

**COUNTY:** OXFORDSHIRE

**SITE NAME:** ARDLEY CUTTING AND QUARRY

**Status:** Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981(as amended)

**Local Planning Authorities:** Cherwell District Council, Oxfordshire County Council

**National Grid Reference:** SP540269

**Ordnance Survey Sheet 1:50,000:** 164 **1:10,000:** SP52 NW, NE

**Date Notified (Under 1949 Act):** 1972 **Date of Last Revision:**

**Date Notified (Under 1981 Act):** 1988 **Date of Last Revision:** 28 July 1999

**Area:** 40.13 ha 99.12 ac

**Other information:** Part of the site is managed by the Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust

### **Description and Reasons for Notification**

This site lies in the eastern part of the Oxfordshire Cotswolds along a section of the London to Birmingham railway line. It is of geological interest for its exposures of Jurassic rocks and has biological interest associated with limestone grassland, scrub, ancient woodland and wetland habitats. The soils are mostly shallow loams of the Aberford Series, interrupted in places by bands of ill-draining clays and outcrops of Northants sands giving rise to changes in the flora.

The railway cutting and southernmost quarry constitute one of southern England's key sites for Jurassic strata. It has exposures ranging from the lowest Bathonian Chipping Norton Formation to the White Limestone Formation thus exhibiting the entire local Bathonian development with the exception of the Forest Marble.

The Chipping Norton Formation is composed of oolitic limestones, sandy limestones, and mudstones. The formation is deeply excavated by sand-filled channels which themselves are topped by rootlet horizons and a lignite, indicating a period of emergence as low, marshy land. The overlying Sharps Hill Formation here consists of a thin oyster-bearing clay horizon and indicates the return of marine conditions.

The Taynton Formation, consisting of flaggy, oolitic limestones and a basal oyster bed was deposited in a relatively inshore site under turbulent conditions. The Hampden Marly Formation contains a rich fauna of oysters and brachiopods at a number of horizons. The cutting is the only site where an ammonite has been recovered from this formation and places it in the *Procerites progacilis* Zone, correlating it with the Acuminata Beds of the South Cotswolds and Somerset. The uppermost White Limestone Formation consists of approximately seven metres of micritic and peloidal limestones with subsidiary marls and clays. The site is the type locality for the Ardley Member of this formation. The abundant gastropods, bivalves and brachiopods preserved in these limestones enable correlations with the White Limestone Formation to the south in the Cotswolds, and with the Blisworth Limestone Formation in Lincolnshire and Northamptonshire.

This is a key site for its fossil marker horizons, palaeontology, sedimentary features such as channels and emergent surfaces, and its stratigraphy. The rocks of Ardley enable the Bathonian sections of the Midlands to be correlated with those of the Oxford area and Cotswolds and as such is of national importance for the understanding of the Jurassic Period in Britain.

The limestone grassland on the steep banks of the railway cutting and the adjacent quarry forms the main biological interest. It is one of the largest limestone grassland sites in the Oxfordshire Cotswolds where unimproved grassland is now very

rare.

The grassland is a characteristically tall sward either dominated by upright brome *Bromopsis erectus* or a mixture of brome and tor-grass *Brachypodium pinnatum*. The grassland contains a variety of species associated with limestone grassland including quaking grass *Briza media*, basil thyme *Acinos arvensis*, clustered bellflower *Campanula glomerata*, dropwort *Filipendula vulgaris* and sainfoin *Onobrychis viciifolia*. Other species which are locally common in the sward include horseshoe vetch *Hippocrepis comosa*, kidney vetch *Anthyllis vulneraria*, glaucous sedge *Carex flacca*, blue fleabane *Erigeron acer*, bee orchid *Ophrys apifera*, green-winged orchid *Orchis morio* and cowslip *Primula veris*, as well as a number of well-established introductions such as dragon's teeth *Tetragonolobus maritimus*, elecampane *Inula helenium* and broad-leaved everlasting pea *Lathyrus latifolius*.

The flora of the woodland includes lords and ladies *Arum maculatum*, wood anemone *Anemone nemorosa* and the uncommon green hellebore *Helleborus viridis*. The eastern edge of the quarry has a near vertical rock face with a seasonally dry pool at its base. This pool is contiguous with a low lying, marshy section containing willow carr and a flora dominated by soft rush *Juncus effusus*, reedmace *Typha latifolia*, reed canary grass *Phalaris arundinacea*, and water mint *Mentha aquatica*.

