Appendix 10.2
National Vegetation Classification (NVC) Survey

M74 JUNCTION 5, RAITH

NVC SURVEY

Final Report

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1 INTRODUCTION

1.1 Background

Young Associates (Environmental Consultants) Ltd. (YA) undertook a National Vegetation Classification (NVC) survey of all designated sites of ecological importance and main areas of land-take within the survey area proposed M74, Junction 5 Raith improvements, referred to here as Raith. The northern part of Hamilton Low Parks SSSI is situated within the survey area and there are Sites of Importance for Nature Conservation (SINCs) of regional / local value in the survey area. This appendix provides a description of the plant communities of the northernmost part of the SSSI, SINCs and other main land-take areas associated with the proposed junction improvement scheme.

1.2 Survey Area

The NVC survey area is shown in Figures 10.2 and 10.3. The survey area extends approximately 500m out from the road centre line of the scheme.

For ease of reference to ecological features the existing road network divides the survey area into four fairly comparable sized sections. These are:

- **Bothwell Park** lies to the north of the A725 and to the east of the M74. Bothwell Park Farm and Bothwell Park House lie at the northern edge of the area. The latter property includes a large, private woodland garden that wasnot accessed as part of the survey;

- **Strathclyde Country Park** is situated to the south of the A725 and to the east of the M74. The north end of Strathclyde Loch lies within the survey area;

- **Hamilton Low Parks SSSI** is located to the west of the M74 and to the south of the A725. The SSSI is split by the River Clyde and the north riverbank defines the southern margin of the survey area. This specific area is called Raith Haugh but is referred to in this report as the Hamilton Low Parks SSSI for the sake of clarity; and

- **Laighland** lies north of the A725 and west of the M74. The suburban fringes of Bothwell delineate the western margin of the area.

Consultation with SNH confirmed the boundary of the Hamilton Low Parks SSSI. The northern section of the site (that lies north of the River Clyde and west of the M74 and east of the A725) was surveyed. The locations of SINC sites were confirmed through consultations with South and North Lanarkshire Councils. These indicate that there are three SINCs that lie within, or partly within, the survey area.

- Bothwell Corridor SINC VIII (NS715592; 5 ha) – Bothwell Park Wood and Disused Railway Cutting;

- Bothwell Corridor SINC IX (NS713588) – Laighland / Bothwell Park Wetlands (composed of three sub-sites); and

- North Lanarkshire SINC 75/1a - Strathclyde Country Park. The part of the SINC that is situated within the survey area comprises Strathclyde Loch with its landscaped shoreline and a man-made island. As this part of the SINC has no natural, or even partly naturalised, plant communities and its primary ecological value is ornithological. This site is not considered further in this report.

The results of a detailed botanical mapping study of the main land-take areas of the scheme (Figure 10.3) is included in this report, adding to the data arising from NVC survey of the SSSI and SINCs. The detailed study of the land-take area includes the northern margin of the SSSI and an area of land that adjoins the western edge of the SSSI. The latter area lies west of the A725 near its crossing of the River Clyde and east of the B7071 link road from the southern outskirts to Raith junction. This area is referred to in this report as the Bothwell Bridge site. A botanical description of the area of land-take within the Laighlands area, which fringes the southern edge of the Laighlands SINC, is also included in this report.

1.3 Aims and Objectives

The aim of the survey work and report is to determine the distribution, size and botanical structure and composition of plant communities of the SSSI, SINCs and main land-take areas of the proposed scheme in the vicinity of Raith junction. Using these data, the report outlines the nature of the plant communities in terms of their origin, composition, and ecological significance.

2 METHODS

2.1 Survey Methods

The NVC survey was carried out during June and July 2004 and July 2005. This involved a general walkover survey of plant communities and detailed assessment of species present at representative areas of vegetation within each different plant community.

The boundaries of all plant communities were mapped as accurately as possible and a handheld GPS was used to ensure that the representative plant community locations were accurately recorded. In rare instances there were some locations within dense woodland where the GPS received no signal and the mapping depended on the use of topographic features and compass bearings for accuracy. Also, not all plant community boundaries are sharply defined and some ecotones (botanical gradational zones) were present. In the latter case, plant community boundaries were estimated by drawing a line through the centre of the ecotone between communities.

The standard survey methodology for the NVC system (detailed in Rodwell, 1991) was adopted for NVC survey. As all of the communities were determined to be either sufficiently small in area and / or botanically homogenous, one representative sample of each community was studied (avoiding edge effects from adjacent vegetation communities). In each detailed sample, the domin scale was used to quantify the cover of each plant species. Details of the domin scale are provided below:

Domin Scale

Cover of 91-100% is recorded as Domin 10
Cover of 76-90% is recorded as Domin 9
Cover of 51-75% is recorded as Domin 8
Cover of 34-50% is recorded as Domin 7
Cover of 26-33 is recorded as Domin 6
Cover of 11-25% is recorded as Domin 5
Cover of 4-10% is recorded as Domin 4
Cover of <4% with many individuals is Domin 3
Cover of <4% with several individuals is Domin 2
Cover of <4% with few individuals is Domin 1

Higher plant identification and nomenclature follow Stace (1997) and Watson (1981) for bryophytes.

2.2 Survey Limitations

This survey was carried out at an optimal time of year (mid summer) for most habitat types of the Raith area (*i.e.* swamp, tall herb-fen, aquatic, grassland, open habitat and woodland). Although it is possible that some plant species were undetected by the survey, if only present in the early spring or late summer, this is not considered to have significantly affected the conclusions of this report.

It is important to emphasise that unlike grassland, open habitat and aquatic communities, woodland communities take long periods of time to become established. It is generally accepted that long-established climax (*i.e.* botanically stable) woodlands take well over a hundred years to develop from the pioneering stage of early woodland growth. This is because most woodland herb species (*e.g.* dog's mercury (*Mercurialis perennis*), bluebell (*Hyacinthoides non-scripta*)) take many years to colonise and become established in woodlands and because of the inherently slow growth rate of native tree species. Considering this, the report describes (for the SSSI and SINCs) semi-natural ancient and long established woodland communities, long-established woodland of plantation origin, and plantation woodlands.

