Water on Exmoor

Exmoor can be very wet! Situated close to the coast of North Devon and Somerset, the high moor causes the warm, damp air from the Atlantic to rise, cool and drop its moisture. Annual precipitation i.e. rain, snow, sleet, on the Chains (487m, 1600 ft) is over 2000 mm compared with 800mm to the east of the moor. Generally the months between May and September are much drier than the rest of the year.

Some of this rain soaks into the ground, a small proportion is trapped in reservoirs, about a quarter evaporates into the atmosphere and the rest, known as run-off, flows into the rivers and streams and so back to the sea. There are about (483 km) 300 miles of named rivers on Exmoor.

Over centuries people and animals have adapted to the wet climate of the moor. Cattle and sheep have been bred to withstand the cold and wet of an Exmoor winter. The hardy Exmoor pony, which has lived on the high moorland longer than humans, has developed a special coat. An undercoat of short wool type hair is topped by a longer greasy coat. This repels the rain which simply runs off. Whorls of hair strategically placed help to direct water away from sensitive parts of the body. The two layered coat retains body heat while the snow lies on the pony’s back for days.

Heavy falls of snow regularly used to block the lanes for weeks, cutting off people living in isolated farms and villages and making daily work on the land slow and difficult. Sheep had to be rescued from the drifts and occasionally children weren’t able to get to school for a month or more! These days well-stocked freezers, radio weather reports and supply helicopters, which can provide an emergency link if needed, make it easier to manage. However, global warming has meant that such winters are becoming rare.

Windsurfers on Wimbleball Lake
Photograph - Heather Lowther (ENPA)
Rivers

The high ground of Exmoor with its heavy rainfall is the catchment area for Exmoor’s eight main rivers and numerous tributaries. Many springs also feed into the river system. The rivers are clear and fast-running. They provide excellent spawning grounds for salmon and trout and the presence of salmon particularly indicates good quality clean water which is valuable for the reservoirs which supply water to much of Devon and Somerset.

The river banks are generally owned by the local farmer or landowner while the fishing rights may be owned or leased separately. The water itself is the responsibility of the Environment Agency. Exmoor’s rivers provide fine opportunities for fishing but in order to fish, permission and licences must be obtained. For rod fishing these are needed for all but tidal waters.

Rivers, streams and reservoirs all attract visitors and easy access points at places like Tarr Steps and Horner quickly become congested. Other problems can include damage to river banks, pollution and disturbance to wildlife.

Environment Agency

The Environment Agency are the ‘guardians of the water environment’. They have statutory responsibilities for water resources, controlling pollution, flood defences, fisheries, water-related recreation and conservation. They therefore work closely with the National Park Authority to protect the water-based environment for the benefit of local communities and visitors.

Water at work

Water has been an important source of power on Exmoor for centuries. Used first for grinding corn, the water wheel was gradually adapted to a variety of tasks and only in this century has it been ousted by modern power supplies. In the medieval villages there were mills for fulling woollen cloth. With the introduction of machinery, farmers installed wheels to work threshing machines, feed crushers and root pulpers. On estates there were saw-mills. Water wheels drove the pumps, whins and crushers in the Exmoor mines and pulled loads and worked pumps in the limestone quarries.

Rainfall in mm. Selected sites in West Somerset and North Devon. 1996

<table>
<thead>
<tr>
<th>Minehead</th>
<th>Tivington</th>
<th>Dunkery</th>
<th>Chains Barrow</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS 963 457</td>
<td>SS 931 458</td>
<td>SS 874 417</td>
<td>SS 734 420</td>
</tr>
<tr>
<td>58m AMSL</td>
<td>80m AMSL</td>
<td>518m AMSL</td>
<td>518m AMSL</td>
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<tr>
<td>90.3</td>
<td>78.4</td>
<td>76.4</td>
<td>75.0</td>
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<td>107.3</td>
<td>89.9</td>
<td>76.5</td>
<td>77.1</td>
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<td>92.0</td>
<td>143.6</td>
<td>81.6</td>
<td>94.4</td>
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<tr>
<td>122.0</td>
<td>179.5</td>
<td>61.5</td>
<td>98.5</td>
</tr>
<tr>
<td>821.9</td>
<td>929.8</td>
<td>1381.0</td>
<td>1710</td>
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</table>
In 1890 a hydro generating plant was installed at Lynmouth to supply electricity to the town. Dulverton and Porlock followed with similar schemes. The Lynmouth plant continued in use until 1952 when the station was destroyed in the great flood, but a new plant elsewhere in Lynmouth supplies electricity to the National Grid. Some private houses had their own hydro-driven generators but perhaps the most unusual use was a wheel at Woolhanger which provided the power to drive the bellows of a pipe-organ!

