
Chapter 7 British Late Jurassic fossil reptile sites

Introduction: British Late Jurassic reptile sites

Late Jurassic reptiles have come from many localities along the length of the English outcrop, between the Dorset coast and Yorkshire, and are represented in rocks ranging in age from Late Oxfordian to the Portlandian. The recorded British Late Jurassic reptile sites are detailed below stage by stage. The listings are based on sources as noted, together with examinations of major museum collections.

Oxfordian

Reptile remains are rare in the Upper Oxford Clay and Corallian Beds. A few sites have yielded plesiosaurs and marine crocodylians, but the most important remains are isolated finds of dinosaurs from Dorset, Cambridgeshire and Yorkshire. References include Newton (1878), Fox-Strangways (1892), H.B. Woodward (1895), Strahan (1898), Galton (1980a, 1980b), Martill (1986, 1988) and Martill and Hudson (1991).

DORSET: Sandsfoot Castle, Weymouth ([SY 676 774]; *Pliosaurus*, *Teleosaurus* jaw from Sandsfoot Grit (*regulare* Zone; Upper Oxfordian)); Hill Crest Road, Weymouth (?[SY 673 775]; *Muraenosaurus*); Nothe, Weymouth ([SY 688 788]; *Teleosaurus* from Lower Calcareous Grit); Osmington (?[SY 72 82]; *Ophthalmosaurus* from the Corallian); Preston (?[SY 69 83]; *Muraenosaurus*, *Macropterygius*).

WILTSHIRE: Steeple Ashton ([ST 91 57]; *Plesiosaurus* from the 'Coral Rag'); Rood Ashton ([ST 887 560]; '*Plesiosaurus*' from the 'Coral Rag'); Heddington ([SU 00 67]; *Pliosaurus* teeth).

BERKSHIRE: Hatford, Faringdon ([SU 33 94]; '*Plesiosaurus*', dinosaur from the Corallian).

OXFORDSHIRE: Stanford-in-the-Vale ([SU 34 93]; *Megalosaurus* from the 'Coral Rag'); Marcham ([SU 45 96]; *Teleosaurus* from the Corallian); Cothill ([SU 46 99]; crocodile from the 'Lower Calcareous Grit'); Bladon Fields ([SP 44 14]; *Teleosaurus* from the Corallian); Littlemore, Oxford ([SP 53 02]; *Megalosaurus*); Wheatley ([SP 59 07]; *Pliosaurus* teeth); Headington 'Quarry Field' (?[SP 555 071]; *Cetiosaurus*, *Metriorhynchus* from the 'Coral Rag' and 'Lower Calcareous Grit'); Garsington ([SP 58 02]; '*Plesiosaurus*').

BEDFORDSHIRE: Ampthill ([TL 04 38]; *Steneosaurus*, *Ophthalmosaurus* in the Ampthill Clay).

CAMBRIDGESHIRE: Great Gransden ([TL 260 561] or [TL 252 564]; type of dinosaur *Cryptodraco eumerus*, *Pliosaurus* from Ampthill Clay [*serratum* Zone]); Warboys Brick Pit ([TL 308 818]; *Ophthalmosaurus* from Upper Oxford Clay [*mariae* Zone]; Martill, 1986); Gamlingay [TL 23 52]; *Ophthalmosaurus*); Mepal [TL 44 80]; '*Plesiosaurus*' in the Ampthill Clay).

YORKSHIRE: Slingsby ([SE 708 744]; *Pliosaurus*, *Steneosaurus* teeth; type of *Dacentrurus? phillipsi* from Malton Oolite Member [*vertebrate* Subzone; *densiplicatum* Zone]); Malton ([SE 78 71]; *Pliosaurus*, *Steneosaurus*, *Metriorhynchus*); Appleton-le-Street (?[SE 734 737]; *Pliosaurus* from 'Birdsall Calcareous Grit'); Scarborough ([TA 04 88]; *Pliosaurus*); North Grimstone ([SE 84 67]; *Pliosaurus*, *Teleosaurus*); locality unknown (type of *Priodontognathus phillipsii* ?from the Calcareous Grit).