Also in some plant communities (such as grasslands) there is evidence for the onset of scrub invasion and there is therefore a reasonable possibility that such plant communities will inherently change as this process progresses. The survey principally aims to describe the current nature of plant communities and not what they may gradually develop towards. NVC information is provided where matches with the published information (Rodwell, 1991, 1992, 1995 and 2000) can be reasonably made. Botanical data is supplemented by basic geographic data (such as soil conditions and hydrology) gathered during the survey. Furthermore, the surveyor's botanical experience of the wider area and practical knowledge of NVC communities that are typical of Central Scotland is used to back-up the findings.

All parts of the SSSI and SINCs within the survey area indicated on Figure 10.2 were surveyed, with the exception of parts of the wetlands considered too dangerous for close inspection. In such cases, surveying was done using distance observation with binoculars from suitable vantage points.

3 RESULTS

Each site is described below. For further details including community distributions and species lists refer to the maps (Figures 10.2 and 10.3) and summarised floristic data (Tables 1 and 2).

3.1 Hamilton Low Parks SSSI

The majority of the SSSI that lies within the survey area is composed of flat-lying floodplain vegetated by unmanaged open habitats. However, woodlands and scrub characterise the margins of the SSSI (i.e. embankments of the A725, M74 and riparian zone of the River Clyde).

The water level of the River Clyde is situated several metres below the surface level of the floodplain under normal flow conditions. However, on rare occasions, when the river's flow rates are greatly elevated, the SSSI is extensively inundated by floodwaters.

Consultations and desk study revealed no existing detailed habitat or botanical data for the SSSI. Since its designation as a nature reserve in the 1950s the land that forms the SSSI has been virtually unmanaged and there have been no significant agricultural improvements to the area. In fact livestock grazing has been disallowed since the site became a SSSI in 1986.

Survey work and consultations with the South Lanarkshire Council's ranger serviced indicate that some the ditches of the SSSI have been recently subject to unauthorised mechanical dredging and vegetation clearance, contravening one of the Potentially Damaging Operations (PDOs) for the SSSI.

3.2 Tall-herb Fen

In mid-summer the northern part of the floodplain is extensively covered by tall, rank vegetation that colonises the areas characteristically soft and fine grained, minerotrophic soils. Moreover, soil moisture levels are high as the water table lies close to ground level. The vegetation is quite homogenous, comprising predominantly mesotrophic grass species; meadow foxtail (*Alopecurus pratensis*), Yorkshire fog (*Holcus lanatus*) and tufted hair-grass (*Deschampsia cespitosa*), with a reasonable cover of a number of dicot species. Dicot species that are particularly commonplace include meadowsweet (*Filipendula ulmaria*), creeping thistle (*Cirsium arvense*), wild angelica (*Angelica sylvestris*), cleavers (*Galium aparine*), common nettle (*Urtica dioica*) and cow parsley (*Anthriscus sylvestris*).

At the Phase 1 Habitat Survey level (JNCC, 2003) this habitat is classified as semi-improved neutral grassland. However, analysis of floristic data at the NVC level is problematic as the vegetation does not correlate with any NVC mesotrophic grassland communities (Rodwell, 1992). Instead the data tentatively suggest affinity with tall-herb fen community S28 *Phalaris arundinacea* (reed canary-grass). Nevertheless, the data are not a good fit with this NVC community, as reed canary-grass, the community constant for S28, is only sporadically present (typically in the wettest areas).

Rodwell (1995) indicates that the S28 tall-herb fen community is reasonably characteristic of floodplains, such as in the case of the Raith area, with mineral substrates composed of sandy sediment. Reed canary-grass is intolerant of permanent flooding and prefers areas where the water-table tends to lie below the surface for most of the year. Field data tends to suggest that this is the case and suggests that the correlation with S28 is credible, even though the constant species of S28 (reed canary-grass) is only sporadically present.

To the south of the community described above, constrained by the carr at the east edge of the large pond and the embankment of the M74, there is a moderately large area of tall-herb fen (NS715579) that is much wetter in character than the vegetation to the north. The community is composed of a low diversity of species. Reed canary-grass is dominant with only occasional marsh marigold (*Caltha palustris*). Again, like the community described above, this is S28 *Phalaris arundinacea* (reed canary-grass) tall-herb fen.

3.3 Swamp

In the SSSI swamp fringes an area of open water in floodplain situated close to the River Clyde (NS713578). The habitats have formed within a large, shallow depression in the floodplain (possibly due to large-scale ground subsidence). The fringe of swamp is typically about 20-30 m wide comprising a monotonous stand of bulrush (*Typha latifolia*). The community correlates well with S12 *Typha latifolia* swamp, a community that is highly typical of these kinds of standing waters with silty substrates that are generally nutrient-rich (Rodwell, 1995). There was no evidence of aquatic plant communities within the area of open water.

3.4 Open Habitat

Apart from sporadic stretches of riparian woodland, the part of the floodplain that fringes the River Clyde is characterised by vegetation classified as tall-ruderal habitat at the Phase 1 Habitat Survey level. Tall-ruderal vegetation has colonised the flat-ground of the floodplain and also the mostly very steep riverbank (2-3 m high). The substrate of the area is comparable in composition with that of the tall-herb fen community described above, except that the soil is better draining and consequently the water table is deeper. The vegetation is composed of a fairly highly diverse range of dicot species and a small number of mesotrophic grasses which have a patchy distribution. In general no species dominate the community but great willowherb (*Epilobium hirsutum*) and common nettle are constant with frequent hogweed (*Heracleum sphondylium*), common comfrey (*Symphytum officinale*), meadowsweet and water figwort (*Scrophularia auriculata*). The presence of these species suggests that the vegetation is an OV26 *Epilobium hirsutum* community and the frequency of Yorkshire fog, water figwort and meadowsweet suggest the OV26c *Filipendula ulmaria - Angelica sylvestris* (meadowsweet and wild angelica) sub-community.

The moist, yet well draining soils, and riparian setting, plus the fact that the community borders either tall-herb fen (where there is a gradual increase in soil moisture) or swamp (where soil moisture increases abruptly) further confirm the OV26 classification (Rodwell, 2000). It is also pertinent to note that Rodwell suggests that OV26 is closely associated

with nutrient enriched soils and groundwater, and it is reasonable to envisage that soil enrichment has occurred close to the riparian zone of the SSSI due to infiltration of nutrient-rich river water into the adjacent floodplain.

