
Parish Plans Biodiversity Project

Bradworthy

Report by the
Devon Biodiversity Records Centre
and
Devon County Council



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DEVON COUNTY COUNCIL

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Bradworthy - Parish Plan Biodiversity Project

Introduction

The Saxon town of Bradworthy stands above the valley of the River Waldon, and is bounded on two sides by two important rivers: the Torridge and Tamar. These rise on Woolley Moors, at the edge of the parish, and their sources are in Morwenstow parish, only a few hundred yards from the Bradworthy border. Much of the parish is windswept and high, affording magnificent views - away to Dartmoor and far down into Cornwall.

Much of the landscape is now predominately agricultural with many areas given over to pasture. Small fragments of the wild landscape that once was still remain. Bradworthy lies in the heart of the Culm Measures of north-west Devon. The Culm Measures give rise to acidic soils with poor drainage which produce a distinct habitat-type called Culm grassland.

Culm grassland is extremely vulnerable to loss via agricultural modification and only small areas now remain. Many of these areas in Bradworthy parish are now protected, being identified as Sites of Special Scientific Interest and County Wildlife Sites. The Culm grassland on Bradworthy common is home to the internationally rare marsh fritillary butterfly, which has declined substantially over the last 150 years.

There are also a range of interesting wildlife features within Bradworthy parish, including species-rich hedges, some of which could be 700-800 years old, green lanes, species-rich grassland, wetland and veteran trees. Many of these features can be viewed from some of the walking trails around the parish.

Designated Sites

Bradworthy Common Site of Special Scientific Interest and candidate Special Area of Conservation:

Bradworthy Common supports certain mire communities which are both rare in Devon and contain various scarce plant and insect species. The site overlies the Carboniferous Culm measures of north Devon which give rise to acidic soils with poor drainage. These conditions produce a mixture of wet heath, rush-pasture, fen-meadow, mire and scrub which is known locally as Culm grassland (and, more generally, as Rhôs pasture).

The vegetation of the site comprises a mosaic of mire and fen-meadow communities. The majority of the site is dominated by purple moor-grass, with meadow thistle, devil's-bit scabious and bog asphodel. Heathland-type species include heather, cross-leaved heath, heath rush and deergrass.

The abundance of devil's-bit scabious means that the site supports an exceptionally large colony of the scarce marsh fritillary butterfly. The uncommon small pearl-bordered fritillary butterfly and the keeled skimmer dragonfly are also present on site.

Culm grassland is one of Devon's most important habitats, and because of this it is listed on the **Devon Biodiversity Action Plan** as a habitat of conservation concern. It is also listed on the **UK Biodiversity Action Plan**. Devon contains approximately 80% of the extent of the habitat in England, and approximately 8% of that in the UK as a whole.

There are three main concentrations of Rhôs pasture in Devon. On the Culm measures of north-west Devon and north-east Cornwall it is known as Culm grassland. It also occurs on the edges of Dartmoor and on the Blackdown Hills around the springline.

Key species associated with this habitat include: wavy St. Johns-wort, whorled caraway, meadow thistle, marsh hawk's beard, greater butterfly orchid, lesser butterfly orchid, marsh fritillary butterfly, brown hairstreak, narrow-bordered bee hawkmoth, curlew, snipe, and barn owl.

Rhôs pastures are a priority for nature conservation because they are highly susceptible to agricultural modification and reclamation throughout their range.

The marsh fritillary is also listed on the **Devon and UK Biodiversity Action Plans**. Marsh fritillaries are very habitat specific: they breed in two main habitats, damp neutral or acid grasslands (Rhôs pastures) and dry chalk and limestone grasslands. They are dependant on the presence of their larval food plant, devil's-bit scabious.

The UK is a major European stronghold for the species, but even here it has declined substantially over the last 150 years. In Britain, its range has reduced by over 62%, and it has recently disappeared from most of eastern England and eastern Scotland. It is still quite widespread in parts of south-west England and Wales, but colonies are estimated to be disappearing at a rate of well over 10% per decade. Colonies are often small and prone to extinction, so extensive networks of habitat patches which permit re-colonisation are essential to their long term survival.

Sites of Special Scientific Interest (SSSI) are notified by English Nature because of their plants, animals or geological features (the latter are geological SSSIs or gSSSI). English Nature needs to be consulted before any operations likely to damage the special interest are undertaken. SSSI is a statutory designation with legal implications.

In addition to the SSSI designation Bradworthy Common is also a **candidate Special Area of Conservation**.

The Culm Grasslands **candidate Special Area of Conservation** comprises several SSSIs including Bradworthy Common; Bursdon Moor; Dunsdon Farm; Hare's Down, Knowstone and Rackenford Moors; Hollow Moor and Oldham Moor; Kismeldon Meadow; Mambury and Stowford Moors and Thorne and Doves Moor.

The area is considered to have a high diversity of habitats and species of European importance. These include the marsh fritillary butterfly, *Molinia* (i.e. purple-moor grass) meadows on calcareous, peaty or clay-silt-laden soils and Northern Atlantic wet heaths with *Erica tetralix* (i.e. cross-leaved heath).

Special Areas of Conservation (SAC) are notified by English Nature because they contain species and/or habitats of European importance (listed in the Habitats Directive 1994), and are part of a network of conservation sites set up through Europe known as the Natura 2000 series. On land, almost all candidate SACs are, or will be, also notified as SSSIs. English Nature needs to be consulted before any operations likely to damage the special interest are undertaken. SAC is a statutory designation with legal implications.

Culm grassland County Wildlife Sites

There are many County Wildlife Sites within Bradworthy identified for the presence of Culm grassland and associated habitats. These are: Hardsworthy (S); East Youlstone; West Lodge, Bradworthy; West Youlstone; West Greadon; Biteford Farm; Horton Farm; Maddocks; Worden Farm; Quoitgate; Dinworthy; North Whitley; High Park; West Ash; Cleverdon; Instaple Farm; Wheelers Cross 1; Osbourne's, Kimworthy and Lower Hele.

From looking at the 1999 aerial photos it appears that some of the sites identified in the early 1990s have been lost to scrub invasion, afforestation and agricultural improvement. However, there do appear to be additional sites that were not identified during the original survey that could be of considerable wildlife interest.

Culm Grassland is the local name given to species-rich marshy habitats found on the Culm measures of north-western and central Devon and north-east Cornwall, also known as Rhôs Pasture, and referred to in the UK Biodiversity Action Plan as Purple Moor Grass and Rush Pastures (*Molinia-Juncus*). Culm Grassland is a variable habitat whose main plant communities are classified by the National Vegetation Classification (NVC) as follows:

- M16 *Erica tetralix-Sphagnum compactum* wet heath
- M23 *Juncus effusus/acutiflorus-Galium palustre* rush pasture
- M24 *Molinia caerulea-Cirsium dissectum* fen meadow
- M25 *Molinia caerulea-Potentilla erecta* mire
- M27 *Filipendula ulmaria-Angelica sylvestris* mire

Culm grassland is listed in the **Devon Biodiversity Action Plan** as a priority habitat and in the **UK Biodiversity Action Plan**. Culm grassland is characterised by purple moor-grass, as well as sharp-flowered rush, and various flowering species such as devil's-bit scabious, meadow thistle, heath spotted orchid, water mint and round-leaved sundew. Culm grassland may support the rare marsh fritillary butterfly and narrow-bordered bee hawkmoth, as well as the barn owl and curlew.

County Wildlife Sites (CWS) are sites of county importance for wildlife, designated on the basis of the habitat or the known presence of particular species. This is not a

statutory designation like SSSIs, and does not have any legal status. County Wildlife Sites are usually included in Local Plans as sites of substantive nature conservation interest and are covered by Planning Policy Guidance note nine (PPG9). CWS recognition does not demand any particular actions on the part of the Landowner and does not give the public rights of access. However, it may increase eligibility for land management grants.

Please note, PPG9 (Planning Policy Guidance: Nature Conservation) was published by the Department of the Environment in 1994. It sets out the Government's policies on aspects of planning in relation to nature conservation. It includes guidance for Local Plans (i.e. District planning frameworks) to have planning policies for nature conservation sites, including County Wildlife Sites (though the weight attached to these in planning matters will be less than that for sites with international and national designations).

The Office of the Deputy Prime Minister is currently consulting on PPG9's replacement, a Planning Policy Statement (PPS9) on Biodiversity and Geological Conservation.

Bradworthy Mill Quarry Regionally Important Geological Site

Bradworthy Mill Quarry has been identified as a Regionally Important Geological Site because it shows a good example of the Carboniferous Bude Formation sandstone and shale with sediment features, plant remains & folding.