The invertebrate fauna is particularly rich along the railway cutting, with large populations of calcareous grassland butterflies like small blue *Cupido minimus*, brown argus *Aricia agestis*, dark green fritillary *Argynnis aglaja*, green hairstreak *Callophrys rubi* and Duke of Burgundy *Hamearis lucina*, all of which are uncommon in Oxfordshire. There is also a colony of the nationally rare four-spotted moth *Tyta luctuosa* whose larvae feed on field bindweed *Convolvulus arvensis*, as well as the nationally uncommon leaf beetles *Cryptocephalus hypochaeridis* and *C. moraei*.

The Cutting and adjacent quarry also support a notably wide range of vertebrates. These include part of a large population of the internationally protected great crested newt *Triturus cristatus* which spreads into several adjacent quarries.

**Site Name:** Ardley Trackways SSSI

**County:** Oxfordshire

**District:** Cherwell

**Status:** Site of Special Scientific Interest (SSSI) notified under section 28 of the Wildlife and Countryside Act 1981, as substituted by Schedule 9 to the Countryside and Rights of Way Act 2000.

**Local Planning Authority:** Cherwell District Council

**National Grid reference:** SP540248

**Area:** 63.59 ha

**Ordnance Survey Sheet:** 1:50,000: 164

**1:10,000:** SP 52 NW, SP 52 SW

**Notification date:** 19 January 2010

### **Reasons for notification:**

Ardley Trackways SSSI is a nationally important site containing a rock horizon close to the top of the Shipton Member of the White Limestone Formation which, in the immediate vicinity of the SSSI, has revealed the presence of an array of fossilised trackways. These trackways were formed by the passage of a herd of sauropod dinosaurs, and several theropod dinosaurs, along a shoreline in what is now north-eastern Oxfordshire, during the Middle Jurassic (approximately 165 million years ago). Such extensive and relatively complete assemblages of trackways are otherwise unknown in England and are rare in the Middle Jurassic worldwide. The rarity of these trackways and their geological and environmental context for future research, mean that Ardley Trackways SSSI can be regarded as being of international importance. Based on the orientation of the trackways studied to date, the SSSI has been identified as containing a finite buried reserve of the trackway bed, which is accessible for scientific study.

### **General description:**

Ardley Trackways SSSI consists of a series of working quarries lying either side of the railway line from Bicester to Banbury, to the south of the village of Ardley, about 4 km northwest of Bicester in Oxfordshire. The bedding-plane in which the trackways lie is near the top of the Shipton Member of the White Limestone Formation. The general trend of the trackways is on a bearing north-north-east to south-south-west, although a few trend north-east to south-west. The Shipton Member of the White Limestone Formation is of Bathonian age (Middle Jurassic – approximately 165 million years ago) and was deposited within a belt of near-shore lagoons on the north-western margin of the London Platform (a land mass extending over part of the area now consisting of south-eastern England, the southern North Sea and Belgium).

In locations where it has previously been exposed immediately adjacent to the SSSI, the bedding-plane surface has so far revealed the presence of over 40 more-or-less continuous trackways attributed to two-legged, carnivorous (theropod) dinosaurs and four-legged vegetarian (sauropod) dinosaurs. The trackways yield information relevant to our understanding of dinosaur locomotion, their burial and how they came to be preserved (taphonomy), the implications these trackways have for the classification (systematic taxonomy) of the footprints, the evolutionary relationships of the dinosaurs thought to be represented by the trackways, the taxonomic composition of this particular ecosystem, and insights into the behaviour (ethology) of these animals.

Evidence of a change in the stride (gait transition) associated with a temporary increase in speed on a theropod trackway has important implications for understanding the mechanics of the limb movement and the evolution of the oldest theropods. The interpretation of many of the sauropod tracks as having been formed by members of the Titanosauria (a large group of sauropods characterised by their wide-gauge limb posture), pushes the origins of this group back into the Middle Jurassic. This provides evidence to counter theories that titanosaurs originated in Gondwana (the continent consisting of Africa, Antarctica, Australia and South America) after the break-up of Pangea (the supercontinent consisting of Gondwana combined with Eurasia and North America) during the late Middle Jurassic. The similar directions of the trackways, combined with the relatively limited time period over which the tracks could have been formed, may suggest that the sauropods were moving in a mixed herd. It has also been speculated that the theropods were following the sauropod herds and that additional evidence from the site might provide insights into pack behaviour in large theropod dinosaurs.