Kimmeridgian

Overall the Kimmeridge Clay has yielded abundant turtles, crocodiles, pterosaurs, plesiosaurs, pliosaurs, ichthyosaurs and dinosaurs, and includes some of the best Late Jurassic marine reptile faunas in the world. There are many localities, although most sites have yielded only remains of one or two marine reptiles. However, abundant remains have been found in Dorset, Wiltshire, Oxfordshire, Cambridgeshire and Yorkshire. References include Seeley (1869a), Phillips

(1871), H.B. Woodward (1895), Strahan (1898), Arkell (1933, 1947a, 1947c), Tarlo (1958, 1959b, 1959c, 1960), Delair (1959, 1960, 1966), Brookfield (1978b), Cope (1967, 1978) and Taylor and Benton (1986).

DORSET: Ringstead Bay ([SY 751 813]; *Steneosaurus*, *Pliosaurus*, *Ophthalmosaurus*); Osmington Mills ([SY 73 82]; *Pliosaurus*; *Ophthalmosaurus*, some at least from the *mutabilis* Zone, one plesiosaur limb bone from the *eudoxus* Zone; Clarke and Etches, 1992); Isle of Portland coast [SY 68 72]–[SY 70 72]; *Ophthalmosaurus*, *Cimoliasaurus*, *Pliosaurus*, *Thaumatosauros*, *Colymbosaurus*; recent *Colymbosaurus* specimen from Grove Cliff [SY 706 722] in the *pavlovi* Zone, Brown, 1984; Palmer, 1988); Upwey ([SY 66 84]; '*Plesiosaurus*'); Hazelbury Bryan (*Pliosaurus*); Motcombe ([ST 84 25]; *Liopleurodon*); Gillingham Brick Pit ([ST 809 258]; *Liopleurodon*, *Dacentrurus*, *Ophthalmosaurus*, type of *Ophthalmosaurus pleydelli* from the *mutabilis* and *cymodoce* Zones (Lower Kimmeridgian)); Fiddleford, near Sturminster Newton ([ST 80 13]; *Ophthalmosaurus*, *Liopleurodon*).

SOMERSET: ?Ilminster ([ST 36 14]; *Ophthalmosaurus*, *Liopleurodon*).

WILTSHIRE: Stour cutting ([ST 779 305]; *Ophthalmosaurus*; Bristow *et al.*, 1992, p. 141); Broughton-Gifford ([ST 87 63]; *Peloneustes*); Westbury Clay Pit ([ST 880 527]; '*Plesiosaurus*'; recent finds of thalassemyid turtle and *Metriorhynchus* skull from *mutabilis* Zone, and *Pliosaurus* skull from *eudoxus* Zone; plesiosaur limb bone from the *eudoxus* Zone, Clarke and Etches, 1992); Chippenham ([ST 91 73]; *Pliosaurus*); Foxhangers ([ST 937 615]; *Ophthalmosaurus*, *Cimoliasaurus*, *Pliosaurus*, *Liopleurodon*, *Metriorhynchus*, *Megalosaurus*; Delair, 1973); Rodbome, near Swindon ([ST 93 83]; ?nodosaurid ankylosaur; Galton, 1980b (?Lower Kimmeridgian)); Westbrook(e), Bromham ([ST 96 66]; type of *Ophthalmosaurus trigonus*); Potterne ([ST 99 58]; *Cimoliasaurus*, *Ophthalmosaurus*); Devizes ([SU 01 61]; *Thalassemys*, *Ophthalmosaurus*, *Cimoliasaurus*, *Pliosaurus*, *Liopleurodon*, *Metriorhynchus*); Wootton Bassett ([SU 06 82]; *Ophthalmosaurus*, *Cimoliasaurus*, *Pliosaurus*, *Liopleurodon*, *Metriorhynchus*; type of *Dacentrurus hastiger* from the Early Kimmeridgian); Swindon Brick and Tile Pits ([SU 156 834]; *Ophthalmosaurus*, *Megalosaurus*, *Ornithocheirus*, *Cimoliasaurus*, *Pliosaurus*, *Liopleurodon*, *Thaumatosauros*; types of *Plesiochelys passmorei* (turtle), *Bothriospondylus suffossus* and *Omosaurus armatus* (dinosaurs), *Pliosaurus brachydeirus* and *P. macromerus* from *baylei* and *cymodoce* Zones (Lower Kimmeridgian); Delair, 1982a); Stanton-Fitzwarren ([SU 17 90]; *Ophthalmosaurus*, *Liopleurodon*).