Riparian habitats are prone to colonisation by invasive, non-native species due to the dispersal effect of rivers, and stands of Indian balsam (*Impatiens glandulifera*) are frequent in the riparian zone. Other non-native invasive species such as giant hogweed (*Heracleum mantegazzianum*) and Japanese knotweed (*Fallopia japonica*) are not evident in the area. However, there are a small number of plants of the garden escape species, common blue-sow-thistle (*Cicerbita macrophylla*) in the riparian zone although this is not a strongly invasive species (in the surveyor's experience).

3.5 Woodland

In terms of area coverage, woodland habitat is not a principal feature of the SSSI's landscape, yet it helps to protect the site by stabilising much of the riparian zone and road embankments that form the margins of the site. Furthermore, woodland screens the floodplain habitats from visual and noise disturbance and it provides refuge for wildlife such as roe deer, rabbit and brown hare, whose browsing and grazing help to stop the open habitats of the SSSI being invaded by scrub.

A community of scrubby willow carr is sporadically present upon short stretches of the River Clyde and at the north and eastern outer margin of the open water and swamp area that lie close to the river. Overall the community is too fragmented and small in area for systematic NVC survey. In general the field layer vegetation of the woodland is that of the OV26 *Epilobium hirsutum* (great willowherb) community described above. There is not a high diversity of species in the canopy of the carr within the SSSI with only grey willow (*Salix cinerea*) and osier (*Salix viminalis*) evident. The floristic composition, lowland context of the site, and its nutrient-rich minerotrophic soils, point to the community being W1 *Salix cinerea - Galium palustre* (grey willow and marsh besdtraw) woodland. Moreover, W1 is typical of floodplains and sluggish rivers, which conforms well to the setting of the SSSI (Rodwell, 1991).

A small block of open-canopy semi-natural mature woodland fringed by scrub (NS714582) has developed on a moderately steep-sloping mound that adjoins the M74 embankment. Unlike the rest of the SSSI the area is formed by well-drained ground that rises above the eastern edge of the floodplain and is separated from the wetlands to the east by a ditch-like watercourse. The canopy of the native woodland is composed of sycamore (*Acer pseudoplatanus*) with occasional ash (*Fraxinus excelsior*), oak (*Quercus* sp.) and beech (*Fagus sylvatica*) with a scarce scrub layer of elder (*Sambucus nigra*). The ground flora includes abundant bluebell, cleavers and bramble (*Rubus fruticosus* agg.), with occasional raspberry (*Rubus idaeus*), lesser celandine (*Ranunculus ficaria*), ground-elder (*Aegopodium podagraria*), few-flowered leek (*Allium paradoxum*), common nettle, wood dock (*Rumex sanguineus*) and red campion (*Silene dioica*). Hedge woundwort (*Stachys sylvatica*), nipplewort (*Lapsana communis*), common male-fern (*Dryopteris filix-mas*), hogweed (*Heracleum sphondylium*) and wild angelica are rare in the woodland.

Due to the limited extent of the woodland conclusive analysis of its NVC type is difficult. Much of the above floristic data and the free-draining nature (*i.e.* the community is unrelated to the carr woodland of the SSSI) suggest that the woodland approximates to a community of W10 *Quercus robur - Pteridium aquilinum - Rubus fruticosus* (pedunculate oak, bracken and bramble).

The scrub that fringes the mature woodland described above is much less botanically rich. The community is composed of both dense and open stands of hawthorn (*Crataegus monogyna*). The dense scrub is located just south of the mature woodland close to the northern bank of the ditch-like watercourse (NS714582). Open hawthorn scrub characterises the gently sloping land that is the feature of the northern end of the SSSI. This community has been created by the spread of hawthorn from two remnant stretches of old hedges in this area into grassland that was probably once used for agriculture. Overall the scrub community approximates to W21 *Crataegus monogyna - Hedera helix* (hawthorn and ivy) scrub.

Landscaping, mainly in the form of plantation woodland and scrub, has been created on the embankments of the A725 and M74. The landscaping at the northern margin of the SSSI lies within the land-take of the scheme. A variety of scrub species characterise these areas, such as hawthorn and blackthorn (*Prunus spinosa*). In general these plantations have no real botanical interest and are subject to too much disturbance from the adjacent busy roads to be of conservation interest. Nevertheless, the screening helps to block the core of the SSSI from visual disturbance.

3.6 Bothwell Park Wood and Disused Railway SINC

Bothwell Park Wood is a topographically and ecologically complex site located on mainly steep sloping ground that rises up from the flat lying land of the southern part of Bothwell Park. Bothwell Park borders the Bothwell Park / Laighland SINC and two minor watercourses that feed into the wetlands of the latter mentioned SINC pass through Bothwell Park Wood. Bothwell Park Wood comprises both undisturbed ground (the eastern part of the site) and land that was industrial in historic times, comprising the disused railway line and, to the west, steeply sloping land formed from the remains of extensive spoil heaps.

A limited amount of open canopy, high forest woodland is present just to the east of the site's central part (NS715591, immediately east of an old railway cutting) on gently sloping ground at the top of the steep slope down to the flat lying ground of the southern part of Bothwell Park. Oak (*Quercus* sp.) dominates the canopy with occasional ash. Undercanopy and shrub layers are virtually absent in this part of the site. Groundlayer vegetation is composed of extensive stands of bluebell, with lesser amounts of greater stitchwort (*Stellaria holostea*), wood-sorrel (*Oxalis acetosella*), wood avens (*Geum urbanum*), pignut (*Conopodium majus*) and cleavers. Floristics suggest the woodland is W10 *Quercus robus – Pteridium aquilinum – Rubus fruticosus* (pedunculate oak, bracken and bramble) woodland. It is reasonable to envisage that this part of the SINC is a relict of ancient woodland that was much more extensive in past times.

Dense scrub fringes the western margin of the open woodland described above. This community is located on the steeper sloping ground that occupies most of the disused railway cutting. The dense scrub layer comprises elder, hawthorn and blackthorn with an occasional understorey of ash and birch (*Betula* sp.). Compared with the open woodland to the east the groundlayer of this woodland is more heterogeneous being composed of small stands of herb Robert (*Geranium robertianum*), lesser celandine, bluebell, pignut, hogweed, common nettle and wood anemone (*Anemone nemorosa*). Floristics and vegetative structure suggest the woodland is probably W21 *Crataegus monogyna – Hedera helix* (hawthorn and ivy) scrub.

