

Appendix C. Details of the Routine Management and Maintenance of Greenways



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The following chapter refers to the maintenance of the greenway with specific reference to the relationship of the greenway with the surrounding natural habitat.

Once the greenway has been constructed we will need to think about how the corridor of the route can be maintained to ensure unhindered passage for users, as well as encouraging diversity in both the parks landscaping and as a habitat for wildlife. The landscape of the greenway can be sculpted to create stimulating patterns by contrasting trees and shrubs with patches of open space, revealing views or sculpture.



Link to Kilmersdon

Greenways and the wild land that adjoins them, are linear features, following old railways, canals, quiet roads and paths and threading through extensive urban areas. They link and combine with other linear wild land at rivers, roadsides and railways, and with the more extensive lands of gardens, parks, forests, lochs, reserves and rough grazings. All these components combine to create a high value network of wild habitat. The continuity of wild land habitat is very important to wildlife.

Linear wild land habitat also undoubtedly enriches the varied landscape of the UK by allowing for species to move from one habitat to another.

Designers can help to extend the greenway as an active ‘connector’ by seeking to assemble wild or public land along greenways, and to secure and manage this land, perhaps as a whole, in strong partnership with appropriate agencies and interest groups. The example on the left shows land alongside the Colliers Way in Somerset, which has now been set aside for a wildlife reserve. The land is sandwiched between an arable field and a sewage works, a previously unattractive and little visited place on the edge of the village of Kilmersdon. It is now used by children walking and cycling to and from school and makes for an easily reached place for the pupils’ field trips.

Forward Looking Design

In order to avoid future maintenance problems it may be worth thinking about certain issues from the very start. This is particularly important when it comes to greenways due to the prevalence of mown verges. These verges can often be resource rich, providing a launch pad for plants that can rapidly root through and beneath the path, causing damage to the surface.

The following points are worth considering in order to help allay this problem from the outset.

NB: throughout this chapter we will refer to the term ‘natural succession’ – by this we mean the process by which habitat naturally rejuvenates itself. In our Atlantic climate, natural succession tends to favour strategies which allow fast growth through warm periods and perennation (arrested growth) through cold periods.

- design and construction solutions must robustly set back the effects of succession, from the very start.
- maintenance of surfaces, verges, structures and drains must remove new growth and accumulation by scheduled routine works.

- tree and shrub management whilst reducing the harmful effects of growth succession, must be balanced with its many beneficial effects (eg. on CO₂, habitat, landscape and local context)
- management designed for perennial growth, must also consider and simultaneously control growth which is annual or biennial.
- remove low value grass turf especially on wet or fertile sections
- remove excess construction spoil and woody vegetation waste
- build surfaces above ground level to delay the build up of verge turf
- roll, compact or face-off the entire edges of bitmac to hinder in-growth
- build wide path verges from low fertility stony construction spoil
- build wide surfaces to allow tractors to work from on the path surface only
- build high capacity open drainage ditches or swales
- allow desirable natural re-vegetation of verges and slopes after construction, unassisted by topsoil, fertiliser or seed.

Greenway Verges

The following suggestions are to be considered when maintaining a path and will help to manage and control any succession of plants that can cause damage to the surface:

- use tractor equipment for 'end to end' works running on the surface – this may of course depend on the surface of the path and what it is able to withstand
- use pedestrian equipment for sections inaccessible to tractors
- avoid maintenance vehicles which operate by running off surface
- sweep/blow cut growth and debris off surface and edges after all works
- shift all generated works debris off verges and ditches

...and on an annual cycle:

- remove debris accumulations from surface edges and verges
- sweep/blow leaf and twig fall off surface edges and verges
- mow verges, with mown height and cutting frequency depending upon site/habitat
- apply herbicide at minimum volume/frequency/width to in-growth of turf
- monitor ditches, pipes and culverts and resolve minor blockages

...and on a regular cycle; at a frequency appropriate to site:

- scrape off verge turf to set back its' accumulation
- remove debris in open ditches in winter
- flail briars etc. from open ditches and fence lines in winter
- flail or saw branch, thorn and briar growth at edges of 'mass' in winter
- control undesirable tree and shrub regeneration
- control growth of nuisance/noxious plants



Paisley Greenway

As a result of regular mowing, tolerant grasses are favoured, and a depth of vigorous grass turf is created. This rises higher than the surface, hinders runoff and can root over, through and under the surface, especially if aided by debris at the edges, and can fragment the bitmac surface.