BERKSHIRE: Stanford-in-the-Vale ([SU 34 93]; *Ophthalmosaurus*, '*Plesiosaurus*'); Oday Common, south of Abingdon ([SU 492 949]; plesiosaur; Delair, 1982a; ichthyosaur in Abingdon Museum; turtle).

OXFORDSHIRE: Hardwick ([SP 37 06]; *Machimosaurus*); Marcham ([SU 45 96]; *Pliosaurus*, '*Plesiosaurus*'); Drayton ([SU 47 94]; *Ophthalmosaurus*, '*Plesiosaurus*' from Lower Kimmeridge Clay); Foxcombe Hill ([SP 49 01]; *Cimoliasaurus*, *Pliosaurus*, *Ophthalmosaurus*); Culham ([SU 50 95]; *Dakosaurus*); Radley Sand-pits ([SU 51 99]; *Pliosaurus*); Oxford (SP 5106 — ?exact locality; *Cimoliasaurus*, *Pliosaurus*); Sandford-on-Thames ([SP 53 01]; *Pliosaurus*); Headington Pits, Oxford ([SP 555 072]; *Cimoliasaurus*, *Ophthalmosaurus*, type of *Pliosaurus brachyspondylus*); Nuneham Courtenay ([SU 55 99]; *Ophthalmosaurus*, *Plesiosaurus*); Baldon ([SP 56 00]; *Cimoliasaurus*, *Macropterygius*); Horspath ([SP 57 04]; *Pliosaurus*); Shotover Hill ([SP 588 065]; *Ophthalmosaurus*, *Cimoliasaurus*, *Pliosaurus*, *Dakosaurus*, *Metriorhynchus*, type of *Liopleurodon macromerus*, *Pliosaurus grandis*, *P. nitidus*, *Cimoliasaurus trochantencus*, *Metriorhynchus palpebrosum*); Garsington ([SP 58 02]; *Metriorhynchus*, '*Plesiosaurus*', *Pliosaurus*, *Ophthalmosaurus*); Wheatley ([SP 59 05]; *Cimoliasaurus*, *Ophthalmosaurus*, *Macropterygius*).

BUCKINGHAMSHIRE: Hartwell ([SP 79 16]; *Liopleurodon*); Hardwick ([SP 80 19]; *Pliosaurus*); Winslow ([SP 76 27]; *Ophthalmosaurus*); Denbigh Hill, Fenny Stratford ([SP 88 34]; *Pliosaurus*); Newport Pagnell ([SP 87 43]; *Cimoliasaurus*); Aylesbury ([SP 821 134]; 'marine reptiles', including a plesiosaur recently, from Lower and Upper Kimmeridge Clay, mainly from the Homan's Bridge Shale Member; Upper Kimmeridge Clay, *wheatleyensis* Zone).

NORTHAMPTONSHIRE: Higham Ferrers ([SP 96 68]; *Pliosaurus*).