Pitts, quarries and cuttings are listed on the **Devon Biodiversity Action Plan** as habitats of conservation concern in Devon. The numerous working pitts and quarries in Devon are used for the extraction of a variety of minerals and are of great importance to the local and national economy. The pitts and quarries are also of importance for the varied wildlife they support. Uncommon species of bird such as the peregrine falcon and raven may use the quarry edges to nest, greater and lesser horseshoe bats next in cave-like quarries and reptiles such as common lizard and adder may be found basking in sunny areas in many quarries.

Bradworthy Mill Quarry is characteristic of other quarries in the North Devon area which are predominantly Culm Shale and Sandstone quarries.

Regionally Important Geological and Geomorphological Sites (RIGS) are earth science sites that are of regional or local importance. Like County Wildlife Sites, they are included in Local Plans and referred to under PPG9. These may represent good examples of local rock formations or landform features or they may contain interesting fossils. They are identified by the RIGS Group (Regionally Important Geological Sites Group).

Other habitats (identified from field survey):

Species-rich hedges

Hedgerows tend to be taken for granted as they always seem to be there, providing such a constant in a familiar landscape. However, they do require regular attention to keep them in good condition. That so many are still in good condition is a testament to the skill and hard work of generations of farmers. But there are changes even in the oldest hedgelines as the way the majority are managed has altered with less farm labour available and more reliance on mechanical cutting. Even the mechanical cutting has changed as reciprocating cutters that could cut shrub stems cleanly have given way to tractor-mounted flails which can tackle slightly older growth but at the expense of every stem being shattered, leaving them much more susceptible to infection. As individual hedge plants die, they leave gaps which render the hedge less effective and which would in the past have been filled when the hedge was next layed.

With the advent of mechanical hedge-trimming has come another change - that it now becomes possible to trim all the hedges on a farm in one year. It is this that perhaps has the most impact on the vertebrate wildlife as the fruiting and seeding species are very much less productive and there is a different and less varied structure. Shrubs that do produce a good berry crop may be cut in the early autumn before the birds, particularly the migrants, can gain any advantage. A couple of generations ago, many hedges on a farm might have been cut only once in five or even seven years, allowing them to be much more productive in the meantime.

Recognising these changes does allow choices in the way hedges are managed in the future with perhaps only one or two of the three 'faces' (the top and the two sides) being cut in any one year. This wouldn't stop road or drive side hedges being cut from both the safety and visual aspects but for the majority of hedges it would have two major benefits, it would take less time and, hence, cost and it would benefit wildlife!

Once it was realised nationally that many thousands of kilometres of hedgerow were being lost annually and that something ought to be done about it, the Hedgerow Regulations (made under Section 97 of the Environment Act 1995) were introduced in England and Wales in 1997 to protect them. The Regulations are intended to prevent the removal of most countryside hedgerows without first submitting a hedgerow removal notice to the local planning authority. The local planning authorities are only able to require the retention of 'important' hedgerows. The Regulations then set out criteria to be used by the local authority in determining which hedgerows are important. (Bickmore, 2002)

In such a clearly agricultural landscape, the hedgerows and hedgebanks represent continuity as features in the landscape and provide a significant wildlife resource at a time when the fields themselves are being more intensively used. The UK Biodiversity Action Plan (UK Steering Group, 1995) lists ancient and or species-rich hedgerows as one of its priority habitats.

Many of the hedges in Bradworthy parish could be described as species-rich, with an average of five woody species in a 30 metre length. The hedges range from being

relatively species-poor with only three or four species in a 30 metre length, to extremely species-rich with seven or eight species. This suggests that some of these hedgerows could be up to 700 years old.

The best examples of a species-rich hedge are found between North and South Wrangworthy farms; near to North Lane; near to Three Lane End and next to the school. Woody species recorded from these areas include ash, sycamore, hawthorn, blackthorn, holly, hazel, beech and oak. The associated bank flora is also quite rich with several species recorded that are indicative of ancient woodland: primrose, betony, barren strawberry, common polypody, hart's-tongue fern and bluebell. Additional species include creeping cinquefoil, foxglove, herb Robert and greater stitchwort.

There are also two notable beech tree lined avenues in the parish - at Berridon and Blatchborough to the west of the village. These were planted in the last decade of the 19th century.

Species rich hedges are listed on the **Devon Biodiversity Action Plan** as a habitat of conservation concern in Devon.

Churchyard

The parish church of St. John the Baptist has a fairly large churchyard with moderately species-rich grassland. Species recorded from here include cock's-foot, hogweed, cat's-ear, lesser celandine, creeping buttercup, ox-eye daisy and common sorrel.

Recreation areas and public open space

There are few areas of amenity grassland and open space in Bradworthy, namely the recreation ground/playing field next to Tucker's Park and the village green. In addition to these areas there are several public footpaths, a nature reserve and links to the Bradworthy Ruby Trail, a walking route.

Ruby trails

The Ruby Country initiative is a rural regeneration project in North West Devon surrounding the traditional towns of Holsworthy and Hatherleigh, with many interesting villages and hamlets to discover throughout. Ruby Country is being developed as a visitor destination and local attraction encompassing the environmental, cultural and other assets of the area.

Ruby Country takes its name from the County's red ruby cattle, which have a long, proud history. It was this hardy, docile beef cow, with its rich red coat, that the Pilgrim Fathers chose to take and farm.

The Ruby Trails Scheme is based around the creation of circular walking, cycling, horse riding and other special interest trails centred around the towns between Hatherleigh and Holsworthy. The trails are interpretative, concentrated on the environment and marketed to a niche tourist sector. The Project aims to promote local businesses and produce with the aim of developing new income streams for the area.

The Project is supported by a wide range of groups and organisations and an initial feasibility phase has been funded by Torridge District Council, Devon County Council, West Devon Borough Council, The Devon Wildlife Trust and recently Leader+.

Some of Devon's most beautiful and unspoilt countryside lies in the rural hinterlands surrounding the market towns of Holsworthy and Hatherleigh, known as Ruby Country. The tranquillity and gentle rolling hills, with stunning views to Dartmoor, make the area an ideal base for cycling, rambling, horse riding and fishing. In addition the area is the heart of the South West Forest and contains some of the country's finest examples of Culm grassland.

Culm grassland is one of Devon's most valuable wildlife habitats supporting spectacular and, in some cases, very rare species. It provides important breeding grounds for curlew, rare butterflies, barn owls and otters, to name but a few.

Bradworthy route:

Bradworthy is a large but attractive Saxon village built around an open square in the high north of Ruby Country. The Village Square can boast to be the largest in the westcountry, and is surrounded by white rendered houses of the 18th century to early 19th. The trail leads you across the richness of Culm grassland on Bradworthy Common which is designated a Site of Special Scientific Interest on account of the fen meadow and mire communities. It also crosses the River Waldon and offers good views over much typical Ruby Country landscape.

Brief Directions:

The trail is 13km/8miles in total. Just follow the red Ruby way markers. Bradworthy has a formal car park in the centre of the large village square. Take the road past the post office and the industrial park on left. Take the first lane to the left. Follow this lane through Bradworthy Common.

Take the next left hand footpath which crosses an old wall stile on the right. From the stile head towards the metal gate into Whitely Farm at a 2 o'clock direction. Turn immediately left down the track towards the bottom of the field and the bridge crossing the River Waldon.

Over the bridge take the left hand hedge steps and then turn left up the lane. On reaching Heath farm turn left through the farmyard and through the two metal gates leading onto a farm track. Take care to close the gates.

Continue along this track until it meets the field, through the metal gate and along the left hand field boundary heading down the left hand side of the old farm quarry. You will reach a stile at the bottom of the quarry and a bridge taking you on to Bradworthy Common.

From the bridge, head in a 2 o'clock direction up the common to finally reach a metal gate on the right hand side. Take the farm track through the farmyard, which returns the road. Turn left again taking you back into the centre of Bradworthy.

The Bradworthy trail is an attractive route passing through a variety of interesting and important habitats. These include woodlands, green lanes and Culm grassland. The Site of Special Scientific Interest at Bradworthy Common, which is legally protected from damage, supports a colony of the internationally rare marsh fritillary butterfly. There are several veteran trees present and some of the hedges contain eight woody species, meaning they could be up to 800 years old.

Broadhill village green

Broadhill village green is located close to the post office following the lane out of the village towards the industrial estate. The name probably survives from the *broad estate* of the Saxons, which has remained as an open green. The grassland is semi-improved and species-poor (it was levelled and re-seeded in the 1960s) with common grassland species present including daisy, creeping buttercup, white clover and yarrow. There are also several scattered trees including copper beech which was planted to commemorate the coronation of King George VI in 1937. There are also several cherry trees.

Tamar Lakes

Tamar Lakes straddle the Devon and Cornwall border near the source of the river Tamar, and approximately 80% of Tamar lakes fall within Bradworthy parish.

The Lower Tamar Lake was created in 1819 as a reservoir to supply the old Bude Canal, and subsequently to provide Bude with drinking water. It covers about seventy acres and was made a bird sanctuary in 1949. The dam is the oldest within the ownership of South West Water and was completed in 1823 by Napoleonic prisoners of war.

