Conservation of Britain's biodiversity: *Rubus dasycoccus* (Rosaceae), Thick-berried Bramble

R. D. RANDALL and T. C. G. RICH

Dept. of Biodiversity and Systematic Biology, National Museum & Gallery, Cardiff CF10 3NP

ABSTRACT

Rubus dasycoccus W. C. R. Watson is a rare British endemic species. Field and herbarium studies indicate at least 14 sites in three 10-km squares in v.cc. 34, 35 and 41, and many populations have fewer than ten plants. It is a perennial which reproduces by seed and appears to colonise new habitats readily. It occurs in a broad range of habitats and soils, but probably grows best in marginal habitats such as woodland edge and unkempt hedgerows on deeper brown earths. The main potential threats appear to be from inappropriate forestry and regular mowing of hedgerows or road verges, but its scattered distribution with broad ecological requirements indicate few significant threats to its long-term survival.

KEYWORDS: Endemic, rare species, England, Wales.

INTRODUCTION

Rubus dasycoccus W. C. R. Watson, Thick-berried Bramble (from the Latin name *dasy* - thick, *coccus* - berry), is a rare British endemic species with a very localised distribution centred on Tintern and Trelleck in v.c. 35 Monmouth, with out-lying colonies at St Briavel's and Bigsweir in v.c. 34 West Gloucester and Rudry, Rhydygwern and Llanfedw in v.c. 41 Glamorgan. Along with a number of other rare brambles, it has been included in the 3rd edition of the *Vascular Plant Red Data Book* (Wigginton 1999), but as yet little is known about its detailed distribution or ecology. In 1998 the information available about it was collated and combined with a field survey to establish its current status and determine its needs for conservation. A summary of the work is given below; full details are given in Randall & Rich (1999).

In many respects *R. dasycoccus* is similar to *R. trelleckensis* Edees & Newton, Trelleck Bramble which grows in the same area (Randall & Rich 2000), but it has broader ecological tolerances, a wider distribution and would appear to be less threatened.

TAXONOMY

Rubus dasycoccus would probably not have received a name if it had not been distributed in the *Set of British Rubi* as supposedly representative of *R. amplificatus* Lees, a more widespread and superficially similar species. It was first collected near Tintern by A. Ley in 1891 and distributed through the Botanical Exchange Club as "*R. montanus* Wirtgen?", where W. O. Focke suggested it might be a "var. of *R. amplificatus* Lees?" (Rogers 1892). Material collected in 1892 was then distributed in 1893 as No. 33 of the *Set of British Rubi*, labelled "*R. macrophyllus* Weihe & Nees var. *amplificatus* Lees". Watson (1931) pointed out the characters which distinguished the Trelleck plant from *R. amplificatus* Lees and described it as *R. lasiocarpus*. Unfortunately this name was already in use and he was forced to allocate it a new name, *R. dasycoccus* (Watson 1933).

R. dasycoccus is a distinct species and fits fairly well into its current position in Series *Sylvatici*, but there are a number of other species in Series *Sylvatici* and Series *Rhamnifolii* which resemble it to some degree. A guide to superficially similar species in South Wales and adjacent counties (v.cc. 34–36, 41–43) is given by Randall & Rich (1999). Distinctive characters of *R. dasycoccus* are the obovate leaflets with long cuspidate, often curved tip, cylindrical panicle, long patent sepals, rather pale pink petals, white filaments, green styles and the densely hairy carpels.

No hybrids of *R. dasycoccus* are currently known, but in shaded habitats the fruits of *R. dasycoccus* are often poorly formed so plants could be easily confused with hybrids.