In-growth of turf can be set back by bi-annual applications of herbicide at minimum swathe width. However an over reliance on herbicides can promote problematic plants tolerant to the herbicide (eg. Marestalk) or create bare verge readily colonised by others (eg. Coltsfoot).

One mechanical solution is to scrape across the full width and depth of the turf using a small digger, and casting the debris a distance from the Greenway. This task should be arranged on a priority or section basis, on a four-year cycle. This cyclic scraping may allow the greenway manager to be less concerned about controlling yearly in-growth of turf and accumulation at the edges, but only if the scraping is reliably executed. This may be more relevant for western Britain and damp and/or more fertile/fertilised sections.

Scraped verges will lightly re-vegetate naturally from seed and fragments. This work recreates low fertility habitat colonised by stress tolerant growth, yielding high value species rich habitat and landscape.

Some vigorous perennial verge plants cause eruptions and breakage of sealed greenway surfaces by lateral and shallow root extension (eg. Coltsfoot, Bracken, Marestalk, Hardrush, coarse grass, Knotweed). Their growth within 500mm of sealed path surfaces can be set back by periodic local spot applications of herbicide.

Some plants are very problematic and require fuller control, including native plants such as Ragwort, Marestalk and Bracken.

Invasive exotic species, not subject to co-evolved biological control mechanisms, can rapidly exclude all native species and habitat, and can create practical problems such as damage to structures and risk to human health (eg. Japanese Knotweed, Giant Hogweed, Rhododendron, Himalayan Balsam).

Control can be effective by manual, mechanical, herbicidal and combined techniques, though often the period of control is protracted and success cannot be guaranteed. It is often only practical to try to limit the spread of the problem, to keep it at bay, and to eradicate problem plants only where vital, or required by law. Influential legislation includes; Wildlife and Conservation Act 1981; Environment Protection Act 1990; Weeds Act 1959.



Forest road with good side ditch

Effective control of problem plants, and especially safe approved use of herbicides, is best undertaken by professionals and the subject is better covered in the relevant subject manuals. The use of herbicides is subject to; Food & Environment Protection Act 1985, Control of Pesticides Act 1986, Control of Substances Hazardous to Health Regulations 1988

Trees and shrubs

To design for trees and shrubs

In any initial design, there should be a management plan for trees and shrubs that is flexible and renewed on a consistent basis. It should take into account the needs of greenway users and their safety, as well as issues of habitat, landscape, neighbours and the local context. Below are a few points that we trust will be applicable to most situations:

- regard trees as backdrop – to be set well back from the surface and drainage
- make use of and sculpt from existing trees, rather than planting anew
- aim for a well thinned out park landscape at populated sections
- aim for a well thinned out open landscape in dark sections
- allow plenty of wild woodland to develop elsewhere
- enrich only if necessary with appropriate native species and designs
- create the right balance from mass (the trees and shrubs) and space (open grassland, views, etc)

Forward looking basic removals

- excess 'low value' tree + shrub growth, especially if wet or shaded
- excess 'low value' grass turf especially if wet or fertile
- lower branches of retained mature trees

To manage trees and shrubs

- prioritise works and proceed on a section basis, with a realistic budget
- monitor and address matters if succession to woodland is inundating open grassland, creating 'tunnels', obscuring views, damaging structures, drainage and boundaries, and creating too much 'mass'

- allow a natural under-storey habitat of briars to develop where suitable
- thin to favour long life and smaller trees, rather than pioneers or giants
- create a varied edge habitat, along, but distant from the Greenway
- create high value hedge habitat wherever appropriate
- engage willing volunteer contribution where appropriate
- undertake necessary works before trees become too cumbersome
- expect that cut material will stay on site, processed as appropriate to site

