



Consultancy Services

Sevenoaks Wildlife Reserve, Bradbourne Vale Road, Sevenoaks, Kent TN13 3DH

Extended Phase 1 Habitat Survey



KWT Consultancy Services



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Any information provided by third parties and referred to within this report has not been checked or verified by KWT Consultancy Services unless otherwise expressly stated within this document.

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1 SUMMARY

INTRODUCTION

Kent Wildlife Trust is seeking to obtain planning permission for improvements to the existing visitor experience at its Sevenoaks Wildlife Reserve. The land subject to development proposals comprises a c.1.75ha area located in the south-west of Sevenoaks Wildlife Reserve and Site of Special Scientific Interest (SSSI).

In consideration of the current potential ecological interest of this site, KWT Consultancy Services was commissioned to undertake an extended Phase 1 Habitat Survey of this area in November 2019.

DISCUSSION AND RECOMMENDATIONS

No legally protected vascular plant species that are listed in Schedule 8 of the Wildlife and Countryside Act (1981) were found during the current survey. It is not considered likely that these species would be present within the habitats currently within the site boundary.

No vascular plant species of Principal Importance (previously known as BAP priority species) were recorded during the survey. It is not considered likely that these species would be present within the habitats currently within the site boundary.

No species of vascular plant mentioned in the SSSI citation for 'Sevenoaks Gravel Pits' (namely, small cudweed, dwarf elder and slender bird's-foot-trefoil) were recorded during the survey. However additional work is required as follows:

- Small cudweed. The proposed new visitor centre and the pre-fabricated maintenance building may be sited on the disturbed bare ground areas where this plant may occur and as such a brief check of these areas in early summer could be carried out by an experienced botanist prior to start of any works. However, the ground clearance and disturbance associated with the construction phase of any development may also lead to the reappearance of the plant from the seedbank and subsequent botanical monitoring could be carried out and provision made for management if it is found. As part of the proposed development, potential mitigation or enhancement could be the creation and maintenance of disturbed areas for this and other ephemeral species at the site.
- Slender bird's-foot-trefoil. Although, the current survey was carried out at the wrong time of year to pick up this usually annual and ephemeral species, the evidence would suggest it is unlikely to be present. A short follow up visit could verify absence in the development footprint prior to commencement of works. The habitat requirements seem to be winter damp and well-drained soil in summer with only limited competition from other plants. As with small cudweed, the conditions around the development may result in germination from any existing seedbank and similar enhancement opportunity and management advice would apply.
- Dwarf elder. The current survey was probably carried out too late in the season to pick up this herbaceous species. A follow up visit could be conducted to verify absence in the development footprint prior to commencement of works.

One Invasive non-native species - wall cotoneaster, as listed in Schedule 9 Part II of the Wildlife and Countryside Act (1981) was found on the site. This plant is controversial as it does provide foraging opportunities for pollinating insects and birds. In its current 'wildlife garden' context, it unlikely to impact on the surrounding habitats, since it is not located close to any habitats where it usually causes impacts, such as chalk grassland or chalk scarp sites. However, the landowner does have a legal obligation to ensure that it does not spread to the wild and changes to legislation may require for it to be managed or eradicated from the site. It should be considered that this site is within a SSSI. This site also has an educational role in demonstrating good practice to the public which may not be furthered by the presence of a Schedule 9 INNS. Similarly, the two other species that are non-native with a tendency to be invasive should be part of the management plan for the reserve. Butterfly-bush is present in much of the survey area and only provides limited pollinator and cover opportunities for wildlife and the shading of some areas may have impacted upon or prevented colonisation of other species. Snowberry, although currently very limited on site, is likely to spread within the woodland habitats. Fringecups is a widespread garden escape that seeds readily, it is a non-native plant that likes damp

woodland habitats and it has become established in the damp woodland (TN2). It is recommended that where feasible these species are removed as part of the development and management plans.

Additional recommendations. There were no grassland habitats of principal importance present within the survey boundary. The grassland habitat was all improved/amenity grassland and it is unlikely that any mitigation will be required.

All broadleaved woodland is considered priority habitat, however none of the woodland within the site was ancient woodland; it was secondary woodland that has developed over previous gravel workings. Consistent with the secondary nature of the woodland, the ground flora appeared fairly limited at the time of survey, with the caveat that this assessment is based on late / very early season surveys. The woodland and scrub provide valuable habitats for wildlife and the proposed development should, where possible, aim to limit impacts to areas of non-native shrub, already developed or disturbed areas and bare ground. The provided plans appear to indicate that this is the intention. No additional botanical surveys or mitigation are recommended unless the footprint changes or significant impacts on broadleaved woodland habitats are anticipated. The standing water and wetland habitats were not part of the brief for this Phase 1 Habitat Survey. A botanical survey would be recommended for the aquatic and wetland habitats should impacts become likely.

2 INTRODUCTION

2.1 Background

Kent Wildlife Trust is seeking to obtain planning permission for improvements to the existing visitor experience at its Sevenoaks Wildlife Reserve. The land subject to development proposals comprises a c.1.75ha area located in the south-west of Sevenoaks Wildlife Reserve and Site of Special Scientific Interest (SSSI) – herein termed as ‘the site’.

The current proposals are understood to include the following:

- Demolition of five structures, several containers and limited areas of dense scrub and trees to facilitate new access and parking areas.
- Removal of a limited area of trees and scrub in the vicinity of the existing visitor centre building and the enlarged parking areas and one way road system.
- Extension and renovation of the existing visitor centre building.
- Recladding and improved thermal performance of the visitor centre, requiring the temporary removal of all roof tiles and timber weatherboarding from all elevations.
- Installation of air sourced heat pumps within the visitor centre and photo voltaic panels on the visitor centre roof.
- Resurfacing of all access routes and parking areas.
- New play area to east of visitor centre.
- New areas of tree planting and soft-landscaping in the north, east and west of the site.

2.2 Survey Location / Area

The proposed development area is located within Sevenoaks Wildlife Reserve, located on the northern periphery of Sevenoaks town. The village of Dunton Green is located to the west, the A25 to the South, residential and commercial areas to the west and open agricultural land to the north. The central OS grid reference for the proposed development area is TQ 51942 56702.

The site comprised a group of lakes, formed by flooding of former gravel workings and fed by the river Darent. Historically, the site underwent extensive landscaping and planting to provide habitat for breeding and wintering birds. In 1968, the whole site was designated as a Site of Special Scientific Interest (SSSI) - Sevenoaks Gravel Pits. The major features of interest of the SSSI are centred around birds but the citation states that “the botanical interest of the site is known to be developing” and cites that “Plants of note include small cudweed *Filago minima*, dwarf elder *Sambucus ebulus*, and slender bird’s-foot-trefoil *Lotus angustissimus*.” It should be noted that *Filago minima* has recently had its scientific name revised to *Logfia minima* [Stace, 2019].