DISTRIBUTION

Locality and habitat information was abstracted from the literature, and from herbarium sheets at the Natural History Museum (**BM**) and the National Museum of Wales (**NMW**) which between them include much Botanical Exchange Club material and the herbaria of W. M. Rogers, H. J. Riddelsdell and E. S. Edees (cf. Sewell *et al.* 2000). Because *R. dasycoccus* has been confused with *R. amplificatus* Lees, *R. albionis* W. C. R. Watson, *R. questieri* Lef. & P. J. Mull. and probably other species, earlier records cannot be accepted without voucher specimens.

HISTORIC LOCALITIES

V.C. 34, WEST GLOUCESTER

Brockweir, near Tintern (**BM**). Bigsweir, 1894, Herb. W. A. Shoolbred, det. B. A. Miles (Newton 1986; specimen not located at **BM** or in herb. Shoolbred at **NMW**).

V.C. 35, MONMOUTH

Trelleck (**BM**). Beacon Hill, Trelleck (**NMW**). Trelleck to Tintern (**BM**, **NMW**). Trelleck to Tintern (**BM**). Hedgerow between Tintern and Trelleck (**NMW**). Trelleck Hill, near Tintern ("Set No. 33", **BM**, **NMW**). Bottom of Trelleck Hill, Tintern (Shade-grown specimen, "Set No. 33", **BM**). Hedgerow, Catbrook Lane, near Tintern (**NMW**). Hedgerow, lower end of Catbrook Lane, near Tintern (**BM**). Catbrook road, near Tintern (**BM**). Open space in Wye Wood, Mon. (**NMW**). Wooded hill, Barbadoes hill, Tintern (**NMW**). Near Tintern (**BM**, **NMW**).

V.C. 41, GLAMORGAN

Forestry track, Coed Cefn-pwll-du (**NMW**).

FIELD SURVEY 1998

The historic records indicate that *R. dasycoccus* is widely distributed in the Tintern and Trelleck area, and these and other suitable sites were consequently checked during the field survey. The survey was carried out between mid-July and early-September 1998, the best time being mid-July to early-August when plants were flowering.

When estimating population sizes of *Rubus dasycoccus* it was not possible to give exact counts as plants spread vegetatively and were often densely entangled. For linear populations it was assumed that if the plant was found in two consecutive lengths of 2 m that one plant was found in each; in some cases this may result in an underestimate of the population size but it is unlikely that a serious overestimate has been made. Where the plant was found to colonize larger areas, as at Upper Hales Wood, one plant per 2 m × 2 m was assumed; this is also likely to be an underestimate but when a blanket cover occurs it is impossible to be certain where one plant ends and another begins. Populations were estimated using the following log scale where exact counts could not be made: **A** = 1–9 plants, **B** = 10–99 plants, **C** = 100–999 plants and **D** = 1000 or more plants. It should be stressed that all counts are crude estimates and should only be used to indicate the relative sizes of the populations.

V.C. 34, WEST GLOUCESTER

The Nedge, St Briavel's (SO554039), one non-flowering plant was found on the path through woodland (**A**).

V.C. 35, MONMOUTH

Hale Wood; plants occurred in four areas of this wood which is conifer or mixed plantation at different stages of maturity. At Upper Hale Wood (SO512012), a population in excess of 2500 plants was found dominating the ground flora of the *Picea* plantation (**D**). In another section of the Plantation (SO517017) on a gentle slope near "The Oaks", fewer than ten plants were seen scattered along the forestry tracks (**A**). At Bardadoes Hill (SO522007) more than 100 plants were present along track sides (**C**). On the minor road between Yew Tree House, Whitelye (SO513015) and Botany Bay (SO525019) several patches occurred scattered in hedges and along verges and walls (**B**). Botany Bay to Coed Beddick (SO525021 to SO526019), about 30

