

BAWDRIP PARISH COUNCIL

BAWDRIP RAILWAY EMBANKMENT



SURVEY AND MANAGEMENT PLAN

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Farm & Countryside Liaison Services

November 2020

PREFACE

Bawdrip Parish Council owns the area of land which once formed part of the historic railway embankment here and which forms such a key landmark within the village. The council is keen to manage it both for its historic interest and as a nature reserve.

This document describes the location, setting, history and ecological interest and potential of the site, and offers some suggestions for how it might continue to be maintained for the benefit of its wildlife and its appreciation and enjoyment by local people.

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INTRODUCTION

1.1. Context

This project centres on an area of land owned by Bawdrip Parish Council, which once accommodated the railway line from Bridgwater to Edington Junction and Glastonbury. The line closed to traffic in 1954, but the substantial embankment which carried the line, along with the fine road bridge, remain in place. Woodland has developed in the interim over much of the embankment, while other parts have become overgrown with brambles and scrub. The area as a whole has been managed as a nature reserve, and advice has been sought on how best to continue with this arrangement.

This document describes the outcome of a recent ecological survey, and offers some suggestions as to how the property might be managed to uphold the wildlife habitats and their flora and fauna, both in their own interest, and to be enjoyed and appreciated by local people.

1.2. Setting

The embankment land is centred on National Grid Reference ST 3403 3968 (OS, 2008).¹ It extends to some 0.515ha (1.27 acres),² running WSW-wards from the handsome and well preserved road bridge, and encompassing that part of the embankment lying between Little Wall Lane (a track) to the north, and the new housing development of Shaw's Orchard to the south. Plan A shows the setting of the target land and its boundaries as stipulated on mapping kindly provided by the Parish Council.

1.3. History

The site is intimately associated with railway history, of course, with the line originally having been opened, as the Bridgwater Railway, in 1890, under an arrangement between the London & South-Western and the Somerset & Dorset Joint Railways (LSWR and SDJR), the latter later absorbed into the Great Western Railway (GWR), this in turn becoming part of the western region of British Rail. The Bawdrip section linked Bridgwater with the Highbridge to Glastonbury line at Edington Junction (actually nearer to Burtle), but was closed in 1954, and the track taken up the following year. There is a book about this (Bown, 2018), and good coverage on the Parish Council and other local web sites.

1.4. Physical features

The site lies at a point where the land is just rising from the low-lying Somerset Levels east of Bridgwater towards the westernmost tip of the Polden Hills, so strictly just falls within the Mid-Somerset Hills National Character Area (CA, 1999). Altitude is between 5 and 10m (16-33ft) above Ordnance Datum. Geologically the area is underlain by a much-faulted complex of deposits marking the transition from the Triassic Mercia Mudstone and Penarth Groups to the Blue Lias of the Jurassic (BGS, 1984).

¹For details of references cited here in the text, see Appendix IV.

²As determined from 1:2500 OS cover: the actual area will be slightly greater due to the steep gradients.

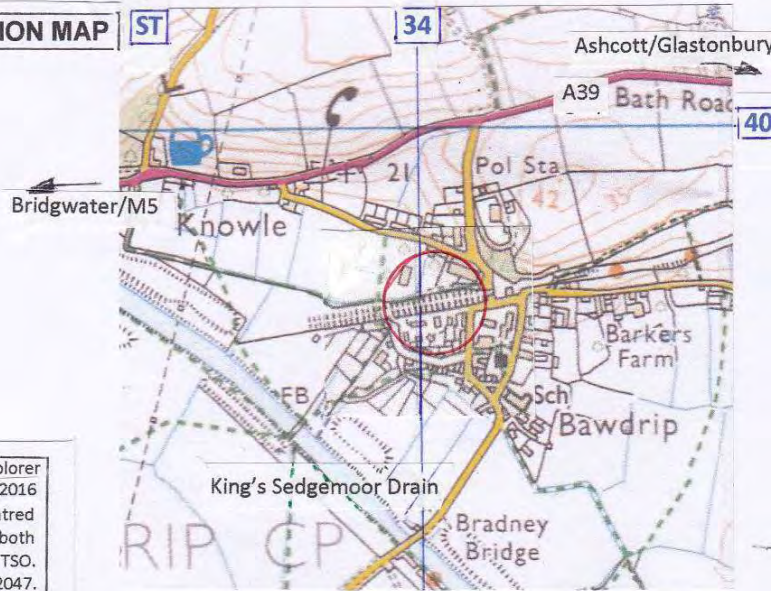
PLAN A

BAWD RIP RAILWAY EMBANKMENT LOCATION MAP AND EXTENT OF PROPERTY

GRID NORTH



LOCATION MAP

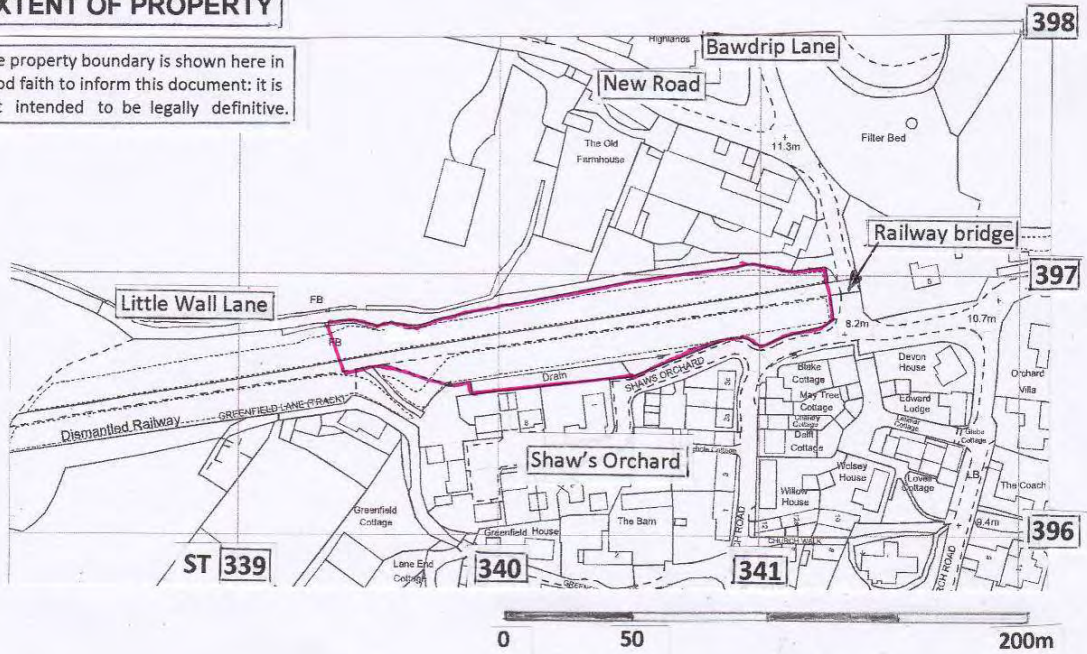


Inset map from Ordnance Survey 1: 25 000 Explorer Series, Sheet 140, Quantock Hills & Bridgwater (2016 Edition), and main plan from OS 1: 2500 site-centred MasterMap cover (2020), Ref. HMC-00876769, both with the sanction of the Controller of TSO. Crown copyright. Licence No. AL100012047.

0 0.5km

EXTENT OF PROPERTY

The property boundary is shown here in good faith to inform this document: it is not intended to be legally definitive.



The Soil Survey of England & Wales maps the predominant soil here as the Worcester series (SSEW, 1983), though this was to the relatively small scale of 1: 250 000, and in any case the construction of the substantial embankment would have involved much in the way of made ground. Nevertheless, it seems safe to say that the site is likely to be characterised by relatively free-draining and possibly somewhat calcareous substrata.

The climate at Bawdrip reflects that of Somerset generally, with a long-term historic annual rainfall average of 865mm (34in) and a typical summer soil moisture deficit of 66mm (2.6in) (Smith, 1976). However, predictions of future hotter, drier summers and stormier winters are now widely accepted, with greater concentrations of rainfall likely at any one time (Hopkins, 2007), with the latter two items at least showing signs of coming true already.

As for microclimate, the embankment has contrasting steeply north- and south-facing aspects, which will differ markedly in the amount and strength of insolation they receive, and with a tendency to accumulate cold air along their lower edges during anticyclonic conditions, especially in autumn, winter and spring, and so be liable to frost.

1.5. Habitats

Plainly the most conspicuous feature of the former railway land is the mature broadleaved deciduous woodland which now dominates the site. There are, however, other habitats, notably the area of more shrubby vegetation and brambles below the woodland edge on the southern aspect, which includes some orchard plantings, while at the foot of the bank here is a strip of grassland with an intermittent ditch contained by a series of brick culverts. A small water course also runs along the bottom of the westernmost part of the northern aspect of the embankment. There is also a more open area towards the SW corner of the property, which extends beyond the (notional) embankment land boundary, where it is contained by a new hedge.³ At the eastern end, a post-and-rail fence marks the property boundary at the bridge.