On an annual cycle

- monitor/survey the condition of mature trees
- monitor rate and extent of general natural succession to woodland
- monitor impact of growth on land drainage, boundaries and structures

On a regular cycle - at a frequency appropriate to site

- remove, thin or prune trees and shrubs to a management plan
- control undesirable regeneration from seed, sucker or stumps
- assess weather damage

Equipment to use

General approach;

- use volunteer teams and hand tools where appropriate to labour and task
- use tractor equipment for 'end to end' routine works
- use pedestrian equipment for first verge cut and tight and short sections
- remove cut growth and debris off surface and edges after all works
- remove cut growth and works debris from verges and ditches

For verges, 'mass' edges, hedges, ditches, slopes

- tractor side-boom hydraulic-drive flail mower (eg. 1200mm cut)
- tractor side-boom hydraulic-drive circular saw, single or multiple
- pedestrian/small engine powered flail mower (eg. 600mm cut)

For dense/ impenetrable bush

- tracked excavator + tractor pto-drive mulcher/shredder
- chainsaw + clearing saw + brush-cutter

For tree work

- chainsaw + high reach pruning saw (manual + motor)
- tractor pto-drive winch or Tirfor cable winch
- tractor pto-drive wood chipper or excavator for brush etc.



Tractor front brush

Routine tractor flail work

Tractor side-boom hydraulic-drive flail mowers are the most appropriate versatile equipment, for verges, edges, ditches and slopes. This is largely due to the following reasons:

- they are readily available as standard hires from contractors
- are road licensed, requiring no other plant to move about
- operate entirely from the surface
- reach to the areas of most routine works
- flail can accommodate damage caused by stone and metal objects
- four-wheel drive capability for turning in difficult situations
- mow or flail all requirements combined in single operations
- mow single, multiple or variable widths as appropriate
- mulches cut growth and debris to small size
- simple to adjust cut heights to suit site requirements
- auxiliary air-blower cleans debris from surface and edges during work
- operates within a practical safe working zone

Over reliance on tractor flails to set back shrub growth can create ugly cuts. This can be reduced by using circular saws periodically, and mulching the cut debris with a flail mower. This may also reduce cycle punctures caused by thorns. Debris should be removed by an auxiliary air blower and thorn bushes should be kept back from the verges by design and regular work.

The frequency, height and timing of verge cutting by flail can be arranged to meet verge and habitat management requirements. Scheduling is considerably influenced by local climate and annual variations to it. The aim is to ensure summer grass and herb growth is cut before it collapses and thereby reduces Greenway width and accumulates on the surface edges.

In general, fairly close mown verges are appropriate where they are in use as part of the Greenway, or where the context is urban. However the main environmental impacts of mowing grass are diesel consumption, creation of a sterile habitat and the encouragement of an ever more vigorous grass turf.

Open areas further from the verges can be left un-mown to develop as habitat or be cut only once a year or less frequently. However it must be noted that although this can be classed as habitat it is unlikely to be biologically diverse.

It may take on an air of neglect and give rise to much human complaint. Without management, succession to perennial herbs and scrub is likely.

The first cut of the year is best done fairly late to 600mm width by pedestrian flail mower, leaving plenty open uncut herb and grassland habitat to flourish and satisfy the eye, until well into the summer. If tall herbaceous plants later collapse when wet, they fall into the first cut swathe. A single annual cut may be all that is needed where verges are dry, infertile, mildly toxic or where there is a high value habitat.

The second cut is best done by tractor flail to 1200mm width, well into summer when herbaceous vegetation is fully established and starting to fall over after flowering and/or seeding.

The general extent and nature of verge mowing can be adjusted to suit local requirements at link paths, gates, bends, width constrictions and to blend in with adjoining managed landscapes and wild habitat.