The Lynmouth floods

During the 24 hours of Friday August 15th 1952 more than 225 mm of rain fell on the Chains, the catchment area for most of Exmoor’s main rivers. It was one of the three highest daily rainfalls recorded in Britain during the last hundred years. Most of the rain fell during the afternoon and evening. And the flood came during the night.

It had been a wet summer. The peaty soil was already saturated and could absorb no more. The rivers were full and during the storm every stream and rivulet became a torrent which poured off the moor in a raging flood. To the south the Barle uprooted trees, carried away the huge stones at Tarr Steps and flooded Simonsbath to a depth of ten feet. At Dulverton the river rose twenty feet above normal and there and at Exford there was widespread flooding. The flood carried all the way down the Exe to Tiverton and Exeter.

To the north west all the water poured into the narrow, steep-sided valleys of the East and West Lyn. The rushing rivers became torrents bearing boulders, tree trunks and other debris in a remorseless flood towards the sea. In the narrow sections of the valleys and behind bridges this debris formed dams. Floodwater built up behind them until they eventually burst and huge surges of water poured down the valleys.

Near the confluence of the East and West Lyn in the holiday village of Lynmouth the course of the West Lyn had been constricted by narrow bridges and embankments. A bridge became blocked with debris and the river took a new course, sweeping away the tightly packed houses and hotels that had been built on the flood plain.

It was a night of fear and of heroism. In the morning the full extent of the devastation began to be realised. 34 people had lost their lives in the Exmoor area. Lynmouth lay under tonnes of debris and many buildings were destroyed or beyond repair. The sea wall was badly damaged; nineteen boats had disappeared from the harbour and 38 cars had been lost without trace, swept out to sea. Roads had been undermined and bridges swept away. Electricity and telephone links had been lost during the night. Sewers and water supplies were totally disrupted.

The whole town had to be evacuated as clearing up and rebuilding operations began. The emergency services, including the army and police, were engaged for a month in the first phase of reconstruction. Donations to the Emergency Fund totalled more than £500,000 (£10m at today’s values) in just a few weeks. Measures were taken to make sure that if it were humanly possible such a disaster should not occur again in Lynmouth. A new wider course for the East Lyn was created with high walls and an overflow area, while the West Lyn was re-channelled to the south of its pre-flood course.

A new street was built as a buffer between river and buildings, and bridges with wider spans and higher arches were built. On the moor the predecessors of the Environment Agency took on the responsibility of maintaining rivers and making sure that water courses were kept clear of debris. In 1960, when river levels rose to similar heights, all was well.

Rainfall figures for Friday August 15th 1952
Some aspects of erosion

A more common problem than flooding is erosion caused by excessive rainfall.

Following heavy rain, torrents of water pour down the hillsides turning footpaths and tracks into temporary streams. Topsoil is washed away leaving an uneven surface of loose stones. After swaling or burning the moorland vegetation, the peat is washed away more easily until it builds up again.

In the rivers heavy loads of silt, pebbles and debris are carried downstream by the rushing waters, which pound the river banks in times of flood. Where fields or moorland have been drained, rain runs off more easily into the rivers contributing to a faster flow.

On vulnerable curves the bank can be cut away underneath so that trees and paths slip into the stream. One way of preventing this is to shore up the bank with gabions (steel cages filled with pebbles), but this can be unsightly.

On the coast many landslips are caused after high winds bring down trees. As a result the soil is loosened and heavy rainfall washes away both soil and trees. In the National Park repairs to footpaths and preventative measures are carried out chiefly by the National Park Authority’s Field Service Team. More information about erosion on Exmoor can be found in Questex also published by ENPA.

Pollution

Although there has been an increase in the number of reported cases of water pollution nationally, few have occurred on Exmoor where the monitored quality of water is usually very good. Possible concerns are of nitrates which enter the water in run-off from fertilised land and of pollution from household waste and slurry from farms.

It has been the practice in many parts of the South West to discharge crude sewage into the sea. There are still problems of pollution on beaches but both South West Water and Wessex Water have begun schemes to replace the old out-dated sewage outfalls with modern coastal treatment works.

The water of the Bristol Channel is sometimes polluted by heavy metal discharges from the industrial works at Bristol and Avonmouth and South Wales.
Sea and shore

The coastline within the National Park stretches for (54 km) 34 miles. It is outstanding for both its scenery and its wildlife and was one of the prime reasons for the designation of Exmoor as a National Park. In April 1991 it was created a Heritage Coast, reinforcing its value and the need for conservation already recognised by National Park status.