Figure 1 shows the extent of the Reserve and the general location of the site. Figure 2 shows the development proposals.

2.3 Limitations

Phase 1 habitat Surveys can be conducted at any time of year but the optimal season for botanical surveys is generally from April to October, depending on the seasonal conditions and the type of habitats to be surveyed. The main survey was conducted at the end of

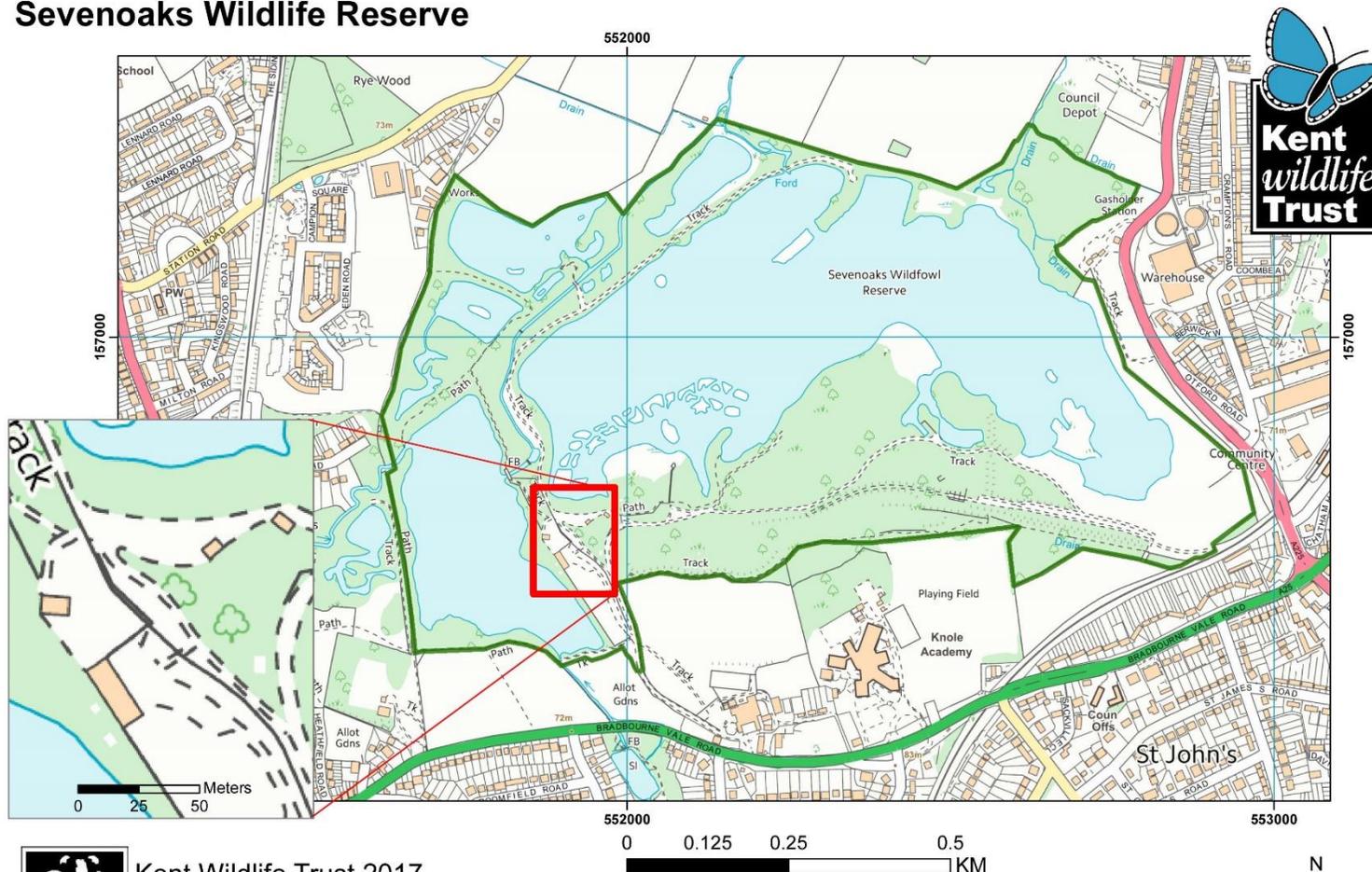
November following some very wet weather and some cold, frosty conditions. It is reasonable to assume that some plant species will no longer be present or that it would be difficult or impossible to record other species at this time of year. There is a high likelihood that species such as those of woodland ground flora, spring ephemerals and some annual species may be missed or under-recorded in such a late season survey.

A second survey visit, covering an extension to the initial survey area took place in mid-March 2020. This is still early in the year for the majority of flowering plants and again, it is likely that this will have impacted the number of species recorded.

There were some areas of the site that were inaccessible or unsafe to enter due to barbed-wire fencing, heavy plant operation or had ground conditions that were too wet underfoot. However, these areas were either bare ground or considered sufficiently removed from the given locations of the proposed development as to be unlikely to be impacted.

Figure 1: Site Location / Boundary Map. Map provided by Kent Wildlife Trust showing extent of Sevenoaks Wildlife Reserve (outlined in green), and the general location of the site (outlined in red)

Sevenoaks Wildlife Reserve



Kent Wildlife Trust 2017

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Figure 2: Development proposals



3 METHODOLOGY

An extended Phase 1 Habitat Survey was carried out following the standard guidelines outlined in the Handbook for Phase 1 habitat survey [JNCC, 2010].

The terrestrial Phase 1 habitats, within the designated survey area, were mapped and described in detailed target notes. The survey was extended to include a list of all the vascular plant species observed on the day of the survey.

Species nomenclature throughout follows the standard botanical text [Stace, 2019].

An effort was made to keep an eye out for the plant species listed within the SSSI citation [Natural England, 1981]. Notes were made of invasive non-native species (INNS) of vascular plant found during the survey, including those listed in Schedule 9 Part 2 of the Wildlife and Countryside Act and those that are not currently listed but which may impact on the features of interest of the SSSI [GB-NNSS, 2016]. Species of Principal Importance, on the Kent Rare Plant Register (KRPR) or species of conservation concern as in the Red Lists are also highlighted (NERC, 2006; Kitchener, 2019; Cheffings, 2005; Stroh, 2014 & JNCC, 2016).

The main survey was undertaken in November 2019 by Dr Lesley Mason, a botanical consultant (Field Identification Skills Certificate - Level 5) with extensive knowledge of the Kent Flora.