These contrasting habitats, along with their flora and fauna, are described in more detail in Section 2. How they might be managed is considered in Section 3.

1.6. Access

A statutory public footpath crosses the extreme western end of the embankment (see Plan A), negotiating the steep gradients on both aspects by means of flights of concrete steps. This path links, via a footbridge over the abovementioned water course, with the green track known as Little Wall Lane which skirts the northern side of the embankment, and which is a public bridleway.

The greater part of the embankment land is overgrown and inaccessible, but access to its lower grassy part on the south side is gained via the open space or service road of the Shaw's Orchard development and either of the field gates provided.

³This part is nonetheless included in the descriptions and proposals which follow.

1.7. Adjoining land

An area of open space adjoining the lower SW part of the embankment land was provided as a facility for residents of Shaw's Orchard when this development was built, though as noted above, the boundary between this and the embankment land is entirely notional on the ground. The wooded former course of the railway continues WSW-wards, with a more open stretch at the opposite eastern end atop the bridge and thence continuing eastwards.

Derelict farm buildings and yards occupy most of the land to the north of Little Wall Lane. This area is destined for further residential building development.

The wider setting includes Bawdrip village itself, with farmland beyond – towards the King's Sedgemoor Drain and the Levels to the south, and the higher land of the Poldens proper to the north, beyond the A39.

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WILDLIFE

2.1. Ecology and biodiversity

As noted in Section 1.5, while the embankment land as a whole is very much dominated by woodland, it contains examples of additional habitats, namely scrub, grassland, wetland, areas of open ground, a newly planted orchard and other trees, and a new hedge. These habitats, of which the approximate distribution is shown on Plan B, are now described in turn, along with their flora and fauna. Appendix I provides a series of illustrations. Common names of plants as well as animal life encountered during the main survey are used in the text and captions for ease of reading: scientific names are supplied in Appendix II, which also serves as an overall check list.

2.2. Woodland

Broadleaved woodland, which has established or expanded since the closure of the railway, occupies the topmost ridge of the embankment and extends down both sides, though most completely on the northern aspect. Ash predominates in the main canopy, along with sycamore – the latter more abundant at the eastern end. Wych elm is also present throughout, though much of it succumbing regularly to Dutch elm disease.⁴ Old hawthorns and the odd yew also occur in the main stand. A horse chestnut has established on the north bank near the bridge, while oak, sallow, hornbeam and a somewhat overshadowed walnut occur at the foot of the south bank. Towards the western end of the north bank is an area of younger regenerating woodland, as though this corner might have been affected by wind-blow at some stage in the recent past.

Both ash and sycamore again are regenerating in the understorey of the main woodland area, which also contains younger hawthorn, along with blackthorn, dogwood, elder, honeysuckle, wild privet, sallow, brambles and field rose. Ivy occurs both climbing up tree trunks and as extensive – even exclusive – ground cover. Otherwise, the field layer contains mainly cow parsley, hogweed, garlic mustard, lords-and-ladies, stinging nettle, cleavers, nipplewort, hedge bedstraw, wood avens, wood dock, herb Robert and wood false-brome grass. This woodland resembles the W8 community of the National Vegetation Classification (NVC) (Rodwell, 1991).

2.3. Orchard plantings

Bawdrip has a long history of orchards, stretching back at least to 1550, and reflected in the naming of the new estate. So it is good to see the continuing upkeep of orchard trees along and at the foot of the railway bank, including a number of apple trees of traditional Somerset varieties. These are of particular historic interest here, though also a valuable wildlife asset, for their incomparable blossom in spring and the bees and other insects these attract, and their autumn surplus of fruit which the wasps, late butterflies and blackbirds help recycle .








⁴There weren't any obvious signs of ash die-back in the main canopy, but it is almost bound to be there – or to arrive sooner or later: more on this anon.

PLAN B

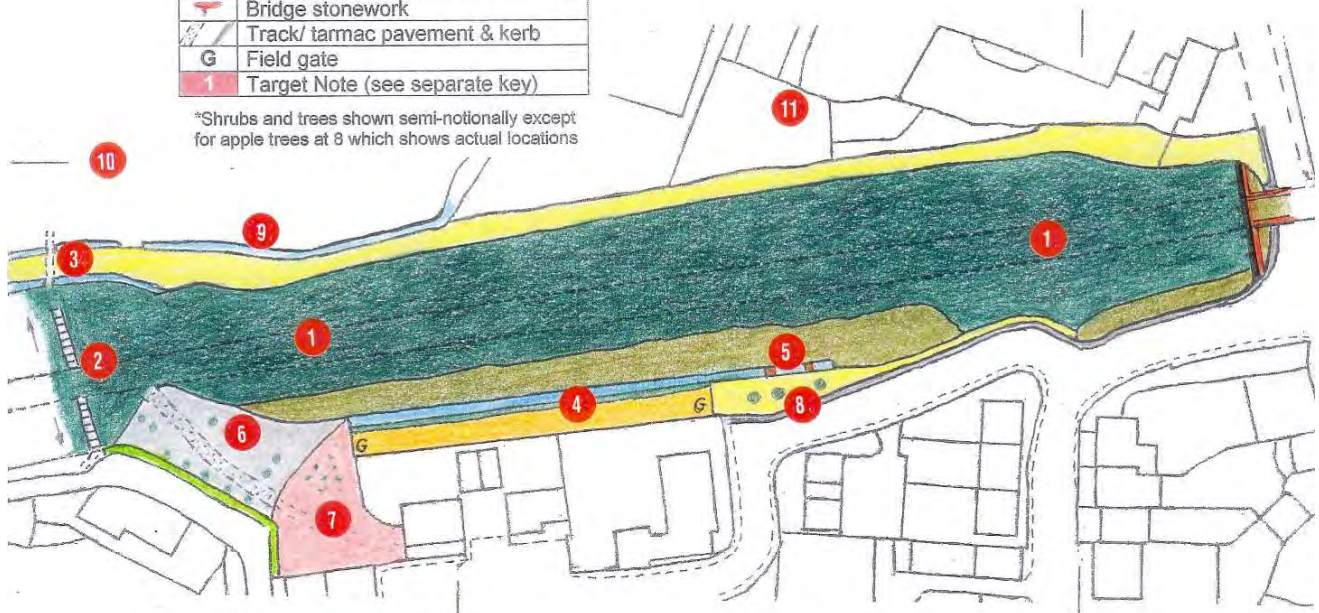
BAWD RIP RAILWAY EMBANKMENT WILDLIFE HABITATS AND OTHER DETAILS

A FIRST APPROXIMATION

KEY TO HABITATS ETC

	Broadleaved woodland
	Brambles and scrub
	Made ground with hemlock etc.
	Short grassland
	Taller grassland (hay regime)
	Wildflower meadow
	Apple/other planted trees/shrubs*
	Hedge/ ditch
	Steps (arrows show down)
	Post & rail fence (adj. bridge)
	Brick culverts (approx location only)
	Bridge stonework
	Track/ tarmac pavement & kerb
	Field gate
	Target Note (see separate key)

*Shrubs and trees shown semi-notionally except for apple trees at 8 which shows actual locations



SOME ADJOINING HABITATS ALSO SHOWN

KEY TO TARGET NOTES

Code	Feature
1	Course of original track bed
2	Steps for public footpath
3	Footbridges for public footpath
4	Young willows alongside ditch
5	Approx locations of brick culverts
6	Apparent dell: location of spring?
7	Shaw's Orchard amenity area.
8	The three roadside apple trees
9	Lt Wall Lane Rhyne wildlife site
10	Arable land (barley in 2020)
11	Derelict farmyard area.*

*Destined for development

0 10 50m

Base map from OS 1:2500 site-centred MasterMap cover (2020). Ref. HMC-90876769, with the sanction of the Controller of The Stationery Office. Crown copyright. Licence No. AL100012047.

2.4. Scrub

Scrub is represented on the embankment land by the very substantial spread of brambles, accompanied by prolific amounts of greater bindweed, which adorns most of the mid- to lower parts of the southern slope. It is, of course, quite inaccessible, but there appear also to be varying amounts of hawthorn, blackthorn, honeysuckle and willow and/or goat willow, with saplings of ash and sycamore again. The brambles have flowered profusely in 2020, resulting in an enormous crop of blackberries!

2.5. Grassland

The main areas of grassland on Parish Council land occur along the verge of the access road to Shaw's Orchard where it skirts the foot of the south side of the embankment, and in the strip enclosed by the two field gates. The verge is closely mown in places but intervening patches have been allowed to grow taller, and this latter situation applies also to the coarser pasture between the gates.

