

Jurassic jewel

Almost 100 miles of coastline and 185 million years of history are explored by **Barry McLoughlin** at the breathtaking Jurassic Coast World Heritage Site

LOOKING UP from the foot of the sheer sandstone cliff face, you see laid out above you a snapshot of how the Earth was born and developed – a cross-section of millions of years of history.

The layers of different types of rock, striped like a Mark Rothko painting, are the geological slices that make up our planet – or at least this corner of it.

This is Ladrham Bay on the Jurassic Coast, a breathtaking 95-mile journey through time on England's southernmost shore and its hinterland.

At the other side of the beach, the sea washes around the spectacular, other-worldly stacks of ancient rock rising from it. The shallow turquoise waters could almost be in the Caribbean or Indian Ocean – and you have to remind yourself this is Devon not the Dominican Republic.

The desert-red Triassic rocks of East Devon mark the oldest and westernmost point of England's first and only natural World Heritage Site (WHS).

Covering 95 miles, the epic sweep of coastline on the English Channel contains rocks recording 185 million years of the Earth's history – that's about two million years a mile...

Begging for a Clannad-style soundtrack, it's the only place on the planet where so many millions of years of the Earth's history are sequentially exposed in dramatic cliffs, secluded coves, coastal stacks and barrier beaches.

The 'tilt' of the rocks creates a unique 'walk through history' from 250 million to 65 million years ago – from ancient deserts to tropical seas – through the Triassic, Jurassic and Cretaceous periods as you walk eastwards along the site. And

COASTAL PROTECTION

The Jurassic Coast World Heritage Site is safeguarded by UK laws that cover Sites of Special Scientific Interest. Thirteen sites cover most of the coast, usually divided at the 'gateway' towns.

As well as the geology, the SSSIs also protect wildlife, and about three-quarters of the coast is designated as Special Areas of Conservation under the EU Habitat Directive.

The setting of the site is largely protected by Area of Outstanding Natural Beauty designations.

unlike some, less accessible sites elsewhere in the world, it can be walked along its entire length, on the South West Coast Path. The path is perfect for the tourist, rambler, ornithologist, geologist – or even military history buff.

Receiving its WHS charter in 2001, the Jurassic Coast joined the likes of the Grand Canyon, Great Barrier Reef and Galapagos Islands as one of UNESCO's wonders of the natural world. Officially, it is the Dorset and East Devon Coast World Heritage Site and it's fast becoming as familiar as the UK's other natural wonders, such as the Lake District and Giant's Causeway in Northern Ireland.

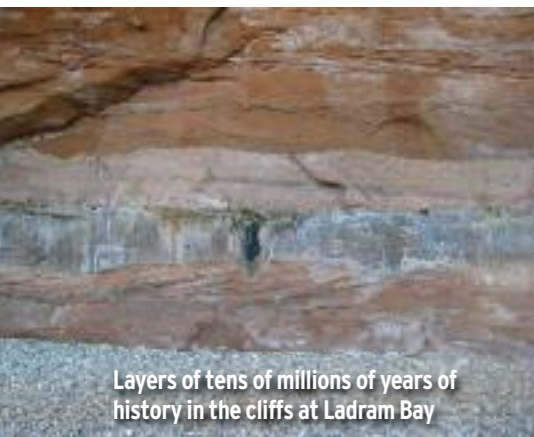
It's the second wholly natural World Heritage Site designated in the UK – the other is the Giant's Causeway – achieving the status because of its unique insight into the earth sciences.

It stretches from Old Harry Rocks at Handfast Point in Studland Bay, near Swanage, in the east to Orcombe Point, near Exmouth, in the west, and also covers the coastal hinterland.

It's a popular site for television producers – ITV's smash-hit drama *Broadchurch* was set there.

It contains striking examples of land forms, such as the natural arch at Durdle Door, the cove and limestone folding at Lulworth Cove, and an island – the Isle of Portland – which is famous for its limestone, used to construct many landmark buildings, including St Paul's Cathedral.

The sheer-faced, dazzlingly white chalk Old Harry Rocks are examples of sea stacks. These rock formations mark the youngest and easternmost point of the



Layers of tens of millions of years of history in the cliffs at Ladram Bay



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Clockwise from main: The striking whiteness of Old Harry Rocks; the majestic sandstone sea stacks of Ladram Bay; This rock containing three ammonites and a belemnite, from around Lyme Regis, was presented to Dorset County Museum by archaeologist E Cunnington; A Jurassic ammonite – asteroceras – from Charmouth

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Jurassic Coast. By contrast, the majestic sea stacks at Ladram Bay are red Triassic rocks laid down during the dawn of the dinosaurs.