The footprint of the proposed development was amended by the Kent Wildlife Trust Project Team following completion of the initial extended Phase 1 Habitat Survey, and this resulted in an extension of the overall survey area, with the additional area being surveyed in March 2020 by Dr Clair Thackray, Consultant Ecologist, KWT Consultancy Services.

4 RESULTS

A list of all the vascular plant species recorded is given in Appendix A, including reference to INNS, KRPR species (KRPR* in the table indicates those species that are relatively frequent in Kent), species of conservation concern and any useful notes including identification limitations for species.

The Phase 1 Habitat maps for the survey area are shown in Appendix B, with Photographs included at Appendix C. The map areas are numbered with reference to the following detailed target notes (TN) of habitats and species:

TN1. Semi-natural Broadleaved Woodland. Bordering the lake, the bank above comprised alder *Alnus glutinosa* and ash *Fraxinus excelsior* woodland with other canopy trees including pedunculate oak *Quercus robur*, sycamore *Acer pseudoplatanus*, silver birch *Betula pendula*, hybrid crack willow *Salix x fragilis* and a large hybrid poplar *Populus x canadensis* with nesting holes. The understorey was mainly elder *Sambucus nigra* and bramble *Rubus fruticosus* agg. scrub with occasional non-native butterfly-bush *Buddleja davidii*. Ground flora, that was still apparent in November, included abundant ground ivy *Glechoma hederacea* along with common nettle *Urtica dioica*, pendulous sedge *Carex pendula*, wood avens *Geum urbanum*, red campion *Silene dioica*, cleavers *Galium aparine*, three-nerved sandwort *Moehringia trinervia*, male fern *Dryopteris filix-mas* and green alkanet *Pentaglottis sempervirens* along the path edges. The scrub layer extended right down to the lake margins. There were very few marginal plants evident, some small rosettes of water forget-me-not *Myosotis scorpioides* were found.

TN2. Semi-natural Broadleaved Woodland. Down on a lower level below the pathway and next to the lake was an area of wet woodland priority habitat with abundant alder in the canopy layer. Other species included goat willow *Salix caprea*, grey willow *Salix cinerea* ssp. *oleifolia*, pendulous sedge, common nettle, gooseberry *Ribes uva-crispa*, and a patch of the garden escape fringecups *Tellima grandiflora*. The wettest and marginal areas had swamp vegetation with branched bur-reed *Sparganium erectum*, fool's-water-cress *Helosciadium nodiflorum* and a sedge *Carex* sp. that was dead and unidentifiable at the time of survey.

TN3. Miscellaneous habitat of cultivated or disturbed land – Introduced shrub. This strip bordering the woodland track and north of the fisherman's carpark was dominated by a dense thicket of non-native and 'invasive' butterfly-bush with some bramble and limited ground flora of common nettle and ground-ivy.

TN4. Bare ground and ephemeral / short perennial. Access tracks here were churned up with wet bare mud from the movement of excavators and dumpers. The centre of the track had low growing ephemeral/short perennial vegetation with species found including creeping bent *Agrostis stolonifera*, selfheal *Prunella vulgaris*, scarlet pimpernel *Lysimachia arvensis*, common stork's-bill *Erodium cicutarium*, daisy *Bellis perennis*, dandelion *Taraxacum* agg., creeping buttercup *Ranunculus repens* and parsley-piert *Aphanes* sp..

TN5. Ephemeral / short perennial. A small triangular area between the trackways. Abundant ground cover by bryophyte species, vascular plants included thyme-leaved speedwell *Veronica serpyllifolia*, buck's-horn plantain *Plantago coronopus*, common centaury *Centaureum erythraea* and ground-ivy. Taller ruderal species included teasel *Dipsacus fullonum* and prickly sow-thistle *Sonchus asper*. There were a few dead plants of a

dead-nettle species on the edge of the area that may have been wild basil *Clinopodium vulgare*.

TN6. Semi-natural Broadleaved Woodland. Predominant canopy tree was alder with elder and bramble scrub underneath. The understorey included spindle *Euonymus europaeus* and butterfly-bush was present, especially at the southern end, nearest the fisherman's carpark. The ground flora, like **TN1**, had pendulous sedge, common nettle, green alkanet, ground-ivy, basal leaves of probably wood forget-me-not *Myosotis* cf. *sylvatica* and false brome *Brachypodium sylvatica*.

TN7. Semi-natural Broadleaved Woodland. Alder and ash canopy with elder, grey willow and hawthorn *Crataegus monogyna* in the shrub layer with bramble and similar ground flora to **TN6**. A narrow pathway of bare mud led around towards the lake margins. The path had narrow grassy margins, mainly perennial rye-grass *Lolium perenne*, rough meadow-grass *Poa trivialis* and creeping buttercup, backed by dense continuous bramble scrub with common nettle between the path and Tahoma's garden.

TN8. Semi-natural Broadleaved Woodland. The woodland here was predominantly secondary birch woodland with an understorey of bramble and common nettle with scattered grey willow, butterfly-bush, elder and dog-rose *Rosa canina* agg. Spindle, pendunculate oak and ash were also occasional with holly *Ilex aquilifolium* rare and sycamore was beginning to colonise this area too. The ground flora included Yorkshire fog *Holcus lanatus*, false brome, creeping buttercup, cleavers, hedge woundwort *Stachys sylvatica*, male fern, red campion and ground-ivy.

TN9. Semi-natural Broadleaved Woodland and Dense continuous scrub mosaic. The narrow track continued along the lake margin with narrow grass and common herb margins, including green alkanet. Bounding the track along behind the visitor centre was dense bramble scrub with butterfly-bush. Below the birdwatching hide some raspberry *Rubus idaeus* was also part of the scrub margin, this is native on acidic woodland soil but it could also have spread from plantings in the garden. The lake margins had alder trees and grey willow shrubs along with some sycamore saplings. Pendulous sedge was frequent in the ground layer along other common herb species including common nettle, wood avens, false brome, and ground-ivy. The marginal species of the lake included branched bur-reed, reed sweet-grass *Glyceria maxima* and great willowherb *Epilobium hirsutum*. Common ragwort *Jacobaea vulgaris* was occasional in the grassy path margins but it doesn't present any problem in this location as part of the native flora.

TN10. Native Species-rich Intact Hedge. Planted along the lakeside boundary of the 'wildlife garden' was a mixed broadleaved species hedge including hazel *Corylus avellana*, spindle, dogwood *Cornus sanguineus*, field maple *Acer campestre*, rowan *Sorbus acuparia* and elder. There were also non-native garden shrubs, raspberry and butterfly-bush in the hedge. Ground flora included green alkanet, wood avens and red campion.