CAMBRIDGESHIRE: Cottenham ([TL 452 684]; *Dakosaurus*, '*Plesiosaurus*'; *Pliosaurus*, *Ophthalmosaurus*); Haddenham (a 4674; *Cimoliasaurus*, *Pliosaurus*); Wood Walton ([TL 21 80]; *Pliosaurus*); Witcham ([TL 46 80]; plesiosaur); Downham ([TL 52 83]; *Pliosaurus*); Great Ouse River Board Pit, Stretham ([TL 516 743]; *Liopleurodon*, *Ornithopsis*); Chettisham, Ely ([TL 55 83]; *Ophthalmosaurus*, *Cimoliasaurus*, *Teleosaurus*); Peterborough (n. 1998; *Pliosaurus*); Oakley Cutting ca

0254; *Steneosaurus*); Bourn ([TL 32 56]; *Dakosaurus*).

NORFOLK: Stow Pumping Station ([TL 589 057]; ?pliosaur); Downham Bridge ([TF 601 033]; ?pliosaur); Downham Market Brickyard ([TF 608 039], [TF 610 031]; *Ophthalmosaurus*, '*Plesiosaurus*', *Teleosaurus*, *Dakosaurus*); Southey Pumping Station ([TL 612 932]; ?pliosaur); Ten Mile Bottom ([TL 612 966]; ?pliosaur); Denver Sluice ([TF 591 013]; *Pliosaurus*, ?*Ornithopsis*); Setchey ([TF 63 13]; *Pliosaurus*); Stowbridge ([TF 604 069]; type of ichthyosaur *Grendelius mordax* from *wheatleyensis* Zone).

LINCOLNSHIRE: Market Rasen ([TF 10 89]; *Ophthalmosaurus*, type of *Pliosaurus brachydeirus*?); Sweaton (*Ophthalmosaurus*).

YORKSHIRE: Speeton, Filey Bay ([TA 15 76]; *Ophthalmosaurus*).

Portlandian: Portland Beds

The term 'Portlandian' is used here to refer to the last stratigraphic stage of the Jurassic, in preference to 'Tithonian', the primary international reference standard. This is because a basal boundary stratotype for the Tithonian has not been selected, and because the Kimmeridgian stage as used by British workers is much longer than that used elsewhere. Stratigraphic equivalents are:

UK northern France	Tethys	Russia, Poland
Portlandian	Tithonian	Volgian
Upper Kimmeridgian	Tithonian	Volgian
Lower Kimmeridgian	Kimmeridgian	Kimmeridgian

Cope (1993) has attempted to resolve this problem by reintroduction of the Bolonian Stage for the Upper Kimmeridgian *sensu anglico*, thus allowing the standard use of the Portlandian and Volgian stage names. For the present work, we use the traditional British 'long' Kimmeridgian stage name.

Reptiles have only been found on the Isle of Portland (turtles, plesiosaurs, ichthyosaurs). Isolated specimens of marine reptiles have also been collected in Wiltshire, Oxfordshire and Buckinghamshire, with a few dinosaur teeth from near Aylesbury. References include Phillips (1871), H.B. Woodward (1895), Strahan (1898) and Arkell (1933, 1947a, 1947c). Sites not included in the reptiles GCR coverage are listed here.

DORSET: Winspit Quarry, Seacombe ([SY 985 767]; type of '*Plesiosaurus winspitensis*'); Haysoms' Quarry, St Aldhelm's Head ([SY 964 761]; turtle); Preston, Weymouth ([SY 70 88]; turtle).

WILTSHIRE: Tisbury ([ST 94 29]; *Cimoliasaurus*); Chicks Grove (sauropod, ?stegosaur, and megalosaur teeth, lizards, pterosaurs, *Goniopholis*); Town Gardens Quarry, Swindon ([SU 152 834]; *Ichthyosaurus*).

OXFORDSHIRE: Oxford (SP 5106 — ?exact locality; type of *Metriorhynchus gracile*); Shotover Hill ([SP 59 06]; *Cimoliasaurus*); Garsington ([SP 58 02]; *Cetiosaurus*).