Grasses making up these swards include annual and rough-stalked meadow-grasses, perennial ryegrass, cocksfoot, red and tall fescues, Yorkshire fog, couch, tufted hair-grass and tall oat-grass – some flower heads of this last species affected by the smut fungus *Ustilago arrhenatheri*, which is very common. Among the wildflower element, yarrow is especially abundant, and in the gated section so are both ragwort and stone parsley. Others noted in varying amounts include common and ox-eye daisies, creeping and meadow buttercups, lesser knapweed, field bindweed, dandelion, smooth hawkbeard, tansy, cut-leaved cranesbill, white deadnettle, black and spotted medics, white and red clovers, ribwort plantain, self heal and common fleabane. A patch of the distinctive *Primula x pruhonisensis* cv "Wanda" is a familiar garden escape.

(The grassy area with planted *Escallonia* and other shrubs, which strictly forms part of the Shaw's Orchard amenity land, merges imperceptibly with the railway land, but presents a delightful and complementary feature, with its profusion of meadow grasses and flowers, which are presumably the result of a deliberate sowing.)

2.6. Wetlands

The stretch of ditch, with its brick culverts, running along the bottom of the south side of the embankment, is almost hidden, and the most obvious features marking its course are the row of young willow, goat willow and osier trees, accompanied by a herbaceous border of tall-growing greater hairy willow-herb. A patch of water betony was also noted at one point.

On the opposite side of the embankment, another ditch comes across from the farmland to the north of Little Wall Lane, which it apparently crosses by an unseen culvert, to run alongside the embankment for the last twenty or so metres, accounting for the need for the aforementioned footbridge on the boundary of the Parish Council land. A colony of field horsetail was noted here along the ditch bank, recognisable as such from the whorls of lateral branches up the main stems, but slightly unusual in having these branches divide.

2.7. Open ground

This seems the best description for the area at the SW corner of the property, adjoining the Shaw's Orchard meadow, which harbours quite a different flora, dominated by tall annuals and biennials typical of disturbed ground, and known as *ruderals*. Aerial photos of the plot at the time Shaw's Orchard was being built show how an area of spoil from the original farmyard was pushed up the slope at this location, and this may account for the specific soil conditions here.

Most obvious from its sheer size is hemlock, whose tall and bulky foliage and purple-spotted flowering shoots, which can persist long after they have seeded and died, dominate most of this area – even where some of the orchard trees have been planted. While the frothy white flowers are quite attractive to summer insects, this is not a plant to encourage, for it is among the most poisonous of all our herbaceous plants, and famously was the means by which Socrates put paid to himself. It continues to seed prolifically, and a distinct unpleasant smell pervaded this area in the muggy conditions at the time of the main survey. Hemlock here is bad news, and is all the more so for the fact that this area is accessible to walkers. It is discussed again later under the heading of continuing management.

Other herbaceous species here include some of the more decorative dandelion look-alikes such as smooth hawkbeard, bristly ox-tongue and nipplewort, which are also classic ruderal species, and highly attractive to insects seeking pollen or nectar. Teasel is another bee-friendly plant noted in flower here. White campion is also abundant, having spread prolifically from the Shaw's Orchard meadow patch, while filling in the gaps is hedge mustard, distinctive after flowering for its long and narrow seed pods, closely appressed to the main stems.

2.8. The hedge

The hedge planted to form the SW boundary of the area (just outside the formal railway embankment boundary) after completion of Shaw's Orchard takes in some of the "hemlock ground", but is thriving. The main species are hawthorn, blackthorn and dogwood.

2.9. Fauna

Among the mammals, the most abundant, alas, appears to be the introduced grey squirrel, whose distinctive signature of stripped bark was readily visible along the northern fringes of the wooded embankment. The hazel dormouse – now a European Protected Species – is said to be present, and if this is so it may find the flowers of the sycamore and all those blackberries to its liking, though no hazel was recorded: this species provide the nuts which are a key winter food source for dormice. Unfortunately the peak bird breeding season coincided with the coronavirus lockdown period in 2020, and so was missed by the author. By mid July, wood pigeon accounted for the main bird activity within the tall woodland canopy, though holes in some trunks suggest woodpeckers – probably great spotted – use the wood. Tawny owls are to be heard regularly, and nest boxes have been provided for them (D. Rayner, *pers. comm.*). The scrubby southern slopes are clearly bird heaven for cover and food – blackbird, blue tit, house sparrow and blackcap were all seen here, with the first three making great use of the dead wych elm branches as perches.

Butterflies seen included peacock, red admiral, comma, small and green-veined whites, ringlet, hedge brown (gatekeeper), speckled wood and holly blue. (Orange-tips no doubt came and went during lock-down, as they did everywhere in the spring of 2020, which was an exceptional season for them: two of their key larval foodplants are present on site, namely garlic mustard and hedge mustard.) Caterpillars of the cinnabar moth were found feeding on ragwort – their primary larval food plant.

Bees were well represented and numerous, and included buff- and red-tailed bumble bees as well as honey bees. Damselflies and hoverflies were observed amongst the grassy vegetation.

Examples of these and other groups are illustrated in the photographs in Appendix I and listed in Appendix II.

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ONGOING MANAGEMENT

3.1. Objectives

The main objectives of management are:

- to maintain the railway embankment land in a condition which upholds, and ideally increases, its visual qualities and ecological interest, and
- to manage the areas currently accessible to the public so as to provide the opportunity for local people and visitors to the area to enjoy and appreciate these attributes.

Here, on the strength of the foregoing review, and knowing the Parish Council's basic plans for the site, some suggestions are put forward with a view to meeting the above objectives, in the form of a series of management projects of varying scale and ambition. Prioritisation and timing are considered later.

3.2. Compartmentalisation

To facilitate the identification of the various parts of the embankment land to be targeted, a series of management compartments is proposed, as indicated on Plan C. These are:

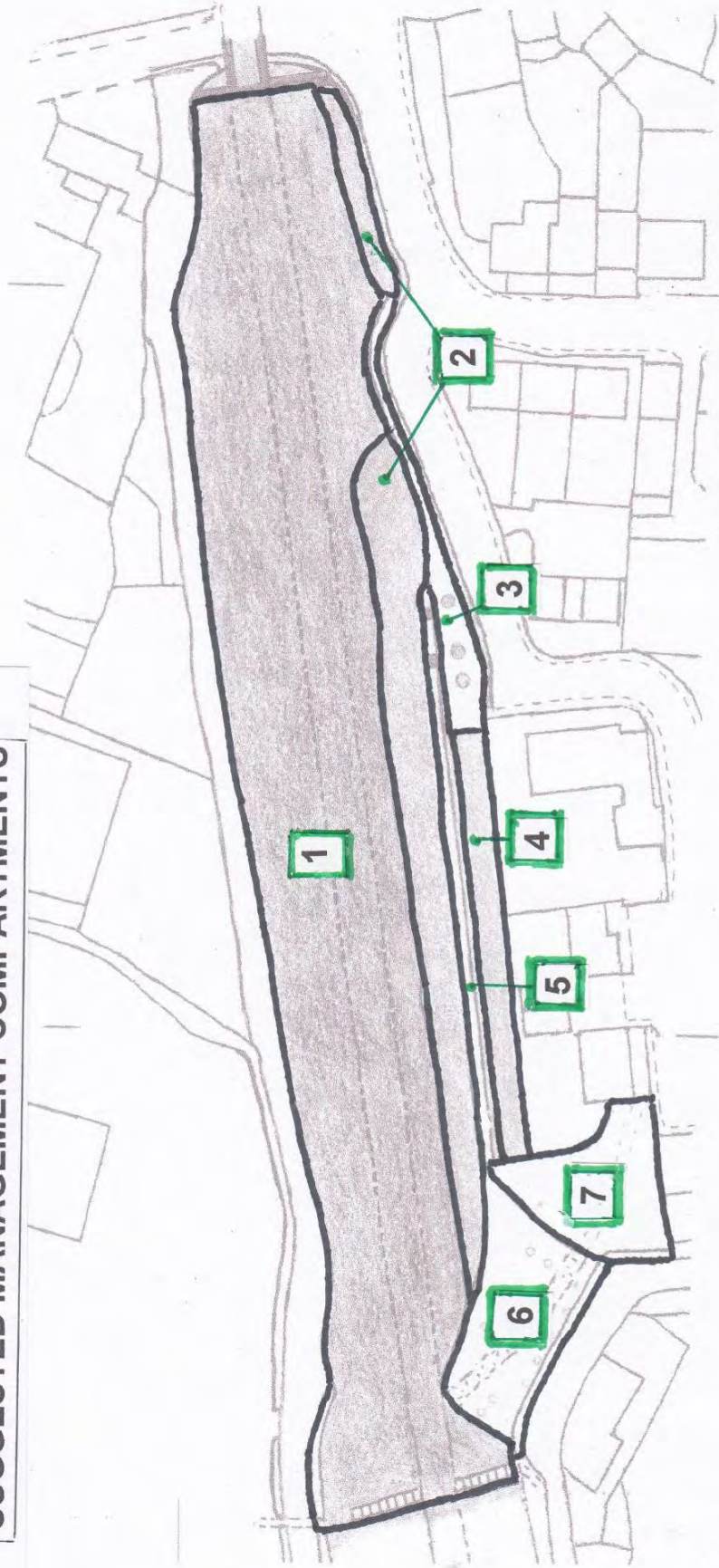
- the main area of mature woodland occupying the course of the former railway line along the top of the embankment, as well as the slopes to either side – more so on the north side than the south (Cpt 1);
- the area of dense brambles and scrub taking up the greater part of the southern slope (Cpt 2);
- the roadside verge along the foot of the eastern part of the embankment (Cpt 3);
- the grassy strip between the two field gates (Cpt 4);
- the ditch running the length of the two previous compartments (Cpt 5); and
- the orchard area (Cpt 6 – outside the formal railway land boundary).