TN11. Broadleaved Trees. A line of planted mature trees between the grassland area and the car park entrance road. The trees were a mix of grey willow, goat willow, weeping willow *Salix x sepulcralis* and white willow *Salix alba*. Underneath the trees was bramble scrub with common nettle, wood avens and ground-ivy.

TN12. Broad-leaved Trees. A line of planted mature white willow trees. There was under planting of hazel, spindle, dogwood and hawthorn *Crataegus monogyna*.

TN13. Dense Continuous Native Scrub. A ‘hedge-line’ of dense continuous bramble scrub with a ground flora of common nettle, ground-ivy, creeping cinquefoil *Potentilla reptans*, cleavers and occasional creeping thistle *Cirsium arvense*. A small tree of pedunculate oak was also in the ‘hedge’.

TN14. Dense Continuous Native Scrub. Continuing along the other side of the grassland was a ‘hedge-line’ of dense continuous scrub mainly comprising native shrubs including bramble, dogwood, spindle, dog-rose, raspberry and guelder-rose *Viburnum opulus*. Non-native butterfly-bush was also in the line. Common nettles were at the base.

TN15. Improved Grassland. Regularly mown grassland with species including perennial ryegrass, creeping bent, creeping buttercup, white clover *Trifolium repens*, selfheal, common mouse-ear *Cerastium fontanum*, ground-ivy and germander speedwell *Veronica chamaedrys*. A weak indicator species of semi-improved grassland, lesser stitchwort *Stellaria graminea* was also found, but was only rare in the sward and confined to the edge of the grassland. Underneath the line of white willow trees (TN12), crosswort *Cruciata laevipes* was growing along the very edge of the grassland. Crosswort is a KRPR species, although it is relatively common in semi-improved grassland in Kent [Kitchener, 2019]. Crosswort is reported to have declined from 201 to 137 tetrads over an approximate period of 30 years [Philp, 2010 & Philp, 1982]. Nationally, crosswort’s conservation status is ‘Least Concern’ in Great Britain and ‘Near Threatened’ in England [JNCC, 2016; Cheffings, 2005 & Stroh, 2014].

TN16. Improved Grassland. Regularly mown, disturbed, trampled area of shaded grassland that appeared to be used for education and demonstrations of wildlife gardening. The improved grassland species in the sward were very similar to TN15. There were lots of log piles, compost heaps, wildlife boxes/homes and dead hedges covering much of the area. There was a mixed broad-leaved hedge of hazel, hawthorn and birch.

TN17. Amenity Grassland. A more formal area of wildlife garden surrounded by hedges and shrubs. The lawn is regularly mown and trampled improved grassland. There are many horticultural varieties of herbaceous perennial and non-native shrubs which are great for wildlife. The shrubs included the INNS wall cotoneaster *Cotoneaster horizontalis* which is listed in schedule 9 part II of the Wildlife and Countryside Act (1981) [GB NNSS, 2016]. This area included lots of wildlife garden features and a small pond.

TN18. Bare Ground. Small area of bare ground covered by wood chips and surrounded by a living willow *Salix* sp. fence.

TN19. Amenity Grassland. An area of regularly mown trampled improved grassland with picnic tables. Species included perennial ryegrass, creeping buttercup and common ragwort. The edges had native shrubs/scrub including bramble and spindle with pendulous sedge at the bottom.

TN20. Amenity Grassland. Improved grassland lawns surrounded the education building ‘Tahoma’. Other habitats included areas covered by weed control fabric and paths of bare ground with chippings, compost heaps, habitat piles and dead hedges. There was a young

laid hedge of hawthorn and hazel bordering the main track. The garden species were like the other improved grassland/Amenity grassland areas, additional species included a small yew *Taxus baccata*, hart's-tongue fern *Asplenium scolopendrium* next to the building and a small patch of soft rush *Juncus effusus*. There was a very large mature pedunculate oak (with multiple potential bat roost features).

TN21. Semi-natural Broadleaved Woodland. At the northern end, this area comprised a line of trees over scrub and it became a more open woodland area at the southern end with grassland dominated by bryophytes in the field layer. The canopy was frequent silver birch with occasional field maple, pedunculate oak, wild cherry *Prunus avium* and hornbeam *Carpinus betulus*. The scrub and ground flora was similar to the other woodland areas. The main bryophyte was neat feather moss *Pseudoscleropodium purum*.

TN22. Introduced shrub. The bank sloping down to the 'Fisherman's car park' was dominated by butterfly-bush. There was also snowberry *Symphoricarpos albus*, another non-native shrub that is widely naturalised in the countryside and arguably invasive. A large mature pedunculate or hybrid oak tree.

TN23. Tall Herb and Fern – Continuous Bracken. The bank sloping up above the parking area was dense bracken *Pteridium aquilinum* with occasional foxglove *Digitalis purpurea*. At the top of the bank next to the Fisherman's entrance track was a line of tall trees including red oak *Quercus rubra* and wild cherry with bramble, spindle and butterfly-bush underneath and the same common ground flora species.

TN24. Coniferous Trees. A group of tall planted Leyland cypress *Cupressus x leylandii* was adjacent to dilapidated buildings.

TN25. Introduced shrub with Scattered broadleaved trees. This large area was dominated by established butterfly-bush scrub with bramble and common nettle. There were some large mature pedunculate oak trees, particularly along the margins and scattered silver birch, both large mature trees and saplings. There were a few small sheds/buildings amongst the scrub that are not shown on the map.

TN26. Coniferous Plantation. An area of tall mature planted Leyland cypress with butterfly-bush scrub, common nettle and teasel.

TN27. Semi-natural Broadleaved Woodland. This low-lying area of woodland was fenced off and access wasn't possible. Access for botanical survey is not necessary since the current proposals are not likely to impact on this area. The woodland appeared to be damp secondary woodland of birch and willow species with an understorey of elder with mainly bramble and nettles in the field layer. A disused pheasant/animal shelter was just inside the fence line. There was a raised bank between the woodland and the track with pendulous sedge, male fern, bramble, common nettle, hawthorn and elm *Ulmus* sp. suckers.

TN28. Improved Grassland. Tiny patch of mown grassland, with a wooden bench, within the surrounding bracken and bramble. Species included creeping bent, Yorkshire fog, ground-ivy, agrimony *Agrimonia eupatoria*, lesser burdock *Arctium minor* and common ragwort.

