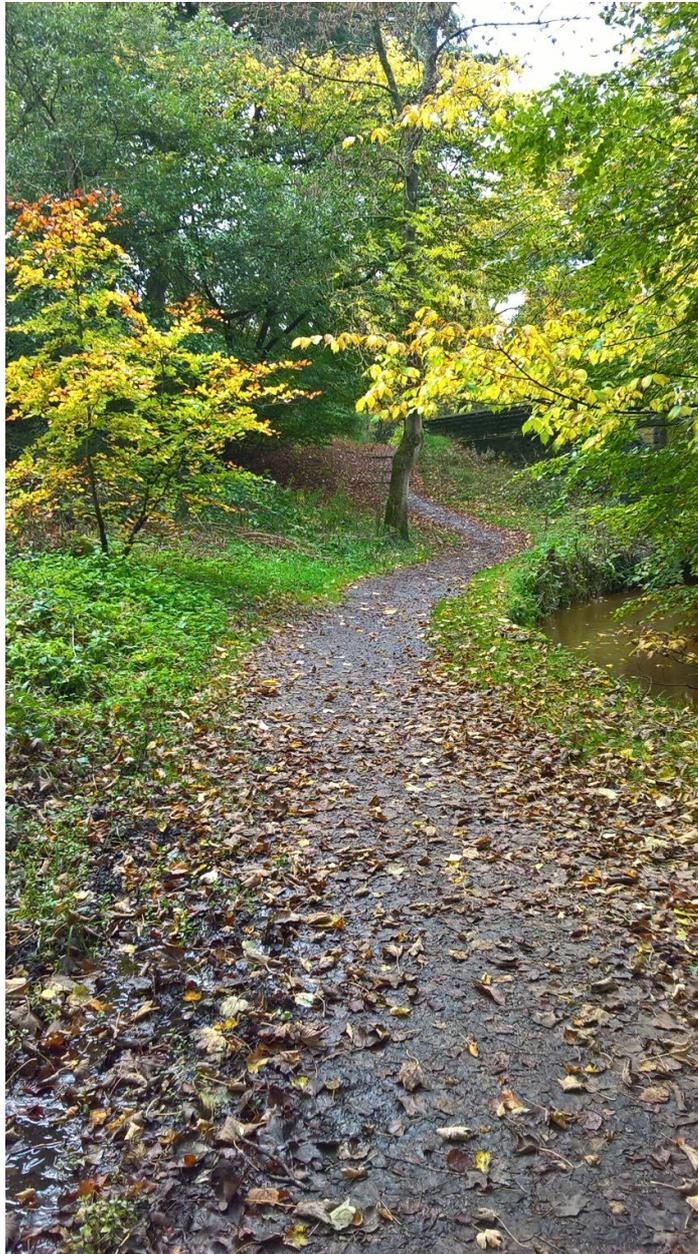


Serpentine Walks

Biodiversity Plan

2022 – 2027

With thanks to Buxton Field Club and BCA for their help and guidance in developing the plan.



1. Overview and Context

The Parks Strategy is the overarching document which informs the management of all our parks. It sets out a clear vision with key priorities and guiding principles as well as specific objectives.

This Biodiversity Plan, which sits within the principal Pavilion Gardens and Serpentine Walks' Management Plan, contributes to the delivery of Objective 1 of the Strategy and demonstrates the Council's commitment to reviewing maintenance regimes to ensure our parks and green spaces are maintained to a high standard, in an affordable and sustainable way and to make improvements to increase and enhance biodiversity and positively affect climate change.

The following information outlines the approach to delivering improvements to increase and enhance biodiversity within Serpentine Walks, including specific identified actions, over a 5 year period.

2. Habitat Management Aims

The management aims are to enhance ecological value of the site for biodiversity by developing resilient habitats. Improving habitats for wildlife benefits the wider landscape and adds aesthetic appeal within Serpentine Walks.

Minimalistic habitat management regimes aim to stimulate self-sustaining ecological processes within the woodland, grasslands and river habitats while maintaining areas of amenity grassland and formal gardens for recreational use.

3. Current Ecological status of the Site

Serpentine Walks is a mix of parkland trees and semi-natural woodland, herbaceous planting and amenity grassland, with small wildflower areas and boggy zones that have been more naturally managed. More than half of the area has mature tree cover comprising mainly beech, sycamore, yew and non-native conifers, and alder, birch and willow. The soils are alkaline pH7.5 to neutral pH7. Around the river, soil moisture levels are very high. The river is partly channelised, and partly semi-natural river bank, particularly on the north bank.