The reservoir known as the Upper Tamar Lake was constructed in 1973 and is about eighty acres in extent. It cost £1.5 million, and was opened in October 1977. Fly fishing, sailing, and other water sports are catered for. There is good parking space, a picnic area, a cafe and shop.

Lower Tamar lakes was designated as a bird sanctuary in 1951 and it is also a Local Nature Reserve. 50 different bird species have been recorded from the site including wigeon, common sandpiper, mallard and great crested grebe which all nest there.

The lake has a semi-natural appearance with stands of reed canary-grass and reedmace. There are also areas of reed swamp, willow carr, scrub and neutral grassland.

Wet woodland is a **UK Biodiversity Action Plan** habitat and is also listed on the **Devon Biodiversity Action Plan**.

Wet woodland occurs on poorly drained or seasonally wet soils, usually with alder, birch and willows as the predominant tree species, but sometimes including ash, oak, pine and beech on the drier riparian areas. It is found on floodplains, as successional habitat on fens, mires and bogs, along streams and hillside flushes, and in peaty hollows. These woodlands occur on a range of soil types including nutrient-rich mineral and acid, nutrient-poor organic ones.

Wet woodland supports a rich lichen flora as well as a rich invertebrate flora. Such an abundance of insect food attracts a rich assemblage of breeding birds including the uncommon willow tit. Wet woodland may also provide lying up areas for otters and suitable habitat for dormice.

The edges of the lakes are interesting with grassy verges with species present including common knapweed, red clover, ribwort plantain, meadow buttercup, germander speedwell, cat's-ear, red bartsia and crested dog's-tail. The grassland is species-rich and has affinities to the National Vegetation Classification community MG5 *Cynosurus cristatus-Centaurea nigra* grassland (a once common, but now rare and valued, grassland community). The grassland is backed by gorse and bramble scrub. Wetland species present along the margins of the lake include purple loosestrife, greater bird's-foot trefoil, soft rush and hemp-agrimony.

Flower-rich meadows and pastures are a habitat of conservation concern in Devon and are listed on the **Devon Biodiversity Action Plan** as well as the **UK Biodiversity Action Plan**. Unimproved neutral grassland habitat has undergone a huge decline in the 20th century, almost entirely due to changing agricultural practice. It is estimated that by 1984 in lowland England and Wales, semi-natural grassland had declined by 97% over the previous 50 years to approximately 0.2million ha.

Unimproved grassland is often very flower-rich and as a result of this attracts an abundance of butterflies and other invertebrates. The rich insect life in turn attracts bats such as the greater horseshoe bat and birds such as the green woodpecker and cirl bunting.

Footpaths run around the edge of the lakes and one of the footpaths links up with the Bude Aqueduct walk, along the old canal formerly used to transport lime from Bude to the farms inland. You can also walk (or drive direct) to Upper Tamar lakes.

Gardens

Gardens are a haven for wildlife and can provide links to other areas of wildlife habitat. Several species have been recorded from gardens in Bradworthy parish including swallow, common toad, common frog, pipistrelle bat, badger and goldcrest.

Species-rich grassland

Roadside verges often support flower-rich grassland, as well as a variety of semi-natural habitats including calcareous grassland, neutral grassland, acid grassland, heathland, open water (ditches), broadleaved woodland, scrub, hedgerows and walls. They may also support populations of scarce or declining species of flora and/or fauna, some of which enjoy statutory protection. Linear grassland habitats provide a valuable wildlife resource. Verges provide shelter and food for a variety of species from small mammals, to birds of prey and insects.

Devon has a very substantial resource of roadside verges; approximately 14,000 km of roads, corresponding to about 2,000 ha of roadside verge. However, of this very large resource, the area which is species-rich is relatively small and localised in distribution.

Devon County Council and the Highways Agency manage roadside verges to incorporate prescriptions to maintain or enhance wildlife interests. DCC operate a **Special Verge Scheme** to manage areas of particular wildlife or amenity value. These verges are protected from damaging activities, and grass cutting is limited to specific periods to avoid the destruction of attractive stands of wildflowers.

There are no special verge sites in Bradworthy parish, but there are several roadside verges supporting species-rich neutral grassland, heathland and acid grassland. The wide road verges close to the Kimworthy Farm track support species-rich neutral grassland with species present including common knapweed, smooth hawk's-beard, red clover, red bartsia, common bird's-foot trefoil, meadow vetchling and meadow buttercup. The grassy verges along the Lower Tamar lake also support unimproved neutral grassland.

The grassy banks close to Brimford Bridge support heathland-type flora. Species recorded from here include bell heather, purple moor-grass, hard fern, common gorse, heath bedstraw, tormentil and tufted hair-grass. The verge near the forestry plantation at Brimford Cross supports wild angelica, meadowsweet, greater bird's-foot trefoil, purple moor-grass, common valerian, devil's-bit scabious, tormentil and sneezewort, flora indicative of Culm grassland. These remnants of Culm grassland allow a snapshot of what the landscape of the parish may have looked like in the past.

Veteran trees

Several veteran trees were noted in the parish. A veteran hawthorn tree exists adjacent to Bradworthy Common, and a large, old ash tree was seen near to South Wrangworthy.

English Nature have defined veteran trees as: "trees that are of interest biologically, culturally or aesthetically because of their age, size or condition". In relation to oak it has been taken that trees with a diameter of more than:

- 1.0m are potentially interesting
- 1.5m are valuable in terms of conservation
- 2.00m are truly ancient.

Veteran trees will be at least as big as these measurements:

- 1 metre - Hawthorn, blackthorn
- 2.5 metres - Field maple, rowan, yew, birch, holly
- 3 metres - Oak, ash, scot's pine, alder
- 4.5 metres - Sycamore, limes, chestnuts, elms, poplars, beech, willows, pines, non-native trees.

It has been estimated that Britain may be home to around 80% of Europe's ancient trees. Veteran trees are large old trees found in wood-pasture and parkland, but also in a number of other locations: ancient yews in churchyards; mature oaks in hedgerows; black poplars along stream-sides; and many noble trees in ancient woodlands.

Ancient trees support particularly rich assemblages of invertebrates, fungi, mosses and lichens. Several species of bat may use hollow trees as roosting sites and birds such as tree creepers and woodpeckers feed on the insects living in the bark. Insects such as stag beetles and hornets are associated with old trees.

Green lanes

There are several footpaths around Bradworthy parish that could be described as 'green lanes'. A green lane can be defined as an unmetalled track with field boundaries either side. These boundaries may be banks, hedges, woodland edge, stone walls or fences and often features such as ditches or streams are incorporated within the lanes. The combination of the track, its boundaries and associated features create a landscape unit with its own microclimate and ecology. These sheltered conditions within lanes are of great importance to butterfly populations and may be more botanically species-rich than single hedge boundaries.

Green lanes are present near to South Wrangworthy Farm, the bridleway near Bradworthy Mill, near to Rectory Cottage and near to Heath Farm. Species recorded from these areas include primrose, common dog violet, foxglove, honeysuckle, bugle, dog's mercury and bluebell. Several species of bird were also recorded including chiff chaff, chaffinch and blue tit. The thick hedges along these green lanes also have the potential to support dormice.

Species

Important Species

A report from the DBRC database showing what legally protected, locally notable or noteworthy (eg Japanese Knotweed) species are known to have been present in and around Bradworthy has been prepared and is presented separately (Appendix 1).

Birds

Several species of birds were recorded during the survey including buzzard, woodpigeon, raven, rook, jackdaw, robin, swallow, house sparrow and willow warbler.

The many Culm grassland County Wildlife Sites in the parish support a range of uncommon birds. The reed bunting has been recorded from Brimford Bridge and West Lodge as well as the willow and grasshopper warblers.

The rough, marshy ground of Culm grassland supports many small mammals, which are the preferred foods of the barn owl. Barn Owl habitat includes rough grassland (where field voles can be numerous), field margins, hedgerows, woodland edge, stubble fields, drainage ditches and farmyards. This bird has been recorded from several areas in the parish including Broomfield, West Lodge and Dinworthy.

The barn owl is listed on the **Devon Biodiversity Action Plan** as a species of conservation concern as it has undergone a major decline in the last 30 years.

In the last 30 years, loss of hunting habitat through widespread agricultural change has probably been the main cause of this bird's decline. Rough grassland and field edges (often associated with hedgerows) are disappearing, hay meadows have been converted to silage and more and more former marginal land has been lost.

All this may have been exacerbated by the loss of many traditional nest (and roost) sites as old hedgerow trees were removed and old farm buildings demolished, modernised or converted for other uses. The new second generation rodenticides, such as brodifacoum, bromadiolone and difenacoum, are much more toxic to barn owls than first generation poisons such as warfarin, and should not be used on farms where barn owls are known to be present. The barn owl is also highly susceptible to severe winters, particularly long, cold spells and lengthy periods of snow cover. Encouragingly, barn owl numbers are now on the increase in much of Devon.