TN29. Semi-improved Neutral Grassland. A small area of disturbed semi-improved neutral grassland, on a slight slope, over sandy soil. Given its proximity to the visitor centre this area may have been seeded in the past but the mix of species of disturbed ground that were currently present are likely to be self-sown. The grass species included creeping bent, false brome, cock's-foot *Dactylis glomerata* and red fescue *Festuca rubra* agg. Herbaceous species included ground-ivy, common nettle, teasel, common mouse-ear, spear thistle *Cirsium vulgare*, a species of evening primrose *Oenothera* sp. and hound's-tongue *Cynoglossum officinale*. Hound's-tongue is listed in the KRPR, although it is relatively common on sand and gravel and at coastal locations in Kent [Kitchener, 2019]. Hound's-tongue was reported to have declined slightly, from 59 to 55 tetrads, over an approximate period of 30 years [Philp, 2010 & Philp, 1982]. Nationally, hound's-tongue is 'Near Threatened' in both vascular plant Red Lists for of Great Britain and England [JNCC, 2016; Cheffings, 2005 & Stroh, 2014].

TN30. Dense Continuous Native Scrub. Patch of dense continuous bramble scrub with ground flora including common nettle, and ground-ivy.

TN31. Semi-natural Broadleaved Woodland and Dense Continuous Native Scrub mosaic. The scrub and ground flora were similar to the other woodland areas with a scattered canopy overhead.

TN32. Bare Ground. The entrance trackway has been widened in this area to create a compound with a stockpile of grit and a parking area for excavators, dumpers and other vehicles. The substrate was bare mud and mainly surfaced with grit. In places the wet muddy edges had patches of soft rush and pendulous sedge.

TN33. Bare Ground. The main car parking area for the reserve.

TN34. Bare Ground. There was no safe access to this area, it seemed to be the 'Fisherman's car park and had parked vehicles and an excavator working at the time of the survey.

TN35. Dense bramble scrub with scattered trees supporting dense stands of ivy *Hedera helix*. Species: Elder, hawthorn, willow sp. Well established / moss covered log pile refugia. Sparse, shaded ground flora including lords-and-ladies *Arum maculatum*, common nettle. Northern edge supports cow parsley *Anthriscus sylvestris*, cleavers, red dead-nettle *Lamium purpureum*, clover and herb Robert *Geranium robertianum*.

TN36. Dense scrub habitat along roadside – Tree species: Blackthorn dominant with occasional elder, hawthorn and butterfly-bush (r). Ground heavily shaded beneath with bare ground dominating. Pendulous sedge and butterfly-bush are dominant at the northern end. Roadside edge habitat includes bramble (d) with common nettle, red dead-nettle, cleavers, green alkanet, hogweed, ivy-leaved speedwell *Veronica hederifolia*, forget-me-not species *Myosotis* sp., common mouse-ear, white dead-nettle *Lamium album*, burdock *Arctium* sp., ground-ivy, lords-and-ladies, spear thistle, groundsel *Senecio vulgaris*, wavy bitter-cress *Cardamine flexuosa* and pendulous sedge (r).

TN37. Short sward semi-improved grassland and ephemeral vegetation bordered to the east by a line of goat willow and cricket bat willow *Salix alba caerulea* trees and to the west by mixed woodland along the lake shoreline. A line of semi-mature willow and alder trees runs

through this area (TN38). Shrub and ground layer beneath trees includes elder saplings, scattered bramble scrub, common nettle, red dead-nettle, ivy, honeysuckle, lords-and-ladies, forget-me-not species, common mouse-ear, creeping buttercup and primrose *Primula vulgaris*. To the north of a short section of low (1m high) laid willow hedging lies the Education Area, which includes a short hawthorn hedgerow with a dry ditch and scattered trees including silver birch, *Prunus* sp., willow, elder and hawthorn. Well established composting areas, log pile refugia and insect hotels are also present.

TN38. Treeline running north-south through TN37. Species include frequent willow and alder with occasional elder. The majority of trees were assessed to have negligible potential for bats, with features limited to small/healing splits, upward-pointing features and cluttered flight lines. Shrub layer includes immature hawthorn and blackthorn. Patchy ground flora includes pendulous sedge, common nettle, dog-rose, lords-and-ladies, cleavers, lesser celandine, hogweed, red dead-nettle, broadleaved dock and green alkanet. Small log and brash piles are present.

TN39. A band of dense bramble scrub and semi-mature mixed woodland mosaic to the east of the lake. Dominant species are willow and alder and elder, with hawthorn, silver birch and European larch *Larix decidua*. The majority of trees were assessed to have negligible potential for bats, with features limited to healing branch scars which did not appear to extend. A semi-mature willow on the lake shoreline has been fitted with bat and bird nest boxes. The understorey is similar to that in TN37 and TN38. Additional habitat features include large log piles, deadwood and brash along the lake shoreline. Large well established log pile refugia were also noted.

TN40. Area of uneven/disturbed ground colonised by dense bramble scrub with scattered trees including immature willow, turkey oak *Quercus cerris*, hawthorn and holly. Ground flora species include those recorded in TN37 and TN38.

TN41. Broadleaved woodland with mature and semi-mature trees including oak, silver birch, hazel, willow sp., elder and sapling ash, oak and hawthorn. Shrub layer of dense bramble scrub with butterfly-bush and pendulous sedge; sparse ground flora including those species recorded within TN36 in addition to teasel, daffodil *Narcissus* sp. and bluebell *Hyacinthoides* sp. Dead wood refugia also noted.

TN42 Coniferous plantation of Lawson's cypress *Chamaecyparis lawsoniana* with scattered self-sown silver birch. Understorey is heavily shaded, with herb species such as common nettle, teasel and butterfly-bush restricted to the edges.

TN43. Ephemeral vegetation within fenced area to the east of TN42. Moss species dominant with occasional thistle and teasel.

TN44. Dense stand of butterfly-bush and scattered immature silver birch. Ground flora restricted to edges and includes those species found within TN36.

TN45. Dense stand of butterfly-bush with scattered immature silver birch and alder.

TN46. Sloping bank (north-facing) leading to flatter ground at southern edge of East Lake. Stand of wet woodland, young and semi-mature alder dominant; average height 15-20m.

Heavily shaded, sparse understorey of occasional hawthorn with common nettle, hemlock water-dropwort, lords-and-ladies, cleavers and hart's-tongue fern. The ground layer includes a deep, soft litter layer with rotting wood and moss sp. throughout. Areas of standing water support yellow iris *Iris pseudacorus*, pendulous sedge, water forget-me-not, water mint and lesser water-parship *Berula erecta*. The majority of trees had no features with potential for roosting bats; two alder on the southern edge of TN46 had signs of damage or decay.