Green corridors provide links between fragmented habitats which improve the foraging opportunities, breeding success and dispersal of wildlife. Serpentine Walks forms part of the green corridor linking Pavilion Gardens, large private gardens, Gadley Wood, and the Cavendish Golf Course woodland to farmland and open moorland to the west. The green at the entrance to Gadley Road is an important link in this corridor, with mature tree cover, recently planted orchard, and a recently reduced mowing regime. More natural grassland management and native tree and shrub planting on Gadley Green and in Serpentine Walks would greatly improve this natural connectivity.

Two branches of the young River Wye converge in Gadley Wood then flow under St. Johns Road and through Serpentine Walks and Pavilion Gardens, creating a corridor for specialised aquatic species and associated wildlife such as bats. Although no formal surveys have taken place in Serpentine Walks, observations over the past few years allow some assessment of the ecological status.

4. Biodiversity Management Objectives

The following outlines the management objectives of the biodiversity plan:

- to improve the areas of wildflowers in Areas 2 and 3 through reduced mowing regimes, natural regeneration and introduction of species into existing amenity grassland;
- creation of a more naturalised river zone to encourage and support wildlife;
- allowing Area 4 to remain informal and wildlife friendly;
- creating signage to explain the importance of increasing biodiversity;
- planting native trees and shrubs to diversify the woodland;
- installation of bird and bat boxes;
- volunteer survey work to measure the success of the scheme.
- to retain in situ wherever possible and safe to do so, any fallen trees, branches or logs to encourage habitat development

5. Areas for Biodiversity Improvements and Suggested Management

Please see map with areas shown and detailed description provided below.



Area 1

This cultivated border at the Burlington Road entrance has developed a range of wildflowers including lesser celandine, cowslip, woodruff, cuckoo-pint and snakeshead fritillary, although it also has a range of overly dominant species such as pendulus sedge and wood avens. An area of mahonia bushes is highly attractive to winter and early spring pollinators, but there is a need for a wider range of native shrubs and perennials. During the early part of 2022, this area was disturbed as a result of underground pipework by Severn Trent Water and although this was temporarily disruptive, it has provided an opportunity to remodel and replant much of this area.

Management:

A native wildflower mix to be sown in the now disturbed area in the first year (spring) to provide immediate colour and impact, to be monitored for success throughout year 2. Overly dominant species such as pendulus sedge to be removed. Overly large shrubs to be pruned back. New perennials and bulbs to be planted from Year 2 onwards.

Area 2

Area 2 is an area of wildflowers and mown grass to the north of the river which is part of the natural river floodplain, being waterlogged for much of the year and partially inundated during heavy rain and river floods.

The central area of this zone has been a focus for wildflowers since 2005 when it was sown with a cornfield mix. Due to the boggy nature of the floodplain, this mix of flora was not self-sustaining, and in 2018 Volunteers from BCA, the Town Team and Urbitat relocated species suited to the damp conditions (such as meadowsweet, water avens, hemp agrimony and willowherbs) to form three discrete wet meadow areas. Volunteers have provided time and expertise to establish this wildflower area.

The far western end near to the ornamental bridge was a small stand-alone area of wildflowers separated from the original wildflower area by mown grass. To create a continuous swathe of wildflowers and visually improve the area, the plan is to encourage the spread of the species from the rest of Area 2, with additional planting through division of existing plants. To this end the limited mowing regime for the rest of Area 2 will be extended to this western area, up to the ornamental bridge. This should help to enhance ecological connectivity and the development of wildlife corridors.

Management:

This area to remain as wildflower zone the extent of which is identified as Area 2 on the map. For the first year, the area will generally be left and monitored with a limited mowing regime (1 cut in late August/early Sept) with regular monitoring of the species present – particularly the western end which is very wet and currently over-dominated by meadow sweet. Some limited planting in year 1 of yellow iris and other wet-loving plants e.g. marsh marigolds, to add colour. For year 2 onwards the intention is to maximise the desirable species in this area through selective removal of undesirable species, dividing and planting, reseeding or introduction of plug plants.

Informal paths to be cut alongside and through the wildflower area to create a clear structure which will better complement more formal areas of the park. This will comprise a 1m mown strip next to the tarmac path, a 1m mown path parallel with the river (located at least 1-2m from the water's edge) and 2 or 3 paths at right angles to the river which give access to the river's edge. After the autumn cut, thatch and arisings to be removed either by cut and collect machine or by raking and removal with volunteer support. To both aid riverbank stability and wildlife habitat and cover, a minimum 1-2 m wide uncut strip will be maintained adjacent to the river edge and there will be no cutting or pruning of shrubs along the river bank.