Other bird species recorded from Bradworthy parish include cuckoo, snipe, skylark and meadow pipit.

It is said that one of the biggest starling roosts in North Devon is to be found in the park of Berridon Hall. Since the 1830s the starling's range and numbers increased greatly, making it a common and abundant species, but since the 1960s their population has declined across much of Europe, including the UK. Loss of permanent

pasture and mixed farming, and increased use of farm chemicals are probable causes of starling decline in the UK. Access to the birds main food of earthworms and leather jackets has declined, particularly on arable land. There is also a shortage of nesting sites in many parts of the UK. Long-term monitoring by the British Trust for Ornithology shows that starling numbers have fallen by 66% in Britain since the mid-1970s. Because of this decline in numbers, the starling is **red listed** as a bird of high conservation concern.

Plants

Plant species noted on a visit on the 15 September 2004 are listed in Appendix 2.

Several uncommon species of plant are present in Bradworthy parish. Many of these are confined to the areas of Culm grassland. The nationally scarce (and Devon Notable plant species) wavy St. John's-wort is found at Brimford, Lower Tamar lake, Horton Farm and Wheeler's Cross Culm grassland sites. Wavy St. John's-wort is a Culm speciality and confined to the north-west of Devon, in damp heaths, rough pasture and bogs. It has declined in recent years from habitat loss due to agricultural intensification.

Marsh cinquefoil is also a Devon notable plant species and has been recorded from East Youlstone and West Lodge. This plant's distribution is also confined to the north-west of Devon in bogs and marshes. Marsh cinquefoil has also declined in southern England as a result of drainage, agricultural improvement and lack of grazing.

Mammals

Several common mammal species have been recorded from within Bradworthy parish. These include roe and red deer recorded from Meddon, Greadon Farm, Brimford Bridge, Broomfield and Dinworthy.

Badgers have been recorded from Brimford Bridge and Dinworthy, and pipistrelle bats from Sanguine Cottage and Lower Alfardisworthy.

Otters are present along the River Torridge which passes along the edge of Bradworthy parish. The otter is listed on the **Devon Biodiversity Action Plan** as a species of conservation concern.

Formerly widespread throughout the UK, the otter underwent a rapid decline in numbers from the 1950s to 1970s and was effectively lost from midland and south-eastern counties of England by the 1980s. Populations remain in Wales, south-west England and much of Scotland, where sea loch and coastal colonies comprise one of the largest populations in Europe. There is also a significant population of otters in Northern Ireland. The decline now appears to have halted and sightings are being reported in former habitats.

Devon has an internationally important otter population and otters are now found on most watercourses and wetlands throughout the County. Otters are even now

recolonising areas where they were thought to have been lost during the 60's and 70's. The main serious threat to otters today is from road kills, with many animals sadly reported dead each year.

Invertebrates

Many of the Culm grasslands in the Bradworthy area support internationally important populations of the rare marsh fritillary butterfly. The uncommon pearl-bordered fritillary butterfly is also present on Bradworthy Common.

The marsh fritillary was once widespread in Britain and Ireland but has declined severely over the twentieth century, a decline mirrored throughout Europe. Its populations are highly volatile and the species probably requires extensive habitats or habitat networks for its long-term survival.

Reptiles and Amphibians

A range of common reptile and amphibian species have been recorded from Bradworthy parish. Common frog and toad are present in many garden ponds in the village and surrounding farms, and smooth and palmate newt and common lizard have also been seen.

Common frogs and toads and grass snakes can probably also be found in many of the Culm grassland areas.

The Devon Biodiversity Action Plan (BAP).

The Devon Biodiversity Action Plan (BAP) describes the key actions needed to look after 37 of Devon's most important habitats and species. It does not stand alone, but is part of a much wider process aimed at conserving our biodiversity.

The Devon BAP is a direct descendent of a process started at the famous 'Earth Summit' held in Rio de Janeiro in 1992. At this summit, world leaders pledged to halt and reverse the loss of the planet's biodiversity. For its part, the UK government produced a series of Action Plans for a great many threatened habitats and species. These national plans have been joined by a series of regional Action Plans aimed at providing a more local perspective.

The Devon BAP builds on this endeavour, identifying local priorities and providing targets and plans of action for the County.

All of this work has one aim: to encourage practical action on the ground. Its success depends upon us all.

Biodiversity links:

- The Devon BAP can be viewed at www.devon.gov.uk/biodiversity. This site also contains links to other nature conservation issues relevant to Devon, such as information on hedges. If you do not have access to the internet and require paper copies of relevant sections of the Devon BAP please contact Devon County Council's Biodiversity Officer on 01392 382804.
- Details of biodiversity planning in the South West region can be viewed at www.swbiodiversity.org.uk.
- National Action Plans can be viewed at www.ukbap.org.uk. This site also contains useful background information on UK biodiversity action planning.

Links between the wildlife of Bradworthy and the Devon BAP:

Bradworthy wildlife feature	Brief description of feature	Link with the Devon Biodiversity Action Plan (BAP)
Bradworthy Common SSSI	The site comprises a mosaic of mire and fen-meadow communities known as Culm grassland	<ul style="list-style-type: none"> • Rhôs pasture Habitat Action Plan • Marsh fritillary Species Action Plan • Pearl-bordered fritillary Species Action Plan
Culm grassland County Wildlife Sites	Several smaller areas of Culm grassland scattered around the parish.	<ul style="list-style-type: none"> • Rhôs pasture Habitat Action Plan • Barn Owl Species Action Plan
Species-rich Hedges and green lanes	Important – often ancient – wildlife habitats that can also form an important network of corridors along which wildlife can move and disperse.	<ul style="list-style-type: none"> • Species-rich Hedges Habitat Action Plan • Dormouse Species Action Plan
River Torridge		<ul style="list-style-type: none"> • Otter Species Action Plan
Bradworthy Mill RIGS	Bradworthy Mill is important because it shows a good example of the Carboniferous Bude Formation sandstone and shale with sediment features, plant remains & folding.	<ul style="list-style-type: none"> • Pitts, quarries and cuttings Habitat Action Plan
Tamar Lakes nature reserve	A lake managed as a bird sanctuary with areas of reed swamp, willow carr, scrub and neutral grassland.	<ul style="list-style-type: none"> • Wet Woodland Habitat Action Plan
Churchyard & road verges	These features support species-rich grassland which has been protected from agricultural improvement.	<ul style="list-style-type: none"> • Flower-rich Meadows and Pastures Habitat Action Plan

View the Devon Biodiversity Action Plan at www.devon.gov.uk/biodiversity.

Some Ideas for Local Action...

This section of the report is provided by Devon County Council (contact: nature@devon.gov.uk or 01392 382804).

A major step to knowing what you can do for your local wildlife and geology is to know what you have already got. This report will help you in this, but it is just a start. Ultimately, the protection and enhancement of the local natural environment requires the interest and enthusiasm of the local community.

There follow some initial ideas for local nature conservation action. Many of them will directly help to achieve the objectives of the habitat and species action plans contained in the **Devon Biodiversity Action Plan**.

It is by no means an exhaustive list. As a community, you may have many more ideas for action that you would like to take forward in the coming years.

1 Further survey:

This report is just a beginning. Carrying out further survey within your area will help build a better picture of the wildlife present, and of the opportunities for enhancement. Gaining a better understanding of the resource is usually a key objective of the Devon BAP's habitat and species action plans.

Specific features to survey in Bradworthy might include otter signs and Culm grassland. The last two actions would directly contribute to the **Otter Action Plan** and the **Culm grassland Action Plan**.

One example of survey work that might usefully be undertaken would be to produce a hedgerow appraisal for your local area. Comparing the current distribution of hedges against boundary lines shown on old maps will give a clue as to how this important resource has changed over recent years. It may also highlight opportunities for restoring hedges in your area. It might also be possible to assess the condition of hedges and this may, in turn, give some ideas about improving their future management to benefit wildlife.

Survey work could be undertaken as a community group or in liaison with conservation groups active in the area. For example, the Devon Wildlife Trust manages the nearby Volehouse Moor Nature Reserve, and the South West Lakes Trust manage Tamar Lakes.

Help to build up a picture of the state of Devon's environment by sending your records to the Devon Biodiversity Records Centre where they can be properly collated.

2 Influence the management of Public Open Space:

Creating areas of more species-rich grassland will help to reduce the isolation of the remaining fragments of traditionally managed agricultural land, contributing to the **Flower-rich Meadows and Pastures Action Plan**. Churchyards have often received less intensive management than the surrounding land and can provide good opportunities for wildlife.

