

PURWELL MEADOWS LOCAL NATURE RESERVE GREENSPACE ACTION PLAN (GAP) 2017 - 2022



April 2017

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1 SITE SUMMARY

Name	Purwell Meadows Local Nature Reserve
Address	Cambridge Road Hitchin SG4 0NE
Grid ref	TL 20013 29861
Size	8.8 ha (21.7 acres)
Owner	North Herts District Council (NHDC)

The Greenspace Action Plan (GAP) for Purwell Meadows Local Nature Reserve sets out the management, maintenance and development framework of the site over five years, with detailed action plans and management maps provided for the each year of the plan and core aspirations for the long term management of the meadow.

The previous GAP ran from 2011 to 2016. This new GAP follows on and seeks to build on, the legacy of a successful Veolia Landfill Communities Fund (LCF), NHDC and HCC funded project where CMS worked in partnership with NHDC from 2012 to 2014. The project enabled enhancements to be made to entrances, interpretation, grazing infrastructure, river restoration and other wildlife habitat improvements.

The management plan will be reviewed annually, so that any outstanding tasks can be rescheduled as necessary. The management plan will also be frequently reviewed in conjunction with the Countryside Management Service and any other relevant bodies.

VISION STATEMENT

Purwell Meadows will continue to be an important site for wildlife in the Purwell Valley, managed as good quality habitat and serving as a stepping stone for wildlife to move along the valley. It will provide visitors and local residents an attractive greenspace in the heart of Hitchin.

This will be achieved by the following aims:

To provide clear and welcoming access into and throughout the site

To ensure that visitors to Purwell Meadows feel safe and able to enjoy the site at all times

To ensure the standard of maintenance is maintained and relevant throughout the site

To ensure ongoing costs are sustainable and secure external funding for capital works

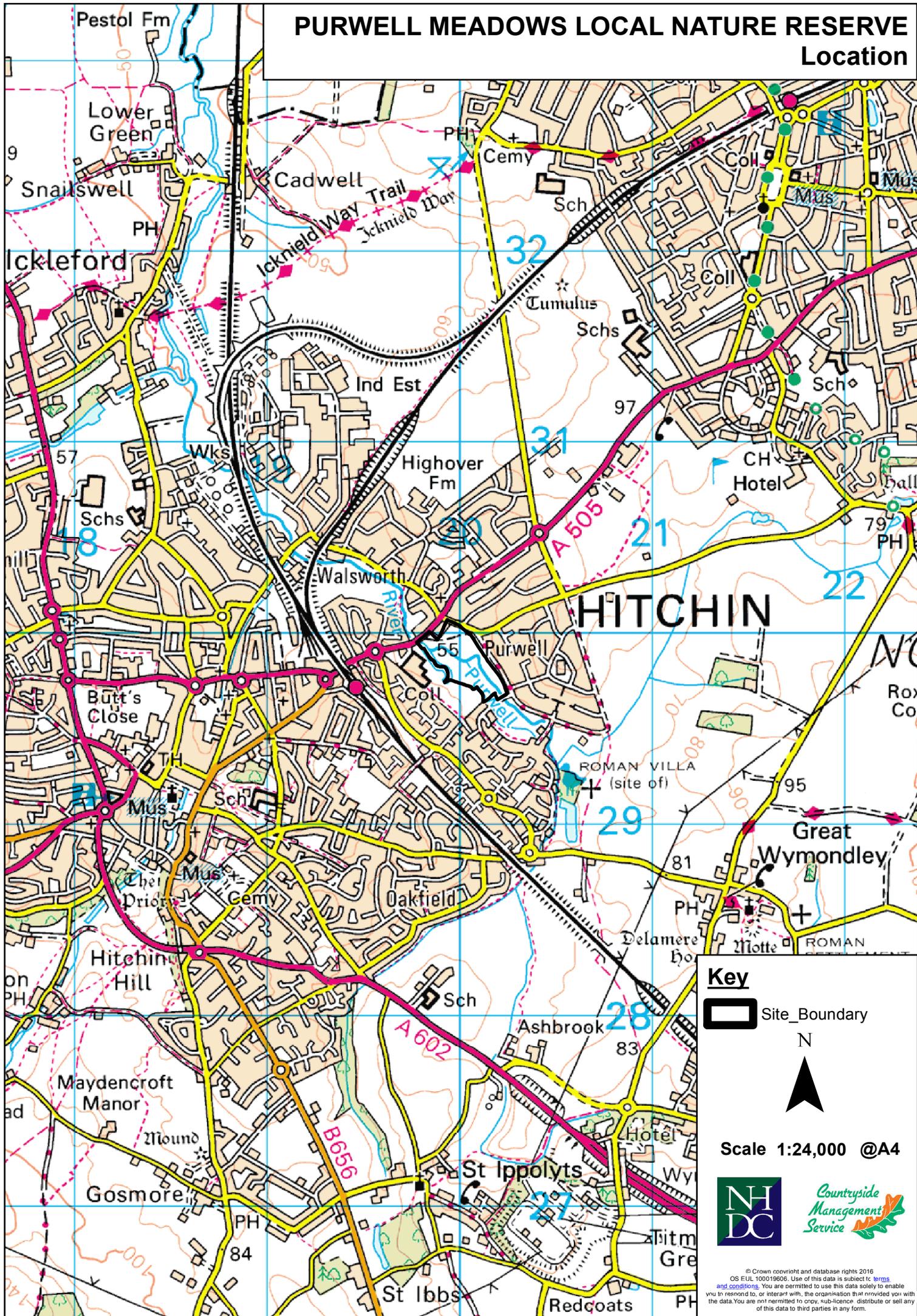
To protect and enhance the biodiversity that can be found on site

To support and encourage community involvement at Purwell Meadows

To promote awareness, interest and engagement in Purwell Meadows

PURWELL MEADOWS LOCAL NATURE RESERVE

Location



Key

- Site_Boundary

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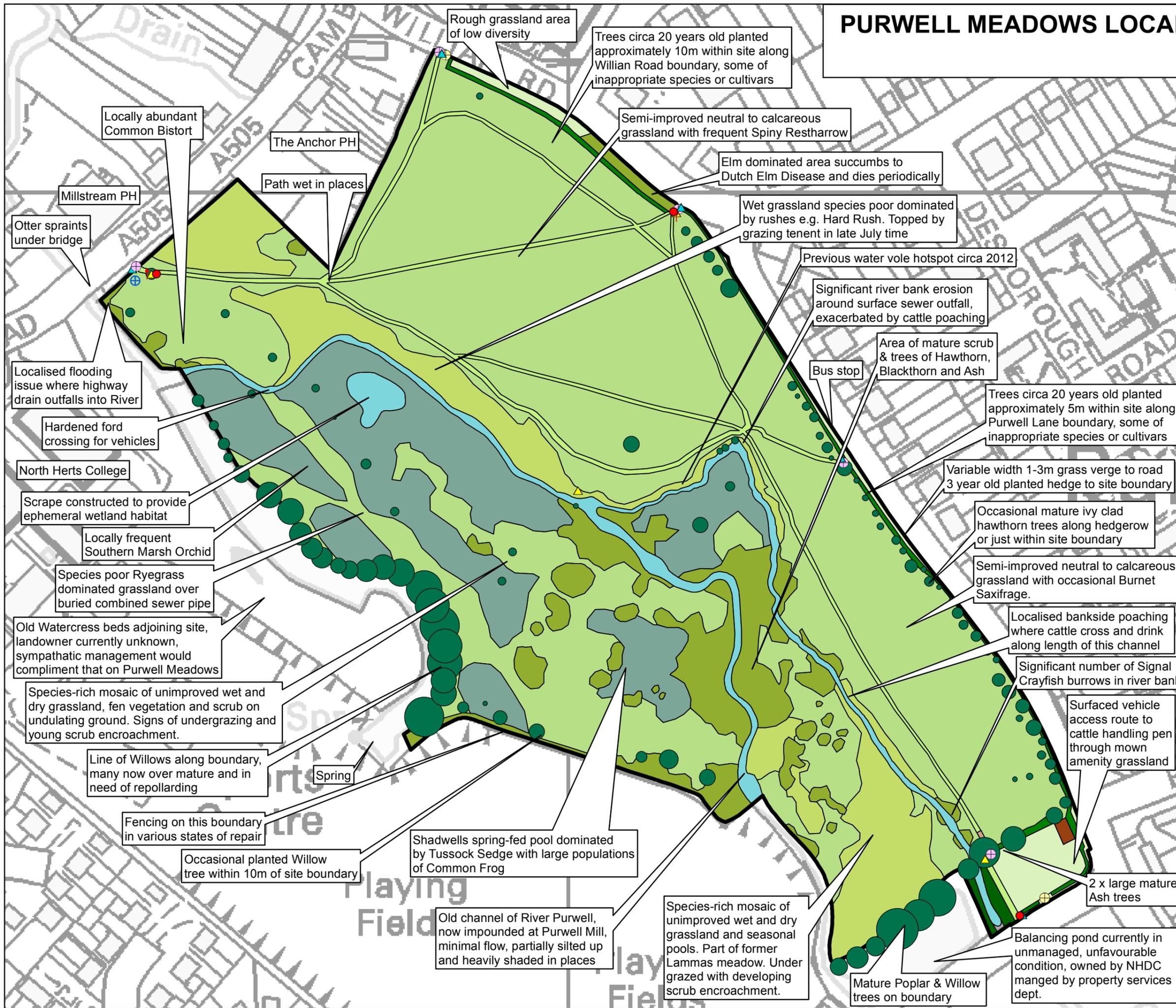
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PURWELL MEADOWS LOCAL NATURE RESERVE

Site Description



- Key**
- Site Boundary
 - Amenity grass
 - Grass path
 - Hedgerow
 - Permeable path
 - Culvert
 - Scrub
 - Wet rush pasture
 - Dry calcareous/neutral grassland
 - Water
 - Fen vegetation
 - Woodland
 - Cattle Handling Pen
 - ▲ Entrance sign
 - ▲ Interpretation sign
 - ▲ Notice board
 - ↑ Waymarking post
 - Dog bin
 - ⊕ Kissing gate
 - ⊕ Vehicle gate
 - ⊕ Flag pole
 - Trees

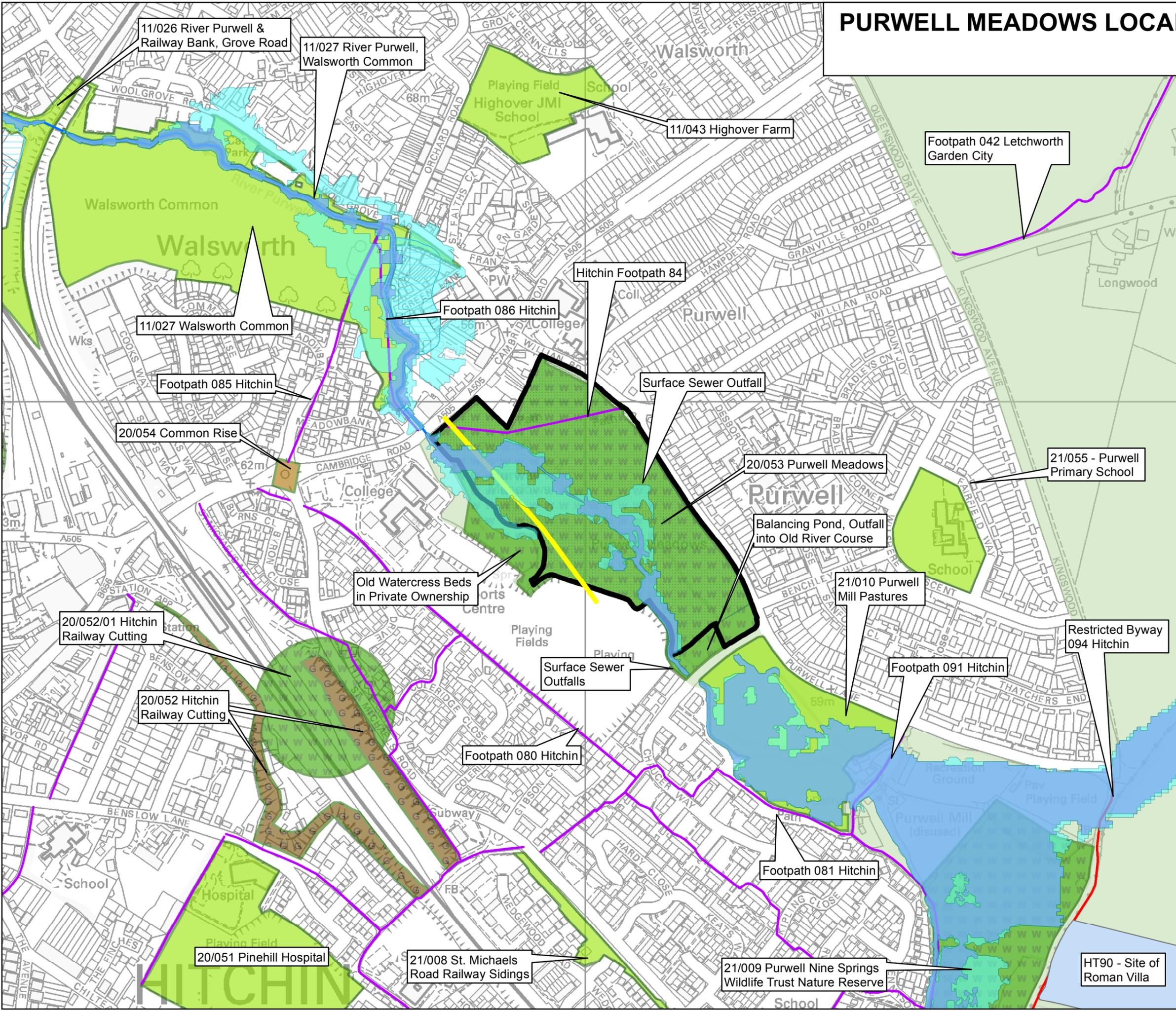


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PURWELL MEADOWS LOCAL NATURE RESERVE Constraints



Key

- Flood Zone 3
- Flood Zone 2
- Historic Flood Map
- Main Rivers
- Site Boundary
- Buried Combined Sewer Pipe
- Scheduled Monument
- Byway Open to All Traffic
- Restricted Byway
- Bridleway
- Footpath
- Temp Closed Footpath
- Temp Footpath
- Unmetalled UCR
- Local Nature Reserve

Local Record Centre Sites

Site Type

- Wildlife Site
- Deselected Wildlife Site
- Ecosite
- Deleted Ecosite
- Local Geological Site
- Geosite
- Deleted Geosite
- Greenbelt - March 2007



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2.3 INTRODUCTION

Purwell Meadows Local Nature Reserve is a 8.8 hectare (21.7 acre) greenspace owned by North Hertfordshire District Council, and managed in partnership with Countryside Management Service (CMS).

The mosaic of dry grassland, marshy grassland, hedgerows and scrub along the river at Purwell Meadows are home to a wide variety of plants, birds, animals and insects. The site is part of a chain of important wildlife areas along the Purwell Valley linked by the River Purwell. The meadows provide a “stepping stone” for the movement of wildlife along the valley such as Water Voles and Otters. The clear, mineral rich water of the river keeps the low lying land of Purwell Meadows damp, creating marshy wet grassland and wet hollows which support a rich and distinctive variety of wildlife.

Springs rise out of the chalk bedrock at St. Ippolyts, flowing down Ippollits Brook, joined by other springs to form the River Purwell. Chalk Rivers are a rare habitat globally and in the UK, making the River Purwell of worldwide importance.

2.4 LANDSCAPE & GEOGRAPHY

The site is covered by a number of designations, listed below:

Scale	Designation	Detail
County	Local Wildlife Site	The majority of the site is designated under 20/053 Purwell Meadows with the LWS inventory giving the following reasons for designation; Old pastures along the River Purwell and its associated streams, mostly of unimproved calcareous grassland with areas of marshy ground and associated springs, some scrub, a former cress bed and secondary neutral grassland. The site supports a diversity of lower and higher plant species including a number of species uncommon or rare in Hertfordshire. Species of interest recorded include Quaking Grass (<i>Briza media</i>), Spiny Rest-harrow (<i>Ononis spinosa</i>), Greater Bird's-foot Trefoil (<i>Lotus pedunculatus</i>), Common Fleabane (<i>Pulicaria dysenterica</i>), Water Horsetail (<i>Equisetum fluviatile</i>), Blunt-flowering Rush (<i>Juncus subnodulosus</i>), Brown Sedge (<i>Carex disticha</i>), Bottle Sedge (<i>C. rostrata</i>), Adder's-tongue (<i>Ophioglossum vulgatum</i>) and Southern Marsh-orchid (<i>Dactylorhiza praetermissa</i>). The meadows are of local importance to birds especially for passage and feeding. Protected species have been recorded on the site. Wildlife Site criteria: Grassland indicators; fen and swamp indicators.
District / Borough	Conservation area	The entire site is contained within the Metropolitan Green Belt.
	Local Nature Reserve	The site was declared in 1994 by North Herts District Council.