Area 3 (including 3A and 3B)

Area 3 as a whole has traditionally been an area of mown grass with x16 cuttings per year. In 2021, certain sections were left unmown, with informal pathways cut around the edge and this allowed for some more naturally occurring species to thrive as well as still allowing use for information recreation.

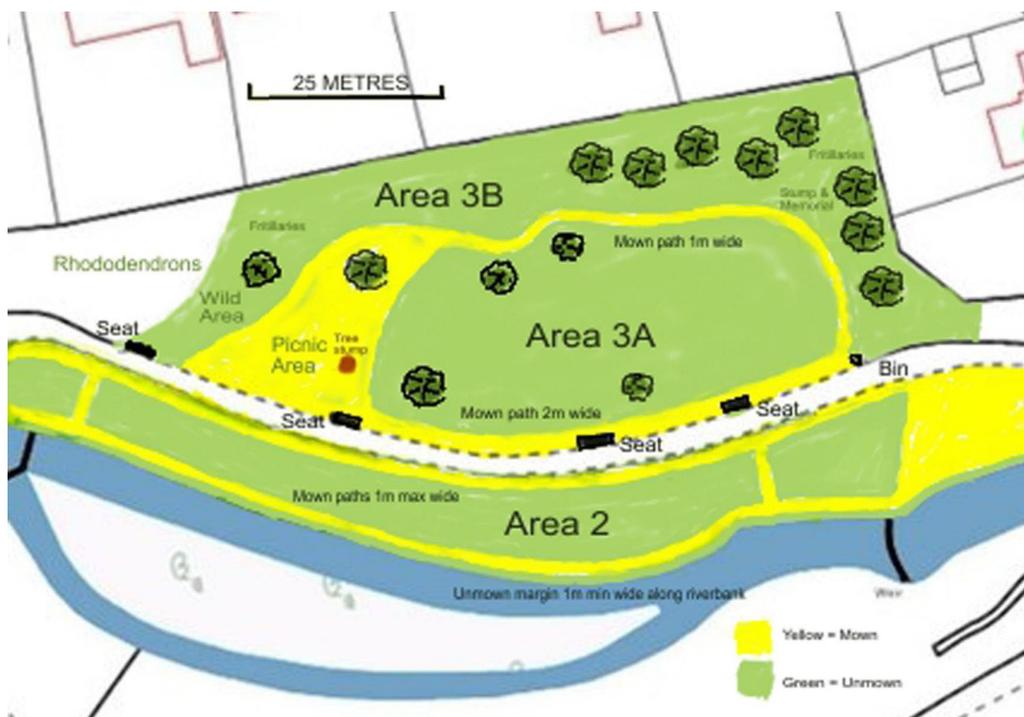
Area 3A is a damp area with soft rush which has been left unmown and **Area 3B** along the boundary

with the properties on St John's Road, is currently snowberry and rough grass with dock and creeping buttercup etc.

The area to the west of Area 3, beyond the rhododendron, to the north of the tarmac path and bordered by the dry stone wall separating the park from the gardens of houses on St John's Road is planted with trees and has large patches of meadow saxifrage in the spring. This is suitable for further enhancement with woodland species and for a similar reduction in mowing as Area 2.

Management (see map below):

Main western section, adjacent to path (around beech stump), to remain on GA mowing frequency for informal recreation or same approach as 2021 with reduced overall mowing but with mown pathways throughout. Area 3a to remain on reduced mowing frequency and to be planted in autumn with suitable species such as fritillary, lady's smock and cowslip. Continue to monitor area. Area 3b would benefit from removal of the over-dominant snowberry and replacing it with native hedging and seeding/plug planting including species such as hawthorn, other native shrubs/small trees such as purging buckthorn, guelder rose, crab apple, native roses, rowan, silver & downy birch, wild cherry, goat willow, dogwood, hornbeam, honeysuckle, hazel, wild privet and spindle, and wildflowers such as foxglove, forget-me-not and red campion.



Area 4

Area 4 is the most naturalised area of Serpentine Walks, situated south of the river and west of the rustic bridge. Along the southern boundary there are trees and shrubs (including native species alder, sallow and birch) with some field layer, which form good habitat for a number of bird species. Fallen trees, felled trees and brash piles create valuable dead wood habitat supporting high numbers of invertebrates and small mammals such as voles. Areas bordering the tarmac path are heavily waterlogged for much of the year and were described as 'bog/damp meadows' on a park information

board that was present within the last 5 years. Wildflowers recorded here include marsh marigold, ramsons, meadowsweet, figwort and great willowherb.

