Environment Agency began work on the scheme in 1996 and the work - carried out by the Agency's in-house workforce - was completed in June 1998.

## **The Weir**

The existing concrete weir was replaced with an adjustable flap gate weir 40 metres further downstream. Permission for removing the existing weir was granted by the Duchy of Cornwall, and the weir had to be replaced in two stages to maintain river flows throughout.

The weir maintains water levels for amenity and recreational use but during flood events will automatically lower to maximise the safe passage of flows.

The new weir was brought into action in March 1998 and has successfully aided flows in the river ever since.

The weir is controlled automatically by water level sensors housed in the control building constructed next to the neighbouring car park.

The weir can be lowered manually and by a petrol engine should power fail during a flood. Contractors GEC Alstom Hydropower from Rugby carried out the mechanical and electrical elements of the weir flap gate.



*Control building*

## **Nanny Moore's Bridge**

Lowering the river bed at the bridge - a grade II listed structure - was a delicate operation carried out in piecemeal fashion to reduce the risk of damage.

Nanny Moore's Bridge presented a major restriction to flow once the weir was removed. To improve the capacity the river bed was lowered substantially.

*A section of the weir is lowered into position*





*Installing the gate - a delicate operation*

## Conservation and Recreation

For the first time in the South West, the Environment Agency sought funds from the European Regional Development Fund to enable it to undertake extra conservation and recreation work as part of the scheme. This funding also enabled the industrial estate at Petherick's Mill to be given an increased standard of flood protection.

By the effective control of water levels, the new weir benefits the Bude Marsh Local Nature Reserve. Another benefit of the scheme is a new wetland area next to the River Neet.

The overall flood defence scheme has provided a viewing area on the right bank of the river and access steps to the river, aiding recreational users.

Additional footpaths and the basis of a new cycle route are also being developed with the backing of North Cornwall District Council.

To aid fish migration a fish pass has been incorporated into the new weir.

The scheme was completed at a cost of £1.1 million and was designed by consulting engineers Sir William Halcrow and Partners of Exeter. The project was approved by the Environment Agency's South West Regional Flood Defence Committee and funded by the Environment Agency, North Cornwall District Council, Ministry of Agriculture, Fisheries and Food, European Regional Development Fund and the private sector.

The scheme was officially opened at a ceremony on June 12 1998 - the 100th anniversary of the major flood that led to the improvements.

*The prefabricated wall sections are lowered to the river bed*

## The Completed Scheme

Completion of the scheme has raised the standard of flood defence substantially. The capacity of the river at Bencoolen Bridge is now 110 cubic metres per second.

## Helebridge

To reduce the risk of flooding at Helebridge the Agency's in-house workforce carried out, in 1995, improvement works at the confluence of the Rivers Strat and Neet.

A minor stretch of the River Neet was diverted to improve the angle at which the Neet met the Strat, and a footbridge was built to maintain public access along the Bude Canal.

General strengthening work and repairs were carried out on the canal banks and river walls.



Conservation

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South West Region  
Manley House  
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### SOUTH WEST REGION OFFICE

Manley House, Kestrel Way,  
St John's Exeter EX2 7LQ  
Victoria Square  
Bodmin PL31 1BB  
Tel: 01208 78321  
Fax: 01208 78321

### NORTH WESSEX AREA OFFICE

Environment Agency  
Rivers House, East Quay  
Bridgwater TA6 4YS  
Tel: 01278 457 333  
Fax: 01278 452 985

**DEVON AREA OFFICE**  
Environment Agency  
Rivers House  
Business Park  
Shaftesbury Road  
Bridgwater DT11 8ST  
Tel: 01278 456 080  
Fax: 01278 455 998

### DEVON AREA OFFICE

Environment Agency  
Exminster House  
Miller Way  
Exminster  
Devon EX6 8AS  
Tel: 01392 444 000  
Fax: 01392 316 016



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