The open space forming part of the amenity area of the new Shaw's Orchard properties is given the compartment number 7. It does not strictly form part of the BPC land, although reference is made in passing to its management. The same applies to the bridleway along the north side of the property (Little Wall Lane).

3.3. Topics to be considered

The proposals are presented here in turn under three main headings, namely (1) aesthetics and amenity, (2) ecology and wildlife conservation, and (3) access and informal recreation. The relevant management projects corresponding to these headings are identified by numbers prefixed A, E and R, respectively: they are outlined below, and summarised in Tables 1- 3 and on Plans D, E and F.

PLAN C
BAWD RIP RAILWAY EMBANKMENT
SUGGESTED MANAGEMENT COMPARTMENTS



Base map from OS 1: 2500 site-centred MasterMap cover (2020), Ref. HMC-00876769, with the sanction of the Controller of The Stationery Office. Crown copyright. Licence No. AL100012047.

NOTE THAT CPTS 6 & 7 MAY NOT STRICTLY FORM PART OF THE RAILWAY EMBANKMENT LAND

3.4. Aesthetics and amenity

The embankment land contributes significantly to the attractiveness of the local landscape and an important part of this is its “naturalness”. In fact, managing for nature conservation will largely take care automatically of this aspect. In no way would it be appropriate to over-manicure the property as might be the case for a more formal park or recreation ground.

However, there are two areas where attention might be directed specifically towards enhancing the appearance of the property, and these are at its opposite ends. At the eastern end of Cpt 2, near the bridge, there is a considerable amount of dead elm. And while dead wood is an important habitat in itself, as noted later, too much in one place can look a bit depressing, and may even be hazardous. **Project A1** addresses this issue.

The same goes for the area around the orchard in Cpt 6, where hemlock predominates. Although the flowers of this species are quite attractive and visited by various insects, once the plants go over, with their dead stems leaning at various angles, the prospect is dismal. The plants are poisonous, moreover, and so undesirable in that regard, too. This is covered by **Project A2**.

There is a further attribute which might be addressed under this heading of aesthetics and amenity – *viz.* the orchards.

The orchards, of course, are essentially there (in Cpts 3 & 6) for the fruit they yield, but their very presence, with their spring blossom and the apples which appear later, at least in a good year, are so much a part of the Somerset landscape as to warrant inclusion in this section. This would be **Project A3**.

It is worth stressing that all the initiatives referred to above overlap with both ecological and recreational proposals, so that some projects considered later will also bear on these visual aspects.

Table 1: Projects addressing aesthetics and amenity

Proj	Topic	Cpt	Comments
A1	Remove excess standing dead elm wood.	2	See also Project E1.
A2	Reduce or eliminate hemlock.	6	See also Project E7.
A3	Protect and conserve the orchards.	3,6	

3.5. Ecology and wildlife conservation

3.5.1. Opportunities

Opportunities for upholding – and enhancing – the value of the railway embankment for wildlife are best considered habitat by habitat, which is the main basis for the compartmentalisation of the property. The key headings therefore will be woodland, brambles and scrub, grassland and wetland, although managing the orchard and controlling the hemlock are best considered under one heading as they both occupy Cpt 6. Proposals for conserving specific examples of the fauna have a section to themselves, as does how the adjoining Shaw's Orchard plot might be managed so that it and the railway land complement one another.

3.5.2. Woodland

Some ideas on possible low-key management of the main woodland area which would not contravene its TPO status were floated during an earlier (pre-coronavirus) site meeting, but it has become clear from feedback following the submission of my earlier draft plan that there is absolutely no wish to carry out woodland work of any kind, and that the policy here will be truly one of non-intervention. However, to emphasise this decision, it is included here as **Project E1**.

Issues of safety (relating to dead or dying trees), and of deliberately promoting certain woodland fauna, are picked up later, however.

3.5.3. Brambles and scrub

Both brambles and scrub (which overlap to some degree) can have great value for wildlife, especially birds, and some should be retained, taking the opportunity to enhance the species diversity of the shrub element as indicated in Appendix III. This would be **Project E2**. However, the sheer extent of brambles in Cpt 2 warrants concerted action to reduce their dominance, and this should be combined with grassland restoration as indicated below.

3.5.4. Grassland

Here we consider both the conservation of the (very limited) areas of existing grassland (in Cpts 3 and 4), and opportunities as observed above for restoring grassland to those parts of Cpt 2 which can be effectively cleared of brambles.

The road-verge sward (Cpt 3) and the grassy strip between the field gates (Cpt 4) should both continue to be maintained as they have been up till now, the former kept short by regular strimming, and the latter cut less frequently, simulating a hay regime and encouraging the taller and more diverse grassland community which thrives there. The ragwort in this latter compartment was seen to be supporting a good population of cinnabar moth caterpillars so a small amount of this plant might be retained annually for this benefit, though not to be allowed to seed on to adjoining properties. Managing these contrasting strips of grassland should constitute **Projects E3 and E4**, respectively.

Clearing brambles from Cpt 2 would allow the restoration of grassland which must surely have predominated along this bank in times gone by. However, this will demand much the greatest input of any of the suggestions being made in this plan, justifying specialist machinery and contractors with the skills to operate them, especially on the steep gradient, but the effect could be stunning, particularly if a suitably diverse and colourful mix of native grasses and wildflowers were to be sown after clearing. Patches of scrub would be retained (see Project E2) to maximise habitat diversity, but the grassland restoration part would take precedence. This would be **Project E5**, and could be started by opening up a swathe alongside the stream in conjunction with Project E6, below. More information on the re-creation of species-rich grasslands is contained in Appendix III.

3.5.5. Wetlands

The ditch running along the foot of the southern side of the embankment (Cpt 5) contains some limited wetland interest but this feature could be made more of by improving the flow and encouraging or planting in a greater range of plants associated with damp habitats, such as yellow flag iris, purple loosestrife, greater bird's-foot trefoil, ragged robin, meadowsweet etc. Conditions might even be improved for the likes of the commoner dragonflies and damselflies, and amphibians too. These options should be explored through **Project E6**.

3.5.6. Hemlock

It really would be worth endeavouring to eliminate the hemlock in Cpt 6, either by spraying or manual removal, taking due precautions either way when it comes to handling and disposing of this highly poisonous plant. This would constitute **Project E7**. There appears to be a huge seedbank so that there is bound to be considerable regeneration to start with, necessitating repeat treatments, but the seeds don't live for more than 3-5 years, and once clear, the ground there could be grassed down, perhaps with a similar mix to that used in Project E5. Doing this would also have the effect of enhancing the visual appeal of the orchard, which occupies the same area, as referred to under Project A3.

3.5.7. Promoting individual species

Mention has been made of the owl box, but there are two further possible targets under this heading, and others may be found worth pursuing. This would be **Project E8**. Firstly the holly blue butterfly. One was seen on the wing during the survey of July 2020, so this attractive species may already breed on site, or at least nearby. Ensuring that both holly and ivy – this butterfly's alternate larval food plants – are present would help to continue to attract it to the embankment land.

It seems that hazel dormice could be here, and even if not, steps could be taken to encourage them. Sycamore flowers (of which there will always be plenty here) are a favourite part of its summer diet. Hazel – ultimately to provide nuts – could be included in the shrub plantings, and boxes provided for overwintering. Comprehensive coverage of the ecology of this iconic little mammal can be found in the Dormouse Conservation Handbook (Bright *et al*, 2006), accessible via the People's Trust for Endangered Species web site, <https://www.ptes.org>.⁵

⁵Note that, if indeed dormice do prove to be present, anyone likely to handle the animals is required to obtain a licence from Natural England.