5 DISCUSSION AND RECOMMENDATIONS

No legally protected vascular plant species that are listed in Schedule 8 of the Wildlife and Countryside Act (1981) were found during the current survey [JNCC, 2016]. It is not considered likely that these species would be present within the habitats currently within the site boundary. It is recommended that, as part of the desk survey, the KMBRC record search is checked for any records of these species.

No vascular plant species of **Principal Importance** (previously known as BAP priority species) under Section 41 of the NERC Act (2006) were recorded during the survey [JNCC, 2016 and NERC, 2006]. It is not considered likely that these species would be present within the habitats currently within the site boundary. It is recommended that, as part of the desk survey, the KMBRC record search is checked for any records of these species.

No species of vascular plant mentioned in the SSSI citation for ‘Sevenoaks Gravel Pits’ [NE, 1968] were recorded during the survey; an assessment of the potential for these species to occur in the survey area follows:

Small cudweed *Logfia minima* (syn. *Filago minima*) is recorded on the KRPR as relatively common in Kent and records have increased [Kitchener, 2019; Kitchener, 2019a & Philp, 2010]. Small cudweed is restricted to sandy sites such as waste ground and quarries and thrives in open ground with low competition. Previous habitats at the ex-quarry workings within Sevenoaks reserve may have been lost through succession since the site was notified. Historical records exist within the survey boundary, as shown on the interactive BSBI distribution map for this species, but the most recent records seem to be from the east of the current site boundary [BSBI, 2019]. Small cudweed was not recorded in any of the most likely disturbed areas during the current survey; however it is an annual ephemeral species that is unlikely to be found in a late season survey. The proposed new visitor centre and the pre-fabricated maintenance building may be sited on the disturbed bare ground areas where this plant may occur and as such a brief check of these areas in early summer could be carried out by an experienced botanist prior to start of any works. However, the ground clearance and disturbance associated with the construction phase of any development may also lead to the reappearance of the plant from the seedbank and subsequent botanical monitoring could be carried out and provision made for management if it is found. As part of the proposed development, potential mitigation or enhancement could be the creation and maintenance of disturbed areas for this and other ephemeral species at the site.

Slender bird’s-foot-trefoil *Lotus angustissimus* is a very rare plant in Kent, it was thought extinct in the County until it was rediscovered in East Kent in 2016 [Kitchener, 2019; Kitchener, 2019a & Philp, 2010]. Plants found c.1977 in a gravel pit in Sevenoaks, tetrad at TQ5256 so pertaining to the wider area of the reserve, did not persist and were dismissed as introduced through planting with other species [Philp, 2010]. Inspection of the interactive BSBI distribution map for this species show that historical records for this species are to the east of the current survey boundary [BSBI, 2019a]. Although, the current survey was carried out at the wrong time of year to pick up this usually annual and ephemeral species, the evidence would suggest it is unlikely to be present. A short follow up visit could verify absence in the development footprint prior to commencement of works. The habitat requirements seem to be winter damp and well-drained soil in summer with only limited competition from other plants. As with small cudweed, the conditions around the

development may result in germination from any existing seedbank and similar enhancement opportunity and management advice would apply.

Dwarf elder *Sambucus ebulus* is an archaeophyte, introduced herbaceous perennial species of rough waste ground. Dwarf elder is listed on the KRPR and there are historical records from 6 tetrads, including TQ5256 [Kitchener, 2019 & Philp, 2010]. It is likely that the species is still present within this tetrad, if not outcompeted by habitat succession, however inspection of the interactive BSBI distribution map for this species show that the available records for this species from 1970 -1986 are to the east of the current survey boundary [BSBI, 2019b]. The author would recommend that, as part of the desk survey, the KMBRC record search is checked for more recent additions. The current survey was probably carried out too late in the season to pick up this herbaceous species. A follow up visit could be conducted to verify absence in the development footprint prior to commencement of works.

Two species currently on the **Kent Rare Plant Register**, crosswort and hound's-tongue, were recorded at the site, both species are relatively frequent in Kent [Kitchener, 2019]. Both species are recorded as '**Near Threatened**' on the Vascular Plant Red Data List for England [Stroh, 2014 and JNCC, 2016]. These species are not legally protected, are unlikely to be significantly impacted by the planned development and do not require any further surveys or mitigation.

One INNS, wall cotoneaster, as listed in Schedule 9 Part II of the Wildlife and Countryside Act (1981) was found on the site [GB-NNSS, 2016]. This plant is controversial as it does provide foraging opportunities for pollinating insects and birds. In its current 'wildlife garden' context, it unlikely to impact on the surrounding habitats, since it is not located close to any habitats where it usually causes impacts, such as chalk grassland or chalk scarp sites. However, the landowner does have a legal obligation to ensure that it does not spread to the wild and changes to legislation may require for it to be managed or eradicated from the site. It should be considered that this site is within a SSSI. This site also has an educational role in demonstrating good practice to the public which may not be furthered by the presence of a Schedule 9 INNS. Similarly, the two other species that are non-native with a tendency to be invasive should be part of the management plan for the reserve. Butterfly-bush is present in much of the survey area and only provides limited pollinator and cover opportunities for wildlife and the shading of some areas may have impacted upon or prevented colonisation of other species. Snowberry, although currently very limited on site, is likely to spread within the woodland habitats. Fringecups is a widespread garden escape that seeds readily, it is a non-native plant that likes damp woodland habitats and it has become established in the damp woodland (TN2). It is recommended that where feasible these species are removed as part of the development and management plans.

Additional recommendations: There were no grassland habitats of principal importance present within the survey boundary. The grassland habitat was all improved/amenity grassland and it is unlikely that any mitigation will be required. All broadleaved woodland is considered priority habitat, however none of the woodland within the site was ancient woodland, it was secondary woodland that has developed over previous gravel workings. Consistent with the secondary nature of the woodland, the ground flora appeared fairly limited at the time of survey, with the caveat that this assessment is based on survey work undertaken very late and very early in the survey season. The woodland and scrub provide valuable habitats for wildlife and the proposed development should, where possible, aim to

limit impacts to areas of non-native shrub, already developed or disturbed areas and bare ground. The provided plans appear to indicate that this is the intention. No additional botanical surveys or mitigation are recommended unless the footprint changes or significant impacts on broadleaved woodland habitats are anticipated. The standing water and wetland habitats were not part of the brief for this Phase 1 Habitat Survey. A botanical survey would be recommended for the aquatic and wetland habitats should impacts become likely.