BUCKINGHAMSHIRE: Brill Brick Yard ([SP 655 144]; *Plesiosaurus*, *Teleosaurus*); Quainton Hill ([SP 74 20]; *Cimoliasaurus*).

Late Portlandian to Early Berriasian: Purbeck Beds

The Purbeck Limestone Formation is split between the Jurassic and Cretaceous. Late Jurassic forms include the lizards, 'dwarf crocodylians and some turtles. Early Cretaceous forms are most of the turtles, pterosaurs, crocodylians and footprints. Extremely abundant remains have been obtained from Durlston Bay and quarries west of Swanage, and the smaller freshwater and terrestrial animals are of particular importance (lizards, turtles, small crocodylians, dinosaurs and pterosaurs). References include H.B. Woodward (1895), Delair (1958, 1966, 1982b), Charig and Newman (1962) and Anderson and Bazley (1971).

DORSET: Swanage Quarries ([SZ 021 781], etc.; many of forms found at Durlston Bay — exact information not available; type of *Pholidosaurus laevis* (crocodilian) from Keat's, Quarry); Townsend Road, Swanage ([SZ 0265 7835]; dinosaur footprints; Ensom, 1982a); Herston Quarries ([SZ 020 784], etc.; *Goniopholis*, *Pleurosternum*, dinosaur footprints in the Pink Bed (Bristow's Bed 50) of the Upper Building Stones; Charig and Newman, 1962); Acton Quarries, Langton Matravers ([SY 990 783]; *Pleurosternum*, type of pterosaur *Ornithocheirus validus*, dinosaur footprints); opposite lane leading to Old Court Pound (former underground workings with access at [SY 9919 7872]; footprints *Purbeckopus pentadactylus*; Delair, 1963; Ensom, 1984a, 1986a); Reynold's Quarry, Dancing Ledge ([SY 997 773] or [SY 998 769]; *Goniopholis*, dinosaur footprints); Seacombe ([SY 984 767]; *Goniopholis*); Sunnydown Farm Quarry, Langton Matravers ([SY 9822 7880]; sauropod and other dinosaur tracks and microvertebrate remains; Ensom, 1987a, 1987b, 1988, 1989c, 1990; West, 1988; Ensom *et al.*, 1991); Encombe (?[SY 944 793]; '*Plesiosaurus*'); Nelson Burt Quarry, Worth Matravers (?[SY 97 77]; '*Iguanodon*' in the 'Pinkstone Bed'); Woodyhyde Farm ([SY 9750 7978]; footprint; Ensom, 1986b); Corfe (?[SY 97 82]; *Pleurosternum*, *Goniopholis*); Preston ([SY 70 83]; *Pleurosternum*); Portland ([SY 67 71]; *Cimoliasaurus* in the 'Cinder Bed'); Weymouth (exact locality?; ankylosaur); Lulworth Cove ([SY 83 80]; nodosaurid, *Goniopholis* from Dirt Bed); Worbarrow Tout ([SY 869 796]; dinosaur footprints from several horizons; West *et al.*, 1969; Delair, 1982b; Ensom, 1982b, 1984b, 1985a, 1985b, 1987c; West and El-Shahat, 1985).

WILTSHIRE: Chicksgrove Quarry; Town Gardens Quarry, Swindon ([SU 152 835]; 'reptiles', including megalosaur tooth, in Purbeck; Delair, 1973).

EAST SUSSEX: Darwell Beech Farm (?[TQ 71 19]; *Goniopholis* and 'other reptiles' from a temporary exposure); Poundsford Farm ([TQ 637 226]; *Megalosaurus*); Archer Wood ([TQ 741 119]; 'reptile bones'). All from Cretaceous part of Purbeck.