An earlier second or third cut may be needed where the ground is fertile and/or damp or with tall vigorous herbs (eg. nettles, willow-herb, grasses).

A third cut may be sporadic and can be extended out to cut undesirable seeded pioneer tree and shrub growth (eg. gorse, broom, birch, willow, alder), though this is best done combined with winter tractor work.

The growth of greenway verges can vary considerably, even within short distances, especially along old railways. In some situations only a uniform approach is practical. If resources permit, or if legislation demands it, verges can be managed and extended creatively to develop and conserve high value travelling landscape and habitat.



Tractor flail

The more extensive tractor flail/saw work to vegetation other than the immediate verges and grasses is best done in winter when visibility and contractor availability is good and habitat matters are generally least. These winter tasks can include;

- cleaning ditch sides and the setting back of scrub regeneration
- the trimming of edges of the mass of trees and shrub growth (most tree branch pruning is best done manually by pole saw).

Planted and naturally regenerated woodland is often evenly aged and can lack diversity in both species and structure. Gradual phased work is recommended to ensure as much structural and species diversity as possible. A transitional phase can adapt the edge of the construction corridor to;

- remove growth damaged or affected by works
- remove growth used as a 'sacrificial buffer'
- create gaps and views best revealed after works (ie. 'space')
- thin out the edge of the mass of trees and shrubs
- prune undesirable branches from retained trees

Subsequent cyclic routine tractor work can be used to promote or restrict new growth, as appropriate, but only at the verge. More sensitive work at the edge and all work within the mass of trees and shrubs is best done by good arboricultural technique, planned through a period or years. Below are a number of key of forward looking arboricultural techniques:

- thin out or scallop the edge of the mass
- prune low branches where space through is required
- prune crown branches where desirable
- thin out tree and shrub density where desirable
- favour native species and habitat

- retain dense growth for screening, privacy and noise barriers
- retain growth where the continuity of woodland habitat is valued
- retain plenty of standing deadwood for habitat where appropriate
- remove growth to reduce dark and seclusion at over-bridges
- remove growth where a tunnel canopy is developing
- remove growth especially in cuttings, if appropriate
- remove growth affecting structures, drainage and boundaries
- remove growth deemed to be hazardous
- use herbicide to prevent undesirable re-growth from cut stumps
- allow an understorey to develop where appropriate
- plant 'missing' native species
- survey and monitor mature or damaged trees

and most importantly;

- predict the trend of natural succession and adapt all work accordingly
- arrange initial work on a 'fire-fighting' basis
- arrange further work on a section basis

Thinning (how heavy/light)

Weight depends on age, species and the initial density. The basics are;

- attain the final spacing gradually, perhaps every five years
- assess stability, safety, health and growth, to each tree, each time
- look at the canopies not the stems, thinning to create room to grow

Disposal of brash

Small quantities of cut timber and brash have high value on site as habitat. However, larger quantities retained on site can hinder greenway land management, can be very unsightly, block drains and smother more valuable habitat, especially on linear sites. Options will depend on existing site parameters. Tractor powered larger wood chippers are a useful means of reducing the bulk, where appropriate. Woodchips can simply be disposed at site, or mulched at site, or more usefully elsewhere.

Tree planting, pruning, tree surgery and felling

These aspects are essentially outside the remit of this guide. The British Trust for Conservation Volunteers produces two excellent guides: 'Tree Planting and Aftercare' and 'Woodlands' which cover this subject in more depth.

We should however point out that designers must properly consider the long term viability of planting demanding trees and shrubs on impoverished, toxic or compacted railway, reclaimed and construction 'soil' or on the faces of cuttings. Long term trees are best targeted on original land, slopes of embankments and on adjoining land by agreement or as part of a planned assembly of a corridor/network of wild land, working with appropriate agencies and interest groups.

The management of existing natural trees and shrubs is often much more vital and critical. Extensive new planting can consume a great deal of effort and is best advanced in good partnership with the appropriate agencies and interest groups. Intensive small scale planting, to enrich existing woodland, resolve practical problems and provide key points of interest along the greenway corridor is perhaps the most appropriate approach along greenways.