On gently sloping ground to the east of the high forest woodland, described above, are vegetation communities of scrub and open habitat. This area was probably farmland in past times and has since become colonised by dense hawthorn scrub and rosebay willowherb (*Chamerion angustifolium*) dominated open habitat. These are communities of W21 *Crataegus monogyna* (hawthorn) scrub and OV27 *Epilobium angustifolium* (rosebay willowherb), respectively. Note that Rodwell (2000) uses the old specific epithet *Epilobium* for rosebay willowherb; although *Chamerion* is now the accepted specific epithet (Stace, 1997).

The eastern margin of the SINC is formed by a narrow steep-sided, scrub vegetated valley which contains the minor watercourse that feeds into the eastern wetland of Bothwell Park / Laighland SINC. The scrub is composed of hawthorn, birch and oak. The groundlayer vegetation is poorly developed, probably due to high levels of livestock grazing and poaching, and there are sparse stands of mesotrophic grass, mainly Yorkshire fog, with rare occurrences of wood-sorrel and common dog-violet (*Viola riviniana*). Floristics and vegetative structure suggest that the community has an affinity with W21 *Crataegus monogyna – Hedera helix* (hawthorn and ivy) scrub.

The western part of the SINC (to the west of the railway cutting) is situated on steeply-sloping land that originally formed part of a large spoil heap. Following the cessation of industrial activity in the Raith area, this part of the SINC has been planted and managed as woodland at the southeast margins of the private grounds of Bothwell Park House. The woodland is mainly an open canopy, high forest mixed woodland composed of a reasonably even mixture of oak, Scots pine (*Pinus sylvestris*), ash, birch, alder (*Alnus glutinosa*) and rowan (*Sorbus aucuparia*) and a poorly-developed hawthorn scrub layer. The ground layer is not diverse being composed of stands of bluebell, pignut and creeping soft-grass (*Holcus mollis*). The woodland's floristics do not correlate to any degree with known NVC communities due to the plantation origin of this part of the SINC.

3.7 Laighland / Bothwell Park Wetlands SINC

Consultations with the BSBI indicate that there are records of two locally uncommon plants in the ponds of the Laighlands Wetlands SINC. Mudwort (*Limsella aquatica*) is Nationally Scarce in the UK (only being found in less than 100 different 10 x 10 km grid squares in total) and it becomes progressively rarer to the north (Stace, 1997). There are records of the species for all the ponds of the Laighlands Wetland SINC and in the Hamilton Low Parks SSSI. Most notably the species is only found in one other site in Lanarkshire. There is a record of grey club-rush (*Schoenoplectus tabernaemontani*) in

Laighland Wetland 3 that lies south of the M74. Watson (1990) indicates that the species was present in Laighland Wetland 1 in the early 1990s. The plant has a very scattered inland UK distribution (Stace, 1997) although it is commoner in coastal areas.

Specific searches during the course of the NVC survey did not find mudwort within the surveyed area. Grey club-rush was however recorded at Pond 18 (Figure 10.11), which lies adjacent to the base of the M74 embankment.

The descriptions of the three wetlands provide summaries of this part of the SINC using correlations with NVC published information (most notably Rodwell, 1995) as far as possible. Detailed comparisons with the data and findings of Watson (1990) are avoided since his report on the area's SINCs predates the published NVC system. However, Watson's study does allow some inferences to be made on changes in vegetation in the area, such as reductions in open water due to siltation combined with the spread of non-aquatic vegetation.

3.8 Eastern Bothwell Park Wetland (NS716589)

This is a complex wetland with tall-herb fen, swamp, open water and woodland habitats present. Inspection of an ordnance survey map from the 1960s reveals that, unlike the other two wetlands of the SINC, this wetland was probably much less affected by the original construction of Raith junction. There is some surface water input into the western edge of the wetland from a minor watercourse that passes through the small valley at the eastern edge of Bothwell Park Wood SINC. Water drains out from two points at the southern edge of the open water section of the wetland and water flows along small ditches along the western and southern edge of the wetland.

An overgrown hawthorn hedge forms the southern margin of the wetland. Similarly a linear tract of hawthorn scrub is present at the north edge of the wetland. Just south of this area is a fairly narrow strip of well-drained land colonised by rosebay willowherb that is well described by NVC Type OV27 *Epilobium angustifolium* (rosebay willowherb) community. Dense hawthorn and willow scrub is present on the embankment of the A725, probably approximating to W21 *Crataegus monogyna - Hedera helix* (hawthorn and ivy) scrub. The western edge of the wetland is also characterised by hawthorn, albeit scattered on the eastern edge of the large rounded ridge of the adjacent semi-improved neutral grassland with scattered scrub in the centre of the Bothwell Park area.

The open water has no significant cover of aquatic vegetation. At the northeastern margin of the open water there is a moderately large reedbed comprised almost wholly of common reed (*Phragmites australis*) (at NS717588). This is NVC Type S4 *Phragmites australis* reedbed.

Bulrush is the most characteristic plant of the wetland, forming extensive stands that surround the open water. This is best assigned as NVC Type S12 *Typha latifolia* swamp. The other main plant community evident within the wetland is a small stand of bottle sedge (*Carex rostrata*) at the eastern margins of the open water. This is an S9 *Carex rostrata* swamp.

Referring to Watson (1990) it appears that the open water areas remain quite unchanged since the early 1990s, but that bulrush-dominated swamp has spread to the very southern margin of the site. Furthermore, it also seems that the overall diversity of the wetland has fallen with the site now much more botanically uniform compared to the early 1990s.

3.9 Western Bothwell Park Wetland (NS714590)

This is a small wetland compared with the one described above and is supplied with water from the small watercourse that passes through the disused railway cutting to the north. Watson (1990) indicates that there was a significant component of open water in the wetland in the early 1990s but this was not evident during the survey in 2004.

The wetland has two distinct areas. Tall-herb fen and swamp communities form the wetland's northern section and wet rush-dominated mesotrophic grassland forms the wetlands southern section. The latter section is drier as the swamp and tall-herb fen section of the wetland drains out into a broad slow-flowing ditch that then passes through the northern edge of the rush-dominated mesotrophic grassland. The ditch then passes through a culvert into the Laighland Wetland part of the SINC (see below).