Planting up areas that are currently of little wildlife interest with new copses of native trees and shrubs will also help to attract wildlife. Suitable sites might include unused areas of playing fields, for example.

3 Build relationships with local landowners:

Encourage the adoption of more wildlife-friendly land management. For example, hedges which are cut only every other year will provide an autumn and winter source of nuts and berries for birds and small mammals (and can save the landowner money in management costs). The improved management of hedgerows is a key objective of the **Species-rich Hedges Action Plan**. If the owner is willing, why not get involved with practical management, such as traditional hedge laying or pond restoration?

4 Adopt a road verge:

Many verges can have a significant value for wildlife because they have escaped the intensive management of the surrounding farmland. Ensuring such verges are managed for their wildlife is a very positive step, again contributing to the **Flower-rich Meadows and Pastures Action Plan**.

There are, of course, obvious health and safety implications to roadside management. It is an action that would need to be undertaken in close liaison with the relevant highways authority (generally, this is the Highways Agency for motorways and trunk roads, and Devon County Council for all other roads).

5 Wildlife gardening:

Green up your garden! Collectively the gardens of Bradworthy represent area that could be used to benefit wildlife. Large or small, you can turn your garden (or a part of it!) into a haven for wildlife. A very good source of information on wildlife gardening is the English Nature web site:

[www.english-nature.org.uk/Nature In The Garden](http://www.english-nature.org.uk/Nature_In_The_Garden)

English Nature is the Government's adviser on nature conservation. Its web site also contains links to a number of other very useful sources of information.

6 Join local conservation organisations:

One example of a prominent local conservation organisation is the Devon Wildlife Trust. This trust has a number of Local Groups which, amongst other things, get involved in practical management work.

7 Japanese Knotweed:

Not something to cherish, but it can't be ignored! Unfortunately, Japanese Knotweed is present at several locations in Bradworthy Parish. Introduced into Britain by the Victorians, Japanese Knotweed is a native of Japan, north China, Korea and Taiwan. It flourishes in Britain's mild and fertile environment and has no natural biological enemies here. Consequently, it is very invasive and can overrun large areas, replacing our native flora. It is a serious pest which can be so vigorous as to cause significant damage to buildings and roads. It is also a difficult plant to eradicate.

For these reasons Japanese Knotweed is listed under the Wildlife and Countryside Act 1981 as a plant that is not to be planted or otherwise introduced into the wild. In addition, all parts of the plant are considered as controlled waste under the Waste Regulations.

What can you do?

- Firstly, it is important to build up a picture of where Japanese Knotweed is present. This will give an idea of the scale of the problem and will help to prevent it being accidentally spread during any ditch clearance, highway work and so on. To help develop an understanding of the problem in Devon, records should also be sent to the Devon Biodiversity Records Centre¹. Ideally, records should include when you first saw it and confirmation of when it was seen most recently; its precise location (notes or a sketch map are helpful, as is a grid reference if you have one); the kind of habitat it is in (e.g. next to running water; on a road verge), and a indication of how abundant it is.
- Secondly, be careful not to spread the plant further! This is all too easily done as it can regenerate from even the smallest fragment and is easy to spread unknowingly. It is important not to flail it or to try and dig it up. Often, it is best not to cut Japanese Knotweed at all, but if it is it should be very carefully disposed of on site when dead or removed as Controlled Waste. Any tools used should be properly cleaned.
- Finally, if Japanese Knotweed is on your land, the best way to prevent its spread is to control or eradicate it as soon as possible. Regular cutting can weaken and eventually kill the plant but it is a time-consuming job and proper disposal of the cut material can be a problem. Usually, the most effective method of control is to treat the plant with herbicide. This can take a number of years to be successful but

¹ DBRC, Shirehampton House, 35-37 St David's Hill, Exeter, Devon, EX4 4DA. Phone: 01392 273244; Fax: 01392 433221; E-mail: dbrc@devonwt.cix.co.uk

if the plant is left untreated it will inevitably spread. A number of issues should be taken into account in deciding which herbicide to use, particularly the presence of water (where special care needs to be taken and the advice of the Environment Agency must be sought).

Fortunately, a great deal of advice (including an Environment Agency Code of Practice) is available on the Devon Knotweed Forum's web pages. You are recommended to view these at:

www.devon.gov.uk/biodiversity/japanese_knotweed.

Useful sources of further information:

- Devon Wildlife Trust: www.devonwildlifetrust.org
- Devon Birdwatching and Preservation Society: Secretary tel: 01837 53360
- English Nature: www.english-nature.org.uk
- Plantlife: www.plantlife.org.uk
- RSPB: www.rspb.org.uk
- The Woodland Trust: www.woodland-trust.org.uk
- The Living Churchyards & Cemeteries Project, Arthur Rank Centre, National Agricultural Society, Stoneleigh Park, Warwickshire, CV8 2LZ Tel: 01203 696969 ext. 364/339.

Possible sources of funding:

A number of potential sources of funding are available for local biodiversity projects. Each has its own rules, criteria and objectives but the following sites may be worth checking for suitability:

Awards for All: www.awardsforall.org.uk

Countryside Trust Awards: 01242 521382 or www.countryside-trust.org

Living Spaces: 0845 600 3190 or www.living-spaces.org.uk

Local Heritage Initiative: 01226 719019 or www.lhi.org.uk

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Rose F (1981) *The Wild Flower Key* Penguin Group London

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Websites:

www.ukbap.org.uk

www.barnowltrust.org.uk

www.rspb.org.uk

www.butterfly-conservation.org

www.torridge.gov.uk

www.therubycountry.com

www.village.bradworthy.co.uk

www.book.bradworthy.co.uk

www.english-nature.org.uk

Appendix 1 - Notable sites and species within Bradworthy Parish

File Code	Site Name	Grid Ref.	Area (ha)	Description	Status
SS21/008	Brimford Bridge	SS283175	6.0	Culm grassland	CWS
SS21/009	Hardsworthy (S)	SS286161	4.4	Culm grassland	CWS
SS21/010	East Youlstone	SS282159	6.0	Culm grassland	CWS
SS21/011	East Greadon Farm	SS296187	3.7	Culm grassland	CWS
SS21/012	West Lodge, Bradworthy	SS291154	3.4	Culm grassland	CWS
SS21/013	West Youlstone	SS272154	1.9	Culm grassland	CWS
SS21/018	West Greadon	SS290184 & SS288176	2.3	Culm grassland	CWS
SS31/003	Horton Farm	SS309180, SS304172, SS309171 & SS309176	16.3	Culm grassland	CWS
SS31/004	Maddocks	SS304154 & SS301152	3.0	Culm grassland	CWS
SS31/005	Worden Farm	SS309133	2.2	Culm grassland	CWS
SS31/007	Quoitgate	SS313162	2.7	Culm grassland	CWS
SS31/008	Dinworthy	SS311151	2.4	Culm grassland	CWS
SS31/014	North Whitley	SS321163	3.6	Culm grassland	CWS
SS31/015	Bradworthy Common	SS325149 & SS332150	24.4	Culm grassland: Molinia mire and fen meadow communities. Butterfly interest	SSSI
SS31/016	High Park	SS330150	12.7	Culm grassland	CWS
SS31/019	West Ash	SS330169	9.0	Culm grassland	CWS
SS31/020	Cleverdon	SS334140	23.8	Culm grassland	CWS
SS31/022	Instaple Farm	SS335113, SS342142, SS336152 &	7.6	Culm grassland	CWS
SS31/025	Wheelers Cross 1	SS331156	12.3	Culm grassland	CWS
SS31/046	Osbourne's, Kimworthy	SS309132	6.4	Culm grassland	CWS
SS31/057	Lower Hele	SS331174	5.0	Culm grassland	CWS
TSS31SW1	Bradworthy Mill Quarry	SS318143	0.3	Carboniferous Bude Formation sandstone & shale with sediment features, plant remains & folding	RIGS

Sites of Special Scientific Interest (SSSI): these are notified by English Nature because of their plants, animals or geological features (the latter are geological SSSIs or gSSSI). English Nature needs to be consulted before any operations likely to damage the special interest are undertaken. SSSI is a statutory designation with legal implications.

County Wildlife Sites (CWS): these are sites of county importance for wildlife, designated on the basis of the habitat or the known presence of particular species. This is not a statutory designation like SSSIs, and does not have any legal status. County Wildlife Sites are usually included in Local Plans as sites of substantive nature conservation interest and are covered by Planning Policy Guidance note nine (PPG9). CWS recognition does not demand any particular actions on the part of the Landowner and does not give the public rights of access. However, it may increase eligibility for land management grants.