Parts are affected by springs derived from the water table above the relatively impermeable Melbourn Rock strata in the chalk beneath the site.

The underlying bedrock geology comprises melbourn rock member chalk this is overlain for much of the site by superficial geology deposits of alluvium of clay, silt, sand and gravel. The geology is overlaid by poor draining gleyed soils over alluvial drift predominately. The majority of the soils are clay to sandy loams of riverine clay, sands and gravels. There are local areas of fine sand to sandy loam soils over river terrace sand and gravel.

Purwell Meadows is located in the North Herts Landscape Character Area 217 – River Oughton and Purwell. The area’s key characteristic is traditional cattle grazed water meadows along meandering watercourse with associated ponds and water bodies and linear woodland belts. The River Purwell is typical of this character area with its wooded banks of poplar, willow and ash, with mature hawthorns dotted along the banks.

2.5 HISTORY

Archaeological Interest

The meadows have a number of ancient features. Consultation with Hertfordshire County Council Historical Environment Record in July 2016 found a number of records, 3 records within site boundary and 4 within a few hundred metres of site boundary, only 3 of which are thought to be relevant:

ID	Name
291	NEOLITHIC FLINT IMPLEMENTS, PURWELL, HITCHIN
12573	SITE OF WATERCRESS BEDS, PURWELL MEADOWS, HITCHIN
12579	ROAD BRIDGE OVER RIVER PURWELL, WALSWORTH, HITCHIN
16315	THE ANCHOR PH, CAMBRIDGE ROAD, WALSWORTH, HITCHIN
18205	LATER BRONZE AGE/EARLY IRON AGE DITCH, CAMBRIDGE ROAD, WALSWORTH, HITCHIN

For further details and location of the records are held on file.

The below paragraph summarises the significance of the records:

“..... The record for the prehistoric ditch in the pub yard is interesting, as it shows how long this has been open land; this is quite normal in Hertfordshire, but worth knowing for a specific place. The historic OS maps show that the Millstream pub was really The Ship, to go with The Anchor, but why these nautical names I have no idea. Otherwise, the only other point to make is that watercress beds were a major Hertfordshire industry in the late 19th and earlier 20th centuries, sending vast quantities of cress by train to London markets.”

Land-use history

Compartment numbers and names refer to old management plan map in appendix ...

The Court Leete and View of Frankpledge of the Manor of Hitchin, 21st October 1819, gives full details of the Commons of Hitchin and their uses. In this document, the area known as Shadwells and Mungees are identified as Lammas Meadows (Compartments 6,7 and 8). These pastures were in private ownership, but had rights of common pasture for cattle and sheep as follows:

"The Homage find that the occupier of every ancient messuage or cottage within the Hamlet of Walsworth hath a right to turn and depasture on the commonable land thereof ... two cows and a bullock or yearling cow calf ... upon the Lammas ground in

Walsworth upon and from Old Lammas-day (13th August) until Old, Lady Day (6th April). That no person hath a right to common or turn any sheep upon the Lammas ground of Walsworth between Old Lammas-day and the last day of November."

From this, it is evident that for these two areas at least, common pasture of livestock during the winter was practised, probably at least from medieval times until the beginning of the last century.

The place-names shown on an 18th Century estate plan of the estates of the Whitehurst family, in Herts County Record Office, dated 1767, give some clue that the main Lammas Meadow (Compartments 6 and 7) was a site of some antiquity. The name 'Shadwell' is related to 'Cadwell', and refers to the Anglo-Saxon saint of wells and springs, St Chad. It is possible that the site has some early significance. The same map shows the remainder of site divided into five other fields: Pelters, Great and Little Garrats, Sulters and Gilberts, each enclosed by hedges. The age of these enclosures is unknown, but probably at least Tudor, and quite possibly much earlier. By 1818, when the town of Hitchin was surveyed by W. Merrett, these five fields had been reduced to three: Compartments 2 and 5; Compartment 1; and Compartments 3 and 4. Papers in the Wilshere Collection at Herts. Record Office give these the names Ship Close, Walkers Close and Gilberts. The 1818 map and survey also indicate that the last two fields were then under arable cultivation, and it is possible that all five of the 18th Century fields east of the river have at one time or another been cultivated.

Purwell Mill is of at least 18th Century date, but a mill is known to have been on the site since about the 16th Century at least. The construction of the mill stream would probably date from at least this time. Water flow through the mill along the course of the old River Purwell has ceased to operate, following the stopping up of the mill race in about 1970.

The neighbouring watercress beds appear to have been widened out from the previously existing stream and spring source in about the 1920's. Before this time, the stream and spring were an integral part of the meadowland, and included in the 18th Century area of Lammas meadow, Shadwells. Watercress has not been cultivated here for about ten years.

Since the cessation of Lammas winter grazing, when the meadows would have been cut for hay in summer, there are no accurate records available for the grazing pattern of the meadows. Summer grazing by tenants has been in operation for many years, although a period without grazing in the early 1970's led to some extra scrub growth. Finally, a sewer was laid across the west side of the site in 1972, resulting in dry ground conditions in former marsh areas. This has also encouraged access across the river from the footpath, increasing disturbance, as well as having opened a gap in the west boundary of the site adjacent to the neighbouring college grounds, allowing a through passage.

The site was purchased in 1984 by NHDC with grant support from World Wildlife Fund (WWF) and Countryside Commission. A management plan was formulated, with site being managed by NHDC with a grazing tenancy in place since this time.

In 2011 CMS working in partnership with NHDC undertook a project to deliver a range of capital works from the agreed Greenspace Action Plan, published in the same year, to benefit both people and wildlife. Funding for this project came from a combination of Veolia Landfill Communities Fund, NHDC PRG Grant, and HCC through Flood Risk Management Dept.

This project delivered a number of capital improvements and habitat management works including production and installation of interpretation panels, notice boards and entrance signs at the main entrances, replacement of old stock fencing and access gates, new cattle corral and vehicle access from Chaucer Way, crown lifting of trees and hedgerow restoration along Purwell Lane and Willian Road boundaries, scrub clearance, river bank restoration, formalising of ford and the excavation of wader scrape.

2.6 HABITATS & WILDLIFE

See Site Description map on page 8 for overview

For full description of the various habitats and species present on site see the latest wildlife site survey in appendix 1

2.6.1 GRASSLAND & WETLAND

Old pastures along the River Purwell are a diverse and interesting mosaic of unimproved neutral-calcareous grassland and wet grassland with associated fen, marginal vegetation and springs.

The majority of the eastern side of the river consists of semi-improved neutral grassland a transition between MG5 and MG6. The sward has a high percentage of grasses of Crested Dog's Tail, Perennial Rye Grass, False Oat Grass, Rough Meadow Grass and Red Fescue, with 40% herbs including frequent Spiny Restharrow, Black Knapweed and Meadow Buttercup. This area has frequent Creeping Thistle which is topped each year.

Bordering the river and in wet hollows are areas of rush pasture of MG10b Soft Rush, Yorkshire Fog, Hard Rush sub community, with frequent Hairy Sedge, Hard & Soft Rush, occasional Silverweed and Ragged Robin. At the northern tip between the ford and the road bridge is an area with an abundance of Common Bistort.

To the west of the river and between the old and new river courses to the south is a mix of neutral/calcareous grassland on slightly higher humps of ground with fine grasses and frequent herbs including Common Birds Foot Trefoil, Meadow Saxifrage and Lady's Bedstraw, these areas contain large anthills.

In the wet hollows and low lying damp areas is a mosaic of wet grassland and fen with some affinities to M22b and M27 vegetation communities. The wet grassland is dominated by Blunt-flowered Rush, Hard Rush and Common Sedge, with forbs present including Greater Birds Foot Trefoil, Fen Bedstraw and Silverweed. The fen areas have an abundance of Meadowsweet, Greater Willowherb and Water Figwort. Within these areas is a spring fed pool (referred to as Shadwells) dominated by Greater Tussock Sedge with Marsh Valerian.

Areas of scrub are cleared rotationally each year to maintain the open nature of the grassland and provide space for a diversity of wildflowers to thrive. Grazing has continued on site maintaining the grassland habitat diversity.

Areas of wetland were identified as drying out due to pressures on the water resources feeding them resulting in a poor diversity of species and unfavourable condition of the habitat. A shallow scrape was constructed in 2013 to lower soil levels closer to the current water table. This is being allowed to revegetate naturally, it already shows a diversity of plants including Stonewort sp., Water Crowfoot sp.,

Water Plantain & Plicate Sweet-grass and is being used by wading birds such as snipe and little egret.

2.6.2 TREES, HEDGEROWS & SCRUB

There is a scattering of mature trees across the site mainly within the hedgerows including two mature Ash trees close to the entrance from Chaucer Way. Along the boundary with the watercress beds is a line of tall of over-mature Willow pollards. Following the effects of storms and dutch elm disease in the late 1970s/early 1980s on the number of mature trees on site, a programme of planting was undertaken by NHDC. With occasional Willow trees planted approximately 10 metres into the meadow from the college boundary and a mix of field maple, ash and oak planted along the Purwell Lane/Willian Road boundary with these again being planted within the meadows approximately 5-10m from the boundary. The species are not from local provenance stock and appear to be more cultivated varieties.

In 2012 the main hedgerows along Purwell and Willian Road were coppiced and replanted with standard trees kept and crown lifted to improve the hedgerow for wildlife and open up views across the meadows from the surrounding residential areas. A new section of hedgerow was also added at this time as a continuation of this along the Chaucer Way boundary. Hedgerows along the boundary with the college playing fields are mainly Hawthorn with areas of blackthorn much of which is quite mature and has spread into the meadows forming a bank of scrub.

Within the boundary to Willian Road is an area of regenerating Elm, a remnant of the Elm hedgerow which once ran along this boundary.

The meadows have areas of mature scrub, particularly in the centre of the site between the two river courses, and scattered mature Hawthorn bushes which provide some shade for livestock. The grassland on the east side of the river has very little to no developing young scrub and bramble. Conversely the grassland and wetlands on the west side of the river have areas of young and developing blackthorn, hawthorn rose and bramble.

2.6.3 RIVER

The River Purwell consists of two channels through the southern half of the site, the one to the east is understood to be the old mill channel which returned water to the main River Purwell after passing through Purwell Mill, this now carries the majority of the water flow. The original river channel to the west has low flow due to an impoundment at Purwell Mill when it ceased use in the 1960's, with the water source coming mainly now from surface water sewer flows and the dilapidated balancing pond.

The current main channel has areas of gravel bed and some quite silty sections. The channel has a mix of vegetation including in channel Starwort sp., Watercress with Brooklime and Lesser Water-parsnip on the margins. Where the banks are not as heavily accessed by livestock, stands of Yellow Flag, Branched Bur-reed, Greater and Lesser Pond Sedge have established giving the water course some diversity

There are occasional areas of overhanging blackthorn scrub and occasional young Alder trees on the river bank in the southern half of the site but much of the northern half is unshaded.

Banks of the River Purwell had become badly eroded in certain areas and around the informal fording area. These were restored in 2013 using soft engineering techniques, backfilling with spoil and turfs from the scrape excavation. The ford crossing was formalised which has also enable easier access for management vehicles. The restoration has stabilised the banks and vegetation is well established. There are however still some problem spots along the river where excessive erosion is an issue.

The old original river channel in the south western corner of the site is heavily silted due to the low flow and is more heavily shaded than the other river course. As such the vegetation is more sporadic and less diverse.

2.6.4 WILDLIFE

Evidence of Otters using the site has been found regulary over a number of years with spraints found under the bridge by the Millstream pub.

Evidence of Water Voles using the site has been found sporadically in the last 6-7 years with the records of Water Vole activity recorded in the centre of the site in 2012. Recording effort since this time has been low and yielded little records. Previous records are thought to be foray attempts by the population at Purwell Ninesprings to make new territory/outlying populations, as they coincide with records of high population densities at Purwell Ninesprings.

Himalayan Balsam is present a low numbers within the river system.

The local wildlife site survey (Aug 2016) highlighted that New Zealand Pygmy weed (*Crassuli helmsii*) was present on the site of the old watercress beds, this is not currently identified within Purwell Meadows but should be monitored as this plant could significantly harm the wetland habitats present on the meadows.

Invasive signal crayfish are also present on site in the river with numerous burrows concentrated in particularly areas on site, this is particularly evident in the southern half on the current main river channel.

2.7 ACCESS, INFRASTRUCTURE & FACILITIES

2.7.1 ACCESS

Due to the sites central location in Hitchin and being bounded on several sides by roads with footways, the meadows can be easily accessed by the local community and other visitors.

The meadows on the eastern side of the River Purwell are easily accessible for much of the year with a network of grass paths. Following wet weather and in periods throughout the winter some paths become quite muddy and wet in places.

The meadows on the western side of the River Purwell are quite inaccessible apart from the most persistent visitor. This is due to there being no dry crossing points to this side of the river. The formal ford at the northern end can be crossed in wellies. This is an advantage to the conservation of wildlife and habitats on site by providing a natural barrier to disturbance of sensitive species e.g. ground nesting birds.

2.7.2 SITE ENTRANCES

Pedestrian Entrances

The site has several pedestrian entrances all of which are located on the east side of the river. The main entrance points for visitors have large mobility kissing gates with a Radar padlock allowing access for wheelchairs and mobility vehicles, these are located:

- Opposite the Millstream Pub close to the bus stop on the Cambridge Road
- On Willian Road close to the junction with Purwell Lane
- Off Chaucer Way close to the junction with Purwell Lane

Secondary entrance points taking less traffic have medium mobility kissing gates, these are located:

- North-eastern corner of the site close to the junction of Willian and Cambridge Road
- Mid point on the eastern boundary from Purwell Lane close to the bus stop

Vehicular Entrance

The sites main vehicular entrance is off Chaucer Way close to the junction with Purwell Lane, here there is a drop kerb to a wide (4.8m) double gate, with a surfaced route across the grass to a cattle corral which can be driven through to access the remainder of the site. This access point was created in 2013 to improve safety when accessing the site particularly for the delivery and collection of cattle.

In addition the original vehicle access point (3.6m) was retained in the north-east corner of the site off the Willian Road. Use of this point should be minimised on safety grounds due to the proximity of the junction with the main A505 Cambridge Road junction.

Parking

There is no formal parking for the site. Visitors can park on adjacent residential streets, with Chaucer Way being the easiest and safest option from which to access the site. The Millstream and Anchor pubs have car parks which site visitors may use if they are also visiting one of the pubs.

2.7.3 STRUCTURES & PARK FURNITURE

Signage and Interpretation

In 2013 new routed oak entrance signs following the NHDC house style were installed at each of the five entrances along Chaucer Way, Purwell Lane, Cambridge and Willian Road.

In addition at each of the three main entrances an upright oak framed combination A1 interpretation/ orientation panel with a notice board were installed in the same year.

To complement the interpretation/orientation panels at the entrance, a separate A2 interpretation panel was installed close to the River Purwell (where the old course meets the new) with a water colour illustration of the chalk stream and associated wetland habitats and species. This is mounted in a metal lecture frame rather than timber due to its susceptibility to damage from cattle

Dog waste bins, litter bins

There are dog waste bins located at each of the three main entrances which are regularly emptied. There are no litter bins on site, but one lies close to the main entrance opposite the Millstream pub by the bus stop.

The site does suffer from a slight litter problem, mainly blown in from the adjacent highways/footways and brought in down the river. The grounds maintenance contract carries out regular visits to pick this litter keeping the site clean. This is supported by a volunteer who regularly litter picks parts of the site.

Balancing Pond

This is outside the scope of this management plan but details are included here for future reference. Adjacent to the southern boundary of the site is a balancing pond/silt trap which was installed when the housing along Chaucer Way was built. It has fallen into disrepair, it is now heavily silted up with mature Willow trees established in it. It is therefore unlikely to be functioning as intended. The pond is owned and managed by North Hertfordshire District Council through their property services department.