3.5.8. The Shaw's Orchard amenity area

This area encompasses a very diverse grassland sward as a result of its having been sown with a mix of native grasses and wildflowers at the time the Shaw's Orchard development was built. (A selection of shrubs was planted at the same time around the Wessex Water facility which is also located there.) The grassland makes excellent complementary habitat, adjoining as it does Cpts 4-6 of the railway land, and it would be good if this can continue to be managed under a hay meadow regime, ideally in concert with Project E4 of this plan.

3.5.9. The Little Wall Lane bridleway

This is another attractive feature lying outside the railway land but complementary to it, with its pleasing grassy course, and even a short stretch of the stream which comes in from the north, passing under the bridleway and proceeding westwards at the foot of the embankment. With the abandoned farm yard and buildings immediately to the north of this track earmarked for another tranche of new building, it will be all the more important to preserve the integrity of this strip, which is valuable both in itself and as a buffer protecting the railway land.

Table 2: Projects addressing ecology and wildlife

Proj	Topic	Cpt	Comments
E1	Continue to uphold the existing policy of non-intervention within the woodland, which is subject to a TPO.	1	Bear in mind safety issues where standing dead wood is to be retained.
E2	Retain areas of brambles and scrub in their own interest and to complement the restored grassland as proposed in Project E5 below.	2	Diversify the shrub element by planting additional native species appropriate to the location.
E3	Maintain the short roadside grass sward by regular strimming.	3	These two projects amount to continuing with existing practice. Ideally the Shaw's Orchard amenity area could be managed in conjunction with E4.
E4	Continue to manage the taller grassland between the field gates as a hay meadow.	4	
E5	Restore a grass cover to part of the south bank, using an appropriate seeds mix of native grasses and wildflowers.	2	This will involve a substantial effort to clear the brambles, create a tilth, and seed down the grass mix on this steep slope.
E6	Enhance the wetland interest of the ditch system at the foot of the south bank.	5	Allowance should be made for safety precautions.
E7	Endeavour to eliminate the hemlock and create a more grassy ground cover.	6	This would also improve the environs of the orchard.
E8	Take steps to promote individual species: holly blue butterfly and hazel dormouse.	1/2	Ensure the presence of holly/ivy and sycamore/hazel, respectively.

3.6. Public access

As noted in Section 1.6, **statutory access** to the embankment land is via the public footpath which crosses its westernmost tip at the far end of Cpt 1, via two substantial sets of concrete steps. The Countryside & Rights-of-Way (CROW) Act of 2000 requires that this path be kept clear and readily accessible, as of course the Parish Council will be aware. This will be **Project R1**. The absence of any handrails alongside either set of steps has been acknowledged and is due to be remedied (R. Culverhouse, *pers. comm.*).

Permissive access is provided via a path through Cpt 4 (via the two field gates), Cpt 7 (where it skirts the Shaw's Orchard meadow plot), Cpt 6 (through the new orchard), and Cpt 1, where it links up with the public path between the two flights of steps. This provision will be upheld as **Project R2**, and the immediate course of the path kept clear and strimmed as necessary through the growing season.

Regular checks should be made along both the statutory and permissive paths for any risks from falling (or fallen) dead wood (**Project R3**)

A provisional proposal in an early draft of this plan for extending permissive access to run along the top of the embankment was resoundingly rejected! On reflection, it is also suggested that the construction of a "disabled access" path through Cpt 2 would not be practicable. Nor would it be in the interest of the nature reserve status of the site to instigate any wider publicity than that already provided by the Parish Council.

Table 3: Projects addressing access and informal recreation

Proj	Topic	Cpt	Comments
R1	Uphold access to the public footpath in partnership with SCC Rights-of-Way staff.	1	Hand-rails are due to be installed alongside both flights of steps.
R2	Maintain the permissive footpath along the southern and south-west fringes of the embankment.	1/4/6/7	
R3	Maintain vigilance along both the statutory and permissive paths regarding any risk from falling or fallen dead wood.	1/4/6/7	

3.7. Summary of proposals

All the aforementioned proposals, namely Projects A1-A3, E1-E8 and R1-R3, are summarised diagrammatically on Plans D, E and F, which also gives an indication of timing and prioritisation.

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PLAN D
BAWD RIP RAILWAY EMBANKMENT
SUGGESTIONS FOR MANAGEMENT PROJECTS
I: VISUAL/ AMENITY

Timing/ priority
A1. Part of routine winter work: not urgent in this context.
A2. Ongoing seasonal pruning and annual harvesting.
A3. Inaugurate spraying & clearing programme Yr 1, and repeat Yrs 2 - 5. See also E7.



A1
Cpt 2 (E)
 Remove excess standing dead elm wood for aesthetic improvement. (See also Projects E1 and R3).

A2
Cpt 6
 Reduce or eliminate hemlock to improve the visual prospect of this compartment (see also Project E7).

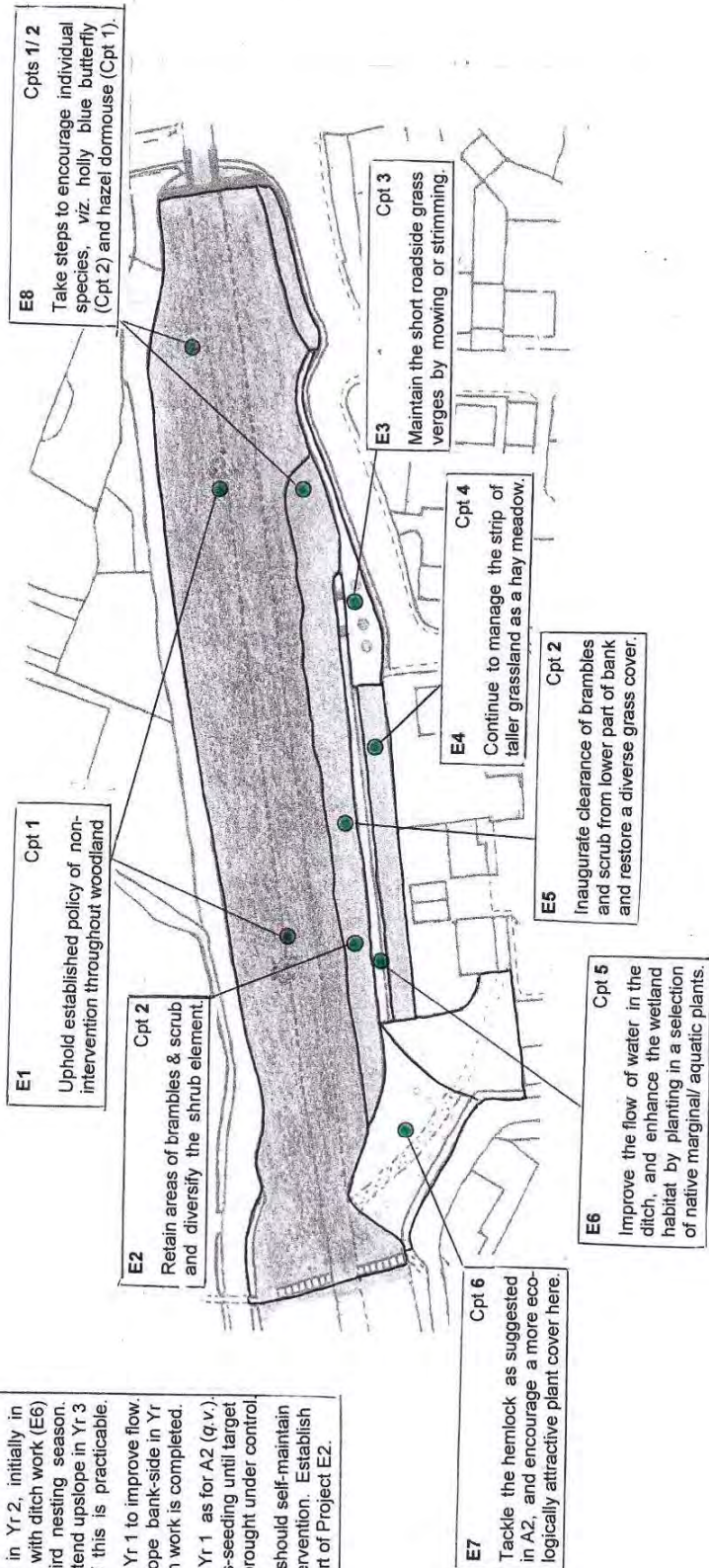
A3
Cpts 3/ 6
 Conserve the orchards as classic Somerset landscape features.

Base map from OS 1:2500 site-centred MasterMap cover (2020). Ref. HMC-00876769 with the sanction of the Controller of The Stationery Office. Crown copyright. Licence No. AL100012047.