The highest point on the Jurassic seashore is Golden Cap at 627ft, which is also the highest location on the entire South Coast. Nearby, Eype – meaning 'Steep Hill' – is one of West Dorset's loveliest villages.

'Gateway' towns for the coast include Exeter, Exmouth, Honiton, Sidmouth, Axminster, Seaton, Budleigh Salterton, Lyme Regis, Bridport, Portland, Weymouth, Dorchester, Swanage, Wareham, Poole, Bournemouth and Christchurch.

Our 'gateway' was Sidmouth in East Devon, which grew from a fishing village into a fashionable seaside resort in the Georgian and Victorian eras. At one end are the red cliffs of the Jurassic Coast and at the other Jacob's Ladder, the beach and the attractive Connaught Gardens.

In the Second World War, sections of



The chalk cliffs of Lulworth Cove

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the coast were commandeered by the government, which built one of the Royal Navy's biggest bases (though now closed) at Portland Harbour.

There's still an important army base at Bovington, and swathes of land – including the so-called 'ghost village' of Tyneham – have been off-limits to the public. The village, on the Isle of Purbeck, was 'temporarily' commandeered by the War Office in 1943 as a firing range – but the 252 villagers never returned. A haven for wildlife, the area has now been reopened at certain times.

Parts of the coast are hazardous for shipping, especially around Portland, and there have been frequent shipwrecks. It suffered its most environmentally damaging wreck in January 2007 when the container vessel *Napoli* was beached at Branscombe, polluting the shore with oil and debris.

Rockfalls are another hazard. In 2008, a 1312ft section was spectacularly reshaped

after a landslide, described as the worst in 100 years.

The rocks that make up the cliffs at Charmouth and Lyme Regis are rich in fossils of animals that swam in the Jurassic seas. This part of the coastline erodes rapidly, resulting in thousands of fossils being fed on to the beaches from the landslides in the surrounding cliffs, especially after winter storms. The remains that have been found here since the 18th century represent one of the richest slices of life in Jurassic times anywhere in the world.

Visitors can enjoy a guided fossil-hunting walk from Charmouth Heritage Centre or Lyme Regis Museum. East of Lulworth Cove is an extraordinary ancient 'Fossil Forest' where dinosaur footprints have been uncovered, and fossils are on show at the Dorset County Museum in Dorchester.

Expert guides include geologist Paddy Howe, marine biologist Chris Andrew and

experienced fossil-hunter Chris Pamplin. The area was also home to the celebrated 19th century palaeontologist Mary Anning, who studied the fossils around Lyme Regis and discovered the first complete ichthyosaur fossil.

■ Always consult tide tables before collecting fossils; it's advisable to hunt for fossils on a falling tide. Always follow the Fossil-hunting Code. Details of Dorset tide times are on the website: (www.bbc.co.uk/weather/coast_and_sea/tide_tables/8/33).

Chesil Beach

Immortalised by Ian McEwan in his Booker Prize-shortlisted novel *On Chesil Beach*, it's one of the world's finest examples of a barrier beach. Sweeping and seemingly never-ending, it features both a 'tombolo' – in which an island is attached to the mainland by a narrow piece of land – and a 'storm beach', washed by particularly strong waves.

The beach, stretching for 18 miles from the Isle of Portland to West Bay, is made up of a 100 million-ton bank of pebbles. Ranging from about 650ft to 120ft wide, it separates the sea from Britain's largest tidal lagoon, the Fleet, a rich wildlife habitat.

The beach is moving inland at the rate of about 16ft every century. Storm waves



The view across Charmouth Beach towards Golden Cap, highest point on the South Coast

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have breached its pebble bank several times, flooding the lagoon and Portland.

It's not a bathing beach; its unspoilt and uncommercialised atmosphere is better suited to a romantic, pebble-crunching stroll.

It was also a popular spot with smugglers, who reputedly could tell where they were at night just by looking at the size of the pebbles. Uniquely, their size varies from one end of the beach to the other. Chesil Cove and Portland comprise large cobbles whereas West Bay is made up of fine grit and gravel. It's thought the heavier stones, because of their larger surface area, are carried further to the east by the south-westerly waves,

while the lighter ones are pushed west by the less powerful south-easterly waves.

Among the hills behind Chesil Bank, the ancient village of Abbotsbury is celebrated for its world-famous swannery.

Bridport Sand Cliffs

The unmistakable sandstone cliffs at Burton Bradstock, a large and pretty village, provide a fine example of the distinctive, alternate hard and soft layered geology of the Bridport Sands, which make it appear to glow bright gold in the sunlight.