2.8 MANAGEMENT, COMMUNITY INVOLVEMENT & EVENTS

2.8.1 MANAGEMENT

Responsibility for the management of Purwell Lane lies with its owners NHDC. Current management operations through grounds maintenance contract include: management and maintenance of the paths surface and signage, grassland management, litter picking, fly tip removal and reactive tree works to address safety issues. The maintenance works are currently carried out by John O'Connor's (JoC) ground maintenance contractors.

A grazing tenancy is active on the site for which a small rent is paid, full details of the tenancy are held on file with NHDC. Terms of the tenancy of particular note regarding management and responsibilities are:

1. It allows for the "grazing of cattle between 1st April and 1st December in each year in accordance with the Management Proposals prepared by the Council as amended by Notice to the Tenant from time to time"
2. Tenant is to "provide and maintain good stockproof fences where required to prevent the egress of cattle from the demised land"

Five year Greenspace Action Plans (GAPs) for the site are produced by the Countryside Management Service in consultation with the relevant partners and stakeholders.

2.8.2 COMMUNITY INVOLVEMENT & EVENTS

Prior to the previous GAP produced in 2011, a Friends of Purwell Valley group was promoted locally to engage the public in local greenspaces including Purwell Meadows. This process helped gain community support for the initial Purwell Meadows GAP. A self sustaining group was never formed but contacts from this exercise were used to keep the local community and other stakeholders informed of events, site management works and volunteer opportunities at Purwell Meadows through an email group.

CMS Thursday volunteer hold occasional practical tasks on site including scrub clearance, hedge planting and maintenance

CMS run a walks and more event programme which hold events irregularly on sites along the Purwell Valley, previous events have linked up with the Wildlife Trust for a joint walk including Purwell Ninesprings Reserve.

3 ANALYSIS AND EVALUATION

3.1 A WELCOMING PLACE

The infrastructure of easy access kissing gates, welcome signs and interpretation installed in 2012/13 greatly enhanced the welcoming nature of the site. This infrastructure should be maintained appropriately to ensure visitors feel welcome on site.

The current state of the west side of the river being difficult to access is beneficial to the conservation of species and habitats on site by providing an area of the site that is less disturbed by visitors. This should be maintained in the future by avoiding encouraging access across the river e.g. by installing bridges.

Due to the nature of the site the paths are unsurfaced crossing grass. The main wear points at entrances were surfaced in the 2012/13 project, but a long term decision is that no surfaced paths should be constructed across the site due to the importance of the wildlife habitats. The river does over top it's banks in the winter and paths do become wet and muddy for some months of the year. This is all part of the uniqueness of the site, an all weather route is not necessary as users can use alternative routes along the paved footways along the adjacent roads if they wish to avoid the paths during these times

3.2 HEALTHY, SAFE & SECURE

The safety of users is of primary importance to NHDC. Formal tree safety surveys are undertaken every three years; any works will be prioritised according to a risk assessment.

3.3 CLEAN & WELL MAINTAINED

Entrance/exit points are to be maintained free from encroaching vegetation.

The dog waste bins are visited weekly and litter bins around the site are visited daily as part of the Grounds Maintenance contract. Fly tipping occurs occasionally this is currently dealt with as part of the Grounds Maintenance contract.

3.4 SUSTAINABILITY

Pressure on water resources within Hertfordshire are high due to high usage for drinking water supplies and increase in demand placed by future population & development growth. The same chalk aquifer that supplies drinking water also feeds wetland features e.g. the spring pool called Shadwells and the river that runs through the site, making them particularly susceptible to drinking water abstraction and periods of low rainfall. The recent wet winters have recharged the system for a time, but the habitats and species that can be found here are always susceptible.

Larger scale projects require external funding to be secured to be able to carry out the works sustainably. Using FSC certified timber for signs, producing products that can be recycled at the end of their life and ensuring that all material removed from the site is disposed of in the correct manner will go towards making the site more sustainable.

3.5 CONSERVATION

3.5.1 GRASSLAND

Grazing is an important tool for managing the grassland and wetland habitats on site, ensuring scrub is kept in check, breaking up the dominance of particular vegetation species and providing structural diversity. It also provides employment, income and is a historic feature of this landscape. Careful management of the timing and levels of grazing on site is important to maximise the benefits in keeping habitats in favourable condition, whilst ensure poaching, overgrazing and bank erosion is kept to a minimum. A balanced approach to this is important for the sustainability of this activity in the future.

The grassland and wetland habitats on the west side of the river have significantly more young and developing scrub than the east side. This is likely to be due to a lower grazing pressure on this side of the river as the cattle have a preference for the more palatable forage of the drier neutral/calcareous grasslands on the east side of the river. Also the east side is often topped by the grazing tenant annually which would assist in scrub control by cutting developing scrub plants whilst also creating a flush of fresh young grass growth for the cattle rather than pushing them to graze the rougher less palatable forage in the wet grassland areas e.g. rushes and sedges.

The wetland and wet grassland habitats on the west side of the river are also believed to be “drying out” with alteration in the general water table and at seasonal changes during the year, this combined with the undergrazing is having an effect on the species diversity, composition and sward structure. Compared to previous site and habitat descriptions/data there is now more of an abundance of meadowsweet, willowherb, hard and soft rush and a reduction in the percentage and diversity of the herb composition sward.

In addition to the above the rush pasture alongside the river particularly on the east side has an increasing dominance of rushes. A recent study of the meadows has shown that these areas have a particularly high nutrient levels almost approaching agricultural levels for phosphate (64.4mg/kg), indicating that not enough nutrient is being removed by the grazing as is required to maintain this habitat in favourable condition.

A combination of the following is required to ensure the grassland and wetland habitats on site return to a more favourable condition:

- Refocusing of cattle grazing pressure on the west side of the river without the need for addition fencing
- Targeted cutting of hard & soft rush/willowherb/meadowsweet dominant areas with arisings removed
- A concerted effort to remove and treat regrowth from scrub with a particular focus on young developing scrub and bramble where the grassland is still present underneath and has better chance of recovery.

There maybe some potential for the increasing grazing pressure on the west side of the river by returning the site or at least parts of the site to more of a meadow form of management that would have existed before the current pasture management. This could take the form of taking a hay cut in mid-late June from the drier neutral/calcareous grassland on the east side of the river, the putting the cattle on immediately after so they would be encouraged to graze the wetland habitats on the

west side of the river whilst at a more palatable stage and whilst the grassland on the east side regrows following the hay cut.

3.5.2 TREES, WOODLAND & SCRUB

The willow pollards alongside the watercress beds are now overmature with two blowing over into the meadows in 2014. They cast a lot of shade on the grassland in this area, contributing leaf litter fall into the meadows and also a large seed burden which is encouraging young willow saplings to develop in the wetland areas.

The ownership of the trees is unclear from the land registry documents, given the stock fence is stapled to the meadows side of the willows in places it maybe the owners of the watercress beds. NHDC dealt with the storm damaged tree in 2014. The owners of the watercress beds have been written to engage them in the plan production, however no response has been received. If the owners are still unresponsive a proactive plan of re-pollarding the Willows should be put in place. This would reduce the financial implications to NHDC of any future reactive health and safety works required.

Scrub management over this plan period should focus on removing and where possible stump treating young and developing scrub across grassland on the west side of the river where there is more of a chance of restoring grassland. Rather than clearing mature scrub in the centre of the site where there is less of a chance of regaining grassland. Dealing with resulting arisings is a problem on site given ground conditions. This has been dealt with more recently via burning on a raised platform then disposing of ash once cooled off site or under mature scrub/hedgerows that will be retained in the future.

Grassland should be kept open only retaining the odd mature tree or Hawthorn bush which is already present and has been for many years.

Deshading the watercourses through a combination of tree thinning, pollard and scrub clearance should also be prioritised to enhance the river habitat particularly through the southern half of the site and along the old river channel. Arising from this should be dealt in the same way as scrub described above.

3.3.3 HEDGEROWS

The hedgerows along the eastern boundaries were restored in 2012 with a process of crown lifting existing trees, thinning, coppicing and replanting. This has been largely successful but ongoing maintenance needs to be maintained to continue good establishment of the planted trees/shrubs. Remulching and/or spraying growth around the base of the planted trees/shrubs is required to help plants establish strongly.

The temporary chestnut pale fencing along the section of hedge on Chaucer Way can be removed in year 2 of this plan if it is judged to be established sufficiently that the threat of vandalism is no longer an concern.

Guards and canes should be removed from the hedge plants in this plan period to give them the best chance of establishment.

In 10-15 years time the hedgerows will have established sufficiently to allow them to be laid and future maintenance following this will be regular trimming e.g. by side arm flail cutter. This will provide a thick and attractive hedge which is good for wildlife.

Hedgerows along the southwestern boundary are now more of a band of scrub. Hedge restoration here is unlikely to be viable and not worthwhile.

3.3.4 RIVER

The southern half of the original river channel is heavily silted up due to low flow and the water sources from surface water sewers. This channel is also heavily shaded for much of its length through this section. This river habitat is in poor condition as a result. This would benefit from deshading work as described in the previous section, this would allow wetland vegetation to establish. Enhancing this channel would also give water voles more potential habitat to move into on site which is less prone to disturbance from visitors and cattle.

The river has accumulated a wide range of manmade rubbish over the years washed in off the site and down surface water sewers. Clearing this as a priority would enhance the watercourses, reducing pollution and blockages.

To coincide with the deshading works to allow more light into the river, encouraging aquatic plant growth, a river clean up needs to be organised for the length of the river with particular focus on the southern end where the rubbish issue is more acute. Smaller scale items can be carried out by CMS volunteers, but for the larger items and to remove the rubbish from site, NHDC grounds maintenance team will be required to assist.

The old mill channel has good flows with some areas where silt deposition is high. The river banks will continue to be susceptible to erosion which is been exacerbated through poaching from livestock. This however does create opportunities for diversification of the river channel particularly the old mill channel which is in the main quite similar in profile and depth for much of its length. If poached areas are given the opportunity for vegetation to re-establish/recover naturally, e.g. through temporary fencing, they can stabilise the bank and with natural water action create a more varied river channel that benefits wildlife e.g. young fish refuge areas.

In addition giving the cattle alternative drinking sources e.g. pasture pump, in a drier area of the site away from the river bank, would help to decrease poaching on the river bank.

Upstream on the River Purwell, work has been carried out on Walsworth Common another NHDC owned green space, to improve water quality. This has been done by installing woody-debris in the river to narrow the channel and direct the flow of water, which redeposits the silts to reveal the gravels.

Where appropriate different river restoration techniques should be used such as using woody material to protect eroding banks and the use of brushwood bundles to help narrow the channel and trap some of the fine sediments.



Deflectors and Brash Buildouts at Walsworth Common

Environment Agency consent will be required for any structure in the watercourse. CMS volunteers and local Environment Agency staff helped to build the deflectors on Walsworth Common so hopefully their expertise can be used here as well. The material retained from the tree works can be used to help make the brash build-outs, which will provide safe areas for fish fry to develop.

These improvements will benefit the flora and fauna that can be found in, using and along the banks of the river. Once areas are opened up and flow is increased, it is hoped that the native wetland plants such as common reed, watercress, starwort and water-crowfoot will increase. With improved habitats fish and other wildlife will also increase and return to the area.

The Environment Agency has been carried out fish surveys on site in 2016. This information can be used as baseline data set and once river restoration works have taken place, monitoring could take place and the data compared to see how successful restoration has been.

One particular problem spot on the River Purwell is a 90 degree bend near in the centre of the site where two surface water sewer pipes feed in. It has become badly eroded in recent years due to a combination of location, river action and poaching by cattle when coming to drink. The pipes and headwall of the surface water sewers are no longer on the bank and instead increasingly in the centre of the channel as the natural river action erodes round the back of the headwalls.

In consultation with Anglia Water the asset owners, Environment Agency and Hertfordshire County Council there should be works to address this issue. The surface water sewer pipe from Purwell Lane should be deculveted into a ditch to slow surface water flows from the road and allow pollutants to settle in the ditch rather than entering the river. A crossing to carry the riverside path will be required.

To accompany this the headwall of the 2nd pipe should be moved back to the current river bank and outfall put in at a appropriate height to prevent any hydrobraking baking up the water up the culvert as currently appears to occur.

Upstream from the pipes brash build outs should be constructed to narrow the river channel and give vegetation a substrate to naturally colonised. This will need to be protected with temporary fencing to keep the cattle off while vegetation establishes.

Temporary fencing from the bank restoration carried out in 2012/13 can now be removed as vegetation is well established and banks appear quite stable.

3.3.5 INVASIVE SPECIES

Himalayan Balsam can be found now occasionally on site, due to the concerted efforts of local volunteers it has largely been eliminated. This work will need to continue to ensure the river system continues to be largely free of this and other invasive species.

3.6 COMMUNITY INVOLVEMENT

Local Volunteers

The intention was for the site to be part of a larger friends group for the Purwell Valley. CMS carried out work to explore and promote the formation of a group with a view to it being self-managing and sustaining in the future. There was a lot of interest from the public but no leaders were forthcoming, so a group was not formed. An email circulation list from interested members of the public is held by CMS and is used to communicate events, site management works and other relevant information to the public.

In the past there has been a limited amount of volunteer activity on the site apart from that CMS volunteer practical tasks once or twice a year.

The proposed river restoration works will create additional volunteer activities on the site. CMS volunteers and possibly Environment Agency staff will be involved with installing the woody-debris structures in the river. This will be a good opportunity to involve and inform local people about the river and its wildlife.

Continue to engage the local community in projects at and around Purwell Meadows as and when they arise, subject to funding.

Purwell Meadows falls into the Upper and Bedford Ouse Catchment Partnership area, which provides a source of wider community engagement opportunities <http://www.ubocp.org.uk>.

Consultations & Public Feedback

Stakeholders and the public have been consulted at each stage of the Purwell Meadows GAP, from Briefing Document to Draft GAP. All relevant responses have been incorporated into the document.

3.7 MARKETING

The site will continue to be marketed through regular CMS Walks and More events and practical tasks on site.

The site leaflet should continue to be distributed widely to local outlets e.g. tourist information centres and libraries, for visitors to pick up.

Web presence is increasingly important, entries and updates on NHDCs and CMSs websites and social media should continue particularly during works being carried out on site as part of keeping local people informed of progress on GAP delivery.

Notice boards can be used at the main entrances to update visitors on works happening on site, future events, grazing activity, etc.

Press releases and articles in publications should be produced as and when opportunities arise in order to raise the profile of the site.

4 AIMS AND OBJECTIVES

The aim of the Purwell Meadows GAP is to improve and enhance the Local Nature Reserve for both wildlife and people.

A A WELCOMING PLACE

To provide clear and welcoming access into and throughout the site

A1 Maintain entrance signs and interpretation to a good standard

A2 Maintain access routes and infrastructure to an appropriate standard for site and visitors

B HEALTHY, SAFE & SECURE

To ensure that visitors to Purwell Meadows feel safe and able to enjoy the site at all times

B1 Carrying out reactive tree works to address safety issues

B2 Proactive response to the misuse of the site

B3 Ensure all access routes, structures and grazing infrastructure are fit for purpose

C CLEAN & WELL MAINTAINED

To ensure the standard of maintenance is maintained and relevant throughout the site

C1 Managing and maintaining the paths and signage

C2 Removing fly tip, litter picking, empty dog bins and carrying out small scale vegetation management at entrances

D SUSTAINABILITY

To ensure ongoing costs are sustainable and secure external funding for capital works

D1 Ensuring ongoing maintenance costs are financially sustainable

D2 Securing external funding to ensure the viability of capital works

E CONSERVATION

To protect and enhance the biodiversity that can be found on site

E1 Ensure sustainable grazing continues on site in a way which promotes the favourable condition of wildlife habitats and biodiversity

E2 Work with river catchment partners to improve the water quality of the River Purwell

E3 Work with natural processes and grazing management to restore and enhance the River Purwell

- E4 Continue with a rotational scrub cutting programme to maintain the open nature of the meadows.