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PLANE E
BAWD RIP RAILWAY EMBANKMENT
SUGGESTIONS FOR MANAGEMENT PROJECTS
II: ECOLOGY/ BIODIVERSITY

- Timing/ priority**
- E1.** Ongoing non-intervention.
 - E2.** Possibly delay until upper part of bank is more accessible following inauguration of E5.
 - E3.** Regular weekly or fortnightly routine as already in place.
 - E4.** One annual mid/ late summer cut according to established practice (see also R2).
 - E5.** Inaugurate in Yr 2, initially in conjunction with ditch work (E6) but after bird nesting season. Possibly extend upslope in Yr 3 onwards if this is practicable.
 - E6.** Inaugurate Yr 1 to improve flow. Plant up-slope bank-side in Yr 2 once ditch work is completed.
 - E7.** Inaugurate Yr 1 as for A2 (q.v.). Delay grass-seeding until target species is brought under control.
 - E8.** Holly & ivy should self-maintain without intervention. Establish hazel as part of Project E2.

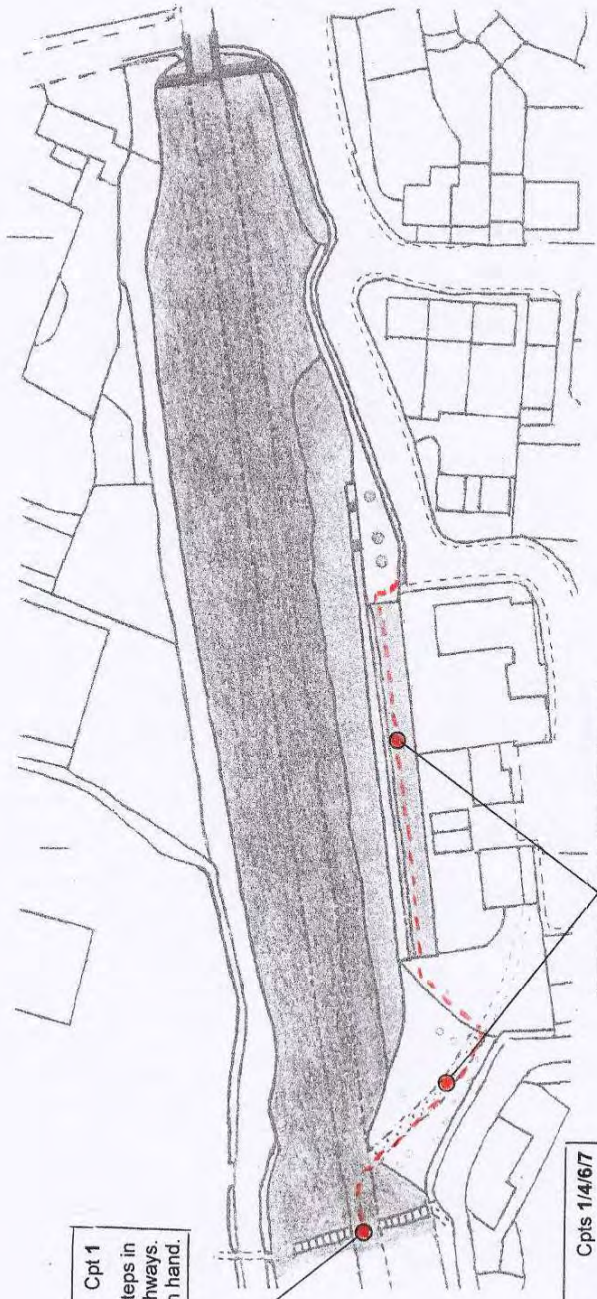


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PLAN F
BAWD RIP RAILWAY EMBANKMENT
SUGGESTIONS FOR MANAGEMENT PROJECTS
III: ACCESS

Timing/ priority
 All projects part of established routine management of site.



R1
Cpt 1
 Maintain public footpath/ steps in collaboration with SCC Highways. Installation of handrails is in hand.

R3
Cpts 1/4/6/7
 Check for any risk from falling (or fallen) dead wood or other hazards along both the statutory and the permissive paths.

R2
Cpts 1/4/6/7
 Maintain the permissive footpath along the S and SW fringes of the embankment land.

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CONCLUSION

4.1. Ideas into action

I hope very much that this survey and report is found to be useful. None of the ideas here should be thought of as cast in stone, and various modifications (or omissions) may be adopted in the end by your council, following due scrutiny of the details. In any event, I shall be interested to see how things progress.

I imagine you will have plenty of experience with obtaining grants. For a project such as this the Heritage Lottery Fund may be the answer. Other possibilities could include the likes of Viridor, who can offer significant financial support to community-orientated initiatives – see www.viridor-credits.co.uk.

4.2. Acknowledgements

It has been a privilege to be asked to undertake this assignment, and I have very much enjoyed exploring the site and liaising with your team, even if, in its various ways, the coronavirus pandemic has restricted both field work and personal contact.

I should also thank my associates Aaron Woods and Tony Parsons for helping me with identifications of the more obscure plants and invertebrates, respectively, and Sue Simpson of Somerset Environmental Records Centre (SERC) for information on nearby Local Wildlife Sites. Also my good friend Francis Farr-Cox, formerly of the Environment Agency, for bringing the Parish Council's requirement for this survey to my attention in the first place.

C.J. Smith *BSc (Hons) Agric, PhD*

November 5th 2020

Appendices follow

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APPENDICES

APPENDIX I

A PHOTOGRAPHIC REVIEW

PHOTOS: I

- 1.** Looking west (strictly WSW) along the south side of the eastern sector of the railway embankment beyond the bridge. The dead and dying elm branches are entering another cycle of Dutch elm disease as the bark thickens up and the fungus-carrying beetles return to make their galleries.

- 2.** Further along on this side is the scrub-fringed ditch marking the foot of the embankment, separated from the road by this strip of mown turf and tarmac footpath. Parish Council representatives Richard Culverhouse (nearer) and Don Rayner were my guides on this first visit (on October 21st 2019), and are just approaching the apple trees recently planted here (see also Photo 9). The arrow indicates one of the brick culverts associated with the ditch.

- 3.** A major feature of this southern side of the embankment is the almost continuous cover of brambles, which were fruiting profusely at this time.

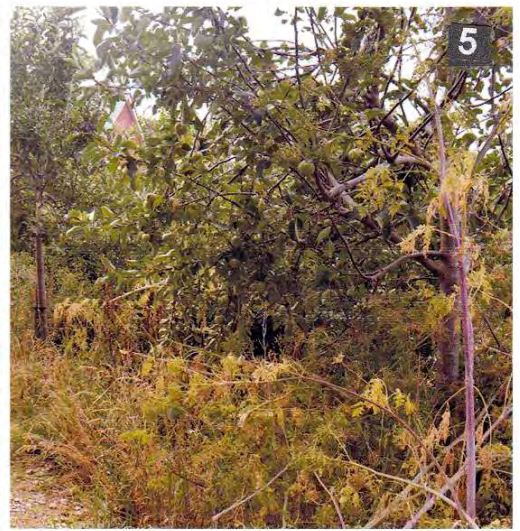
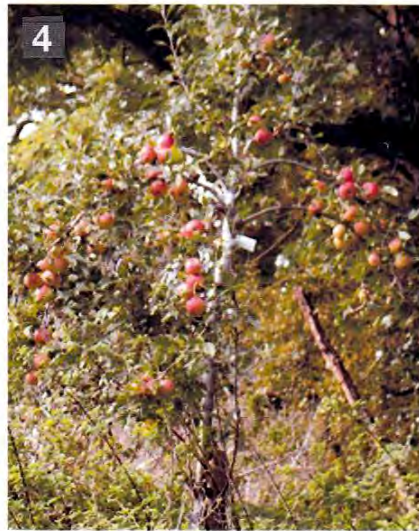
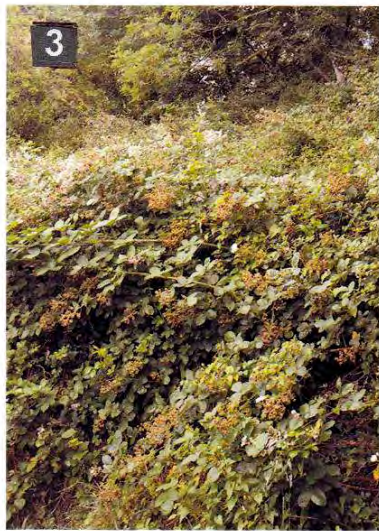
- 4.** The main part of the new orchard occupies the western end of the embankment land on this side. There has been an orchard nearby since 1550.

- 5.** Some of the new orchard trees near the western boundary are somewhat swamped by hemlock – not a good combination with eating apples! Beyond these trees is a new boundary hedge.