The magnificent coast is composed of the British mainland’s highest cliffs and wooded slopes while fast-running streams make their way to the sea by ravine or waterfall. Scree covers some of the lower slopes of the cliffs, curved like hogs’ backs and undercut by the action of the sea. Access to much of the coast is difficult and many of the cliffs, caves and rocky beaches may only be approached by boat - or by the expert rock climber.

At Combe Martin, Lynmouth and Porlock Weir there are small harbours that used to be busy with coastal trade. Now sailing and fishing for pleasure are their mainstay.

Pressures on the coast

Some pressures are man-made. The coast is very popular with visitors and the few places where access by road is possible, such as Combe Martin and Lynmouth, tend to become congested in summer. Haphazard car-parking clogs the roads and erodes wayside areas. Attempts to cater for tourists can lead to unsightly developments.

Other pressures are natural and are part of the ongoing formation of the landscape by the erosive action of wind, weather and, especially, sea. For example, between Foreland Point and Porlock Bay landslips are commonplace. As a result the South West Coast Path has had to be diverted and limits have been placed on access to the area by vehicles.

Porlock shingle ridge

A particular problem in recent years has been the weakening of the shingle ridge that protects Porlock Marsh, much of which is a Site of Special Scientific Interest. The ridge was probably first formed more than 8000 years ago and has been sustained, on and off, by stones from cliff falls at Culbone. The natural supply of stone from Culbone cliffs no longer reaches the beach while the shingle already there is constantly being transported by the sea to build up the eastern end of the beach while the western end becomes thinner. A combination of high water levels and storm waves has led to the ridge being breached on several occasions, most recently in October 1996.

For many years attempts have been made to strengthen the ridge by the use of timber groynes and by replenishing the shingle but this has proved unsuccessful.

In fact it has been suggested that the failure of the ridge was due partly to management measures over years which altered and steepened the profile of the ridge making it less stable. The October storm in fact made the ridge lower and wider and thus more stable.

Now, after consultation with the National Trust who own the eastern end of the ridge, Exmoor National Park Authority, English Nature and environmental consultants, it has been decided to follow a policy of ‘managed retreat’. Nature will be allowed to take its course and this is likely to result in a return to the situation of 200 years ago shown on maps of that period, with a breached ridge and a lagoon instead of a marsh.
Water supply

South West Water and Wessex Water are together responsible for water supply and sewage disposal on Exmoor. South West Water provides for the south and west part of Exmoor and Wessex Water for the north and east part, but supply and disposal areas are not identical. The Environment Agency, who have overall responsibility for water resources (see page 2), is divided into larger regions and Exmoor falls within its south western region. Many people on Exmoor still rely on springs for their water supply. A few have a tendency to dry up in hot summers but most are reliable.

Reservoirs

There are three main impounding reservoirs in the National Park: Challacombe, Nutscale and Wimbleball, with two others, Clatworthy and Wistlandpound, just over the border. They are managed by Wessex Water (WW) and South West Water (SWW).

The creation of a new reservoir may cause heated debate but with careful planning and management it can become an attractive part of the landscape offering opportunities for walking, bird watching, fishing, sailing, and other water recreation. If a new reservoir is proposed, the National Park Authority as the planning authority takes into consideration the impact on landscape and loss of habitats while recognising that it may become a new centre for recreation, taking pressure off the rest of the National Park.

<table>
<thead>
<tr>
<th>Reservoir</th>
<th>Source</th>
<th>Management</th>
<th>Date opened</th>
<th>Capacity</th>
<th>Supplies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challacombe</td>
<td>Tributary/ R. Bray</td>
<td>SWW</td>
<td>1936</td>
<td>52 ML</td>
<td>Ilfracombe</td>
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<tr>
<td>Clatworthy</td>
<td>R. Tone</td>
<td>WW</td>
<td>1961</td>
<td>4499 ML</td>
<td>Wellington</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Taunton</td>
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<tr>
<td>Nutscale</td>
<td>Chetsford Water</td>
<td>WW</td>
<td>1941</td>
<td>161 ML</td>
<td>Minehead</td>
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<tr>
<td>Wimbleball</td>
<td>R. Haddeo</td>
<td>SWW (Admin)SW/WW (Funded/Use)</td>
<td>1979</td>
<td>21320 ML</td>
<td>Taunton</td>
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<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>Bridgwater</td>
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<td></td>
<td></td>
<td>Tiverton, Exeter</td>
</tr>
<tr>
<td>Wistlandpound</td>
<td>Tributary/ R. Yeo</td>
<td>SWW</td>
<td>1955</td>
<td>1550 ML</td>
<td>Barnstaple</td>
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</table>

WW: Wessex Water / SWW: South West Water / ML: Mega (Million) Litres