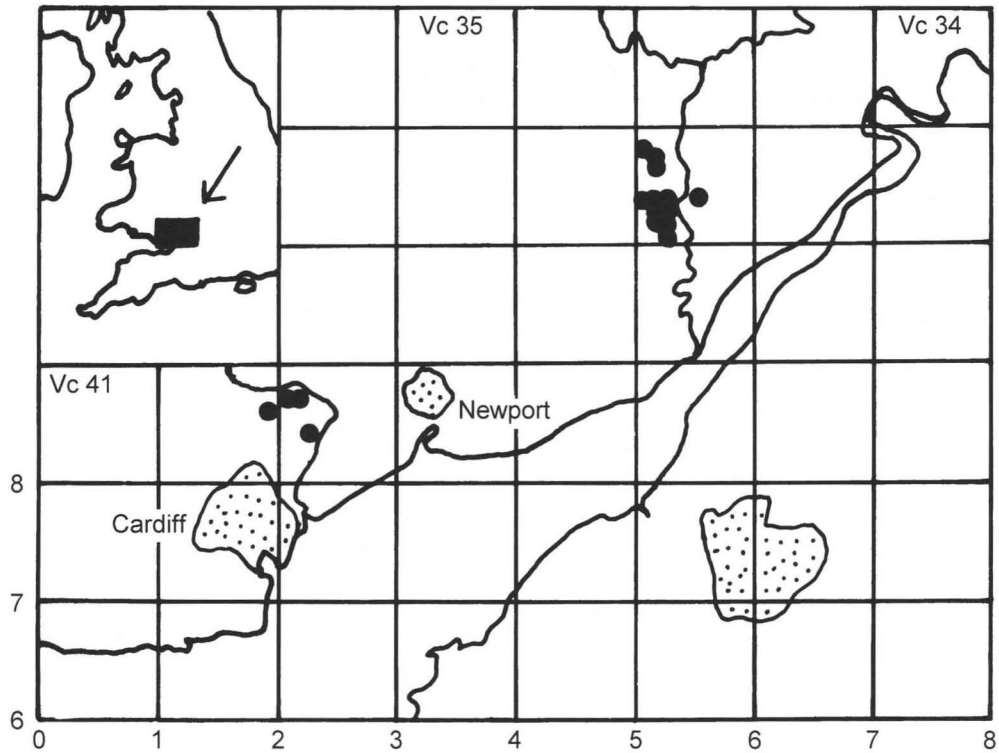

FIGURE 1. Current distribution of *Rubus dasycoccus* (•).

scattered plants were counted along a 300 m section of track through the plantation (**B**). Catbrook Lane (SO518025 to SO519024), scattered along 200 m of the public bridleway through the plantation off Catbrook Lane (**B**). Bargain Wood (SO520033), three clumps were found at the bottom of the slope on level ground in typical heathland community regenerating following tree felling and replanting (**A**). Roadside, Cicelyford to Cleddon (SO504038 to SO513038), scattered colonies were found along the roadside and in an adjacent forestry track (**B**). Parkhurst Rocks (SO501031), one small colony of about five patches was seen by the footpath through the ancient *Quercus petraea* woodland (Park House Wood S.S.S.I.) (**A**). Beacon Hill, Trelleck (SO512054), scattered patches occurred along the tracks and in recently cleared plantations (**B**). Beacon Hill - North Slope (SO513057), abundant on the lower forestry tracks but rare or absent from the upper heathy areas (**B**). Vicar's Allotment, Trelleck (SO512060), thriving populations occurred adjacent to the footpath on the open heathland which until recently has been forestry plantation (**B**). Trelleck Hill near New House (SO504072), one young, non-flowering plant was found along c. 200 m of track through a dense plantation (**A**).

V.C. 41, GLAMORGAN

Llyn Hir/Coed Cefn-pwll-du (ST2086, ST2087, ST2187), up to 100 plants were present along rides and track sides through the plantation (**B**). Morphologically the plants differed from those in the Wye Valley with the leaflets here being mostly quite long and narrow and the stems and petioles generally more hairy, and with variable development of felting under the leaves. Some plants showed the typical broad-based, slightly curved reddish prickles but others had narrower straighter prickles and a darker stem. Cefn Mably Woods (ST225842), a vigorous colony was found along about 100 m of the drive to Cefn Mably Hospital (**A**), exhibiting the same variation as noted for Llyn Hir above. Rudry Common (ST192868), four bushes were found towards the top of the common where the bracken was not dense (**A**).