F COMMUNITY INVOLVEMENT

To support and encourage community involvement at Purwell Meadows

- F1 Supporting volunteer activity at Purwell Meadows and to ensure all involved operate towards achievement of the GAP
- F2 Continue to encourage the local community to become involved in the management of Purwell Meadows in a structured and supported way

G MARKETING

To promote awareness, interest and engagement in Purwell Meadows

- G1 Improve the visitor experience and enhance opportunities for informing people of the wildlife, history, context and management of the site.
- G2 Promote volunteer opportunities to the local community to involve them in site management and events
- G3 Carry out management in an open, organised and structured manner that is clearly communicated to stakeholders prior to delivery

5.0 FIVE YEAR ACTION PLAN

5.1 ANNUAL ITEMS

Action	Obj no.	When	Responsibility	Funding	Estimated Cost (VAT)	Spec ref.	Status Completed/ Comments
Cut round signs, furniture and entrances	B3, C1	Apr-Oct	NHDC	NHDC GM Budget	GM Contract		
Cut paths	B3, C1	Sep-May	NHDC	NHDC GM Budget	GM Contract		
Continue cattle grazing	E1	Jun-Dec	NHDC	NHDC	Grazing lease with farmer		
Invasive species control – Himalayan Balsam	E2, E3	Jun-Sep	CMS/Vols	NHDC GM Budget			
Remove rubbish and fly tip	C2	When required	NHDC	NHDC GM Budget	As required		
Tree risk management inspections	B1	Every 3 years	NHDC	NHDC Tree Budget	As required		
Health & safety inspections and undertaking of works	B1	When required	NHDC	NHDC Tree Budget	NHDC Tree Budget		
Monitor and maintain site infrastructure as required	A2, C1	When required	NHDC	NHDC GM Budget	As required		
Clean signs	C1	When required	CMS/Vols	NHDC GM Budget	As required		

Action	Obj no.	When	Responsibility	Funding	Estimated Cost (VAT)	Spec ref.	Status Completed/ Comments
Empty dog waste (weekly) (These have been removed so there are no dog bins on the site) Consider deleting this line	C2	All year	NHDC				
Publicise all ongoing management works in advance	G2, G3	Ongoing	NHDC/CMS	NHDC GM Budget	As required		
Promote volunteer and community events at Purwell Meadows	F1, F2, G1, G2, G3	All year	NHDC/CMS	NHDC Budget	As required		
Ensuring ongoing maintenance costs are financially sustainable	D1	Ongoing	NHDC	NHDC Budget			
Securing external funding to ensure the viability of capital works	D2	Ongoing	NHDC/CMS				
Review Action Plans							

Abbreviations: CMS – Countryside Management Service, GM – Grounds Maintenance, NHDC – North Herts District Council, Vols - Volunteers

5.2 YEAR 1 ACTION PLAN 2017-18

Action	Obj no.	When	Responsibility	Funding	Estimated Cost (VAT)	Spec ref.	Status Completed/ Comments
Apply to external funder to fund year 1 and 2 of the GAP	D1, D2	Apr-Jun	NHDC/CMS	NHDC GM Budget	GM Contract		
Apply for consents from EA & HCC for river works	D1,D2	Apr-Jun	CMS	NHDC GM Budget	GM Contract		
Install pasture pumps on high ground	E1	Jul-Sep	CMS/ Vols	NHDC GM Budget	GM Contract		
Move pipe headwall back to bank and temporary fence area to allow natural regeneration	E3	Jul-Oct	NHDC/CMS	NHDC GM Budget	GM Contract		
Deculvert surface sewer pipe and provide path crossing points	E3	Jul-Oct	NHDC/CMS	NHDC GM Budget	GM Contract		
Remove temporary fencing on river bank	E1	Oct-Mar	CMS/Vols	NHDC GM Budget	GM Contract		
Temporarily fence areas of bank edge to allow natural regeneration	E1	Oct-Mar	NHDC/CMS	NHDC GM Budget	GM Contract		
Remove old metal post at Chaucer Way end of site	B3	Apr-May	CMS/Vols	NHDC GM Budget	GM Contract		
Willow seeding management	E4	Sep-Oct	CMS/Vols	NHDC GM Budget	GM Contract		
Install deflectors/brash buildouts to narrow the channel and upstream of pipe headwall	E3	Sep-Oct	CMS/Vols	NHDC GM Budget	GM Contract		

Action	Obj no.	When	Responsibility	Funding	Estimated Cost (VAT)	Spec ref.	Status Completed/ Comments
Targeted soft/hard rush cutting with arising removed	E1, E3	Oct-Feb	NHDC/CMS/ Vols	NHDC GM Budget	GM Contract		
Remove litter and rubbish from river	E2	Sep	NHDC/CMS/ Vols	NHDC GM Budget	GM Contract		
Hedgerow maintenance	E4	Oct-Feb	NHDC/CMS/ Vols	NHDC GM Budget	GM Contract		
Clear scrub at point along the river bank	E4	Oct-Feb	NHDC/CMS	NHDC GM Budget	GM Contract		
Pollard ash tree and clear scrub at channel confluence	E3, E4	Oct-Feb	NHDC/CMS	NHDC GM Budget	GM Contract		
Deshade river at Chaucer Way end of site pollard central willow	E3, E4	Oct-Feb	NHDC/CMS	NHDC GM Budget	GM Contract		
Tree/scrub clearance to deshade old river channel	E3, E4	Oct-Feb	NHDC/CMS	NHDC GM Budget	GM Contract		
Liaise with HCC Highways to resolve flooding issues from highway drain at Cambridge Road (A505) end of site, deliver a sustainable solution	E2	Ongoing	NHDC/CMS	NHDC GM Budget	GM Contract		
Continue to liaise with NHDC Property Services over restoration of the balancing pond	E2	Ongoing	NHDC/CMS	N/A			
Review Year 1 Action Plan		Mar 18	NHDC/CMS				

PURWELL MEADOWS LOCAL NATURE RESERVE

Year 1 2017-18

- Actions**
- Apply to external funder to fund Year 1&2 of GAP
 - Remove litter and rubbish from river
 - Apply for consents from EA & HCC for river works
 - Remove previous temporary fencing on river bank
 - Deliver one Walks and More event
 - Monitor and maintain site infrastructure as required
 - Publicise on going management works in advance
 - Continue Himalayan Balsam control

- Liaise with HCC Highways to resolve flooding issues from highway drain
- Deliver sustainable solution

- Hedgerow Maintenance

- Pollard Ash Tree
- Clear scrub at channel confluence
- Install deflectors/brush buildouts to narrow channel

- Install pasture pumps on high ground

- Resolve channel erosion issue:
 - Move pipe headwall back to bank
 - Temporary fence area to allow natural revegetation
 - Build brush buildouts upstream

- Deculvert surface sewer pipe and provide path crossing points

- Temporary fence Water Vole Hotspots & Target areas to allow natural regeneration of bank side vegetation e.g Flag Iris

- Targetted soft/hard rush cutting with arising removed

- Clear scrub at targetted points on river bank

- Hedgerow Maintenance

- Willow seedling management

- Remove old metal post

- Tree/shrub clearance to deshade old river channel

- Deshade river, pollard large central Willow

- Continue to liaise with NHDC property services over restoration of balancing pond

Key

- Site Boundary
- Amenity grass
- Grass path
- Hedgerow
- Surfaced path
- Culvert
- Scrub
- Dry calcareous/neutral grassland
- Wet rush pasture
- Water
- Fen vegetation
- Woodland
- Cattle Handling Pen
- Entrance sign
- Interpretation sign
- Notice board
- Waymarking post
- Dog bin
- Kissing gate
- Vehicle gate
- Flag pole
- Trees

Actions Responsibility

- North Herts District Council
- Countryside Management Service
- Volunteers



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5.3 YEAR 2 ACTION PLAN 2018-19

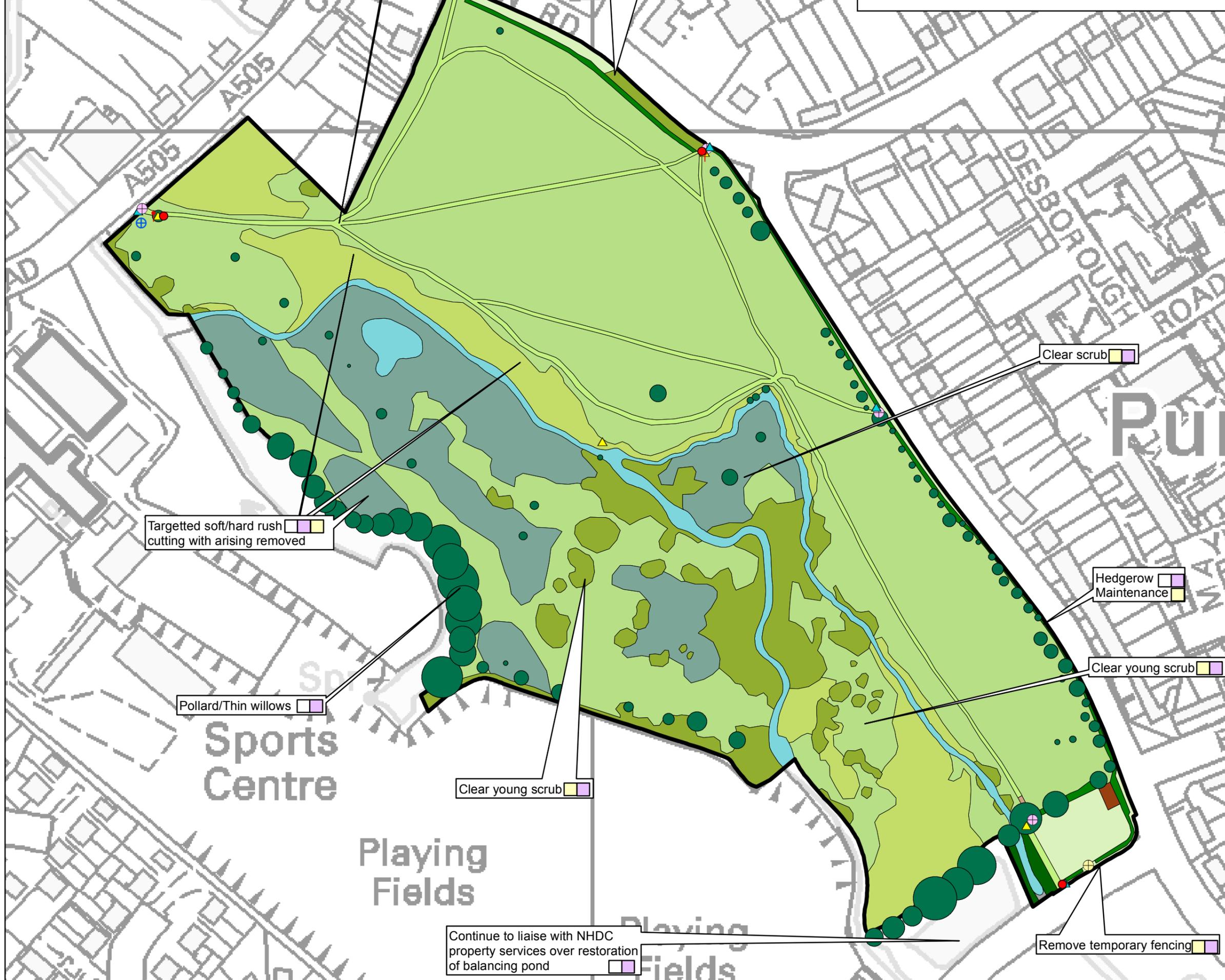
Action	Obj no.	When	Responsibility	Funding	Estimated Cost (VAT)	Spec ref.	Status Completed/ Comments
Targeted path surfacing	A2, B3	May-Aug	NHDC/CMS	NHDC GM Budget	GM Contract		
Targeted soft/hard rush cutting with arising removed	E1, E3	Oct-Feb	NHDC/CMS/Vols	NHDC GM Budget	GM Contract		
Hedgerow maintenance	E4	Oct-Feb	NHDC/CMS/Vols	NHDC GM Budget	GM Contract		
Clear scrub and young scrub	E4	Oct-Feb	CMS/Vols	NHDC GM Budget	GM Contract		
Remove temporary fencing	E1	Oct-Mar	CMS/Vols	NHDC GM Budget	GM Contract		
Pollard/thin willows	E3, E4	Oct-Feb	NHDC/CMS	NHDC GM Budget	GM Contract		
Continue to liaise with NHDC Property Services over restoration of the balancing pond	E2	Ongoing	NHDC/CMS	N/A			
Review Year 2 Action Plan		Mar 19	NHDC/CMS				

PURWELL MEADOWS LOCAL NATURE RESERVE

Year 2 2018-19

Actions
 Monitor and maintain site infrastructure as required
 Publicise on going management works in advance
 Continue Himalayan Balsam control

Targetted path surfacing
 Hedgerow Maintenance



Key

- Site Boundary
- Amenity grass
- Grass path
- Hedgerow
- Surfaced path
- Culvert
- Scrub
- Dry calcareous/neutral grassland
- Wet rush pasture
- Water
- Fen vegetation
- Woodland
- Cattle Handling Pen
- Entrance sign
- Interpretation sign
- Notice board
- Waymarking post
- Dog bin
- Kissing gate
- Vehicle gate
- Flag pole
- Trees

Actions Responsibility

- North Herts District Council
- Countryside Management Service
- Volunteers



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Targetted soft/hard rush cutting with arising removed

Pollard/Thin willows

Clear young scrub

Clear scrub

Hedgerow Maintenance

Clear young scrub

Remove temporary fencing

Continue to liaise with NHDC property services over restoration of balancing pond

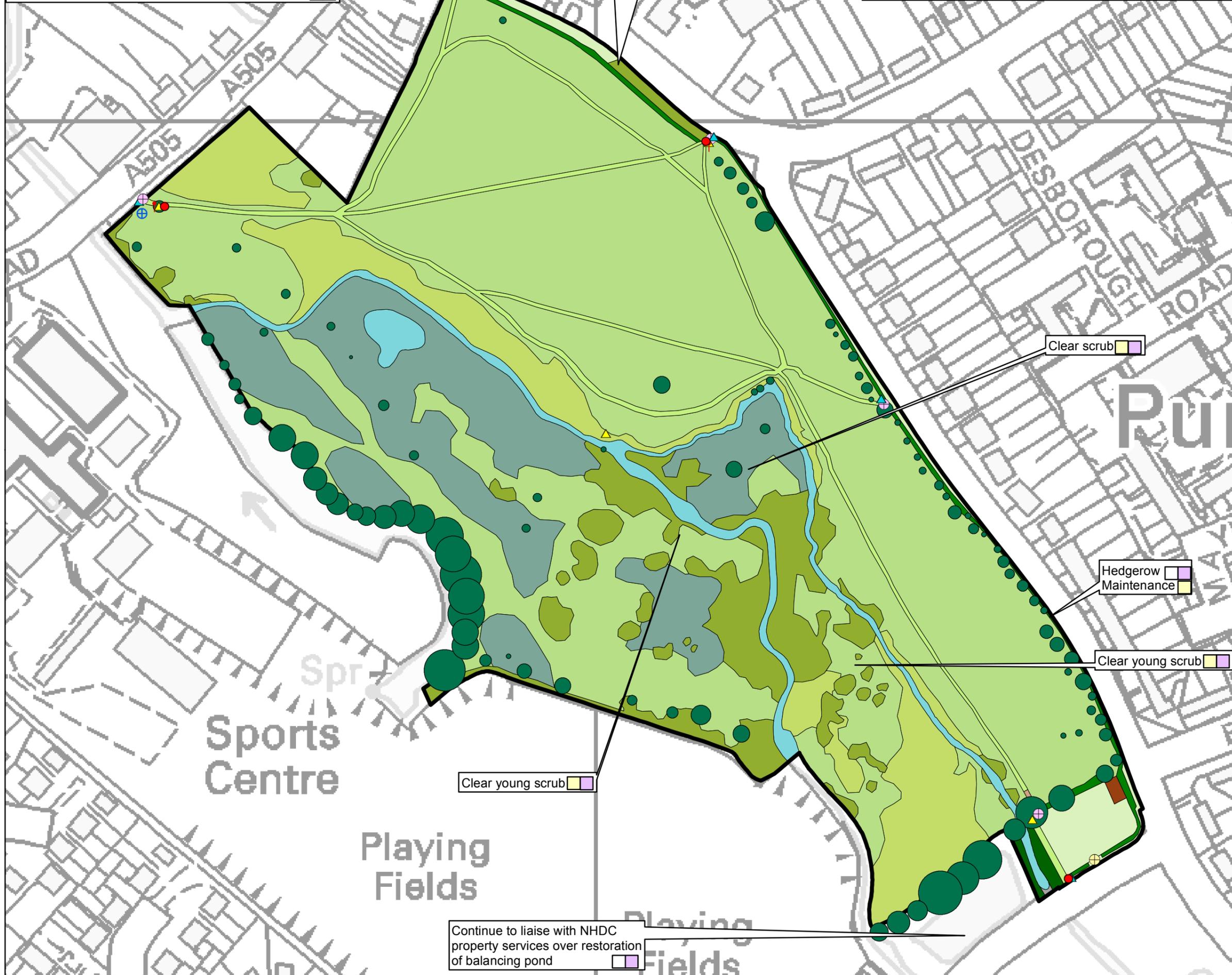
5.4 YEAR 3 ACTION PLAN 2019-20

Action	Obj no.	When	Responsibility	Funding	Estimated Cost (VAT)	Spec ref.	Status Completed/ Comments
Remove temporary fencing installed in year 1 and move to other poached areas of river bank	E1	Oct-Mar	CMS/Vols	NHDC GM Budget	GM Contract		
Hedgerow maintenance	E4	Oct-Feb	NHDC/CMS/Vols	NHDC GM Budget	GM Contract		
Clear young scrub	E4	Oct-Feb	CMS/Vols	NHDC GM Budget	GM Contract		
Review effectiveness of targeting cutting	E1, E3	Jun-Jul	NHDC/CMS	NHDC GM Budget	GM Contract		
Continue to liaise with NHDC Property Services over restoration of the balancing pond	E2	Ongoing	NHDC/CMS	N/A			
Review Year 3 Action Plan		Mar 20	NHDC/CMS				