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Appendix A – Vascular Plant Species recorded during Phase 1 Habitat Survey Visits (November 2019 / March 2020)

Common Name	Scientific Name	Notes
Field Maple	<i>Acer campestre</i>	
Sycamore	<i>Acer pseudoplatanus</i>	
Agrimony	<i>Agrimonia eupatoria</i>	
Creeping Bent	<i>Agrostis stolonifera</i>	
Alder	<i>Alnus glutinosa</i>	
Cow parsley	<i>Anthriscus sylvestris</i>	
Parsley Piert	<i>Aphanes cf. arvensis</i>	Need fruit to confidently confirm ID
Lesser Burdock	<i>Arctium minus</i>	
Burdock species	<i>Arctium sp.</i>	
Lords-and-ladies	<i>Arum maculatum</i>	
Hart's-tongue Fern	<i>Asplenium scolopendrium</i>	
Daisy	<i>Bellis perennis</i>	
Lesser water-parsnip	<i>Berula erecta</i>	
Silver Birch	<i>Betula pendula</i>	
False Brome	<i>Brachypodium sylvaticum</i>	
Butterfly-bush	<i>Buddleja davidii</i>	Invasive species but NOT listed in Schedule 9 WCA (1981)
Wavy Bitter-cress	<i>Cardamine flexuosa</i>	
Hairy Bitter-cress	<i>Cardamine cf. hirsuta</i>	Most likely species in garden situation. Need flowers to confirm ID
Pendulous Sedge	<i>Carex pendula</i>	
Sedge species	<i>Carex sp.</i>	Dead sedge in swamp under woodland
Hornbeam	<i>Carpinus betulus</i>	
Common Centaury	<i>Centaureum erythraea</i>	
Common Mouse-ear	<i>Cerastium fontanum</i>	
Lawson's cypress	<i>Chamaecyparis lawsoniana</i>	
Wild Basil	<i>Cf. Clinopodium vulgare</i>	Dead plants found only
Creeping Thistle	<i>Cirsium arvense</i>	
Spear Thistle	<i>Cirsium vulgare</i>	
Dogwood	<i>Cornus sanguinea</i>	
Hazel	<i>Corylus avellana</i>	
Wall Cotoneaster	<i>Cotoneaster horizontalis</i>	INNS Schedule 9 part II
Hawthorn	<i>Crataegus monogyna</i>	
Smooth Hawk's-beard	<i>Crepis capillaris</i>	
Crosswort	<i>Cruciata laevipes</i>	KRPR*, Red List GB - Least Concern, Red List England - Near Threatened
Leyland Cypress	<i>Cupressus x leylandii</i>	
Hound's-tongue	<i>Cynoglossum officinale</i>	KRPR*, Red List GB - Near Threatened, Red List England - Near Threatened
Cock's-foot	<i>Dactylis glomerata</i>	
Foxglove	<i>Digitalis purpurea</i>	
Teasel	<i>Dipsacus fullonum</i>	
Broad buckler-fern	<i>Dryopteris dilatata</i>	

Common Name	Scientific Name	Notes
Male Fern	<i>Dryopteris filix-mas</i>	
Glandular Globe-thistle	<i>Echinops sphaerocephalus</i>	Garden of Tahoma
Great Willowherb	<i>Epilobium hirsutum</i>	
Willowherb species	<i>Epilobium</i> sp.	Small rosettes found only, insufficient for ID
Common Stork's-bill	<i>Erodium cicutarium</i>	
Spindle	<i>Euonymus europaeus</i>	
Red Fescue	<i>Festuca rubra</i> agg.	
Lesser celandine	<i>Ficaria verna</i>	
Ash	<i>Fraxinus excelsior</i>	
Cleavers	<i>Galium aparine</i>	
Herb Robert	<i>Geranium robertianum</i>	
Wood Avens	<i>Geum urbanum</i>	
Ground-ivy	<i>Glechoma hederacea</i>	
Reed Sweet-grass	<i>Glyceria maxima</i>	
Ivy	<i>Hedera helix</i>	
Fool's-water-cress	<i>Helosciadium nodiflorum</i>	
Hogweed	<i>Heracleum sphondylium</i>	
Yorkshire Fog	<i>Holcus lanatus</i>	
Bluebell	<i>Hyacinthoides</i> sp.	
Holly	<i>Ilex aquifolium</i>	
Yellow iris	<i>Iris pseudacorus</i>	
Common Ragwort	<i>Jacobaea vulgaris</i>	
Soft Rush	<i>Juncus effusus</i>	
Hard Rush	<i>Juncus inflexus</i>	
White dead-nettle	<i>Lamium album</i>	
Red dead-nettle	<i>Lamium purpureum</i>	
European larch	<i>Larix decidua</i>	
Perennial Rye-grass	<i>Lolium perenne</i>	
Scarlet Pimpernel	<i>Lysimachia arvensis</i>	
Water mint	<i>Mentha aquatica</i>	
Three-nerved Sandwort	<i>Moehringia trinervia</i>	
Wood Forget-me-not	<i>Myosotis</i> cf. <i>sylvatica</i>	Over-wintering rosettes only, insufficient for ID
Water Forget-me-not	<i>Myosotis scorpioides</i>	
Forget-me-not species	<i>Myosotis</i> spp.	
Daffodil	<i>Narcissus</i> sp.	
Evening Primrose species	<i>Oenothera</i> sp.	Dead material only of a difficult group to identify, that also often hybridises.
Hemlock water-dropwort	<i>Oenanthe crocata</i>	
Green Alkanet	<i>Pentaglottis sempervirens</i>	
Primrose	<i>Primula vulgaris</i>	
Buck's-horn Plantain	<i>Plantago coronopus</i>	
Annual Meadow-grass	<i>Poa annua</i>	
Rough Meadow-grass	<i>Poa trivialis</i>	