The edges of the wetland are quite well screened by scattered hawthorn (the southeast margin), willow scrub (the northwest margin) and dense hawthorn (western edge close to the M74 embankment). Scrub appears to have increased in abundance considerably in recent times, as there were not such high levels of scrub cover in the early 1990s (Watson, 1990).

The main core of the wetland is formed from large interspersed stands of water horsetail (*Equisetum fluviatile*) and bulrush. These correspond well with NVC Types S10 *Equisetum fluviatile* swamp (S10a *Equisetum fluviatile* sub-community) and S12 Typha latifolia (bulrush) swamp (S12a *Typha latifolia* sub-community). The outer margins of the northern section of the wetland are vegetated by a fairly species poor, tall-herb fen dominated by great willowherb with some meadowsweet and wild angelica. Floristics suggest that this is an OV26 *Epilobium hirsutum* (great willowherb) community and more specifically the OV26c *Filipendula ulmaria – Angelica sylvestris* (meadowsweet and wild angelica) sub-community. Rodwell (2000) indicates that the community is typically found at the fringes of fen and swamp associated with particularly wet conditions, which probably applies to the SINC.

The southern part of the wetland is better drained compared to the northern part and comprises a core of soft rush dominated vegetation surrounded by wet, mesotrophic grassland dominated by tufted-hair grass. Within the wetland there are smaller areas of wild angelica and meadowsweet and in general the species diversity of the wetland is low. The soft rush vegetation approximates to MG10 *Holcus lanatus Juncus effusus* (Yorkshire fog and soft rush) rush-pasture and the grassland community is probably MG9 *Holcus lanatus – Deschampsia cespitosa* (Yorkshire fog and tufted hair-grass) mesotrophic grassland. There are also some subordinate areas that are poorly draining compared to the majority of the wet grassland area. Consequently these are colonised by

stands of reed canary grass, best described as a community of S28 *Phalaris arundinacea* (reed canary-grass) tall-herb fen.

3.10 Laighland Wetland (NS712587)

Unlike the Bothwell Park wetlands, which formed in depressions with no tangible associations to the road system of Raith, the main part of the Laighland wetland SINC has formed in the low lying, base of the M74 embankment. Also in contrast to the Bothwell Park wetlands, which are almost totally unmanaged, the margins of the Laighland wetlands are subject to management in the form of browsing and poaching by livestock and by sporadic dredging of the drainage ditches in the Laighland area. Desk study and consultation with South Lanarkshire Ranger Service indicate that the Laighland wetland is probably considerably younger that the Bothwell Park wetland, being only first noted by local naturalists in the early 1980s.

The Laighland wetland part of the SINC is divided into a northern section and southern section connected by a broad slow-flowing ditch. The source of the wetland's water appears to be the culverted drain from the western Bothwell Park wetland. The water flows south through the Laighland wetland to a dredged drain than passes through the southern part of Laighland.

The northern part of the Laighland wetland comprises about 30% open shallow water, with a small stand of emergent bulrush in its centre. The marginal vegetation that surrounds the open water is a fairly wide belt of bulrush. This zone is narrowest where the wetland borders the M74 embankment, and here there is a sudden transition from bulrush swamp to the steep, scrub vegetated road embankment. The community is species poor and matches S12 *Typha latifolia* (bulrush) swamp (S12a *Typha latifolia* sub-community). Bordering this inner zone of bulrush is an intermediate zone of fairly low diversity swamp dominated by water horsetail with some smaller stands of bulrush, mare's-tail (*Hippuris vulgaris*) and scattered common water-plantain. This approximates to a community of S10 *Equisetum fluviatile* (water horsetail) swamp. The outer edges of the wetland are formed from tall-herb fen composed predominantly of soft rush with a reasonably high cover of greater willowherb, wild angelica, creeping buttercup (*Ranunculus repens*) and water horsetail in the wetter inner part of the community. The community also contains a low abundance of broad-leaved dock (*Rumex obtusifolius*) and cuckoo-flower (*Cardamine pratensis*). Floristics suggest that this is an OV26 *Epilobium hirsutum* (great willowherb) community and more specifically the OV26a *Juncus effusus – Ranunculus repens* (great willowherb and creeping buttercup) sub-community.

The broad slow-flowing ditch that joins the north and south sections of the Laighland wetland contains large stands of water horsetail with lesser amounts of watercress and great willowherb. This approximates to a community of S10 *Equisetum fluviatile* (water horsetail) swamp.

The southern part of the Laighland wetland contains a narrow, elongated area of open water that lies parallel to the M74 embankment. Surrounding the open water is a narrow zone of bulrush dominated swamp. The community is species poor S12 *Typha latifolia*

(bulrush) swamp (S12a *Typha latifolia* sub-community). Where the wetland adjoins the M74 embankment there is an abrupt transition from bulrush swamp to the steep scrub vegetated road embankment. In comparison, the western and southern margins of the bulrush-dominated stands are bordered by a zone of swampy vegetation characterised by jointed rush (*Juncus articulatus*) and subordinate amounts of mare's-tail, greater willowherb and common water-plantain. No realistic matches with NVC community types could be made from this zone of the wetland. Beyond this zone is a wide belt of marshland dominated by soft rush with low levels of cover of Yorkshire fog, broad-leaved dock, creeping buttercup, colt's-foot (*Tussilago farfara*), dandelion (*Taraxacum* sp. agg.), daisy (*Bellis perennis*), and greater plantain (*Plantago major*). Floristics suggest the vegetation approximates to MG10 *Holcus lanatus - Juncus effusus* (Yorkshire fog and soft rush) rush-pasture.

Comparison of the 2004 survey of Raith with Watson (1990) suggests that the northern part of the wetland has remained reasonably stable since the 1990s. In contrast the southern part of the wetland has changed significantly over 15 years as the large area of open water has become replaced by the swamp, tall-herb fen and marshland described above. This may be the result of extensive dredging and widening of the drainage ditch to the south of the wetland.