OTHER LOCATIONS SEARCHED

A number of other locations were searched without success including v.c. 34 Plantation opposite Bearse Farm, St Briavel's (SO573052), Hudnalls, St Briavel's (SO5403) and St Briavel's Common (SO5402), v.c. 35 Church Hill Common, Penallt, (SO5210) and New Wood, Fedw (ST4998 NE, ST5098 NW), and v.c. 41 Michaelston-y-Fedw (ST2484), Pensylvania (ST2585) and Pen-y-lan (ST2584).

Rubus dasycoccus has thus been found in at least 14 sites in three 10-km squares in v.cc. 34, 35 and 41, and it may be more widespread. It was refound in all the historic localities with the exception of the West Gloucester sites whose exact location is not now known (and where it may still be present), and was found in several new localities. Many of the populations are small with fewer than ten plants, but some are also quite large. The current distribution map is given in Fig. 1. It appears that *R. dasycoccus* is a significant, if uncommon, element of the "Archenfield" regional flora (cf. Newton 1980).

ERRONEOUS AND UNCONFIRMED RECORDS

Watson (1931) suggested that Ley had collected *R. dasycoccus* at Aconbury Wood, v.c. 36 Hereford, in 1888 but this has not been confirmed and is not repeated in his subsequent handbook (Watson 1958). Watson (1958) listed *R. dasycoccus* for v.c. 46 Cardigan but the source has not been traced and an error is suspected.

Watson (1958) stated that it was recorded from Vierset-Barse in Belgium under the name *R. dumnoniensis* var. *amplificatus* (Lees) Sudre, presumably in Sudre's account of Belgian brambles (Sudre 1928–1929). There is a record for *R. pyramidalis* Kaltenb. subsp. *amplificatus* Lees in Legrain (1958), where he mentions it recorded for Vierset-Barse. This, no doubt, refers to the same plant, since in this work *R. dumnoniensis* is also relegated to a subspecies of *R. pyramidalis*. An error has been assumed.

ECOLOGY

LIFE CYCLE

Rubus dasycoccus is, like all blackberries, a more or less evergreen perennial with some leaves often remaining until the new year. Panicles arise from buds in the axils of the previous year's leaves as in other species and vegetative branches sometimes grow from the axils of the stronger stems in the first season. The plants are fairly bushy and so it seems likely that individual stems sometimes live longer than the usual two years.

The flowering time is from mid-July to late August (exceptionally into September). Fruits were beginning to ripen at the end of August 1998 while the last flowers were still opening, but on many plants the seed set was rather uneven; whether this was due to environmental or other factors is not known.

Dispersal of seed by birds and mammals probably occurs, the normal mode of dispersal for brambles. Vegetative spread by adventitious roots from the ends of the arching stems was noted but only in a few places did this result in extensive colonies developing, as at Upper Hale Wood where it has become the dominant ground cover. The occurrence of single vegetative plants in new sites suggests it has the potential to colonise further areas where the environment is suitable.

HABITATS, VEGETATION AND SOILS

Rubus dasycoccus was found in a broad range of habitats, including woodland, conifer plantations, woodland rides and tracks, hedges, heathland, roadside banks and verges. An attempt was made to relate the vegetation types of some of the sites to the National Vegetation Classification (Rodwell *et al.*1991 *et seq.*), but its occurrence in recently disturbed plantations, edge habitats and road sides has made this quite difficult (Table 1). The original vegetation types of the sites it now inhabits may have been W16 *Quercus - Betula - Deschampsia* woodland and W10 *Quercus - Pteridium - Rubus* community), and the H8e *Calluna - Ulex gallii* heath.