Culm Grassland: This is the local name given to species-rich marshy habitats found on the Culm measures of north-western and central Devon and north-east Cornwall, also known as Rhôs Pasture, and referred to in the UK Biodiversity Action Plan as Purple Moor Grass and Rush Pastures (*Molinia-Juncus*). Culm Grassland is a variable habitat whose main plant communities are classified by the National Vegetation Classification (NVC) as follows:

- M16 *Erica tetralix-Sphagnum compactum* wet heath
- M23 *Juncus effusus/acuteiflorus-Galium palustre* rush pasture
- M24 *Molinia caerulea-Cirsium dissectum* fen meadow
- M25 *Molinia caerulea-Potentilla erecta* mire
- M27 *Filipendula ulmaria-Angelica sylvestris* mire

Special Areas of Conservation (SAC): these are notified by English Nature because they contain species and/or habitats of European importance (listed in the Habitats Directive 1994), and are part of a network of conservation sites set up through Europe known as the Natura 2000 series. On land, all candidate SACs are, or will be notified as SSSIs. English Nature needs to be consulted before any operations likely to damage the special interest are undertaken. SAC is a statutory designation with legal implications.

No.	Name	Latin Name	Location	Date	UK Protection	International Protection	Status
1	Marsh Cinquefoil	<i>Potentilla palustris</i>	East Youlstone	1990			DN3
2	Reed Bunting	<i>Emberiza schoeniclus</i>	Brimford Bridge	1990			UKBAP(P); Red
3	Wavy St. John's-wort	<i>Hypericum undulatum</i>	Brimford Bridge	1991			NS; DN2
4	Willow Warbler	<i>Phylloscopus trochilus</i>	Brimford Bridge	1990			Amber
5	Round-leaved Crowfoot	<i>Ranunculus omiophyllus</i>	Field 1, Hardsworthy (S)	1990			DN1
6	Cuckoo	<i>Cuculus canorus</i>	Woodland next to Broomfield, Bradworthy,	2003			Amber

			Holsworthy.				
7	Swallow	<i>Hirundo rustica</i>	Garden at Broomfield, Bradworthy, Holsworthy.	2003			Amber
8	Marsh Cinquefoil	<i>Potentilla palustris</i>	West Lodge, Bradworthy	1990			DN3
9	Narrow Buckler-fern	<i>Dryopteris carthusiana</i>	West Lodge, Bradworthy	1990			DN3
10	Reed Bunting	<i>Emberiza schoeniclus</i>	West Lodge, Bradworthy	1990			UKBAP(P); Red
11	Snipe	<i>Gallinago gallinago</i>	West Lodge, Bradworthy	1990			Amber
12	Grasshopper Warbler	<i>Locustella naevia</i>	West Lodge, Bradworthy	1990			Red
13	Willow Tit	<i>Parus montanus</i>	West Lodge, Bradworthy	1990			Red
14	Wavy St. John's-wort	<i>Hypericum undulatum</i>	Lower Tamar Lake	1984			NS; DN2
15	Skylark	<i>Alauda arvensis</i>	Fields at East Greadon Farm, Bradworthy.	2002			UKBAP(P); Red
16	Wavy St. John's-wort	<i>Hypericum undulatum</i>	Horton Farm	1990			NS; DN2
17	Wood Club-rush	<i>Scirpus sylvaticus</i>	Osbourne's, Kimworthy	1992			DN3
18	Dunnock	<i>Prunella modularis</i>	Sunnyside, Dinworthy, Bradworthy, Holsworthy.	2002			Amber
19	Goldcrest	<i>Regulus regulus</i>	Sunnyside, Dinworthy, Bradworthy, Holsworthy.	2002			Amber
20	House Sparrow	<i>Passer domesticus</i>	Sunnyside, Dinworthy, Bradworthy, Holsworthy.	2002			Red
21	Kestrel	<i>Falco tinnunculus</i>	Sunnyside, Dinworthy, Bradworthy, Holsworthy.	2002			Amber
22	Primrose	<i>Primula vulgaris</i>	Sunnyside, Dinworthy, Bradworthy, Holsworthy.	2002			DBAP
23	Willow Tit	<i>Parus montanus</i>	Dinworthy	1990			Red
24	Grasshopper Warbler	<i>Locustella naevia</i>	Quoitgate	1990			Red
25	Skylark	<i>Alauda arvensis</i>	Atworthy Cross near Bradworthy.	2002			UKBAP(P); Red
26	Primrose	<i>Primula vulgaris</i>	Bradworthy. Green lane near Heath Farm.	2003			DBAP
27	Primrose	<i>Primula vulgaris</i>	Bradworthy. Species-rich hedge near North Wrangworthy.	2003			DBAP
28	Stonechat	<i>Saxicola torquata</i>	Bradworthy Common	2003			Amber

29	Floating Club-rush	<i>Eleogiton fluitans</i>	Bradworthy Common	1990			DN2
30	Meadow Pipit	<i>Anthus pratensis</i>	Bradworthy Common	1990			Amber
31	Small Pearl-bordered Fritillary	<i>Boloria selene</i>	Bradworthy Common	1991			Declined
32	Snipe	<i>Gallinago gallinago</i>	Bradworthy Common	1990			Amber
33	House Sparrow	<i>Passer domesticus</i>	Bradworthy. Hedges near Leyland Cottages.	2003			Red
34	Primrose	<i>Primula vulgaris</i>	Bradworthy. Hedges near Leyland Cottages.	2003			DBAP
35	Primrose	<i>Primula vulgaris</i>	Bradworthy. Hedgerow near High Park.	2003			DBAP
36	Primrose	<i>Primula vulgaris</i>	Bradworthy. Broadleaved woodland near River Waldon.	2003			DBAP
37	Marsh Cinquefoil	<i>Potentilla palustris</i>	Bradworthy Common	1990			DN3
38	Wavy St. John's-wort	<i>Hypericum undulatum</i>	Bradworthy Common	1990			NS; DN2
39	White Beak-sedge	<i>Rhynchospora alba</i>	Bradworthy Common	1990			DN2
40	Snipe	<i>Gallinago gallinago</i>	Garden at Bradworthy, Holsworthy.	2003			Amber
41	Wavy St. John's-wort	<i>Hypericum undulatum</i>	Ashmansworthy Bridge	1991			NS; DN2
42	Bottle Sedge	<i>Carex rostrata</i>	Whealers Cross 2	1990			DN3
43	Wavy St. John's-wort	<i>Hypericum undulatum</i>	Whealers Cross 2	1990			NS; DN2
44	Willow Tit	<i>Parus montanus</i>	Whealers Cross 2	1990			Red
45	Common Toad	<i>Bufo bufo</i>	Pond at Newlands Farm, Bradworthy.	1998	WCA 5(S)	Bern III	
46	Roe Deer	<i>Capreolus capreolus</i>	Minor road near Meddon, Bradworthy.	2003	DA	Bern III	
47	Otter	<i>Lutra lutra</i>	Brimford, near Meddon.	2003	WCA 5	EC IIa, IIIa; Bern II	UKBAP(P); DBAP
48	Roe Deer	<i>Capreolus capreolus</i>	West Greadon Fm, Bradworthy	2000	DA	Bern III	
49	Marsh Fritillary	<i>Eurodryas aurinia</i>	East Youlstone	1990	WCA 5	EC IIa; Bern II (GB reservation)	UKBAP(P); DBAP; Nb
50	Badger	<i>Meles meles</i>	Minor road 0.5 miles south of Brimford Bridge.	2002	WCA 6, BA	Bern III	

51	Roe Deer	<i>Capreolus capreolus</i>	In winter wheat (near Brimford Cross, Bradworthy).	2001	DA	Bern III	
52	Red Deer	<i>Cervus elaphus</i>	Brimford Bridge	1990	DA	Bern III	
53	Stoat	<i>Mustela erminea</i>	Nr Meddon	2002		Bern III; CITES (UK reservation)	
54	Stoat	<i>Mustela erminea</i>	By felled conifer in forest (near Broomfield, Bradworthy).	2001		Bern III; CITES (UK reservation)	
55	Barn Owl	<i>Tyto alba</i>	Rough grassland at Broomfield, Bradworthy.	2002	WCA 1, 9		DBAP; Amber
56	Common Frog	<i>Rana temporaria</i>	Broomfield, Bradworthy.	2003	WCA 5(S)	EC Va; Bern III	
57	Common Toad	<i>Bufo bufo</i>	Next door to Broomfield, Bradworthy	2002	WCA 5(S)	Bern III	
58	Palmate Newt	<i>Triturus helveticus</i>	Next door to Broomfield, Bradworthy	2002	WCA 5(S)	Bern III	
59	Roe Deer	<i>Capreolus capreolus</i>	Next door to Broomfield, Bradworthy	2002	DA	Bern III	
60	Common Toad	<i>Bufo bufo</i>	Hillside Farm, Bradworthy.	2002	WCA 5(S)	Bern III	
61	Barn Owl	<i>Tyto alba</i>	In tree (near Broomfield, Bradworthy).	2001	WCA 1, 9		DBAP; Amber
62	Stoat	<i>Mustela erminea</i>	Bradworthy. Crossing minor road into cut down forestry, now rough grassland/heath.	2003		Bern III; CITES (UK reservation)	
63	Roe Deer	<i>Capreolus capreolus</i>	On verge beside minor road, near Broomfield, Bradworthy	2002	DA	Bern III	
64	Roe Deer	<i>Capreolus capreolus</i>	In hedgerow (Devon bank) by stream (Broomfield, Bradworthy).	2001	DA	Bern III	
65	Japanese Knotweed	<i>Fallopia japonica</i>	In hedgerow along roadside near Trentworthy Lodge, Bradworthy, Holsworthy.	2003	WCA 9		
66	Barn Owl	<i>Tyto alba</i>	West Lodge, Bradworthy	1990	WCA 1, 9		DBAP; Amber
67	Viviparous Lizard	<i>Lacerta vivipara</i>	West Lodge, Bradworthy	1990	WCA 5(KIS)	Bern III	