- 6.** The northern side of the embankment is wooded all the way down to its boundary with Little Wall Lane, seen here looking west, with Richard again, though in this case on July 14th 2020. This delightful green track, which is a public bridleway, will form a crucial buffer against the development of the former farmyard and buildings planned on this side.

- 7.** Looking up from the bridleway through the woodland canopy towards the crest of the embankment near its eastern end.

- 8.** Undergrowth at the western end of the bank top discourages people wandering off from either the public footpath between the two flights of steps or the permissive path which joins it here.



PHOTOS: II

9. A closer view of the grass verge shown in Photo 2, which in fact is quite diverse.

10/ 11. Areas of the grassland here which have escaped the mower (but which are subject to occasional strimming) betray the species which thrive in the sward, including yarrow and lords-and-ladies (10 – the bright scarlet berries of the latter can be seen on the left), and common mallow (11).

12. The strip of grassland between the field gates is cut less frequently, simulating a hay meadow regime, and allowing a mix of taller grasses and flowers to flourish. This is the course of the permissive footpath.

13. Most conspicuous at the time of the July visit was this ragwort plant. It had been found by a cinnabar moth which had laid eggs on it (this is its favoured larval food plant), resulting in the familiar yellow-and-dark-brown caterpillars, which never quite manage to stop the plants from seeding! A menace this plant may be, with its toxicity to grazing animals, but it is good to allow the occasional plant to at least get to this stage, since the cinnabar is one of our most attractive moths, with its red and dark grey wings.

14/ 15. Lesser knapweed (14) was attracting various foraging insects including this red-tailed bumblebee (15).

16/ 17. Tall and slender stone parsley (seen in Photo 16 against a rather bright wooden fence panel) is very typical of Somerset meadows and field margins. The plant in Photo 17 is being visited by a tiny copper-coloured soldier fly.

18/ 19. Growing amongst the hemlock on the rough ground beyond the gated meadow strip were two prickly species which nonetheless have attractive flowers which are much visited by bees, butterflies and hoverflies, namely bristly ox-tongue (18), a dandelion look-alike, and the familiar teasel (19). The white flowers in the background of Photo 18 are white campion, which is especially prolific in the Shaw's Orchard amenity patch, and has obviously spread.

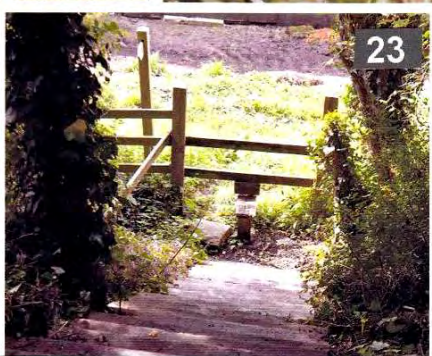
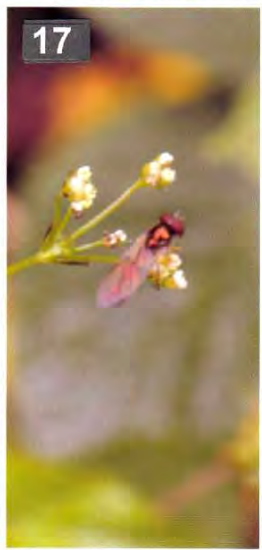
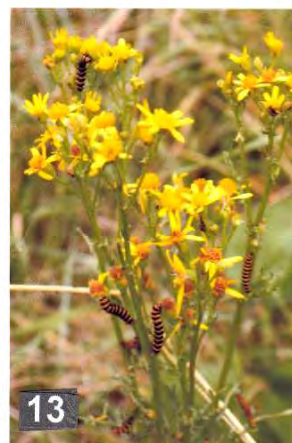
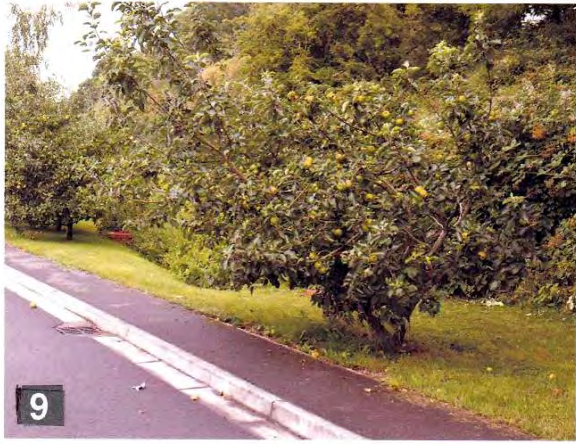
20/ 21. Two butterflies caught taking a rest on July 14th were a hedge brown or gatekeeper (20) and a ringlet (21).

22. This female blackcap was working her way stealthily through the brambles, no doubt in search of insects to feed on.

23. Just the one public footpath crosses the embankment land, incorporating two steep flights of steps. This is the southern set.

All photos C.J. Smith

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APPENDIX II

FLORA AND FAUNA

FLORA AND FAUNA

Plant and animal species recorded during visits to the railway embankment land on October 21st 2019 and July 14th 2020. (Coronavirus lockdown precautions prevented the intended survey of plants, invertebrates and breeding birds originally planned for the spring of 2020.) Nomenclature of vascular plants follows Stace (2019), of fungi Phillips (2006) and of insects, where quoted, Brock (2014). Numbers in brackets refer to footnotes.

FLORA

FERNS AND HORSETAILS

Field horsetail *Equisetum arvense* (1).

GRASSES

Creeping bent *Agrostis stolonifera*; tall oat-grass *Arrhenatherum elatius*; wood false-brome *Brachypodium sylvaticum*; cocksfoot *Dactylis glomerata*; tufted hair-grass *Deschampsia cespitosa*; couch-grass *Elymus repens*; red fescue *Festuca rubra*; Yorkshire fog *Holcus lanatus*; perennial ryegrass *Lolium perenne*; annual meadow-grass *Poa annua*; rough-stalked meadow-grass *Poa trivialis*; tall fescue *Schedonorus arundinaceus* (2).

HERBS (ECOLOGICAL SENSE = WILD FLOWERS)

Yarrow *Achillea millefolium*; garlic mustard *Alliaria petiolata* (3); cow parsley *Anthriscus sylvestris*; lords-and-ladies *Arum maculatum*; daisy *Bellis perennis*; greater bindweed *Calystegia sepium*; lesser knapweed *Centaurea nigra*; creeping thistle *Cirsium arvense*; hemlock *Conium maculatum* (4); field bindweed *Convolvulus arvensis*; smooth hawkbeard *Crepis capillaris*; foxglove *Digitalis purpurea*; teasel *Dipsacus fullonum* ssp. *fullonum*; greater hairy willow-herb *Epilobium hirsutum* (3); lesser hairy willow-herb *Epilobium parviflorum* (3); cleavers *Galium aparine*; cut-leaved cranesbill *Geranium dissectum*; herb Robert *Geranium robertianum*; ground ivy *Glechoma hederacea*; hogweed *Heracleum sphondylium*; ragwort *Jacobaea vulgaris* (2,3); white deadnettle *Lamium album*; nipplewort *Lapsana communis*; ox-eye daisy *Leucanthemum vulgare*; bird's-foot trefoil *Lotus corniculatus* (3); musk mallow *Malva moschata*; common mallow *Malva sylvestris*.

Spotted medick *Medicago arabica*; black medick *Medicago lupulina*; bristly ox-tongue *Picris echioides*; ribwort plantain *Plantago lanceolata*; greater plantain *Plantago major*; primrose *Primula vulgaris*; Primula "Wanda" *Primula x pruhonicensis* cultivar (5); self-heal *Prunella vulgaris*; fleabane *Pulicaria dysenterica*; meadow buttercup *Ranunculus acris*; creeping buttercup *Ranunculus repens*; sorrel *Rumex acetosa* (3); broad-leaved dock *Rumex obtusifolius*; wood dock *Rumex sanguineus*; water figwort *Scrophularia auriculata*; white campion *Silene latifolia* (2); charlock *Sinapis arvensis*; stone parsley *Sison amomum*; hedge mustard *Sisymbrium officinale*; Alexanders *Smyrniolum olusatrum* (6); prickly sow-thistle *Sonchus asper*; common sow-thistle *Sonchus oleraceus*; hedge woundwort *Stachys sylvatica*; tansy *Tanacetum vulgare*; dandelion *Taraxacum officinale*; red clover *Trifolium pratense*; white clover *Trifolium repens*; stinging nettle *Urtica dioica* (3).