Common Name	Scientific Name	Notes
Hybrid Black Poplar	<i>Populus x canadensis</i> agg.	
Creeping Cinquefoil	<i>Potentilla reptans</i>	
Selfheal	<i>Prunella vulgaris</i>	
Wild Cherry	<i>Prunus avium</i>	
Bracken	<i>Pteridium aquilinum</i>	
Turkey oak	<i>Quercus cerris</i>	
Pedunculate Oak	<i>Quercus robur</i>	
Red Oak	<i>Quercus rubra</i>	
Creeping Buttercup	<i>Ranunculus repens</i>	
Gooseberry	<i>Ribes uva-crispa</i>	
Dog-rose	<i>Rosa canina</i> agg.	
Bramble	<i>Rubus fruticosus</i> agg.	
Raspberry	<i>Rubus idaeus</i>	
Wood Dock	<i>Rumex sanguineus</i>	
Dock species	<i>Rumex</i> spp.	Young basal rosettes only - insufficient for ID
White Willow	<i>Salix alba</i>	
Cricket bat willow	<i>Salix alba caerulea</i>	
Goat Willow	<i>Salix caprea</i>	
Grey Willow	<i>Salix cinerea</i> ssp. <i>oleifolia</i>	
Hybrid Crack Willow	<i>Salix x fragilis</i>	
Weeping Willow	<i>Salix x sepulcralis</i>	
Elder	<i>Sambucus nigra</i>	
Groundsel	<i>Senecio vulgaris</i>	
Red Campion	<i>Silene dioica</i>	
Prickly Sow-thistle	<i>Sonchus asper</i>	
Rowan	<i>Sorbus aucuparia</i>	
Branched Bur-reed	<i>Sparganium erectum</i>	
Spiraea shrub species	<i>Spiraea</i> sp.	Garden shrub
Hedge Woundwort	<i>Stachys sylvatica</i>	
Lesser Stitchwort	<i>Stellaria graminea</i>	
Snowberry	<i>Symphoricarpos albus</i>	Widely naturalised garden escape
Dandelion	<i>Taraxacum</i> agg.	
Yew	<i>Taxus baccata</i>	
Fringecups	<i>Tellima grandiflora</i>	Widely naturalised garden escape
White Clover	<i>Trifolium repens</i>	
Elm species	<i>Ulmus</i> sp.	
Common Nettle	<i>Urtica dioica</i>	
Great Mullein	<i>Verbascum thapsus</i>	
Wall Speedwell	<i>Veronica arvensis</i>	
Germander Speedwell	<i>Veronica chamaedrys</i>	
Ivy-leaved Speedwell	<i>Veronica hederifolia</i>	
Thyme-leaved Speedwell	<i>Veronica serpyllifolia</i>	
Guelder Rose	<i>Viburnum opulus</i>	

Appendix B – Phase 1 Habitat Map showing Target Noted Areas

The location and extent of all features shown on the following maps is indicative only.

Sevenoaks Wildlife Reserve. Phase 1 Habitat Map



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Protecting Wildlife for the Future

Appendix C – Representative photographs from survey areas taken during November Survey



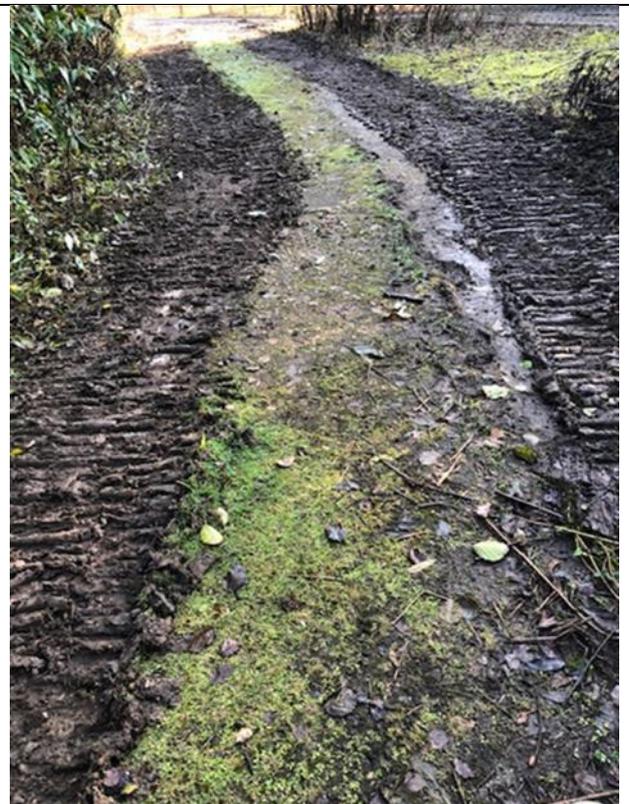
TN2 - Wet woodland and swamp vegetation



TN2 - Fringecups naturalised on bank at edge of TN2



TN3 - Butterfly-bush *Buddleja davidii* scrub north of track



TN4 - Bare ground track with ephemeral short perennial vegetation along centre



TN7 - Dense bramble scrub around Tahoma



TN7 - Looking back towards secondary woodland and scrub understorey of TN6



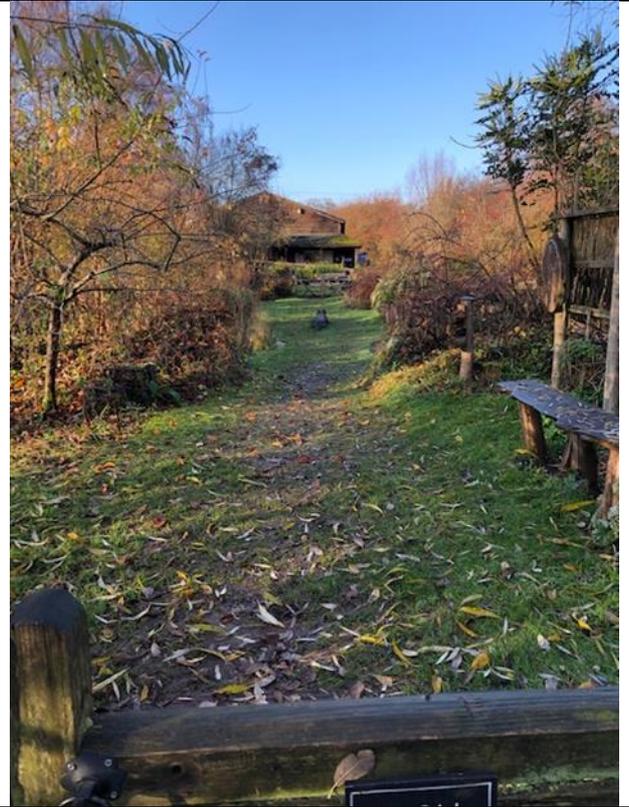
TN9 - Dense continuous scrub and secondary woodland including alder along the lake margins



TN15 - Improved grassland



TN16 – Improved grassland of ‘wildlife garden’ education area



TN17 – Amenity/improved grassland of ‘Wildlife garden’



TN18 – Bare ground and living willow ‘fence’



TN27 – Damp secondary broad-leaved woodland



<p>TN35 - Dense scrub and scattered trees</p>	<p>TN36 - Dense blackthorn scrub</p>
	
<p>TN37 - Short sward SI grassland and ephemeral vegetation with lines of broadleaved trees</p>	<p>TN40 - Area of uneven/disturbed ground colonised by dense bramble scrub with scattered trees</p>
	
<p>TN41 - Broadleaved woodland on eastern edge of survey area</p>	<p>TN42 - Coniferous plantation of Lawson cypress with scattered self-sown silver birch.</p>
	
<p>TN43 - Ephemeral vegetation within fenced area to the east of TN42.</p>	<p>TN46 - Stand of wet woodland, young and semi-mature alder dominant</p>