68	a bat	bat sp.	Sanguine Cottage, Lower Alfordisworthy, Bradworthy.	2003	WCA 5, 6	EC IVa; Bonn II	
69	Pipistrelle	Pipistrellus pipistrellus	Sanguine Cottage, Lower Alfordisworthy, Bradworthy.	2003	WCA 5, 6	EC IVa; Bern III, Bonn II	UKBAP(P)
70	Viviparous Lizard	Lacerta vivipara	On minor road, near Trentworthy Cross	2002	WCA 5(KIS)	Bern III	
71	Common Dormouse	Muscardinus avellanarius	Bradworthy: in overgrown hedge beside lane	1998	WCA 5, 6	EC IVa; Bern III	UKBAP(P); DBAP
72	Otter	Lutra lutra	Horton Bridge	1999	WCA 5	EC IIa, IIIa; Bern II	UKBAP(P); DBAP
73	Stoat	Mustela erminea	Crossing road from one grass field into another (near Northmoor, Bradworthy).	2001		Bern III; CITES (UK reservation)	
74	Marsh Fritillary	Eurodryas aurinia	Maddocks, near Dinworthy, Bradworthy.	2002	WCA 5	EC IIa; Bern II (GB reservation)	UKBAP(P); DBAP; Nb
75	Common Dormouse	Muscardinus avellanarius	Kimworthy Cottage, Bradworthy.	2001	WCA 5, 6	EC IVa; Bern III	UKBAP(P); DBAP
76	Badger	Meles meles	Sunnyside, Dinworthy, Bradworthy.	2002	WCA 6, BA	Bern III	
77	Barn Owl	Tyto alba	Sunnyside, Dinworthy, Bradworthy.	2002	WCA 1, 9		DBAP; Amber
78	Common Frog	Rana temporaria	Sunnyside, Dinworthy, Bradworthy.	2002	WCA 5(S)	EC Va; Bern III	
79	Common Toad	Bufo bufo	Sunnyside, Dinworthy, Bradworthy.	2002	WCA 5(S)	Bern III	
80	Palmate Newt	Triturus helveticus	Sunnyside, Dinworthy, Bradworthy.	2002	WCA 5(S)	Bern III	
81	Peregrine	Falco peregrinus	Sunnyside, Dinworthy, Bradworthy.	2002	WCA 1		Amber
82	Pipistrelle	Pipistrellus pipistrellus	Sunnyside, Dinworthy, Bradworthy.	2002	WCA 5, 6	EC IVa; Bern III, Bonn II	UKBAP(P)
83	Roe Deer	Capreolus capreolus	Sunnyside, Dinworthy, Bradworthy.	2002	DA	Bern III	
84	Smooth Newt	Triturus vulgaris	Sunnyside, Dinworthy, Bradworthy.	2002	WCA 5(S)	Bern III	

85	Pipistrelle	<i>Pipistrellus pipistrellus</i>	Berridon Cottages, Bradworthy.	2003	WCA 5, 6	EC IVa; Bern III, Bonn II	UKBAP(P)
86	Common Toad	<i>Bufo bufo</i>	Bradworthy	2000	WCA 5(S)	Bern III	
87	Otter	<i>Lutra lutra</i>	Kismeldon Bridge	1998	WCA 5	EC IIa, IIIa; Bern II	UKBAP(P); DBAP
88	Bluebell	<i>Hyacinthoides non-scripta</i>	Bradworthy. Hedges near Leyland Cottages.	2003	WCA 8 (S)		
89	Bluebell	<i>Hyacinthoides non-scripta</i>	Bradworthy. Hedgerow near High Park.	2003	WCA 8 (S)		
90	Bluebell	<i>Hyacinthoides non-scripta</i>	Bradworthy. Improved field near South Wrangworthy (hedge).	2003	WCA 8 (S)		
91	Japanese Knotweed	<i>Fallopia japonica</i>	Bradworthy. Hedgerow near Moorlands.	2003	WCA 9		
92	Badger	<i>Meles meles</i>	Bradworthy. Hedge near Leyland Cottages.	2003	WCA 6, BA	Bern III	
93	Otter	<i>Lutra lutra</i>	Fordmill Farm	1999	WCA 5	EC IIa, IIIa; Bern II	UKBAP(P); DBAP
94	Bluebell	<i>Hyacinthoides non-scripta</i>	Bradworthy. Broadleaved woodland near River Waldon.	2003	WCA 8 (S)		
95	Common Frog	<i>Rana temporaria</i>	Eastern section, Bradworthy Common	1990	WCA 5(S)	EC Va; Bern III	
96	Common Frog	<i>Rana temporaria</i>	Holsworthy	2001	WCA 5(S)	EC Va; Bern III	
97	Otter	<i>Lutra lutra</i>	Beside River Torridge in scrubland, upstream of Ashmansworthy Bridge, Woolfardisworthy.	2003	WCA 5	EC IIa, IIIa; Bern II	UKBAP(P); DBAP
98	a newt	<i>Triturus sp.</i>	Bradworthy, Holsworthy	2003	WCA 5(S)	Bern III	
99	Common Frog	<i>Rana temporaria</i>	Bradworthy, Holsworthy	2003	WCA 5(S)	EC Va; Bern III	
100	Japanese Knotweed	<i>Fallopia japonica</i>	About two miles outside Sutcombe, near a house on the right hand side called Belmont.	2002	WCA 9		
101	Japanese Knotweed	<i>Fallopia japonica</i>	Bradworthy. Hedge next to	2003	WCA 9		

			Belmont.				
102	Viviparous Lizard	Lacerta vivipara	On minor road, near East Ash Farm, Nr Bradworthy	2002	WCA 5(KIS)	Bern III	
103	Roe Deer	Capreolus capreolus	In scrubland, beside River Torridge upstream of Ashmansworthy Bridge, Woolfardisworthy.	2003	DA	Bern III	
104	Marsh Fritillary	Eurodryas aurinia	West Lodge Bradworthy	1990	WCA 5	EC IIa; Bern II (GB reservation)	UKBAP(P); DBAP; Nb
105	Pearl-bordered Fritillary	Boloria euphrosyne	Bradworthy Common	1996	WCA 5 (S)		UKBAP(P); DBAP; Nb
106	Marsh Fritillary	Eurodryas aurinia	Bradworthy Common	2003	WCA 5	EC IIa; Bern II (GB reservation)	UKBAP(P); DBAP; Nb

- WCA 1** **Wildlife and Countryside Act (1981) Schedule 1:** birds which are protected by special penalties at all times.
- WCA 5** **Wildlife and Countryside Act (1981) Schedule 5:** species protected against killing, injury, disturbance and handling.
- WCA 5 (S)** **Wildlife and Countryside Act (1981) Schedule 5: (sale):** species protected against sale only.
- WCA 5 (KIS)** **Wildlife and Countryside Act (1981) Schedule 5: (killing & injury):** species protected against killing, injury and sale only.
- WCA 6** **Wildlife and Countryside Act (1981) Schedule 6:** animals (other than birds) which may not be killed or taken by certain methods
- WCA 8 (S)** **Wildlife and Countryside Act (1981) Schedule 8: (sale):** plants protected against sale only.
- WCA 9** **Wildlife and Countryside Act (1981) Schedule 9:** animals and plants for which release into the wild is prohibited.
- BA** **Protection of Badgers Act 1992:** badgers may not be deliberately killed, persecuted or trapped except under licence. Badger setts may not be damaged, destroyed or obstructed.
- DA** **Deer Act 1991:** deer protected under the Deer Act.