TREES, SHRUBS & CLIMBERS

Sycamore *Acer pseudoplatanus*; horse chestnut *Aesculus hippocastanum*; buddleia *Buddleja davidii*; hornbeam *Carpinus betulus*; dogwood *Cornus sanguinea*; hawthorn *Crataegus monogyna*; ash *Fraxinus excelsior* (7); ivy *Hedera helix* (3); tutsan *Hypericum androsaemum*; holly *Ilex aquifolium* (3); walnut *Juglans regia*; wild privet *Ligustrum vulgare* (3); honeysuckle *Lonicera periclymenum*; apple (cultivated) *Malus domestica*; blackthorn/sloe *Prunus spinosa*; pedunculate oak *Quercus robur*; field rose *Rosa arvensis*; dog rose *Rosa canina*; bramble *Rubus fruticosus* agg.; willow *Salix cinerea*; goat willow *Salix capraea*; elder *Sambucus nigra*; yew *Taxus baccata*; wych elm *Ulmus glabra* (7).

FUNGI

Shaggy ink-cap *Coprinus comatus*; loose smut *Ustilago arrhenatheri* (8).

/...continued

FAUNA

Mammals: Grey squirrel (plus signs of damage to trees). Black cat accompanied me for part of the July survey! Hazel dormouse thought to be present.

Birds: Blackbird, robin, blue tit, house sparrow, blackcap, magpie, wood pigeon. Woodpecker hole (probably great spotted) in tree on north side of embankment. Tawny owls known to be here.

Butterflies and moths: Peacock, red admiral, large, small and green-veined whites, meadow brown, hedge brown (= gatekeeper), ringlet, speckled wood and holly blue butterflies, silver Y and cinnabar moths (latter present as caterpillars on ragwort), plus grass moths (micromoths).

Other insects: Hoverflies including marmalade hoverfly *Episyrphus balteatus*, a soldier-fly *Microchrysa* sp., and various other flies (Diptera); bumble bees including red-tailed *Bombus lapidarius*, also honey bees, solitary bees and social wasps; azure damselfly *Coenagrion puella* (9); shield bug *Palomena prasina* (nymph).

Other invertebrates: Ground and money spiders. Garden and white-lipped hedge snails.

FOOTNOTES

1. Growing in and alongside the short stretch of ditch alongside Little Wall Lane.
2. Examples of recent changes to familiar names as cited by Stace (2019). Thus, tall fescue was previously *Festuca arundinacea*, ragwort was *Senecio jacobaea*, and white campion was *Silene alba*.
3. Key larval foodplants for butterflies and moths. Garlic mustard (= Jack-by-the-hedge) is favoured by the orange-tip butterfly, bird's-foot trefoil by the common blue, sorrel by the small copper, stinging nettles by the common vanessid butterflies – peacock, small tortoiseshell, red admiral and comma – and holly and ivy by the holly blue. Ragwort is used by the cinnabar moth (as found in Cpt 6) and the willowherbs by the elephant hawk-moth.
4. Abundant at the western end of the south side of the embankment.
5. A garden escapee.
6. This distinctive plant, which is normally found near the sea, was found growing (and setting its large black seeds) just outside the target area, in the road verge by the east side of the bridge. It may well find its way on to the BDC part of the embankment land in time.
7. No obvious signs of ash die-back were noted but it seems inevitable that this will crop up more significantly in due course. The elms continue to succumb to, and recover from, Dutch elm disease, but are unlikely ever to reach mature tree status.
8. This fungus was found affecting tall oat-grass flower-heads, which is a common occurrence.
9. Associated with the ditch on the south side of the embankment.

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APPENDIX III

RECOMMENDATIONS FOR PLANTING AND SEEDING

DIVERSIFYING THE SHRUB SPECIES ON THE EMBANKMENT

Shrub species to encourage or plant in the course of diversifying this element on the southern bank-side after thinning or clearing brambles. Use transplants of UK – and ideally local – origin.

Hawthorn *Crataegus monogyna*
Blackthorn *Prunus spinosa*
Hazel *Corylus avellana*
Elder *Sambucus nigra*
Holly *Ilex aquifolium*
Spindle *Euonymus europaeus*
Dogwood *Cornus sanguinea*
Alder buckthorn *Frangula alnus*^{1,2}
Purging buckthorn *Rhamnus cathartica*²
Dog rose *Rosa canina*
Wild privet *Ligustrum vulgare*
Honeysuckle *Lonicera periclymenum*
Wayfaring tree *Viburnum lantana*
Guelder rose *Viburnum opulus*¹
Sallow *Salix cinerea*¹
Goat willow *Salix capraea*¹

¹Favouring damper locations

²Exclusive larval foodplants of the brimstone butterfly

CREATING ATTRACTIVE GRASSLANDS

If it proves practicable to restore the bramble-covered southern side of the railway embankment to grassland, it would make sense to make this an attractive feature both for wildlife and for people alike. This could be achieved by sowing down with a colourful mix of native grasses and wildflowers. Such seeds mixes are widely available now, and an example of a formulation which would suit the Bawdrip land is the “standard general purpose meadow mixture” offered by Emorsgate Seeds of Kings Lynn, Norfolk (www.emorsgateseeds.com).

Emorsgate’s standard general purpose meadow mixture (code EM2)

Grasses

Common bent *Agrostis capillaris*
Crested dog’s-tail *Cynosurus cristatus*
Slender creeping red fescue *Festuca rubra*
Small timothy or cat’s-tail *Phleum bertolonii*
Smooth-stalked meadow-grass *Poa pratensis*

Wild flowers

Yarrow *Achillea millefolium*
Lesser knapweed *Centaurea nigra*
Wild carrot *Daucus carota* ssp. *carota*
Lady’s bedstraw *Galium verum*
Field scabious *Knautia arvensis*
Rough hawkbit *Leontodon hispidus*
Ox-eye daisy *Leucanthemum vulgare*
Musk mallow *Malva moschata*
Ribwort plantain *Plantago lanceolata*
Salad burnet *Poterium sanguisorba*
Cowslip *Primula veris*
Self-heal *Prunella vulgaris*
Meadow buttercup *Ranunculus acris*
Yellow rattle *Rhinanthus minor*
Common sorrel *Rumex acetosa*

To this could be added bird’s-foot trefoil *Lotus corniculatus*, to favour the common blue butterfly.

Nowadays, googling “wild flowers” will come up with a large choice of potential suppliers, some cheaper than others, though lower cost mixtures may contain seed of unknown provenance and it is as well to keep to native stocks if possible. Costs can be lowered somewhat by reducing the proportion of flower species, or sowing only selected areas (using a standard all-grass amenity mixture for the remaining land), perhaps enhancing the extent of wildflower sowing over the course of several years, unless spread has occurred naturally. Actual plants are sometimes used in grassland re-creation projects, but seed would be more practicable on the scale envisaged here. Another option is to sow a selection of cornfield annuals – poppies, cornflowers etc. – but this requires regular re-cultivation for repeated displays year on year.

Your team may in fact have some experience of wildflower seeding, since this procedure appears to have been adopted for enhancing the amenity area adjoining the Shaw’s Orchard development as noted in the text.

Any of the more experienced suppliers provide a catalogue with helpful practical guidelines on choice of mix and sowing the seeds, but an invaluable guide to the wider subject is Charles Flower’s *Where have All the Flowers Gone?* (see references).

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APPENDIX IV

REFERENCES

REFERENCES

BGS (1984). Geological Survey of Great Britain: England & Wales. 1:50 000 Series Solid & Drift Map. Sheet 295: Taunton. British Geological Survey, Keyworth, Nottingham.

Bown, D. (2018). The Bridgwater Railway through Bawdrip. Self published. See also Facebook.

Bright, P., Morris, P. & Mitchell-Jones, T. (2006). The Dormouse Conservation Handbook. 2nd Edition. English Nature, Peterborough. Available on line via the People's Trust for Endangered Species at <https://www.ptes.org>.

CA (1999). Countryside Character. The character of England's natural and man-made landscape. Vol. 8. South-West. Countryside Agency, Cheltenham, Glos.

Flower, Charles (2014). Where Have All the Flowers Gone? Papadakis Press, Winterbourne, Berks.

Hopkins, J.J. (2007). British Wildlife and Climate Change. 1. Evidence of Change. British Wildlife **18**, 153-159.

OS (2008). 1:25 000 Explorer Map. Sheet 140: Quantock Hills & Bridgwater. Ordnance Survey, Southampton.

Phillips, R. (2006). Mushrooms. Macmillan, London.

Rodwell, J.S. (Ed.). (1991). British Plant Communities. Vol. 1. Woodlands and Scrub. Cambridge University Press, Cambridge.

Smith, L.P. (1976). The Agricultural Climate of England & Wales. MAFF Technical Bulletin 35. Her Majesty's Stationery Office (HMSO), London.

SSEW (1983). Soil Survey of Great Britain (England & Wales). Soil Maps 1: 250 000. Sheet 5: South-West. Soil Survey of England & Wales, Harpenden.

Stace, C. (2019). New Flora of the British Isles. 4th Edition. C & M Floristics, Middlewood Green, Suffolk.

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