Marginal habitats like woodland edge and unkempt hedgerows probably had the best-grown plants. The least healthy plants occurred in the dry, exposed areas on the more acidic soils, and plants at Bargain Wood were suffering from Felt disease, which may indicate that conditions were

TABLE 1. PROBABLE NATIONAL VEGETATION CLASSIFICATION TYPES AT SITES OF *RUBUS DASYCOCCUS*

Site	National Vegetation Classification types
Botany Bay	W25 *Rubus* - *Pteridium* scrub in hedge over-topped by *Salix caprea* and *S. cinerea*, woodland ride edges in W14 *Fagus* - *Rubus* woodland, W8 *Fraxinus-Acer-Mercurialis* woodland hedge.
Bargain Wood	H8e *Calluna* - *Ulex gallii* heath, *Vaccinium* sub-community developing in 5-year old cleared and replanted conifer plantation.
Cicelyford to Cleddon, roadside	W23 *Ulex-Rubus* scrub grading into W16 *Quercus* - *Betula* - *Deschampsia* woodland along roadside wall.
Beacon Hill	Open H8e *Calluna* - *Ulex gallii* heath, *Vaccinium* sub-community in recently cleared conifer plantation, and abundant in W16 *Quercus* - *Betula* - *Deschampsia* woodland on disturbed edge of possibly original W10 *Quercus* - *Pteridium* - *Rubus* woodland.
Vicars Allotment	H8e *Calluna* - *Ulex gallii* heath, *Vaccinium* sub-community developing in 5-year old cleared and replanted conifer plantation.
Llyn Hir	W24 *Rubus* - *Holcus* underscrub and W25 *Rubus* - *Pteridium* underscrub.
Cefn Mably Woods	W24 *Rubus* - *Holcus* underscrub.

unfavourable. Plants growing under sunny but more sheltered and moister conditions were generally vigorous but a reasonable amount of shade was tolerated at Upper Hale Wood and Parkhurst Rocks.

It is distributed on a range of soils, tolerating poor, dry heath soils but growing best on deeper brown earths (Table 2). With the exception of Llyn Hir where plants grow on Dolomitic limestone, all colonies grew in situations where the underlying geology involved sandstones.

CONSERVATION REQUIREMENTS

Rubus dasycoccus is certainly a rare plant. It is not protected under Schedule 8 of the Wildlife and Countryside Act 1981, but is listed in the *Vascular Plant Red Data Book* (Wigginton 1999) which should draw attention to its rarity, and this should be sufficient to ensure its survival. It occurs on two S.S.S.I.s (at Parkhurst Rocks and Cleddon Bog), though populations at both sites are small. If S.S.S.I.s need to be designated for this species, the largest site at Hale Wood and the type locality at Trelleck Hill are the best candidates.

Given its widely scattered distribution with broad ecological requirements in a range of habitats, there appear to be relatively few significant immediate threats to its survival overall. The main potential threats to individual colonies appear to be change of land-use from forestry to farmland or recreation, weed killing during forestry operations, long periods of deep shade (e.g. colonisation

TABLE 2. SOILS COLLECTED FROM THE *RUBUS DASYCOCCUS* ROOTING ZONES

Site	Soils
Upper Hale Wood, Whitelye	Plantation: a gritty brown organic soil, pH 3·1. Recently disturbed ground: a gritty dark-brown soil some organic matter and pebbles, pH 7·5.
Botany Bay	A fine, light-brown sandy soil, pH 7·0.
Bargain Wood	A fine grey-brown heathy soil with lots of organic matter, pH 4·0.
Beacon Hill	Top: A fine brown heathy soil with organic matter, pH 5·0. North side: A gritty light brown soil, pH 5·0. Track edge: A red-brown, gritty stony soil, pH 7·9.
Vicars Allotment	A blackish organic soil with large quartz sand grains, pH 3·4.
Llyn Hir	A reddish brown earth with many limestone fragments on track side, pHs 7·5 and 7·7.
Cefn Mably Woods	A red brown earth, pH 6·8.

pH was measured in a 50:50 deionised water: soil slurry.

by Rhododendron, lack of clearance of conifers), and introduction of regular close cropping of paths, hedgerows and roadside scrub, or destruction of hedgerows due to road-widening or other schemes.