Bern III	Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) Appendix III: Exploitation of listed animal species to be subject to regulation
Bern II	Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) Appendix II: Special protection for listed animal species and their habitats.
ECIVa, IVb	EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats & Species Directive) Annex IVa: Exploitation of listed animals and plants to be subject to management if necessary.
ECVa, Vb	EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats & Species Directive) Annex Va and Vb: Exploitation of listed animals and plants to be subject to management if necessary.
ECIIa, IIb	EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats & Species Directive) Annex IIa and IIb: Designation of protected areas for animal and plant species listed.
ECIIIa, IIIb	EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats & Species Directive) Annex IIIa and IIIb: Species used as criteria for designating Special Areas of Conservation (SACs).
Bonn II	Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) Appendix II: Range states encouraged to conclude international agreements to benefit species listed.
UKBAP(P)	UK Priority Species (Short and Middle Lists - UK Biodiversity steering Group Report 1995) i.e. species that are globally threatened and rapidly declining in the UK (by more than 50% in the last 25 years). Has a Species Action Plan.
DBAP	Devon Biodiversity Action Plan species: these have been identified as species of key conservation concern in Devon.
NS	Nationally Scarce: 15-100 10km squares in Atlas of British Flora 1962.
Devon Notable Species: Selected species recorded from over 50 2km squares in the Atlas of Devon Flora 1984 (R.B. Ivimey-Cook, Department of Biological Sciences, The University of Exeter).	
DN1	Devon Notable¹: 1-25 2 km squares in Atlas of Devon Flora 1984.
DN2	Devon Notable²: 26-50 2 km squares in Atlas of Devon Flora 1984.
DN3	Devon Notable³: Selected species recorded from over 50 2 km squares in Atlas of Devon Flora 1984.

Decline	Substantial local decline in Devon
Amber List	Bird species of medium conservation concern, such as those whose population is in moderate decline, rare breeders, internationally important and localised species and those of unfavourable conservation status in Europe.
Red List	Bird species of high conservation concern, such as those whose population or range is rapidly declining, recently or historically, and those of global conservation concern.
Nb	Nationally Notable B: recorded from 30-100 10km squares in Great Britain since 1980.

Appendix 2

Species list for Bradworthy parish, recorded during the field survey on 15 September 2004.

Scientific name	Common name
<i>Acer pseudoplatanus</i>	Sycamore
<i>Achillea millefolium</i>	Yarrow
<i>Achillea ptarmica</i>	Sneezewort
<i>Aesculus hippocastanum</i>	Horse-chestnut
<i>Aeshna cyanea</i>	Southern Hawker
<i>Angelica sylvestris</i>	Wild Angelica
<i>Asplenium adiantum-nigrum</i>	Black Spleenwort
<i>Asplenium ruta-muraria</i>	Wall-rue
<i>Asplenium trichomanes</i>	Maidenhair Spleenwort
<i>Athyrium filix-femina</i>	Lady Fern
<i>Bellis perennis</i>	Daisy
<i>Blechnum spicant</i>	Hard Fern
<i>Buteo buteo</i>	Buzzard
<i>Carex pendula</i>	Pendulus Sedge
<i>Centaurea nigra</i>	Common Knapweed
<i>Cerastium fontanum</i>	Common Mouse-ear
<i>Chamerion angustifolium</i>	Rosebay Willowherb
<i>Cirsium palustre</i>	Marsh Thistle
<i>Columba palumbus</i>	Woodpigeon
<i>Cornus sanguinea</i>	Dogwood
<i>Corvus corax</i>	Raven
<i>Corvus frugilegus</i>	Rook
<i>Corvus monedula</i>	Jackdaw
<i>Corylus avellana</i>	Hazel
<i>Crataegus monogyna</i>	Hawthorn
<i>Crepis capillaris</i>	Smooth Hawk's-beard
<i>Cynosurus cristatus</i>	Crested Dog's-tail
<i>Dactylis glomerata</i>	Cock's-foot
<i>Deschampsia caespitosa</i>	Tufted Hair-grass
<i>Digitalis purpurea</i>	Foxglove
<i>Dryopteris dilatata</i>	Broad Buckler-fern
<i>Dryopteris filix-mas</i> agg.	Male Fern
<i>Erica cinerea</i>	Bell Heather
<i>Erithacus rubecula</i>	Robin
<i>Eupatorium cannabinum</i>	Hemp-agrimony
<i>Fagus sylvatica</i>	Beech
<i>Fagus sylvatica 'purpurea'</i>	Copper Beech
<i>Festuca rubra</i> agg.	Red Fescue
<i>Filipendula ulmaria</i>	Meadowsweet
<i>Fragaria vesca</i>	Wild Strawberry
<i>Fraxinus excelsior</i>	Ash
<i>Galeopsis tetrahit</i> agg.	Common Hemp-nettle [agg.]

<i>Galium saxatile</i>	Heath Bedstraw
<i>Geranium robertianum</i>	Herb-robert
<i>Geum urbanum</i>	Herb Bennet
<i>Glechoma hederacea</i>	Ground-ivy
<i>Hedera helix</i>	Ivy
<i>Heracleum sphondylium</i>	Hogweed
<i>Hieracium umbellatum</i>	a hawkweed
<i>Hirundo rustica</i>	Swallow
<i>Holcus lanatus</i>	Yorkshire-fog
<i>Hypochaeris radicata</i>	Cat's-ear
<i>Ilex aquifolium</i>	Holly
<i>Impatiens glandulifera</i>	Indian Balsam
<i>Juncus effusus</i>	Soft Rush
<i>Knautia arvensis</i>	Field Scabious
<i>Lapsana communis</i>	Nipplewort
<i>Lathyrus linifolius</i>	Bitter-vetch
<i>Lathyrus pratensis</i>	Meadow Vetchling
<i>Leucanthemum vulgare</i>	Oxeye Daisy
<i>Ligustrum vulgare</i>	Wild Privet
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil
<i>Lotus pedunculatus</i>	Large Bird's-foot-trefoil
<i>Lythrum salicaria</i>	Purple-loosestrife
<i>Maniola jurta</i>	Meadow Brown
<i>Medicago lupulina</i>	Black Medick
<i>Mentha aquatica</i>	Water Mint
<i>Molinia caerulea</i>	Purple Moor-grass
<i>Odontites vernus</i>	Red Bartsia
<i>Oxalis acetosella</i>	Wood-sorrel
<i>Pararge aegeria</i>	Speckled Wood
<i>Passer domesticus</i>	House Sparrow
<i>Pedicularis sylvatica</i>	Lousewort
<i>Persicaria hydropiper</i>	Water-pepper
<i>Phalaris arundinacea</i>	Reed Canary-grass
<i>Phyllitis scolopendrium</i>	Hart's-tongue
<i>Phylloscopus trochilus</i>	Willow Warbler
<i>Pieris napi</i>	Green-veined White
<i>Plantago lanceolata</i>	Ribwort Plantain
<i>Poa annua</i>	Annual Meadow-grass
<i>Polypodium vulgare</i> agg.	Polypody
<i>Potentilla anserina</i>	Silverweed
<i>Potentilla erecta</i>	Tormentil
<i>Potentilla reptans</i>	Creeping Cinquefoil
<i>Potentilla sterilis</i>	Barren Strawberry
<i>Primula vulgaris</i>	Primrose
<i>Prunella vulgaris</i>	Selfheal
<i>Prunus laurocerasus</i>	Cherry Laurel
<i>Prunus spinosa</i>	Blackthorn
<i>Pteridium aquilinum</i>	Bracken
<i>Quercus robur</i>	Pedunculate Oak
<i>Ranunculus acris</i>	Meadow Buttercup

<i>Ranunculus ficaria</i>	Lesser Celandine
<i>Ranunculus flammula</i>	Lesser Spearwort
<i>Ranunculus repens</i>	Creeping Buttercup
<i>Rubus fruticosus</i> agg.	Bramble
<i>Rumex acetosa</i>	Common Sorrel
<i>Salix cinerea</i>	Grey Willow
<i>Salix</i> sp.	a willow
<i>Sambucus nigra</i>	Elder
<i>Silene dioica</i>	Red Campion
<i>Sorbus aucuparia</i>	Rowan
<i>Stachys officinalis</i>	Betony
<i>Stachys sylvatica</i>	Hedge Woundwort
<i>Succisa pratensis</i>	Devil's-bit Scabious
<i>Sympetrum striolatum</i>	Common Darter
<i>Taraxacum officinale</i> agg.	Dandelion
<i>Taxus baccata</i>	Yew
<i>Tilia cordata</i> x <i>platyphyllos</i>	Lime
<i>Trifolium pratense</i>	Red Clover
<i>Trifolium repens</i>	White Clover
<i>Ulex europaeus</i>	Gorse
<i>Ulex gallii</i>	Western Gorse
<i>Valeriana officinalis</i>	Common Valerian
<i>Veronica arvensis</i>	Wall Speedwell
<i>Veronica chamaedrys</i>	Germander Speedwell
<i>Viburnum opulus</i>	Guelder-rose
<i>Vicia cracca</i>	Tufted Vetch
<i>Vicia tetrasperma</i>	Smooth Tare
<i>Viola riviniana</i>	Common Dog-violet
<i>Viola</i> sp.	a violet