PURWELL MEADOWS LOCAL NATURE RESERVE

Year 3 2019-20

- Actions**
- Monitor and maintain site infrastructure as required
 - Publicise on going management works in advance
 - Continue Himalayan Balsam control
 - Review effectiveness of targetted cutting



- Key**
- Site Boundary
 - Amenity grass
 - Grass path
 - Hedgerow
 - Surfaced path
 - Culvert
 - Scrub
 - Dry calcareous/neutral grassland
 - Wet rush pasture
 - Water
 - Fen vegetation
 - Woodland
 - Cattle Handling Pen
 - Entrance sign
 - Interpretation sign
 - Notice board
 - Waymarking post
 - Dog bin
 - Kissing gate
 - Vehicle gate
 - Flag pole
 - Trees
- Actions Responsibility**
- North Herts District Council
 - Countryside Management Service
 - Volunteers



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Continue to liaise with NHDC property services over restoration of balancing pond

Sports Centre

Playing Fields

Playing Fields

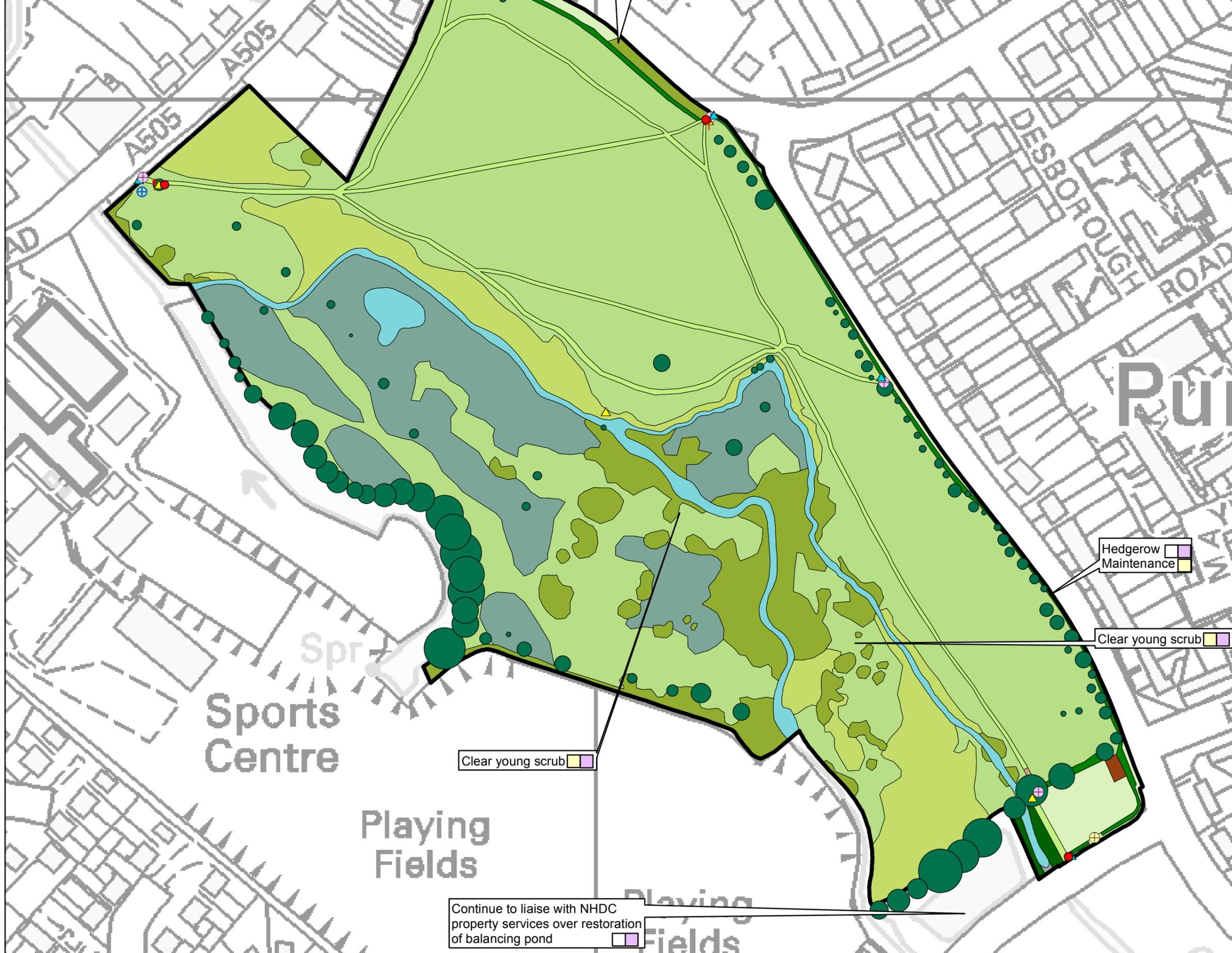
5.5 YEAR 4 ACTION PLAN 2020-21

Action	Obj no.	When	Responsibility	Funding	Estimated Cost (VAT)	Spec ref.	Status Completed/ Comments
Remove temporary fencing installed in year 1 and move to other poached areas of river bank	E1	Oct-Mar	CMS/Vols	NHDC GM Budget	GM Contract		
Hedgerow maintenance	E4	Oct-Feb	NHDC/CMS/Vols	NHDC GM Budget	GM Contract		
Clear young scrub	E4	Oct-Feb	CMS/Vols	NHDC GM Budget	GM Contract		
Continue to liaise with NHDC Property Services over restoration of the balancing pond	E2	Ongoing	NHDC/CMS	N/A			
Review Year 4 Action Plan		Mar 21	NHDC/CMS				

PURWELL MEADOWS LOCAL NATURE RESERVE

Year 4 2020-21

- Actions**
- Monitor and maintain site infrastructure as required
 - Publicise on going management works in advance
 - Continue Himalayan Balsam control
 - Remove temporary fencing installed in Year 1 and move to other poached areas of the river bank



- Key**
- Site Boundary
 - Amenity grass
 - Grass path
 - Hedgerow
 - Surfaced path
 - Culvert
 - Scrub
 - Dry calcareous/neutral grassland
 - Wet rush pasture
 - Water
 - Fen vegetation
 - Woodland
 - Cattle Handling Pen
 - Entrance sign
 - Interpretation sign
 - Notice board
 - Waymarking post
 - Dog bin
 - Kissing gate
 - Vehicle gate
 - Flag pole
 - Trees
- Actions Responsibility**
- North Herts District Council
 - Countryside Management Service
 - Volunteers



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5.6 YEAR 5 ACTION PLAN 2021-22

Action	Obj no.	When	Responsibility	Funding	Estimated Cost (VAT)	Spec ref.	Status Completed/ Comments
Hedgerow maintenance	E4	Oct-Feb	NHDC/CMS/ Vols	NHDC GM Budget	GM Contract		
Continue to liaise with NHDC Property Services over restoration of the balancing pond	E3	Ongoing	NHDC/CMS	N/A			
Review Year 5 Action Plan and consult & write new plan		Apr 21	NHDC/CMS				

PURWELL MEADOWS LOCAL NATURE RESERVE

Year 5 2021-22

- Actions**
- Monitor and maintain site infrastructure as required
 - Publicise on going management works in advance
 - Continue Himalayan Balsam control
 - Review GAP and produce next 5 year plan

Hedgerow Maintenance

Hedgerow Maintenance

Continue to liaise with NHDC property services over restoration of balancing pond

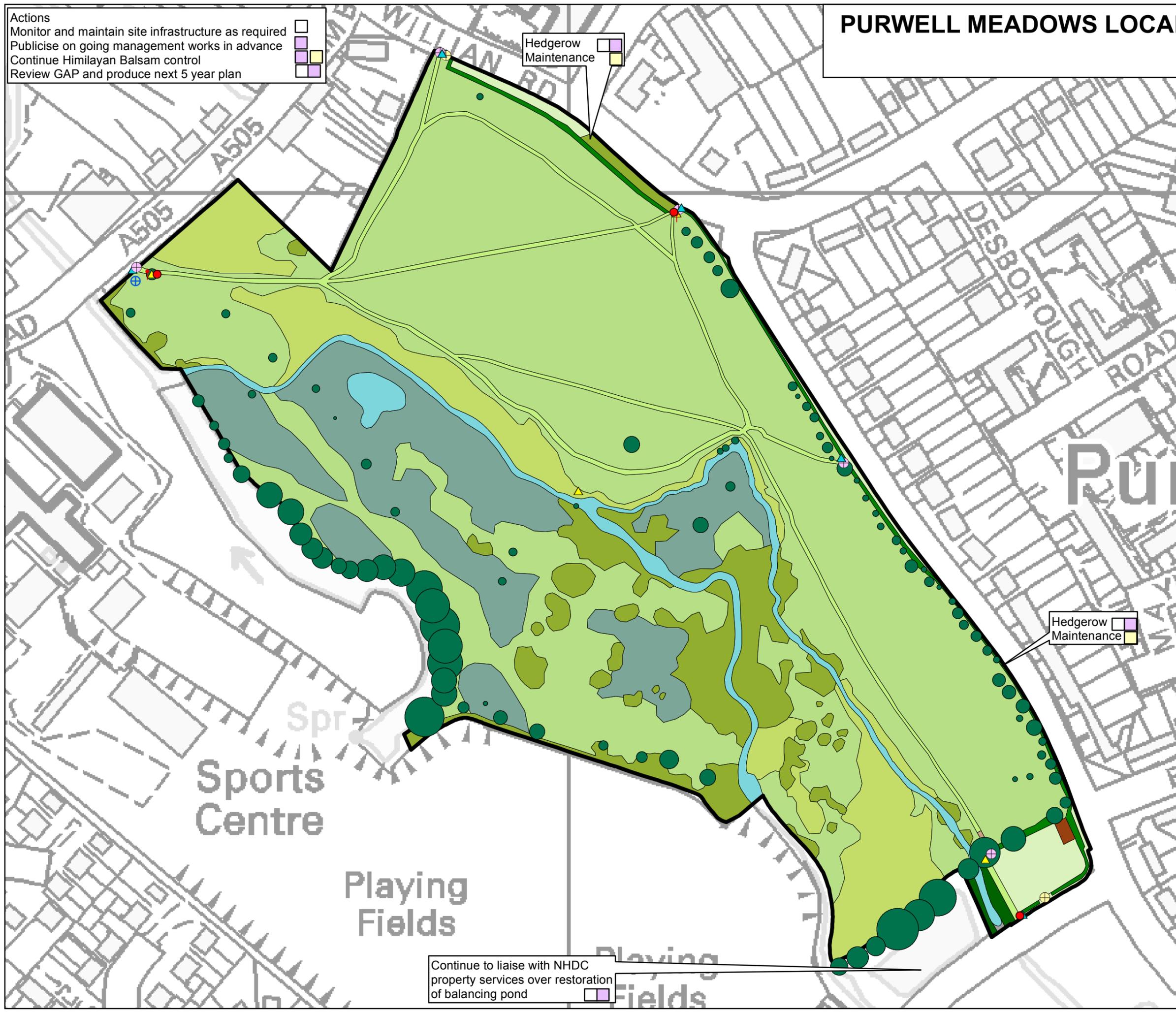
- Key**
- Site Boundary
 - Amenity grass
 - Grass path
 - Hedgerow
 - Surfaced path
 - Culvert
 - Scrub
 - Dry calcareous/neutral grassland
 - Wet rush pasture
 - Water
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 - Notice board
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 - Dog bin
 - Kissing gate
 - Vehicle gate
 - Flag pole
 - Trees
- Actions Responsibility**
- North Herts District Council
 - Countryside Management Service
 - Volunteers



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6. APPENDIES

1. Local Wildlife Site Survey Report 2016

Wildlife Site Survey Report for: Purwell Meadows

LWS Site Ref:	20/053	Site size (ha):	9.66
Local Authority:	North Herts	Central Grid Ref:	TL200298

Date1 of survey:	04/08/2016	Weather:	Very warm, sunny spells and showers	Duration on site:	6 hours
Surveyors:	Andrew Harris, Margaret Harris, Agneta Burton, Ruth Graham				
Spp list by:	AB	Form by:	AH	Map by:	MH

Date2 of survey:	11/08/2016	Weather:	Mainly overcast, warm	Duration on site:	6 hours
Surveyors:	Andrew Harris, Margaret Harris, Agneta Burton, Jean Williamson, Amy Judges, Ruth Graham, Stephen Mason				
Spp list by:	AB,JW	Form by:	AH	Map by:	MH

Geology:	Bedrock:	MELBOURN ROCK MEMBER - CHALK
	Superficial Deposits:	ALLUVIUM - CLAY, SILT, SAND AND GRAVEL

Original criteria:	H.2.2a, H.2.2b, H.2.2d, H.2.2e	Habitat:	Grassland: calcareous, unimproved, Grassland: neutral, Grassland: marsh, Scrub, Open water: running
Criteria met:	H.2.2b Neutral (19); H.2.2a Calcareous (12); H.2.2d Wet (1); H.5.3 Fen (18); H.2.2e Mixed (37)		
Recommended changes to boundary	Yes – Compartments 4 (western section of scrub) and 6 (see map) to be removed as they do not meet criteria.		
Original Site Description:	<p>Old pastures along the River Purwell and its associated streams, mostly of unimproved calcareous grassland with areas of marshy ground and associated springs, some scrub, a former cress bed and secondary neutral grassland. The site supports a diversity of lower and higher plant species including a number of species uncommon or rare in Hertfordshire. Species of interest recorded include Quaking Grass (<i>Briza media</i>), Spiny Rest-harrow (<i>Ononis spinosa</i>), Greater Bird's-foot Trefoil (<i>Lotus pedunculatus</i>), Common Fleabane (<i>Pulicaria dysenterica</i>), Water Horsetail (<i>Equisetum fluviatile</i>), Blunt-flowered Rush (<i>Juncus subnodulosus</i>), Brown Sedge (<i>Carex disticha</i>), Bottle Sedge (<i>C. rostrata</i>), Adder's-tongue (<i>Ophioglossum vulgatum</i>) and Southern Marsh-orchid (<i>Dactylorhiza praetermissa</i>). The meadows are of local importance to birds especially for passage and feeding. Protected species have been recorded on the site. Wildlife Site criteria: Grassland indicators; fen and swamp indicators.</p>		
Overall General Site Description:	<p>Old pastures along the River Purwell and its associated streams with a mosaic of unimproved neutral-calcareous grassland and wet grassland with associated fen, marginal vegetation and springs. There is also some scrub, a former watercress bed and secondary grassland. The site is on the edge of Hitchin and is partly surrounded by urban areas, though there is further pastoral grassland around the headwaters of the River Purwell to the south</p> <p>The grassland has Crested Dog's-tail (<i>Cynosurus cristatus</i>), Common Bent (<i>Agrostis capillaris</i>), Smaller Cat's-tail (<i>Phleum bertolonii</i>), Hairy Sedge (<i>Carex hirta</i>), Meadow Vetchling (<i>Lathyrus pratensis</i>), Ribwort Plantain (<i>Plantago lanceolata</i>), Knapweed (<i>Centaurea nigra</i> agg), Meadow Buttercup (<i>Ranunculus acris</i>) and Red Clover (<i>Trifolium pratense</i>), Wetter areas have Rushes (<i>Juncus</i> spp), False Fox Sedge (<i>Carex otrubae</i>), Marsh Horsetail (<i>Equisetum palustre</i>), Greater Bird's-foot Trefoil (<i>Lotus pedunculatus</i>), Silverweed (<i>Potentilla anserina</i>) and Fen Bedstraw (<i>Galium uliginosum</i>).</p>		