The most favourable forestry management would be a regime similar to that at Beacon Hill, where trees have been cropped in rotation with adjacent areas being felled several years apart allowing colonisation into recently felled areas. For woodland that is being maintained as an amenity or a nature reserve, natural regeneration after cropping followed by selective thinning to produce small clearings and glades would be beneficial. For hedgerows and other marginal situations annual trimming should be avoided as it is detrimental as two or three years are required for stems to reach the flowering and fruiting stage. Where populations are significant, footpaths could be cleared on alternate sides in alternate years, or perhaps on both sides once every 3–4 years.

A small number of fruits from four plants at Beacon Hill (2 populations) and Whitelye have been deposited in the Millennium Seed Bank at the Royal Botanic Gardens, Wakehurst Place for long-term storage; larger samples from a wider range of plants would be worthwhile collecting. No plants are known to be held in cultivation.

ACKNOWLEDGMENTS

This work was jointly funded by Countryside Council for Wales and National Museum & Gallery, Cardiff as part of a joint project into conservation and ecology of critical species. The Royal Botanic Gardens, Kew, contributed towards collecting blackberries for the Millennium Seed Bank.

We would like to thank Andy Jones and Lindi Rich of CCW for their help, and Alan Orange and Jessica Carey for help with field work. We would like to thank the Keeper of **BM** for access to the herbarium.

REFERENCES

EDEES, E. S. & NEWTON, A. (1988). *Brambles of the British Isles*. Ray Society, London.

LEGRAIN, J. (1958). *Rubus* L., in ROBYNS, W., ed. *Flore Générale de Belgique* **3**: 69. Bruxelles.

NEWTON, A. (1980). Progress in British *Rubus* studies. *Watsonia* **13**: 35–40.

NEWTON, A. (1986). *Rubus* L., in HOLLAND, S. C. ed. *Supplement to the Flora of Gloucestershire*. Grenfell Publications, Bristol.

RANDALL, R. D. & RICH, T. C. G. (1999). *Distribution and conservation of* Rubus dasycoccus, *Thick-berried Bramble*. Countryside Council for Wales and National Museum of Wales, Cardiff.

RANDALL, R. D. & RICH, T. C. G. (2000). Conservation of Britain's biodiversity: *Rubus trelleckensis* (Rosaceae), Trelleck Bramble. *Watsonia* **23**: 317–322.

ROGERS, W. M. (1892). *R. montanus* Wirtg.? *Rep. Botl. Exch. Club Br. Isles* **1**: 329.

ROGERS, W. M. (1900). *Handbook of British Rubi*. London.

SEWELL, R. M., EVANS, M., RANDALL, R. D. & RICH, T. C. G. (2000). *Catalogue of* Rubus *specimens in the Welsh National Herbarium (NMW), National Museum & Gallery, Cardiff.* National Museums & Galleries of Wales, Cardiff.

WATSON, W. C. R. (1931). Bramble Notes, 1930. *Rep. Botl. Exch. Club Br. Isles* **9**: 434–435.

WATSON, W. C. R. (1933). *R. dasycoccus* nom. nov. *Rep. Botl. Exch. Club Br. Isles* **10**: 21.

WATSON, W. C. R. (1958). *Handbook of the Rubi of Great Britain and Ireland*. Cambridge University Press, Cambridge.

WIGGINTON, M. J. (1999). *British Red Data Books: Vascular Plants*, ed. 3. J.N.C.C., Peterborough.

(Accepted June 2000)