Management:

Wildflower zones in Area 4 should continue to be monitored and actions added to increase the coverage of wildflowers such as marsh marigold and yellow iris, with possible additions such as butterbur - (only if close monitoring and control is possible). A greater coverage of native species in the very wet zones of Area 4 would improve the areas throughout the year, and play a part in reducing the wet mud that occurs around and on the paths in autumn and winter. There is also a need for a regular programme of maintenance and improvement of the stretches of path next to the river, in this whole area.

A trial compost area using the raised bank as backing and existing logs to create a contained has proved useful and will be retained. This takes the thatch raked from other areas in the site, and is situated to the right of the diagonal path cutting up the bank to the houses behind.

At the far western end volunteers have created a living hedge and fernery with bulb planting. This provides a model for considering further opportunities to create fern planting around the felled deadwood. Brash piles provide important habitats for invertebrates and small mammals and further brash could be added as these rot down to improve the structure of this area. Planting willow and alder into the wettest areas would perhaps help to stabilise the ground, and provide valuable habitat and winter colour interest.

To maximise habitat protection and creation, where there are fallen trees or if trees are felled, where it is appropriate to do so, as much of the wood as possible will be retained on site as valuable habitat. Similarly, valuable ground and tree cover, such as ivy*, will be left in situ to provide sources of food, shelter and habitat, unless identified as problematic to particular trees by the Council's tree officer.

Area 5

An area north of the river which leads up to St. John's Road which is being left to naturalise. There are two desire line paths and the grassed area adjacent is mown on the GA mowing frequency. This area has great potential for further improvement, for example with the planting of native shrubs and bulbs the creation of a stumpery using wood from fallen/felled trees and habitat 'heaps'.

Management:

Leave area to naturalise with the adjacent grassed area mown on the GA frequency.

*The nectar, pollen and berries of ivy are an essential food source for insects and birds, especially during autumn and winter when little else is about. It also provides shelter for insects, birds, bats and other small mammals. Ivy is particularly important to many insects before they go into hibernation and it is an important food plant for some butterfly and moth larvae.

Biodiversity Maintenance Plan 2024 Onwards

This is the management plan for biodiversity and therefore shows the Council and AES, primarily supported by BFC and the Wildflower Volunteer Group, as holding overall responsibility for its delivery. An accompanying Management Plan for the maintenance of physical structures within the Serpentine Walks shows responsibility for supporting the Council and AES in that respect lying with the Town Team.

Area	Description	Proposed Maintenance	Frequency/Timescale	Responsibility/Resources	Costs
1	Existing border next to Burlington Road entrance.	A suitable wildflower mix to be sown in the now disturbed area in the first year (spring) to provide immediate colour and impact. This will be monitored for success throughout year1.	2022	Council/BFC/Wildflower Volunteer Group/AES	£200
		Action to enhance biodiversity and colour in the whole border: removal of overly-dominant and non-flowering species, planting of native wildflowers, bulbs and plants good for pollinators, pruning of shrubs/trees to allow light in to border	2023 Onwards	Council/AES /BFC/Wildflower Volunteer Group AES to assist where needed with removal of arisings	£500 for plants (2023)
2	Wildflower zone, north of the river.	To manage and maintain as wildflower area within current mapped extent – to ensure that overly-dominant species are managed to maintain good diversity and control height. Continued purchasing/planting/relocation of plants such as yellow iris and other wet-loving plants e.g. marsh	2023 onwards One cut of the whole of Area 2 at the end of the summer (late Sept/early Oct) before it gets too wet. Thatch to be removed afterwards by either the cut and collect machine or by raking off and disposal to compost area.	AES/BFC/Wildflower Volunteer Group	None