Trees and the Law

Tree work is subject to the Felling Act 1967. Application for a licence to fell growing trees can be made to Forestry Commission (FC) local offices, with reference to 'Tree Felling - Getting Permission' (FCCS100). Not all tree felling requires a licence. Site specific matters can be discussed with the FC.

Notable exemptions include, in brief;

- felling of up to 5m³ per quarter on a property (except if over 2m³ is sold)
- felling trees inherently required for carrying out development authorised by planning permission (Town & Country Planning Act 1970)
- felling trees growing in a designated public open space
- most tree surgery and pruning (but note TPOs and Conservation Areas)
- trees, thinnings and coppice smaller than proscribed diameter classes
- felling necessary for the prevention of danger or the prevention or abatement of a nuisance (as interpreted by FC and Law)

Unless exemptions apply, FC felling permission is required for tree work within Conservation Areas, and 6 weeks' notice of the intention to fell, or to do surgery, pruning or uprooting, must be given to the relevant local planning authority. The FC and Local Planning Authority (LPA) may liaise and advise accordingly.

Unless exemptions apply, felling permission is required for work to trees subject to Tree Preservation Orders, imposed by local planning authorities to protect specific trees, woodland (and often trees within Conservation Areas). If felling permission does apply, the FC and LPA may liaise and advise accordingly.

Procedures differ in each UK country. If felling permission exemptions do apply, application must still be made to the LPA.

Aspects of property law relate to trees and shrubs, for example at land boundaries, where 'nuisance' and damage may be caused by branches, leaves, debris, the spread of roots, the shade created by tree canopies, and the more serious damage caused as a result of storms, decay and structural roots.

In general, trees and shrubs are considered to be part of a 'property' and their management is considered to be the responsibility of the owner of the land in which they are rooted, and from which they have extended above and below ground.

Owners of adjoining land, generally have rights to remove, from their own land holding, only those parts of a neighbour's trees and shrubs, which cross the land boundary.

The Greenway Construction Corridor

Vegetation works prior to greenway construction should only be undertaken after appropriate site survey to identify and hence advise and influence construction design;

- valuable habitat (and protected species such as badgers and bats)
- problem vegetation, hazards and wastes
- valuable landscape elements

Works should proceed with full consideration of the intended future management of adjacent vegetation, which should be protected from the impact of works and retained. This work requires people experienced in habitat, wildlife, landscape and environmental protection, in addition to, and in close liaison with, people experienced in construction. Initial tree and scrub work (eg. prune, fell, thin, process) is best undertaken by separate forestry or arboricultural contractor, supervised by staff, and prior to subsequent works. Surface clearance works (eg. to turf, debris, roots, waste) are best undertaken by a civil contractor during the first stages of construction.

In general, trees, shrubs and overhanging branches should be removed to define an initial working corridor. Dimensions must be adapted as appropriate to conditions and works. For Greenways on disused railways, the absolute minimum required extent of removal of woody vegetation is;

- across the full width of the level track-bed
- along functional drainage lines and within 3 metres of structures

Greenway use is increased and maintenance input is eased considerably if woody growth is removed at least 3m up the sides of cuttings and 1m down embankments sides, at an early stage, especially on single track lines. A minimum working corridor 7m wide by 5m high is useful. Where less constricted, the working corridor can be diverted around high value habitat and root zones of trees. Seek advice from a qualified arborist on options to minimise disturbance. Herbicides can be used for essential vegetation removal. We recommend:

- eradicate growth in the sub base using trans-located herbicide, and to prevent new growth from within the base by using residual herbicide
- only trained, licensed contractors should carry out this work and then using only herbicides approved for the purpose intended. Actual herbicides used, and the rate and timing of application will depend on the target growth, the time of year, the contractor's method and environmental constraints
- usually trans-located herbicide is effective only if applied to unstressed plants during periods of active growth
- residual herbicide can be applied to the final base formation, just prior to surfacing works, to an appropriate width or full width on bridges.