The cliffs of Burton Bradstock, Freshwater Bay and West Bay mainly comprise 185 million-year-old Lower Jurassic Bridport Sands.

The regular rock falls can often expose fascinating fossils, such as ammonites, recognised by their ribbed spiral-formed shell.

JURASSIC COAST TIMELINE

■ 250 to 100 million years ago: Rocks are continuously laid down as the Earth's crust in this area slowly sinks. The layers record the Triassic, Jurassic and the beginning of the Cretaceous periods

■ 100 million years ago: Massive earth movements tilt all the layers of rock gently to the east, lifting up rocks in the west and exposing them to erosion. The exposed rocks are stripped away, revealing Triassic and Jurassic rocks that have been buried for millions of years

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Turquoise waters at Lulworth Cove

West Lulworth

The sublime Lulworth Cove is an archetypal Dorset cove, surrounded by a picture-postcard landscape. The heritage centre on the beach explains how it has evolved over millions of years, including an informative Jurassic Jaws exhibition.

A short walk from the crescent-shaped cove is the renowned rock arch at Durdle Door. At the famous Fossil Forest nearby, there are the remains of algae and mud that collected around tree stumps and fossilised to form doughnut-shaped 'burrs.' Fossil Forest is reached through Ministry of Defence land which is closed during firing exercises, but it is open most weekends. For opening times, see the website: (www.dorsetforyou.com/index.jsp?articleid=389942).

Immediately west of Lulworth Cove, Stair Hole is a roofless sea cave riddled with arches.

East Lulworth

A man-made landmark, Lulworth Castle was reduced to a virtual ruin by a devastating blaze in 1929. However, it has been restored and the exterior has regained its former magnificence. Inside, artefacts, interpretative information and children's activities tell the story of the castle and the family who lived there.

Charmouth

In the heart of fossil-hunting country, Charmouth has a large shingle beach, with the Heritage Coast Centre on the seafront. Dr Anjana Ford, Jurassic Coast education co-ordinator, said: "Charmouth Beach is a fantastic place for fossil collecting in the winter months due to the Blue Lias geological sequences which are

■ 100 to 65 million years ago: The sea floods across this 'erosion surface' and new rocks form on top, recording the rest of the Cretaceous period

■ 65 million years to 10,000 years ago: Erosion and sea level changes carve into the rocks, slowly creating the coast we see today. The cliffs dissect the tilted layers of rock, allowing us to follow them in sequence. Erosion carves down into the landscape, stripping away the youngest Cretaceous rocks, leaving only a few high



Chesil Beach... one of the world's finest examples of a barrier beach

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rich in fossils. Charmouth Heritage Coast Centre is the place to find out more."

The South West Coast Path runs through Charmouth, though at the time of writing it was diverted because of erosion, and there are many other routes for walkers along the coast, to Lyme Regis in the west or Burton Bradstock in the east.

Durleston Country Park

Durlston Country Park, National Nature Reserve and Castle, a mile from Swanage, is a 280-acre rural paradise, consisting of sea cliffs, coastal limestone downland, haymeadows, hedgerows and woodland.

The imposing cliffs of Jurassic limestone sweep around two bays where rocks record the entire Cretaceous period. A winding path to the castle takes you on a journey through 4.6 billion years via monoliths designed by artist Gary Breeze.

The extraordinary Victorian castle, now

cliffs where they can still be seen. The 'Great Unconformity' is a time gap between rocks of different ages and runs right across the World Heritage Site.

Said a spokesman: "It was created when the layers were tilted and eroded 100 million years ago. The late Cretaceous rocks lie directly on the eroded surface of the Triassic, Jurassic and early Cretaceous. So the walk through time is a little more complex: because both the oldest and some of the youngest rocks in the site are found in East Devon."

Museums and visitor centres

- Bridport
- Fairlynch Museum, Budleigh Salterton
- Charmouth
- Dorset County Museum, Dorchester
- Fairlynch Museum, Budleigh Salterton
- Lulworth Cove
- Lyme Regis
- Portland Bill visitor centre
- Portland Museum
- Sidmouth
- Studland visitor centre, Knoll Beach
- Swanage
- The Fine Foundation Centre, Beer
- The Fine Foundation Centre, Chesil Beach
- Wareham
- Dorset Wildlife Trust Fine Foundation Marine Centre
- Durlston Country Park
- Honiton



Amaltheus, a Jurassic ammonite found at Eype

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painstakingly restored, is the hub of activities on the site. The Fine Foundation gallery offers a varied programme of art exhibitions, music and performance.