		marigold, mimulus purple loosestrife to add colour.			
		<p>Informal paths to be cut alongside and through the wildflower area–</p> <p>There will be 3 access paths of 1m from the tarmac path to the river's edge at the following points:</p> <ol style="list-style-type: none"> 1) From the bench in memory of a member of the Forsyth family 2) From the bench nearest to the remains of the felled beech tree 3) by the large notice board. <p>Replace and updating information signs/panels as necessary</p>	<p>2023 onwards.</p> <p>Cutting regime as above.</p>	<p>AES/Council</p> <p>Council/Wildflower Volunteer Group</p>	<p>£1000</p>
		<p>Retain minimum 1 – 2m wide (the wider the better) uncut strip adjacent to river edge.</p> <p>South side of river edge to be left open to preserve more open landscape as the original feature of the historic parkland.</p>	<p>2023 onwards</p> <p>To be left uncut.</p>	<p>AES</p>	<p>None</p>
		<p>Regularly survey wildflowers, butterflies and bees.</p>	<p>2023 Onwards</p>	<p>BFC/Wildflower Volunteer Group</p>	<p>None</p>
		<p>Maximise the desirable species in this area</p>	<p>2023 Onwards</p>	<p>BFC/Wildflower Volunteer Group</p>	

		through selective removal of undesirable species, dividing and planting, reseeding or introduction of plug plants.			
		Encourage the spread of species from Area 2 with additional planting through the division of existing plants, to create a continuous swathe of wildflowers and visually improve the area. Reduced mowing with one cut in the autumn as with the rest of Area 2.	Limited mowing in year 1 to allow for assessment of naturally occurring flora – only one cut in late summer. Enhance this area with additional planting in year 2.	AES/BFC/Wildflower Volunteer Group	
3 (A&B)	Area adjacent to path (around beech stump) See maps above for detail	To remain on GA mowing frequency for informal recreation with reduced overall mowing but with mown pathways throughout.	2022 onwards Reduced mowing with informal paths cut through and one cut in autumn. Thatch to be removed by cut and collect machine.	AES/BFC/Wildflower Volunteer Group	
	Rest of Area 3 (A & B) mainly wet ground) See maps above for details	Reduced mowing with informal paths cut through. Planting of suitable/wet-loving species such as fritillary, lady's smock and cowslip in the Autumn.	2023 onwards	AES BFC/ Wildflower Volunteer Group	£500
	Section 3B (boundary with properties)	Replacing of snowberry with native hedging/shrubs and seeding/plug planting including	2023	BFC/Wildflower Volunteer Group AES to assist with rooting out of snowberry	£500

		species such as foxglove, for-get-me-not and red campion, to be introduced 2023 onwards. On-going monitoring and removal of unwanted snowberry shoots			
4	Waterlogged area with semi natural woodland and bog/damp meadow.	Allow current flora to spread and stabilise wet soils.	2022 Onwards	BFC/Wildflower Volunteer Group	None
		Retain all ivy in situ unless assessed by HPBC as being detrimental to trees or structures or where it is being replaced with alternative planting		Council/BFC/Wildflower Volunteer Group	
		Retain all trunks, brash and branches of any fallen or felled trees and any dead wood and woodpiles unless deemed unsafe by HPBC and repurpose brash on site if appropriate	2022 Onwards	Council/BFC/Wildflower Volunteer Group	None
		Install, maintain and monitor bird and bat boxes and consider a programme of surveys for trees and clearings	Winter 2022 onwards	BFC/Wildflower Volunteer Group	£200 for materials for boxes
		Maintain compost area to the right of the diagonal path cutting up the bank to the houses behind. This will utilize the raised bank as a backing and existing logs to create a contained area.	Spring 2022	BFC/Wildflower Volunteer Group/AES	Existing on site log piles

		Introduce areas of willow/other water-tolerant species and consider introducing a small monitored area of butterbur	2022 Onwards	BFC/Wildflower Volunteer Group	None
		Consider options to further develop fernery in deadwood areas eg with use of logs or limestone.	2023	BFC/Wildflower Volunteer Group/AES	Unknown
		Carry out a regular assessment and improvement programme on the paths alongside the river to combat regular flooding/innundation	2024 onwards	Council/AES	Unknown
5	Naturalised area bordering north of the river and leading to St Johns Road.	Area to be left to naturalise. Grassed area adjacent to be cut on GA mowing frequency. Addition of native shrubs, planting of tall bulbs and creation of stumpery or habitat heaps 2024 onwards	2024 onwards	BFC/Wildflower Volunteer Group/Council/AES	None
General	Management of Ivy	Ivy to be retained and left in situ on either side of the newly-discovered path on the South of the river, as well as along the stone walls of the river from the little bridge to St John's Road.	2023 onwards	BFC/Wildflower Volunteer Group/AES	None

Other future considerations for further biodiversity enhancements:-

- Protection of the River Wye
- Further tree and shrub planting
- Installation of bat boxes
- Ongoing survey work
- Wider community involvement