	<p>Other species of interest recorded include Spiny Rest-harrow (<i>Ononis spinosa</i>) and Quaking Grass (<i>Briza media</i>) in the neutral-calcareous grassland and Blunt-flowered Rush (<i>Juncus subnodulosus</i>), Water Horsetail (<i>Equisetum fluviatile</i>), Common Fleabane (<i>Pulicaria dysenterica</i>), Marsh Valerian (<i>Valeriana dioica</i>) and Southern Marsh Orchid (<i>Dactylorhiza praetermissa</i>) Ragged Robin (<i>Lychnis flos-cuculi</i>) in the wet grassland/fen areas.</p> <p>There have also been records of Brown Sedge (<i>Carex disticha</i>), Bottle Sedge (<i>C. rostrata</i>) and Adder's-tongue (<i>Ophioglossum vulgatum</i>).</p> <p>The River Purwell, its tributary streams and springs are also of interest being sourced from chalk. The meadows are of local importance to birds especially for passage and feeding. Protected species have been recorded on the site Wildlife Site criteria: Grassland indicators; fen and swamp indicators</p>
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Compartments: An ecological description of each:

Compartment	Description:
<p>1: Semi-improved neutral grassland east of R. Purwell</p> <p>Central Grid Ref: TL200299</p> <p>Map link</p>	<p>Neutral grassland with some smaller areas of wet grassland on the eastern side of the site. Grasses are mainly represented by Crested Dog's-tail (<i>Cynosurus cristatus</i>), Yorkshire Fog (<i>Holcus lanatus</i>), Smaller Cat's-tail (<i>Phleum bertolonii</i>), Perennial Rye (<i>Lolium perenne</i>), Rough Meadow-grass (<i>Poa trivialis</i>) and Common Bent (<i>Agrostis capillaris</i>) with some areas where False Oat-grass (<i>Arrhenatherum elatius</i>) is common. Red Fescue (<i>Festuca rubra</i>), Soft Brome (<i>Bromus hordeaceus</i>) and Cock's-foot (<i>Dactylis glomerata</i>) are among the other grasses present.</p> <p>Of the forbs, Ribwort Plantain (<i>Plantago lanceolata</i>), Meadow Vetchling (<i>Lathyrus pratensis</i>), Knapweed (<i>Centaurea nigra</i> agg), Meadow Buttercup (<i>Ranunculus acris</i>), Self-heal (<i>Prunella vulgaris</i>) and White Clover (<i>Trifolium repens</i>) are among the most common of the widespread species. Spiny Restharrow (<i>Ononis spinosa</i>) forms dense and extensive stands in some areas, particularly the north-central areas of this side of the site. Other forbs are more scattered localised in their distribution include Bird's-foot Trefoil (<i>Lotus corniculatus</i>), native Red Clover (<i>Trifolium pratense</i>), Bulbous Buttercup (<i>Ranunculus bulbosus</i>), Lady's Bedstraw (<i>Galium verum</i>), Burnet Saxifrage (<i>Pimpinella saxifraga</i>) and Creeping Cinquefoil (<i>Potentilla reptans</i>).</p> <p>Wetter areas have a high cover of Hairy Sedge (<i>Carex hirta</i>) though this species also occurs widely over the compartment. On lower lying ground towards the river there is also Hard Rush (<i>Juncus inflexus</i>), Jointed Rush (<i>Juncus articulatus</i>) some Sweet vernal-grass (<i>Anthoxanthum odoratum</i>). Meadow Vetchling (<i>Lathyrus pratensis</i>) is well represented in these marshy areas and other forbs include Silverweed (<i>Potentilla anserina</i>), Tufted Vetch (<i>Vicia cracca</i>) and Ragged Robin (<i>Silene flos-cuculi</i>).</p> <p>Negative indicators are common but not dominant within the sward, though there is a large amount of Creeping Thistle (<i>Cirsium arvense</i>). The vegetation in some of the eastern peripheral parts of the compartment is rather rank with most of the False Oat-grass (<i>Arrhenatherum elatius</i>) here and localised areas with Cow Parsley (<i>Anthriscus sylvestris</i>).</p> <p>Proportion of forbs (excluding negative indicators) is up to 40%</p> <p>National Vegetation Classification: The majority of the grassland is rather transitional between MG5 and MG6 which probably reflects the non-intensive grazing regime. Areas bordering</p>

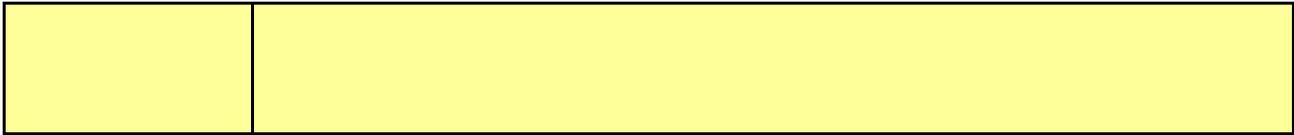
	<p>the paths which cross the site and where cattle congregate trend more towards MG6 while the eastern fringes of the compartment possibly where there is more nutrient enrichment from the surrounding urban environment are transitional towards MG1. Wetter depressions have an MG10b Soft Rush (<i>Juncus effuses</i>) – Yorkshire Fog (<i>Holcus lanatus</i>), Hard Rush (<i>Juncus inflexus</i>) sub-community.</p> <p>Current Management: Light grazing by cattle. The grassland was also topped between the visits.</p> <p>Management prescription: The level of grazing is about right. As has been done, top the vegetation in mid-late summer to control the thistles but ideally pick-up the cuttings.</p>
<p>Compartment 2: Neutral – calcareous and wet grassland mosaic west of River Purwell</p> <p>Central Grid Ref: TL199298</p> <p>Map link</p>	<p>Description:</p> <p>A mosaic of neutral to calcareous grassland, wet grassland and tall fen vegetation on the western side of the site. The grassland has an unimproved character, displaying both species-richness and small-scale variability. The transition between the wet and dryer grassland associations is often gradual so that the mosaic forms a pattern of ecotones. However the tall fen vegetation forms more discrete stands and some wet hollows have their own distinctive association of plants including a recently created scrape.</p> <p>A small tributary of the River Purwell crosses this habitat dividing it into two areas. The vegetation within the northern half (the greater part of this habitat is as follows:</p> <p>The grassland is generally composed of Common Bent (<i>Agrostis capillaris</i>), Crested Dog's-tail (<i>Cynosurus cristatus</i>), Sweet Vernal-grass (<i>Anthoxanthum odoratum</i>), Rough Meadow-grass (<i>Poa trivialis</i>), Smaller Cat's-tail (<i>Phleum bertolonii</i>), some Red Fescue (<i>Festuca rubra</i>), native Red Clover (<i>Trifolium pratense</i>) and Knapweed (<i>Centaurea nigra</i> agg).</p> <p>Dryer, slightly more elevated ground in the centre-west of the site, has the greatest concentration of False Oat-grass (<i>Arrhenatherum elatius</i>), Cock's-foot (<i>Dactylis glomerata</i>) and some Quaking Grass (<i>Briza media</i>) as well as the forbs Bird's-foot Trefoil (<i>Lotus corniculatus</i>), Lady's Bedstraw (<i>Galium verum</i>) and Common Sorrel (<i>Rumex acetosa</i>).</p> <p>Transitions to wetter grassland see an increase in the amount of Hairy Sedge (<i>Carex hirta</i>) and Marsh Horsetail (<i>Equisetum palustre</i>) in the sward. Otherwise the wet grassland community mainly consists of Blunt-flowered Rush (<i>Juncus subnodulosus</i>), Hard Rush (<i>Juncus inflexus</i>), Common Sedge (<i>Carex nigra</i>), with some Soft Rush (<i>Juncus effusus</i>), Common Spike-rush (<i>Eleocharis palustris</i>) and False Fox-sedge (<i>Carex otrubae</i>). Among the forbs present, Greater Bird's-foot Trefoil (<i>Lotus pedunculatus</i>) and Silverweed (<i>Potentilla anserina</i>) have high cover. Meadow Vetchling (<i>Lathyrus pratensis</i>), Fen Bedstraw (<i>Galium uliginosum</i>) and Tufted Vetch (<i>Vicia cracca</i>) sprawl through the taller vegetation. There is some Marsh Thistle (<i>Cirsium palustre</i>), Square-stalked St. John's-wort (<i>Hypericum tetrapterum</i>), Redshank (<i>Persicaria maculosa</i>) and a small patch of Common Fleabane (<i>Persicaria maculosa</i>). One wet hollow which is probably periodically inundated has a stand of Greater Tussock Sedge (<i>Carex paniculata</i>) with Marsh Valerian (<i>Valeriana dioica</i>) colonising the tops of the tussocks.</p> <p>Swathes of taller fen vegetation are composed principally of Meadowsweet (<i>Filipendula ulmaria</i>), Greater Willowherb (<i>Epilobium hirsutum</i>) and Water</p>

	<p>Figwort (<i>Scrophularia auriculata</i>). A large stand of Lesser Pond Sedge (<i>Carex acutiformis</i>) borders the southern end of the old watercress beds.</p> <p>The recently formed scrape is largely covered by Stonewort (<i>Chara aspera</i>), a Water Crowfoot (<i>Ranunculus</i> sp.), and Water Plantain (<i>Alisma plantago-aquatica</i>) are also present and Plicate Sweet-grass (<i>Glyceria notata</i>) occurs on the margins on this depression.</p> <p>The southern part of this habitat is very similar to the northern area, though there is more Hard Rush (<i>Juncus inflexus</i>) and the grasses are less diverse with less a smaller amount of Crested Dog's-tail (<i>Cynosurus cristatus</i>) and Sweet Vernal Grass (<i>Anthoxanthum odoratum</i>) is lacking. There was however a wet hollow along the southern edge which has a different suite of species including Branched Bur-reed (<i>Sparganium erectum</i>), Wild Angelica (<i>Angelica sylvestris</i>), Water-mint (<i>Mentha aquatica</i>), Lesser Water Parsnip (<i>Berula erecta</i>) and Creeping Jenny (<i>Lysimachia nummularia</i>), the latter creeping extensively at the base of the taller vegetation.</p> <p>Proportion of forbs (excluding negative indicators) is c 50% in the northern section of the site and c35% in the south.</p> <p>National Vegetation Classification: The vegetation shows a great deal of complexity, but overall the mosaic of rushes and grassy patches shows a strong similarity with M22b Blunt-flowered Rush (<i>Juncus subnodulosus</i>), Marsh Thistle (<i>Cirsium palustre</i>) fen meadow, Quaking Grass (<i>Briza media-Trifolium</i> spp) sub-community. There is some affinity MG5 on the mounds which in places is transitional with MG1 where the grassland is becoming rank. On wetter ground, tall stands with a high amount of Meadowsweet (<i>Filipendula ulmaria</i>) display a continuum between M22 and M27.</p> <p>Current Management: Light grazing</p> <p>Management prescription: Invading scrub needs to be kept in check to ensure it does not get out of hand. Sapling Ash trees and suckering Blackthorn are becoming a problem particularly in the southern part of the compartment. Bramble invading from the surrounding scrub also needs to be controlled. Grazing level is reasonable, but there could be a little more grazing to reduce False Oat-grass, control invading scrub and open up the rather rank growth of rushes and grasses particularly in the southern part of this compartment where they are tending to collapse and exclude light from other species. This could be tried with rare breeds such as longhorn cattle, but grazing level would be a fine balance: Sufficient to maintain species-richness without being detrimental to the wetland communities.</p>
<p>Compartment 3: River Purwell and tributary streams</p> <p>Central Grid Ref: TL200298</p> <p>Map link</p>	<p>Description: The main channel of the River Purwell is gently meandering and runs NNE to SSW across the site it is joined by a small channel from the SW of the site.</p> <p>The narrow channel is on a bed mainly of gravel and silt with some aquatic vegetation. The bank vegetation is mainly a mixture of wet grassland, rush pasture (particularly on the eastern side) and tall fen (mainly on the western sides and on the northern part of the stream. There is a small amount of overhanging scrub concentrated in the central part of the site.</p> <p>Within the channel there is there is some aquatic Watercress (<i>Nasturtium officinale</i>), Starwort (<i>Callitriche</i> sp.) and Blue Water-Speedwell (<i>Veronica anagallis-aquatica</i>) with Brooklime (<i>Veronica beccabunga</i>), Water Forget-me-</p>

	<p>not (<i>Myosotis scorpioides</i>) and Lesser Water-parsnip (<i>Berula erecta</i>) on the margins. The banks vegetation includes Hard Rush (<i>Juncus inflexus</i>) Creeping Bent (<i>Agrostis stolonifera</i>), Rough Meadow-grass (<i>Poa trivialis</i>) and Yorkshire Fog (<i>Holcus lanatus</i>) particularly on the eastern side. Elsewhere Greater Willowherb (<i>Epilobium hirsutum</i>) lines the side of the stream with Reed Canary-grass (<i>Phalaris arundinacea</i>), Water Figwort (<i>Scrophularia auriculata</i>), Clustered Dock (<i>Rumex conglomeratus</i>), Water-mint (<i>Mentha aquatica</i>), Greater Bird's-foot Trefoil (<i>Lotus pedunculatus</i>), Fen Bedstraw (<i>Galium uliginosum</i>) and Meadowsweet (<i>Filipendula ulmaria</i>). There are localised stands of large sedges: Greater Pond Sedge (<i>Carex riparia</i>) is concentrated along the middle reaches where it is associated with Branched Bur-reed (<i>Sparganium erectum</i>) and Lesser Pond Sedge (<i>Carex acutiformis</i>) which occurs sporadically on the margin. There are also a few clumps of Yellow Flag (<i>Iris pseudacorus</i>)</p> <p>Much of the channel of the tributary stream is obscured by Watercress (<i>Nasturtium officinale</i>) with Marsh Woundwort (<i>Stachys palustris</i>) also having a high cover.</p> <p>National Vegetation classification: The channel margin vegetation closely resembles S23 other water-margin vegetation, though as implied this is rather a 'rag-bag' category. The bank vegetation corresponds to MG10b where mainly rushes, elsewhere on the western bank it resembles S28b Reed Canary-grass (<i>Phalaris arundinacea</i>) tall-herb fen, Great Willowherb (<i>Epilobium hirsutum</i>) sub-community, though interspersed with large sedges more typical of other communities.</p> <p>Current Management:</p> <p>Management prescription: Remove any Himalayan Balsam (<i>Impatiens glandulifera</i>) as soon as it appears. Possibly cut back vegetation if the river gets too overgrown</p>
<p>Compartment 4: Scrub</p> <p>Central Grid Ref: TL200297 and TL199297</p> <p>Map link</p>	<p>Description: This compartment encompasses two areas of scrub: One is in the central part of the site just above the confluence of the two streams and the other to the west of the watercress beds: The scrub is largely of Blackthorn (<i>Prunus spinosa</i>), Hawthorn (<i>Crataegus monogyna</i>) and some Elder (<i>Sambucus nigra</i>); with Bramble (<i>Rubus fruticosus</i>) and Ivy (<i>Hedera helix</i>). The field layer often has Stinging Nettle (<i>Urtica dioica</i>), Ground Ivy (<i>Glechoma hederacea</i>), Rough Meadow-grass (<i>Poa trivialis</i>), Bittersweet (<i>Solanum dulcamara</i>), Cow Parsley (<i>Anthriscus sylvestris</i>), as well as Herb Robert (<i>Geranium robertianum</i>), Wood False Brome (<i>Brachypodium sylvaticum</i>) and other woodland generalists.</p> <p>The scrub in the central area is overtopped by Ash (<i>Fraxinus excelsior</i>) and Alder (<i>Alnus glutinosus</i>) and is otherwise principally Blackthorn (<i>Prunus spinosa</i>) thickets with Stinging Nettles (<i>Urtica dioica</i>) dominating more open areas. West of the Watercress (<i>Rorippa nasturtium-aquaticum</i>) beds has two large White Willows (<i>Salix alba</i>) on the edge and has more Hawthorn (<i>Crataegus monogyna</i>) and less Stinging Nettles (<i>Urtica dioica</i>), otherwise it is generally similar in composition. Unlike the other area it is on very disturbed ground the scrub having colonised a series of banks and troughs aligned perpendicular to the watercress beds. There is some standing water within these troughs with Duckweed (<i>Lemna</i> spp) and one has been invaded by New Zealand Pigmyweed (<i>Crassula helmsii</i>).</p>