Other locations include:

■ **Budleigh Salterton** This historic seaside town nestles on the edge of a pebble beach beneath eye-catching red cliffs, made famous by literary legends like Noel Coward, P G Woodhouse and Anthony Trollope

■ **Branscombe** Reputed to be the longest village in the country, it sweeps along a picturesque valley past thatched cottages and down to the shingle beach

■ **Kimmeridge** Long rock ledges, a pebbled beach line and rocky outcrops make this bay in the Purbeck Voluntary Marine Nature Reserve look breathtaking.

Coast stars in TV hit

Dorset's coastline was one of the key 'characters' in *Broadchurch*, ITV1's hit drama starring David Tennant and Olivia Colman. It was written by *Doctor Who* writer Chris Chibnall, who said: "*Broadchurch* was a love letter to the scenery of the Jurassic Coast which used key West Dorset landmarks as part of its story. The landscape informs the drama: the cliffs, the sea, the beach were all key elements of the story."

Much of the drama was filmed at West Bay and other locations included Eype and Freshwater.

■ A copy of the *Broadchurch Trail* featuring the main locations can be downloaded from the website: (www.visit-dorset.com/about-the-area/broadchurch).



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The giant jaws of a huge marine reptile, about 155 million years old, are on show at Dorset County Museum after being unveiled by Sir David Attenborough. The pliosaurus skull, discovered on the Jurassic Coast by amateur collector Kevan Sheehan, would have belonged to a creature up to 60ft long and is one of the largest fossils of its kind ever found

Passport to the Jurassic Coast

Getting there

■ **By car:** East Devon - From the M5 the East Devon section of the site is reached by the A3052, providing access to all gateway towns from Sidmouth To Lyme Regis. Access to Exmouth is on the A376. The B3178 links Exmouth to Budleigh Salterton

West Dorset - From Lyme Regis the A3052 joins the A35 at Charmouth. This road continues to Bridport. From Bridport the B3157 offers excellent views of the coast

■ **By train:** Direct trains from London depart from Waterloo and call at Bournemouth, Dorchester and Weymouth. Waterloo to Exeter St David's services call at Sherborne and Axminster (for Lyme Regis).

Bristol Temple Meads to Weymouth trains call at Maiden Newton and Dorchester West. South West Trains offers discounted advance fares on many longer-distance routes to and from London, tel: 0845 6000 650, website: (www.southwesttrains.co.uk).

For all rail enquiries, tel: 08457 484950, website:

(www.nationalrail.co.uk)

■ **By coach:** National Express Coaches runs services to the South West from throughout the country, website: (www.nationalexpress.com)

■ **By air:** Regional airports are at Exeter, Southampton (Eastleigh), Bristol and Bournemouth

■ **By sea:** For services to Poole and Weymouth, contact Condor Ferries, tel: 0845 345 2000, website: (www.condorferries.co.uk).

For services to Poole, contact Brittany Ferries, tel: 0870 908 1281, website: (www.brittanyferries.com).

Getting around

■ **Walking and cycling:** There are nearly 300 coast and countryside guided walks and two National Cycle Network routes

■ **Bus:** For timetables of local services, see the websites: (www.travelinesw.com) or (www.dorsetforyou.com). The Jurassic Coast Bus Service is ideal for walkers who want to walk along a section of the coast path as they have the option of either travelling out or back by bus, website: (www.jurassiccoast.org). The Dorset Attractions and Rural Tour (DART) service picks up throughout Bournemouth, Poole and Christchurch. For more public transport information, contact Traveline, tel: 0871 200 2233, website: (www.traveline.info)

■ **Train:** The area is well served by local stations. The preserved Swanage Railway runs from Norden station park-and-ride to Swanage, tel: 01929 425800, website: (www.swanagerailway.co.uk).

Where to stay

■ For accommodation, see the website: (<http://jurassiccoast.org/visiting-the-coast/plan-your-trip>).

Find out more

■ For more information on the Jurassic Coast, see the websites (www.jurassiccoast.org), (www.westdorset.com) or (www.jurassiccoastline.com). *The Official Guide to the Jurassic Coast* is a 64-page booklet produced and sold on behalf of the Jurassic Coast Team by the Jurassic Coast Trust, an independent charity, at £4.95, from local bookshops, tourist information centres and visitor centres, or can be ordered online. A free mini-guide is also available

■ To become a Friend of the Jurassic Coast, e-mail: (friends@jurassiccoast.com). To become a volunteer, e-mail: (volunteer@jurassiccoast.com).