Most of the listed sites could not serve as candidates for inclusion in the GCR since they have been lost to landfill and building. For the most part, only coastal sites could be considered, and the richness and accessibility of the Dorset coast is reflected in the choice of nine proposed GCR sites:

1. Furzy Cliff, Overcombe, Dorset ([SY 698 818]). Late Jurassic (Early Oxfordian), Upper Oxford Clay.
2. Smallmouth Sands, Weymouth, Dorset ([SY 669 764]–[SY 672 771]). Late Jurassic (Early Kimmeridgian), Lower Kimmeridge Clay.
3. Roswell Pits, Ely, Cambridgeshire ([TL 555 808], [TL 551 805]). Late Jurassic (Early Kimmeridgian), Lower Kimmeridge Clay.
4. Chawley Brick Pits, Cumnor Hurst, Oxfordshire ([SP 475 043]). Late Jurassic (Early Kimmeridgian), Lower Kimmeridge Clay.
5. Kimmeridge Bay (Gaulter Gap–Broad Bench), Dorset [SY 91 79]. Late Jurassic (Early Kimmeridgian), Kimmeridge Clay.
6. Encombe Bay, Swyre Head–Chapman's Pool, Dorset ([SY 937 773]–[SY 955 771]). Late Jurassic (Late Kimmeridgian), Upper Kimmeridge Clay.
7. Isle of Portland, Dorset [SY 64 78]. Late Jurassic (Portlandian), Portland Sand–Purbeck Beds.
8. Bugle Pit, Hartwell, Buckinghamshire ([SP 793 121]). Late Jurassic (Portlandian), Portland Stone and lowest Purbeck Beds.
9. Durlston Bay, Dorset ([SZ 034 780]). Late Jurassic–Early Cretaceous (Portlandian–Berriasian), Portland Stone–Upper Purbeck Beds.

Late Jurassic (Oxfordian)

Oxfordian reptiles are rare, especially those of Early Oxfordian age, the only recorded sites being at Cothill and Headington in Oxfordshire and Furzy Cliff, Overcombe Dorset. This may be because of a lack of suitable exposure in the Upper Oxford Clay, but is more probably related to a genuine scarcity of reptilian remains. The rarity of reptiles from British Early Oxfordian rocks is also matched abroad, and the few British sites are of great importance in bridging the faunal gap between the underlying Callovian Middle Oxford Clay and the overlying beds of the Mid Oxfordian (*densiplicatum* Zone), both of which preserve better reptile remains. The best-known Early Oxfordian site is at Furzy Cliff and this is selected as a GCR site.

British Mid and Late Oxfordian localities have produced more reptile remains. The Coral Rag (Mid Oxfordian) of various sites in Wiltshire, Berkshire, Oxfordshire and Yorkshire have yielded teeth of plesiosaurs, pliosaurs, crocodiles, vertebrae of plesiosaurs and dinosaurs, and isolated dinosaur limb bones. The Mid Oxfordian of Yorkshire is important as the source of rare dinosaurs; a nodosaur ankylosaur (*Priodontognathus*) from the Calcareous Grit, and a stegosaur femur, the type of *Dacentrurus*?

phillipsii, from the Malton Oolite Member of the Coralline Oolite Formation of Slingsby, are the only evidence for the Stegosauridae so far from the Oxfordian anywhere in the world (Galton, 1985b). Late Oxfordian reptiles are known from the Sandsfoot Grits of Weymouth and the Ampthill Clay of Cambridgeshire and Bedfordshire.

Comparable Mid and Late Oxfordian sites abroad include Vaches Noires, near Dives, Normandy (*Eustreptospondylus*, *Steneosaurus*), Calvados, Bourgogne and La Vendee (*Steneosaurus*), Boulogne-sur-Mer (*Steneosaurus*), the La Turbie–Cap d'Aggio region, Monaco ('Megalosaurus', ?crocodile) and Baden-Wurttemberg, Germany (*Teleosaurus*).

[References](#)