	<p>National Vegetation Classification This is nearest to W21 Hawthorn (<i>Crataegus monogyna</i>) – Ivy (<i>Hedera helix</i>) scrub, Stinging Nettles (<i>Urtica dioica</i>) sub-community, there are some affinities also with W22 Blackthorn (<i>Prunus spinosa</i>) scrub most apparent in the area of scrub in the centre of the site.</p> <p>Current Management: None apparent</p> <p>Management prescription: While a certain amount of scrub increases the diversity of the site, the central area of scrub should not be allowed to encroach further on the more ecologically important wetland and grassland habitats, so any young trees and developing scrub should be cut back to keep this area of scrub in bounds.</p> <p>The western area of scrub acts as a buffer area for the old Watercress (<i>Rorippa nasturtium-aquaticum</i>) beds so would be largely non-intervention though some coppicing could be done to ensure the Watercress (<i>Rorippa nasturtium-aquaticum</i>) beds are not too highly overshadowed and to increase the structural diversity of the scrub.</p> <p>It is however important that the New Zealand Pigmyweed (<i>Crassula helmsii</i>) is removed from one of the wet depressions in the western area of scrub before it spreads to the edges watercress beds and threatens other areas on the site where the water is slow moving.</p>
<p>Compartment 5: Carr woodland and scrub</p> <p>Central Grid Ref: TL201296</p> <p>Map link</p>	<p>Description: Willow (<i>Salix sp.</i>) carr and scrub on south-eastern margin of the site. There is a large basin within this area with regular, rectangular sides which appears to be a disused reservoir now drained and has been colonised by White Willow (<i>Salix alba</i>). Elsewhere, the canopy has White Poplar (<i>Populus alba</i>), Ash (<i>Fraxinus excelsior</i>), Crack Willow (<i>Salix x fragilis</i>) and a large unknown Willow (<i>Salix sp.</i>). The understorey has saplings of White Poplar (<i>Populus alba</i>) and Willow (<i>Salix sp.</i>), as well as Elder (<i>Sambucus nigra</i>) and Hawthorn (<i>Crataegus monogyna</i>) with Ivy (<i>Hedera helix</i>) scrambling over some of the shrubs and ground. The field layer is largely composed of ruderal species and woodland generalists and has much Stinging Nettle (<i>Urtica dioica</i>), as well as Bramble (<i>Rubus fruticosus</i>), Cleavers (<i>Galium aparine</i>), Pendulous Sedge (<i>Carex pendula</i>), Hogweed (<i>Heracleum sphondylium</i>), Wood Dock (<i>Rumex sanguineus</i>), Hedge Woundwort (<i>Stachys sylvatica</i>) and Hairy Brome (<i>Bromopsis ramosa</i>).</p> <p>The stream flows through this compartment and is steep-sided and moderately fast flowing. It is unvegetated apart from a small amount of marginal Flag Iris (<i>Iris pseudacorus</i>) and some aquatic Water-starwort (<i>Callitriche obtusangula</i>).</p> <p>Himalayan Balsam (<i>Impatiens glandulifera</i>) is present on the margins but not extensive.</p> <p>National Vegetation Classification This resembles W6b Common Alder (<i>Alnus glutinosus</i>) – Stinging Nettles (<i>Urtica dioica</i>) woodland; Crack Willow (<i>Salix fragilis</i>) sub-community. (<i>Alnus glutinosus</i> was not recorded in this compartment but is present in associated scrub on the site)</p>

	<p>Current Management: Non intervention</p> <p>Management prescription: Control Himalayan Balsam from where it has colonised before it takes hold.</p>
<p>Compartment 6:</p> <p>Central Grid Ref: TL202296</p> <p>Map link</p>	<p>Description: A small fenced-off paddock at the south-east corner of the site with improved/amenity grassland. The main species are Perennial Rye (<i>Lolium perenne</i>), Creeping Bent (<i>Agrostis stolonifera</i>), Rough Meadow-grass (<i>Poa trivialis</i>), Common Bent (<i>Agrostis capillaris</i>), Creeping Buttercup (<i>Ranunculus repens</i>), Dandelion (<i>Taraxacum officinale</i>), Self-heal (<i>Prunella vulgaris</i>), Common Cat's-ear (<i>Hypochaeris radicata</i>), Common Mouse-ear (<i>Cerastium fontanum</i>), Slender Speedwell (<i>Veronica filiformis</i>), Germander Speedwell (<i>Veronica chamaedrys</i>) and Autumn Hawkbit (<i>Scorzoneroides autumnalis</i>).</p> <p>There is an indistinct track across the grassland with a typical association of disturbed ground including Annual Meadow-grass (<i>Poa annua</i>), Greater Plantain (<i>Plantago lanceolata</i>), Black Medick (<i>Medicago lupulina</i>) and Scentless Mayweed (<i>Tripleurospermum inodorum</i>).</p> <p>Proportion of forbs (excluding negative indicators) is up to 20%</p> <p>National Vegetation Classification: This has most affinity with MG7</p> <hr/> <p>Current Management: Grassland is being regularly cut, with the cuttings remaining <i>in situ</i>. This area may act as a holding area for cattle</p> <p>Management prescription: Ensure that cuttings are picked up. Allow to grow during flowering season or cut less frequently.</p>
<p>Compartment 7:</p> <p>Old Watercress Beds</p> <p>Central Grid Ref: TL198298</p> <p>Map link</p>	<p>Description: Old Watercress (<i>Rorippa nasturtium-aquaticum</i>) beds on the western side of the site bordered by Willows (<i>Salix sp.</i>) and scrub, spring fed the springs flowing strongly. Though rather low in plant diversity the Watercress (<i>Rorippa nasturtium-aquaticum</i>) beds are of interest as they represent part of the local network of chalk streams.</p> <p>The majority of the water surface is vegetated by emergent Watercress (<i>Nasturtium officinale</i>) and some Fool's-watercress (<i>Apium nodiflorum</i>) with some Blue Water-speedwell (<i>Veronica anagallis-aquatica</i>) and Brooklime (<i>Veronica beccabunga</i>) and floating Duckweeds (<i>Lemna sp.</i>). There are also some more open areas of water which have a small amount of Blunt-flowered Rush (<i>Juncus subnodulosus</i>). Towards the southern end where the bed is shallower and a slow flow from the springs is more discernible a Water-crowfoot (<i>Ranunculus sp.</i>) occurs. There is some more marginal Bulrush Reedmace (<i>Typha latifolia</i>) and Lesser Pond Sedge (<i>Carex acutiformis</i>).</p> <p>Small amounts of Gypsywort (<i>Lycopus europaeus</i>), Reed Canary-grass (<i>Phalaris arundinacea</i>) and Hemp Agrimony (<i>Eupatoria cannabinum</i>) occur along the edge of the watercress beds.</p> <p>National Vegetation Classification The plant association again resembles S23.</p> <hr/> <p>Current Management:</p> <p>Management prescription: Largely non-intervention perhaps cut back some of the trees to let in more light.</p>



Invasive species:	List: Himalayan Balsam (<i>Impatiens glandulifera</i>), New Zealand Pigmyweed (<i>Crassula helmsii</i>)
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Surrounding landuse (briefly describe):	Largely urban amenity grassland immediately to the west. Pastures continue along the course of the Purwell to the south
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TABLE 2: Grassland habitat condition assessment – for information

This is broadly based on Natural England's Common Standards Monitoring 2005 which has been used to assess the condition of the main habitats present on Sites of Special Scientific Interest.

To help with the identification of grassland-type habitats and their condition, please use the following list of Negative Condition Indicators (species) for the typical open habitats found in Hertfordshire. They are divided in to three different ecological groups as below:

<p>Agricultural weeds (indicating increased soil nutrient levels in previously low-nutrient swards, and high levels of disturbance)</p> <p>These species are particularly negative from both the agricultural and ecological perspectives, and usually indicate both disturbance and increased nutrient levels.</p>	<p><u>Including these herbs:</u> Creeping and Spear Thistle, Broad-leaved and Curled Dock, Common Ragwort, Nettle, Greater Plantain, Cleavers, Cow Parsley and Field Horsetail, Daisy, Common Mouse-ear, Rosebay Willowherb, Sow Thistles.</p>
<p>Agriculturally favoured species (indicating increased eutrophication)</p> <p>These species are positive from the agricultural perspective. Ecologically however these species represent high soil nutrient levels, but not disturbance. While a few of these species are a normal component of ecologically valuable communities, a high frequency of these species indicates negative condition.</p>	<p><u>Including herbs:</u> White Clover, Creeping Buttercup;</p> <p><u>Grasses:</u> Perennial Rye-grass, Yorkshire Fog, Soft Brome, Timothy, Floating Sweet-grass, Rough Meadow-grass</p>
<p>Rank grasses, rushes and sedges</p> <p>if very abundant, these species indicate lack of appropriate management and/or waterlogging.</p>	<p>Including False Oat-grass, Cock's-foot, Tufted Hair-grass, Perennial Rye-grass, large-leaved sedge species, Reed Sweet-grass</p>

Species list:

Purwell Meadows 2016. A.Harris, M.Harris, A. Burton,R.Graham(4Aug) plus A. Judges, J.Williamson, S.Mason (11Aug.)		WS inds (*a/n/c/w/f) & neg inds ('-')	date of record (if > 1 day)	Comp1 Neutral grassland 04/08/2016	Comp2 Wet grassland 04/08/2016 and 11/08/2016	Comp3 River 11/08/2016	Comp4 Scrub 11/08/2016	Comp5 Carr woodland 04/08/2016 and 11/08/2016	Comp6 Amenity grassland 04/08/2016	Comp7 Watercress beds 11/08/2016	all inds
Scientific Name	Common Name			DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	
<i>Acer campestre</i>	Maple, Field	*			R						X
<i>Achillea millefolium</i>	Yarrow			R					R		
<i>Aesculus hippocastanum</i>	Chestnut, Horse*							R			
<i>Agrostis capillaris</i>	Bent, Common	a/n		R	R+				R		X
<i>Agrostis stolonifera</i>	Bent, Creeping			R	R	R+			R+		
<i>Ajuga reptans</i>	Bugle	*/n					R				X
<i>Alisma plantago-aquatica</i>	Plantain, Water				R						
<i>Alliaria petiolata</i>	Mustard, Garlic						R	R			
<i>Alnus glutinosa</i>	Alder, Common					R-	R-				
<i>Angelica sylvestris</i>	Angelica	f/w			R	R-					X
<i>Anthoxanthum odoratum</i>	Grass, Sweet Vernal	n		R	R+						X
<i>Anthriscus sylvestris</i>	Parsley, Cow	- c/n/w		R			R				
<i>Apium nodiflorum</i>	Watercress, Fool's									F	
<i>Arrhenatherum elatius</i>	Oat-grass, False	- a/c/n/w		R+	R+				R		
<i>Arum maculatum</i>	Lords-and-Ladies							R-			
<i>Atriplex prostrata</i>	Orache, Spear-leaved				R-						
<i>Bellis perennis</i>	Daisy	- a/c		R					R		
<i>Berula erecta</i>	Water Parsnip, Lesser				R	R+					
<i>Brachypodium sylvaticum</i>	Brome, False						R-				
<i>Briza media</i>	Grass, Quaking	c/n			R						X
<i>Bromopsis ramosa</i>	Brome, Hairy	*			R-		R	R-			X
<i>Bromus hordeaceus</i>	Brome, Soft	- n		R							
<i>Bryonia dioica</i>	Bryony, White				R						
<i>Calamagrostis epigejos</i>	Small-reed, Wood	*			R						X

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Scientific Name	Common Name			DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	
<i>Callitriche obtusangula</i>	Water-starwort, Blnt-fruitd~					R					
<i>Callitriche sp.</i>	Water-starwort, sp.					R		R			
<i>Caltha palustris</i>	Marigold, Marsh^	f/w		R-	R						X
<i>Calystegia sepium</i>	Bindweed, Hedge				R	R	R		R-		
<i>Cardamine pratensis</i>	Cuckoo-flower	n/w			R						X
<i>Carex acutiformis</i>	Sedge, Lesser Pond	f			R	R+				R	X
<i>Carex flacca</i>	Sedge, Glaucous	c/n/w			R-						X
<i>Carex hirta</i>	Sedge, Hairy			R+	O-	R					
<i>Carex nigra</i>	Sedge, Common~	w			R+						X
<i>Carex otrubae</i>	Sedge, False Fox				R						
<i>Carex paniculata</i>	Sedge, Greater Tussock	f			R						X
<i>Carex pendula</i>	Sedge, Pendulous	*			R	R-	R-	R			X
<i>Carex riparia</i>	Sedge, Greater Pond					O-					
<i>Carex spicata</i>	Sedge, Spiked~				R						
<i>Centaurea nigra agg.</i>	Knapweed, Black/Com'n/Chalk	c/n		O-	R+						X
<i>Cerastium fontanum</i>	Mouse-ear, Common	- a		R	R	R-			R		
<i>Cirsium arvense</i>	Thistle, Creeping	- a/c/n/w		O-	R	R-	R		R		
<i>Cirsium palustre</i>	Thistle, Marsh	f/w		R	R					R	X
<i>Cirsium vulgare</i>	Thistle, Spear	- a/c/n/w		R			R-				
<i>Clematis vitalba</i>	Clematis				R						
<i>Convolvulus arvensis</i>	Bindweed, Field			R							
<i>Crataegus monogyna</i>	Hawthorn				R		R	R+			
<i>Crepis capillaris</i>	Hawk's-beard, Smooth			R	R				R		
<i>Cynosurus cristatus</i>	Dog's-tail, Crested	n		O	R						X
<i>Dactylis glomerata</i>	Cocksfoot	- a/c/n/w		R	R				R+		
<i>Dactylorhiza praetermissa</i>	Orchid, Southern Marsh	w			R-						X
<i>Deschampsia cespitosa</i>	Hair-grass, Tufted	- n/w			R						

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Scientific Name	Common Name			DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	
<i>Dryopteris filix-mas</i>	Fern, Male						R				
<i>Eleocharis palustris</i>	Spike-rush, Common				R						
<i>Epilobium hirsutum</i>	Willowherb, Great				O-	O			R-	R	
<i>Epilobium parviflorum</i>	Willowherb, Hoary				R						
<i>Epilobium sp.</i>	Willowherb, unknown sp.			R					R-		
<i>Equisetum arvense</i>	Horsetail, Field	- n			R		R			R	
<i>Equisetum fluviatile</i>	Horsetail, Water				R						
<i>Equisetum palustre</i>	Horsetail, Marsh	f/w			R						X
<i>Eupatorium cannabinum</i>	Agrimony, Hemp	f				R-			R-	R	X
<i>Festuca rubra agg.</i>	Fescue, Red (family)			R+	R				R		
<i>Filipendula ulmaria</i>	Meadowsweet	f/w		R	O	R				R	X
<i>Fraxinus excelsior</i>	Ash						F	O-			
<i>Galium aparine</i>	Cleavers	- c/n					R	R		R	
<i>Galium uliginosum</i>	Bedstraw, Fen~	f/w			R	R					X
<i>Galium verum</i>	Bedstraw, Lady's	c/n		R	R						X
<i>Geranium dissectum</i>	Cranesbill, Cut-leaved			R							
<i>Geranium robertianum</i>	Herb Robert						R				
<i>Geum urbanum</i>	Wood Avens						R	R			
<i>Glechoma hederacea</i>	Ground Ivy						R				
<i>Glyceria notata</i>	Glyceria, Plicate~				R						
<i>Hedera helix</i>	Ivy						O	R			
<i>Helictotrichon pubescens</i>	Oat-grass, Downy	c/n		R							X
<i>Helminthotheca echioides</i>	Oxtongue, Bristly			R-							
<i>Heracleum sphondylium</i>	Hogweed							R			
<i>Holcus lanatus</i>	Yorkshire Fog	- a/c/n/w		O-	O				R		
<i>Hordeum murinum</i>	Barley, Wall			R							
<i>Hordeum secalinum</i>	Barley, Meadow	n		R							X