At the western edge of the Laighlands area there is a minor 'offshoot' of the Laighland wetlands SINC that lies within flat lying improved pasture close to the suburban edge of Bothwell. Fieldwork and up-to-date aerial photographic observation indicates that this part of the Laighland wetland has been almost completely filled in. This area has subsequently become vegetated by MG6 *Lolium perenne Cynosurus cristatus* (perennial rye-grass and crested dog's-tail) mesotrophic grassland, which is typical of the Laighlands area in general. There are, however, minor relics of wetland vegetation at the northern and eastern edge of the MG6 grassland. At the NVC level the dominant wetland vegetation is MG10 *Holcus lanatus - Juncus effusus* (Yorkshire fog and soft rush) rush-pasture that fringes a small area of open water. There are also very minor areas of S19 *Eleocharis palustris* (common spike-rush) swamp and OV26 *Epilobium hirsutum* (great willowherb) community at the margins of the MG10 vegetation.

3.11 Subsidiary Sections of the Bothwell Park and Laighland SINCs

Even though the SINC is primarily designated because of its three main wetland sections (Watson, 1990) the site also contains ditches, grasslands and woodland. Their botanical characteristics are summarised below.

3.12 Semi-improved Grassland with Scattered Scrub – Bothwell Park

A large area of short grassland, with scattered hawthorn, has developed on a broad mound that lies between the two wetland areas of Bothwell Park. The sward mainly comprises Yorkshire fog, tufted hair-grass, red fescue, creeping bent-grass (*Agrostis stolonifera*) and crested dog's-tail. Dicot plant abundance and diversity is low with white clover, field horsetail (*Equisetum arvense*) and creeping buttercup (*Ranunculus repens*). It is probable that rabbit and roe deer grazing help to stop the grassland from both becoming rank and from "scrubbing up". Floristics tend to suggest that the community is

best described as MG9 *Holcus lanatus – Deschampsia cespitosa* (Yorkshire fog and tufted hair-grass) mesotrophic grassland, particularly because of the abundance of tufted hair-grass.

In the southeast of the grassland there is a small wetland in a depression (NS715587) just south of the eastern Bothwell Park wetland. The main vegetation type is MG10 *Holcus lanatus - Juncus effusus* (Yorkshire fog and soft rush) rush-pasture with a subordinate area of S19 *Eleocharis palustris* (common spike-rush) swamp.

3.13 Slow-flowing Ditch at the Base the A725 / M74 Embankments

The broad ditch that connects the two wetlands of Bothwell Park contains slow flowing water that is extensively choked by swamp-like vegetation. The vegetation is characterised by tufted forget-me-not (*Myosotis scorpioides*), soft rush (*Juncus effusus*) and hard rush (*Juncus inflexus*). The floristics could indicate the presence of OV26 *Epilobium hirsutum* (great willowherb) community. However, at the deepest part of the ditch this grades through to swamp characterised by water-cress (*Nasturtium* sp.), floating sweet-grass (*Glyceria fluitans*) and tufted forget-me-not. This suggests the localised presence of S22 *Glyceria fluitans* water-margin vegetation. Localised areas of ferrous deposits are present in the eastern part of the site (close to the A725) that appears not to be conducive to the formation of natural vegetation.

Close to the mid-point between the Bothwell Park wetlands, where the ditch is almost 5 m wide, the presence of bulrush (*Typha latifolia*), branched bur-reed (*Sparganium erectum*) and common water-plantain (*Alisma plantago-aquatica*) suggests the presence of S12 *Typha latifolia* (bulrush) swamp.

The western part of the ditch merges with the eastern wetland of Bothwell Park. This part of the ditch is also as choked by vegetation as the eastern part described above. The vegetation of this section approximates to OV26 *Epilobium hirsutum* (great willowherb) community.

3.14 Improved Grassland and Parkland - Bothwell Park

The northwest of the SINC comprises a horse field and mature parkland. The field is a short, grass dominated, sward composed of Yorkshire fog, crested dog's-tail (*Cynosurus cristatus*), perennial rye-grass (*Lolium perenne*) and red fescue (*Festuca rubra*) with white clover (*Trifolium repens*). This community is an example of MG6 *Lolium perenne Cynosurus cristatus* (perennial rye-grass and crested dog's-tail) mesotrophic grassland. The woodland garden (Bothwell Park House grounds) at the north of the SINC is strictly private and was not surveyed in any detail. Observations indicate that the parkland is mainly composed of lime trees (*Tilia* sp.) with introduced shrubs and amenity grassland.

3.15 Embankments of the M74 and A725

Dense scrub is present on almost all of the road embankments of the Bothwell Park / Laighlands SINC. Hawthorn, willow species and birch typify the species of this part of the

SINC. The community approximates to W21 *Crataegus monogyna - Hedera helix* (hawthorn and ivy) scrub. There is little or no appreciable ground-layer vegetation present due to shading and the generally poor nature of the soil on the road embankments.

3.16 Scrub - Laighland

Dense hawthorn scrub covers the fairly steep former agricultural land that slopes down from Bothwell Park road to the north edge of the Laighland wetland (NS710588). The vegetation approximates to W21 *Crataegus monogyna - Hedera helix* (hawthorn and ivy) scrub.

3.17 Vegetation of the Main Areas of Land-take

The north edge of the SSSI (section 3.1) and southern margin of the western Laighland wetland SINC (section 3.6) lies within the land-take of the scheme. Land-take within the SSSI affects relatively young woodland landscaping at the northern edge of the SSSI (by the A725 embankment) and remnant areas of scrub that predate the construction of the M74 and A725 which are now colonising rank grassland at the northern edge of the SSSI. The vegetation of these communities is succinctly described in Table 2 and Table 3 and their distribution outlined on Figures 10.2 and 10.3. Overall, the vegetation is of low botanical interest, being dominated by young woodland plantations with groundlayer vegetation dominated by rank stands of tall ruderals and / or common grasses. No botanical species of note were encountered, such as ancient woodland indicator species, e.g. native bluebell.

Much of the land-take of the scheme affects land with no special conservation status, i.e. improved grassland at the southern edge of Laighland and also the central part of land by Bothwell Bridge (mainly comprising young woodland landscaping). However, there are minor areas of natural wetland vegetation that lie at the outer edge of the Laighland land-take area. The vegetation of these areas is summarily described in Table 2 (and Table 3 for Laighland) and mapped out in Figure 10.3. The mature woodland of the Bothwell Bridge site that lies in the vicinity of the monument (Target Note B2) and the riparian zone of the River Clyde (Target Note B11) lies outside the scheme's land-take area.