## Oxfordshire Local Wildlife Site description

### RUSH SPINNEY

Site Code: 42X02

Grid Reference: SP494256

Area (ha): 24.1

Local Authority: Cherwell

Last Survey Date(s): June 2000, February 2001

Designation Date: 3/3/2011

### Site Description

Rush Spinney is a small area of marsh lying in a hollow in the south-west corner of an improved permanent pasture with the Oxford Canal forming the western boundary. Part of the marsh is dominated by tall tussocks of greater tussock sedge (*Carex paniculata*) while other areas are dominated by rushes and reed sweet grass, or by greater pond sedge. Rush Spinney has a great variety of interesting wetland and wet grassland species. Species-rich marshes such as this are an uncommon habitat in Oxfordshire and a priority for conservation.

There are two areas of scrub including grey willow, Midland hawthorn, blackthorn, hawthorn and white willow at the edges of the marshy area. The southern marsh orchids and cowslips are in this area, but these are in danger of becoming shaded out by the scrub.

SECTION 41 HABITATS OF PRINCIPAL IMPORTANCE: Lowland fen

## Oxfordshire Local Wildlife Site Citation

### UPPER HEYFORD AIRFIELD

Site Code: 52I05

Grid Reference: SP519269

Area (ha): 74.41

Local Authority: Cherwell District Council

Last Survey Date(s): 2010, extension 2013

Date Selected or Reconfirmed: 2011, extension added 2014

### Site Description

The old airbase at Upper Heyford includes a very large area of grassland which ranges in diversity and includes some species-rich areas which are strongly calcareous in character. There are very large populations of bee orchid and dwarf thistle. Plants associated with the more species rich areas **are cowslip, greater knapweed, glaucous sedge, bird's foot trefoil, ox-eye daisy and lady's bedstraw. Other notable plants present at lower frequency are restharrow, devil's bit scabious, mouse-eared hawkweed, common eyebright, common centaury and hairy violet.** The most strongly calcareous areas have frequent upright brome salad burnet, abundant glaucous sedge and occasional patches of tor grass. In places the grassland lies on thicker soils and is much more neutral in character, lacking most of these species. There are further areas of such grassland outside the wildlife site.

In 2014 an extension was added that covered the old bomb stores area. The extension is fenced off from other areas of the site and has numerous turf covered bunkers. It includes areas of species-rich grassland, semi-improved grassland, broadleaved plantation woodland and a series of water tanks. A large population of great-crested newts have been recorded in the water storage tanks.

Species-rich areas of calcareous grassland include tor-grass, upright brome, musk thistle, fern-grass, greater knapweed, dwarf thistle, blue fleabane, field scabious, fairy flax, common restharrow, mouse-ear hawkweed and salad burnet.

In addition to the botanical interest a large number of skylark appear to be breeding in the grassland and curlew, grey partridge and corn bunting were also noted and almost certainly breed. Tree sparrow was also noted using the wildlife site in late October 1999. Meadow pipit also nests here.

There is additional interest in the occurrence of a collection of annual plants associated with cracks in the concrete runways and along the edges of the runways. Plants present include whitlow grass, parsley piert, dwarf spurge, field madder, sandwort, lesser toadflax, pearlwort and wall speedwell.

Perhaps of greatest interest is the occurrence of stork's bill which is very uncommon in Oxfordshire.

Some 14 species of butterfly were recorded from the site on the 23/7/99. These were Essex skipper, small skipper, large skipper, brimstone, large white, green-veined white, common blue, small tortoiseshell, peacock, marbled white, gatekeeper, meadow brown, ringlet and small heath.

SECTION 41 HABITATS OF PRINCIPAL IMPORTANCE: Lowland Calcareous Grassland

SECTION 41 SPECIES OF PRINCIPAL IMPORTANCE: Skylark, Linnet, Corn Bunting, Tree Sparrow, Grey Partridge, Great Crested Newt

LEGALLY PROTECTED SPECIES:

RED DATA BOOK SPECIES:

NATIONALLY SCARCE or NOTABLE SPECIES:

BIRDS OF CONSERVATION CONCERN:

Red list: Grey Partridge, Skylark, Linnet, Tree Sparrow and Corn Bunting.

Amber list: Kestrel, Curlew, Swallow and Yellowhammer

TYPICAL SPECIES OF LOWLAND CALCAREOUS GRASSLAND: Spring-sedge, Pyramidal Orchid, Heath False-brome, Quaking-grass, Upright Brome, Meadow Oat-grass, Downy Oat-grass, Crested Hair-grass, Burnet-saxifrage, Musk Thistle