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Scientific Name	Common Name	WS inds (*a/n/c/w/f) & neg inds (*~)	date of record (if > 1 day)	DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	all inds
<i>Hypericum tetrapterum</i>	St John's-wort, Sq-stalked	w			R	R					X
<i>Hypochaeris radicata</i>	Cat's-ear, Common			R-					R		
<i>Impatiens glandulifera</i>	Balsam, Indian/Himalayan*	- w/f				R		R			
<i>Inula conyzae</i>	Ploughman's-spikenard						R				
<i>Iris pseudacorus</i>	Iris, Yellow flag				R	R+		R-			
<i>Juncus articulatus</i>	Rush, Jointed	w		R	R						X
<i>Juncus conglomeratus</i>	Rush, Compact~			R							
<i>Juncus effusus</i>	Rush, Soft				R	R					
<i>Juncus inflexus</i>	Rush, Hard			O-	O	O-					
<i>Juncus subnodulosus</i>	Rush, Blunt-flowered~	f/w			R+					R+	X
<i>Lathyrus pratensis</i>	Vetchling, Meadow	n		O-	R+	R					X
<i>Lemna minor</i>	Duckweed, Common									R	
<i>Lemna minuta</i>	Duckweed, Least*~									R	
<i>Lemna trisulca</i>	Duckweed, Ivy-leaved									R+	
<i>Ligustrum vulgare</i>	Privet, Wild									R	
<i>Lolium perenne</i>	Rye-grass, Perennial	- a/c/n/w		O	R	R-			R+		
<i>Lotus corniculatus</i>	Bird's-foot-trefoil, Com'n	c/n		R	R						X
<i>Lotus pedunculatus</i>	Bird's-foot-trefoil, Greater	f/w		R	O-	R					X
<i>Lycopus europaeus</i>	Gipsywort				R	R				R	
<i>Lysimachia nummularia</i>	Creeping Jenny^	w			R						X
<i>Lythrum salicaria</i>	Loosestrife, Purple	f				R-					X
<i>Medicago lupulina</i>	Medick, Black								R		
<i>Mentha aquatica</i>	Mint, Water				R	R				R	
<i>Myosotis scorpioides</i>	Forget-me-not, Water				R	R				R+	
<i>Odontites vernus</i>	Bartsia, Red				R						
<i>Ononis spinosa</i>	Restharrow, Spiny~	c		R+	R						X
<i>Persicaria maculosa</i>	Redshank				R	R					

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Scientific Name	Common Name			DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	
<i>Phalaris arundinacea</i>	Canary-grass, Reed	f				R		R		R	X
<i>Phleum bertolonii</i>	Catstail, Smaller			O-	R+						
<i>Phleum pratense</i>	Timothy	- a/n/w			R						
<i>Picea abies</i>	Spruce, Norway*			R-							
<i>Pimpinella saxifraga</i>	Saxifrage, Burnet	c		R							X
<i>Plantago lanceolata</i>	Plantain, Ribwort			O-	R+				R+		
<i>Plantago major</i>	Plantain, Greater	- a/c/n		R					R		
<i>Poa annua</i>	Meadow-grass, Annual								R		
<i>Poa trivialis</i>	Meadow-grass, Rough	- w		R+	O-	R+	R+	R	O		
<i>Populus alba</i>	Poplar, White*							F			
<i>Potentilla anserina</i>	Silverweed			R	R						
<i>Potentilla reptans</i>	Cinquefoil, Creeping			R	R						
<i>Prunella vulgaris</i>	Selfheal			R					R		
<i>Prunus spinosa</i>	Blackthorn			R	R+		F				
<i>Pulicaria dysenterica</i>	Fleabane, Common	w			R						X
<i>Quercus robur</i>	Oak, Pedunculate							R+			
<i>Ranunculus acris</i>	Buttercup, Meadow	n		R					R-		X
<i>Ranunculus bulbosus</i>	Buttercup, Bulbous	c/n		R							X
<i>Ranunculus repens</i>	Buttercup, Creeping	- w		R		R	R		R+		
<i>Ribes rubrum</i>	Currant, Red						R-				
<i>Rorippa nasturtium-aquaticum</i>	Watercress					O				A	
<i>Rosa canina agg.</i>	Rose, Dog, agg.				R			R-			
<i>Rubus fruticosus agg.</i>	Bramble				R+	R	O-	R+			
<i>Rumex acetosa</i>	Sorrel, Common	n		R	R						X
<i>Rumex conglomeratus</i>	Dock, Clustered			R+	R	R+			R-		
<i>Rumex obtusifolius</i>	Dock, Broad-leaved	- c/n/w		R	R		R-		R-		
<i>Rumex sanguineus</i>	Dock, Wood			R			R	R-			

Purwell Meadows 2016. A.Harris, M.Harris, A. Burton,R.Graham(4Aug) plus A. Judges, J.Williamson, S.Mason (11Aug.)		WS inds (*f/n/c/w/f) & neg inds ('-')	date of record (if > 1 day)	Comp1 Neutral grassland 04/08/2016	Comp2 Wet grassland 04/08/2016 and 11/08/2016	Comp3 River 11/08/2016	Comp4 Scrub 11/08/2016	Comp5 Carr woodland 04/08/2016 and 11/08/2016	Comp6 Amenity grassland 04/08/2016	Comp7 Watercress beds 11/08/2016	all inds
Scientific Name	Common Name			DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	
<i>Salix alba</i>	Willow, White							F			
<i>Salix sp.</i>	Willow, sp.							R+			
<i>Salix viminalis</i>	Willow, Osier				R-						
<i>Sambucus nigra</i>	Elder						R+	R		R	
<i>Schedonorus giganteus</i>	Fescue, Giant	*			R			R-			X
<i>Scorzonerooides autumnalis</i>	Hawkbit, Autumn								R		
<i>Scrophularia auriculata</i>	Figwort, Water				R+	R+				R	
<i>Senecio jacobaea</i>	Ragwort, Common	- a/c/n		R	R						
<i>Silene flos-cuculi</i>	Ragged Robin	f/w		R-							X
<i>Solanum dulcamara</i>	Bittersweet				R		R			R	
<i>Sparganium erectum</i>	Bur-reed, Branched				R	O-					
<i>Stachys palustris</i>	Woundwort, Marsh				R	R+					
<i>Stachys sylvatica</i>	Woundwort, Hedge							R			
<i>Taraxacum officinale agg.</i>	Dandelion family			R					O		
<i>Tragopogon pratensis</i>	Goat's-beard			R-	R						
<i>Trifolium dubium</i>	Trefoil, Lesser			R					R		
<i>Trifolium pratense var. pratense</i>	Clover, Red (native)	c/n		R	R				R-		X
<i>Trifolium repens</i>	Clover, White	- a/c/n/w		R	R				R+		
<i>Tripleurospermum inodorum</i>	Mayweed, Scentless								R-		
<i>Typha latifolia</i>	Bulrush					R				R	
<i>Ulmus procera</i>	Elm, English							R-			
<i>Urtica dioica</i>	Nettle, Stinging	- a/c/n/w		R	R	R	F	A	R-	R	
<i>Valeriana dioica</i>	Valerian, Marsh	f/w			R						X
<i>Veronica anagallis-aquatica</i>	Speedwell, Blue Water					R				R+	
<i>Veronica beccabunga</i>	Speedwell, Brooklime			R-	R	R				R	
<i>Veronica chamaedrys</i>	Speedwell, Germander	c/n		R	R-						X
<i>Veronica filiformis</i>	Speedwell, Slender								R		

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Scientific Name	Common Name			DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	DAFOR	
<i>Vicia cracca</i>	Vetch, Tufted	c/n		R	R						X
<i>Viola odorata</i>	Violet, Sweet								R-		
*= <i>planted/introduced/escape</i>		per compartment totals:		66	92	43	30	28	36	25	
^= <i>note whether planted</i>		^{GR} =8 fig grid ref required									
~= <i>check specimen requirements</i>											

DAFOR Scale:

D	Dominant	>75% cover
A	Abundant	51-75% cover
F	Frequent	26-50% cover
O	Occasional (high)	11-25% cover
O-	Occasional (low)	5-10% cover
R+	Rare (high)	1-5% cover
R	Rare	>5 individual plants up to 1% cover
R-	Very Rare	≥5 (including 5) individual plants

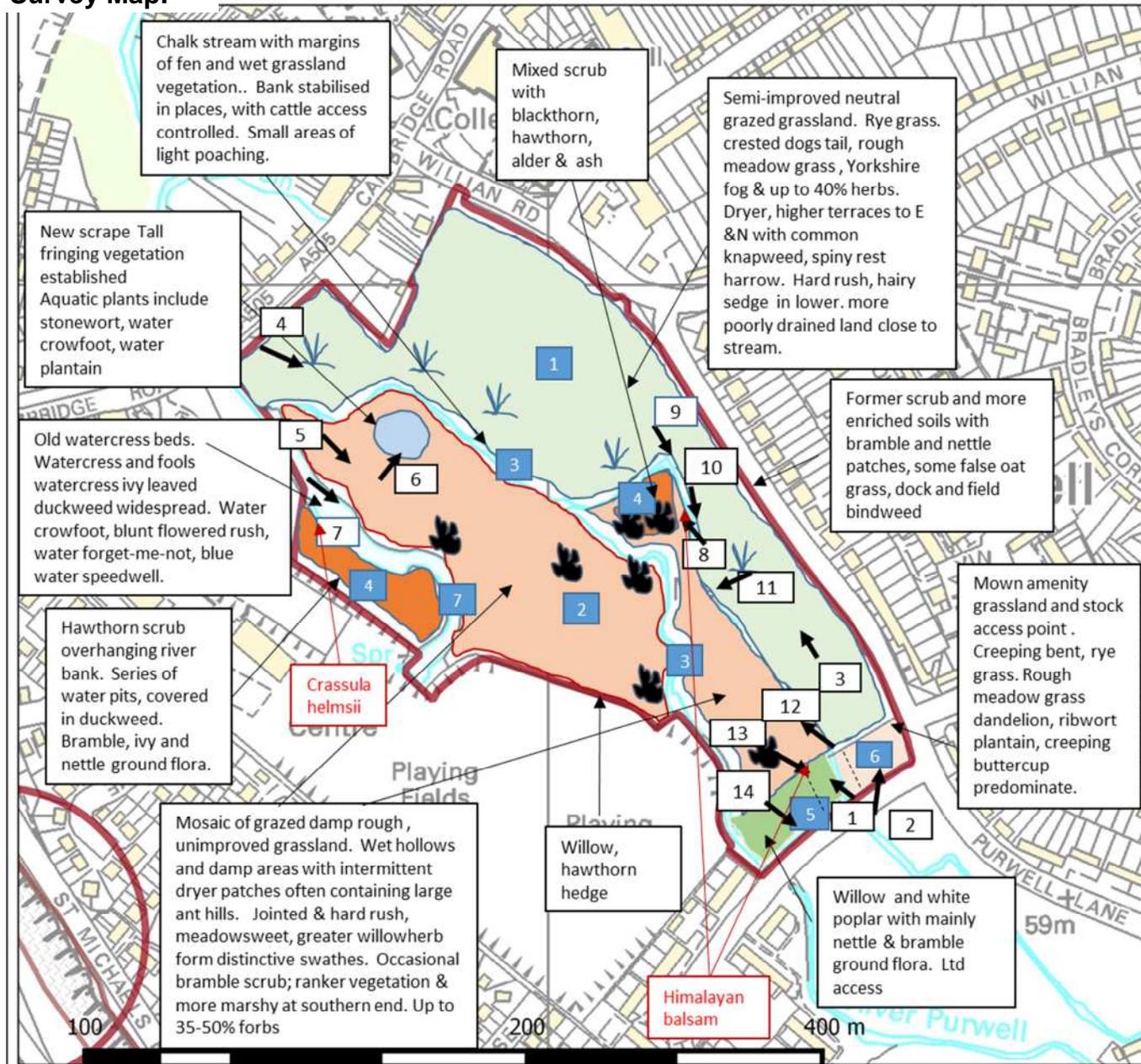
Please note: the total cover for the compartment can exceed 100% because vegetation occurs in layers.

Total species (all comp.s)		total indicators					
	161	47					
	AWI (H.1)	Neut (H.2.2b)	Acid (H.2.2c)	Calc (H.2.2a)	Wet (H.2.2d)	Fen (H.5.3)	c/a/n/w (H.2.2e)
Comp1 Neutral grassland 04/08/2016	0	15	1	10	6	5	23
Comp2 Wet grassland 04/08/2016 and 11/08/2016	AWI	Neut	Acid	Calc	Wet	Fen	c/a/n/w
	5	14	1	9	17	11	30
Comp3 River 11/08/2016	AWI	Neut	Acid	Calc	Wet	Fen	c/a/n/w
	1	1	0	0	5	8	6
Comp4 Scrub 11/08/2016	AWI	Neut	Acid	Calc	Wet	Fen	c/a/n/w
	3	1	0	0	0	0	1
Comp5 Carr woodland 04/08/2016 and 11/08/2016	AWI	Neut	Acid	Calc	Wet	Fen	c/a/n/w
	3	0	0	0	0	1	0
Comp6 Amenity grassland 04/08/2016	AWI	Neut	Acid	Calc	Wet	Fen	c/a/n/w
	0	3	1	1	0	1	3
Comp7 Watercress Beds 11/08/2016	AWI	Neut	Acid	Calc	Wet	Fen	c/a/n/w
	0	0	1	0	3	6	3
All Compartments:	AWI	Neut	Acid	Calc	Wet	Fen	c/a/n/w
	6	19	1	12	18	15	37
Thresholds:	AWI	Neut	Acid	Calc	Wet	Fen	c/a/n/w
min size (ha)	1	0.25	0.25	0.25	0.25	0.25	0.25
min indicators	10	8	5	8	5	5	12
Criteria met		Met		Met	Met	Met	Met

Faunal Species List:

Date of Records: August 2016		Recorder: Andrew Harris	
Common Name	Qualifier	no. observed	Date if >1 day
Birds			
Buzzard	Sighting		04/08/2016
Wood Pigeon	Sighting		04/08/2016
Magpie	Sound		04/08/2016
Jay	Sound		04/08/2016
Carrion Crow	Sighting	pair	11/08/2016
Blue Tit	Sound		04/08/2016
Long Tailed Tit	Sighting	flock	04/08/2016
Wren	Sighting		04/08/2016
Robin	Sound		04/08/2016
Goldfinch	Sighting		04/08/2016
Mammals and Amphibians			
Common Shrew	Sighting (dead)		11/08/2016
Mole	Sign		04/08/2016
Rabbit	Sign		04/08/2016
Common Frog	Sighting	froglets	04/08/2016
Butterflies			
Small Skipper	Sighting		04/08/2016
Green-veined White	Sighting		11/08/2016
Small White	Sighting		04/08/2016
Common Blue	Sighting		04/08/2016
Holly Blue	Sighting		04/08/2016
Gatekeeper	Sighting		04/08/2016
Meadow Brown	Sighting		11/08/2016
Speckled Wood	Sighting		04/08/2016
Bees			
Honey Bee	Sighting		04/08/2016
Common Carder Bee	Sighting		04/08/2016
Hoverflies			
Marmalade Fly	Sighting		04/08/2016
<i>Helophilus pendulus</i>	Sighting		11/08/2016
Dragonflies and Damselflies			
Banded Demoiselle	Sighting		04/08/2016

Survey Map:



Key

Local Sites

HCC_Local_Wildlife_Sites

1 Compartment

1 Photo point

↙ Wetter area
↙ Scrub
↙ Compartment 2

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27/11/2015



M Harris
15.8.2016

Survey Photos (each compartment should have at least one representative photo):

Photo 1:
Compartment 5



Photo 2:
Compartment 6:



Photo 3:
Compartment 1



Photo 4: Compartment 1



Photo 5: Compartment 2



Photo 6: Compartment 2



Photo 7: Compartment 7



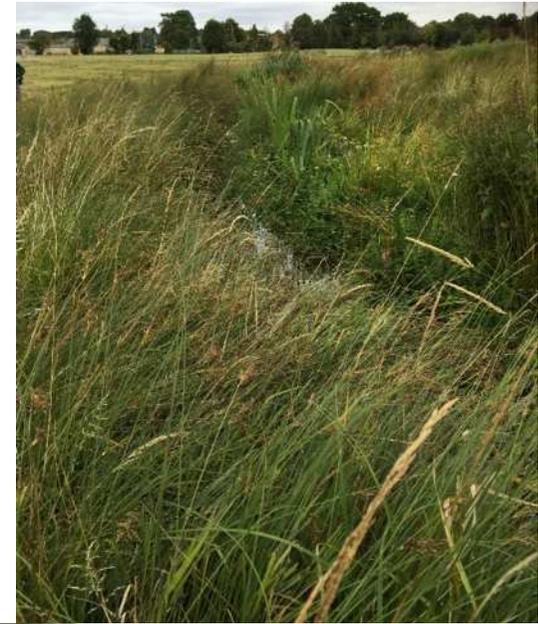
Photo 8:
Compartment 2 &
4



Photo 9:
Compartment 3



Photo 10
Compartment 3



Photograph 11:
Compartment 2



Photograph 12:
Compartment 2



Photograph 13: Compartment 5



Photograph 14: Compartment 5