4 CONCLUSIONS

The habitats of the SSSI and SINCs that lie within the Raith area are diverse for such a small area, comprising mainly a wide variety of woodland, scrub, swamp, fen and grassland communities. The habitats present in each SINC are summarised in the table below (with estimated areas).

	SSSI	Bothwellpark wood	Bothwellpark east wetland	Bothwellpark west wetland	Laighland wetland	Total
MG9				0.15 ha	0.3 ha	0.18 ha
MG10				0.9 ha		0.9 ha
Open	1.5 ha				0.2 ha	1.7 ha
OV26	2.3 ha			0.3 ha	0.2 ha	2.8 ha
OV27		0.6 ha				0.6 ha
S4			0.1 ha			0.1 ha
S10				0.2 ha	0.2 ha	0.4 ha
S12	0.3 ha		3.5 ha	0.2 ha	0.3 ha	4.3 ha
S28	14 ha					14 ha
W1	0.5 ha	0.15 ha				0.65 ha
W10	0.3 ha	0.9 ha				1.2 ha
W21	2 ha	1 ha	1 ha	1.2 ha	1.5 ha	6.7 ha
Mixed		1.3 ha				1.3 ha

As can be seen from the table, and illustrated in Figure 10.2, the most ubiquitous habitat types within the sites are W21 *Crataegus monogyna – Hedera helix* scrub (developed on better drained ground) and OV26 *Epilobium hirsutum* and OV27 *Epilobium angustifolium* tall ruderal communities (colonising disturbed ground), S12 *Typha latifolia* swamp (the commonest swamp community) and poorly draining area of grassland and rush characterised by MG9 *Holcus lanatus – Deschampsia cespitosa* grassland and MG10 *Holcus lanatus-Juncus effusus* rush-pasture. Communities that are similarly widespread but more specific to particular locations are the S28 *Phragmites arundinacea* inundation community (of the SSSI) and W10 *Quercus robur-Pteridium aquilinum-Rubus fruticosus* community that represents semi-natural broad-leaved woodland that has developed on well draining ground above the wetter areas of Raith. Man-made communities are also important features of the area with plantation woodland screening at the northern edge of the SSSI and mature mixed plantation woodland on former industrial land in the north part of Bothwellpark wood.

It is difficult to generalise about the conservation status of each specific plant community described here, as desk study and consultations reveal there is a paucity of NVC studies for Lanarkshire. In the surveyor's experience the majority of communities described here are mostly typical of Lanarkshire, with the notable exception of the S28 *Phalaris arundinacea* inundation community that is the principal community of the SSSI.

The South Lanarkshire BAP (http://www.ukbap.org.uk) does not have priority habitat action plans for lowland habitats such as those described here, as it tends to focus on the uplands. The North Lanarkshire BAP notes that reedbeds are of low local status as they cover an appreciably small area of the district (10s ha). In contrast, areas of fen, marsh and swamp habitat are of high local status in North Lanarkshire as they are more widespread in the district (several 100 ha), at least compared with reedbeds.

Looking at national distribution of NVC communities (Rodwell, 1991, 1992, 1995 and 2000) of the Raith area it can be concluded that they are typical of lowland UK and none have very specific localised distribution. Consequently there are no communities present that are of national significance for purely botanical reasons. It is important to note that the SSSI at Raith is principally designated because of its ornithological importance.

The vegetation communities at Raith have been recorded in the past as supporting two locally uncommon species: grey club-rush and Nationally Scarce mudwort. The botanical survey did not indicate the continuing presence of mudwort within the site, but grey club-rush was recorded at one pond. No specially protected plant species (Schedule 8, Wildlife and Countryside Act 1981 and amendments), UK Biodiversity Action Plan (BAP) plant species or local BAP plant species were recorded through desk study, consultation or field survey during the 2004 (Phase 1 habitat survey) and 2006 (NVC survey) periods.

5 SUMMARY EVALUATION

The most valuable vegetation communities present within the designated sites in the Raith area are:

- S28 *Phalaris arundinacea* tall-herb fen that is a principal plant community of Hamilton Low Parks SSSI. This community is a critical component of the site, which is of national importance for breeding and wintering birds;

- The swamp communities (S4, S10 and S12) of Laighland Wetlands and Bothwell Park, which have been recorded as supporting the nationally-scarce species mudwort and the locally-scarce species grey club-rush rush in the past, although only grey club-rush was recorded during survey;

- W1 *Salix cinerea – Galium palustre* woodland on the west bank of the River Clyde that stabilises the bank and creates suitable habitat for river wildlife (*e.g.* salmonids); and

- Semi-natural woodland W10 *Quercus robur-Pteridium aquilinum-Rubus fruticosus* community in the central part of Bothwell Park Wood that contains a lush ground layer of native bluebell and other native woodland herb species.

The habitats at Raith are also of conservation value as faunal habitat. They support fauna such as wetland birds and fish, amphibians and invertebrates.

6 REFERENCES

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Table 1 – Botanical Data from the SSSI and SINCs

M74 Junction 5, Raith
Table 1 - NVC Botanical Survey Data

		SSSI							Bothwell Park Wood SINC				Bothwell Park / Laighland SINC																
													Eastern Wetland				Northern Wetland				Western Wetland				Scrub / Grassland				
		S12	S28	OV26	W1	W10	W21	BL Plantation	W10	W21	Mixed Plantation	OV27	S4	S12	OV27	W21	S10	S12	MG10	OV26	S10	S12	OV26	MG6	MG10	W1	W21	MG6	MG9	MG10
TREES																													
Sycamore	*Acer pseudoplatanus*					●						●																	
Alder	*Alnus glutinosa*				●																								
Birch species	*Betula sp.*						●	●		●	●														●				
Beech	*Fagus sylvatica*					●																							
Ash	*Fraxinus excelsior*					●																							
Scots pine	*Pinus sylvestris*										●																		
Oak species	*Quercus sp.*					●			●	●	●	●																	
Willow species	*Salix sp.*				●			●																		●				
White willow	*Salix alba*				●			●																						
Crack willow	*Salix fragilis*				●			●																						
Whitebeam	*Sorbus aria*					●	●																						
Wych elm	*Ulmus glabra*							●																						
SHRUBS																													
Hawthorn	*Crataegus monogyna*					●	●			●		●				●									●	●			
Wild cherry	*Prunus avium*						●																						
Blackthorn	*Prunus spinosa*						●		●																				
Raspberry	*Rubus idaeus*					●	●		●																				
Bramble	*Rubus fruticosus agg.*					●		●	●																				●
Willow species	*Salix sp.*						●	●								●					●			●					
Osier willow	*Salix viminalis*																								●				
Elder	*Sambucus nigra*					●	●		●																				

M74 Junction 5, Raith
Table 1 - NVC Botanical Survey Data

		SSSI							Bothwell Park Wood SINC				Bothwell Park / Laighland SINC																
													Eastern Wetland				Northern Wetland				Western Wetland				Scrub / Grassland				
		S12	S28	OV26	W1	W10	W21	BL Plantation	W10	W21	Mixed Plantation	OV27	S4	S12	OV27	W21	S10	S12	MG10	OV26	S10	S12	OV26	MG6	MG10	W1	W21	MG6	MG9	MG10
GRASSES																													
Meadow foxtail	*Alopecurus pratensis*		●			●																							
Crested dog's-tail	*Cynosurus cristatus*																											●	
Cock's-foot	*Dactylis glomerata*			●			●									●													
Tufted hair-grass	*Deschampsia cespitosa*		●								●					●			●									●	
Red fescue	*Festuca rubra*																												
Yorkshire fog	*Holcus lanatus*		●	●			●			●	●	●				●								●				●	
Perennial rye-grass	*Perennial rye-grass*																											●	
Reed canary-grass	*Phalaris arundinacea*		●	●															●										
Common reed	*Phragmites australis*												●																
SEDGES																													
Brown sedge	*Carex disticha*																●				●								
Bottle sedge	*Carex rostrata*													●															
Grey club-rush	*Schoenoplectus tabernaemontani*													●				●											
RUSHES																													
Jointed rush	*Juncus articulatus*																								●				●
Soft rush	*Juncus effusus*			●																			●		●	●			●
Hard rush	*Juncus inflexus*																												●
AQUATIC PLANTS																													
Common water-plantain	*Alisma plantago-aquatica*																				●				●				
Mare's-tail	*Hippuris vulgaris*																				●				●				
Duckweed species	*Lemna sp.*													●															
Watercress	*Rorippa nasturtium-aquaticum*																				●								
HERBS																													
Ground-elder	*Aeogopodium podagraria*			●		●																							
Garlic mustard	*Alliaria petiolata*			●																									
Few-flowered garlic	*Allium paradoxum*			●		●		●																					
Wood anemone	*Anemone nemorosa*								●																				
Wild angelica	*Angelica sylvestris*		●			●													●	●			●						
Cow parsley	*Anthriscus sylvestris*		●	●																					●	●			●
Mugwort	*Artemisia vulgaris*			●																									
Daisy	*Bellis perennis*																								●			●	
Marsh marigold	*Caltha palustris*		●																										
Shepherd's-purse	*Capsella bursa-pastoris*			●																									
Wavy bitter-cress	*Cardamine flexuosa*			●																									
Cuckooflower	*Cardamine pratensis*	●		●																			●					●	
Common mouse-ear	*Cerastium fontanum*			●																									
Rosebay willowherb	*Chamerion angustifolium*			●		●						●			●														

M74 Junction 5, Raith
Table 1 - NVC Botanical Survey Data

		SSSI							Bothwell Park Wood SINC				Bothwell Park / Laighland SINC																	
													Eastern Wetland				Northern Wetland				Western Wetland				Scrub / Grassland					
		S12	S28	OV26	W1	W10	W21	BL Plantation	W10	W21	Mixed Plantation	OV27	S4	S12	OV27	W21	S10	S12	MG10	OV26	S10	S12	OV26		MG10	W1	W21	MG6	MG9	MG10
HERBS Continued																														
Common blue-sow-thistle	*Cicerbita macrophylla*			●																										
Creeping thistle	*Cirsium arvense*		●	●		●	●	●		●						●												●	●	●
Spear thistle	*Cirsium vulgaris*			●																										
Pignut	*Conopodium majus*								●																					
Cruciata laevipes	*Crosswort*			●																										
Viper's bugloss	*Echium vulgare*			●																										
Great willowherb	*Epilobium hirsutum*			●																●			●							
Broad-leaved willowherb	*Epilobium montanum*								●																					
Marsh willowherb	*Epilobium palustre*			●																										
Meadowsweet	*Filipendula ulmaria*		●	●															●	●			●							
Common hemp-nettle	*Galeopsis tetrahit*		●	●																										
Cleavers	*Galium aparine*		●	●		●			●																					
Herb-robert	*Geranium robertianum*			●					●																	●				
Wood avens	*Geum urbanum*								●																					
Hogweed	*Heracleum sphondylium*			●		●			●																					
Bluebell	*Hyacinthoides non-scripta*			●		●			●		●	●																		
Indian balsam	*Impatiens glandulifera*			●																										
Nipplewort	*Lapsana communis*					●																								
Water mint	*Mentha aquatica*																									●				●
Field forget-me-not	*Myosotis arvensis*			●																										
Sweet cicely	*Myrrhis odorata*			●																										
Wood sorrel	*Oxalis acetosella*								●																					
Ribwort plantain	*Plantago lanceolata*			●																								●		
Greater plantain	*Plantago major*																									●		●		
Silverweed	*Potentilla anserina*			●																										
Barren strawberry	*Potentilla sterilis*																									●				

M74 Junction 5, Raith
Table 1 - NVC Botanical Survey Data

		SSSI							Bothwell Park Wood SINC				Bothwell Park / Laighland SINC																			
													Eastern Wetland				Northern Wetland				Western Wetland				Scrub / Grassland						
		S12	S28	OV26	W1	W10	W21	BL Plantation	W10	W21	Mixed Plantation	OV27	S4	S12	OV27	W21	S10	S12	MG10	OV26	S10	S12	OV26		MG10	W1	W21	MG6	MG9	MG10
HERBS Continued																															
Meadow buttercup	*Ranunculus acris*			●																							●			
Lesser celandine	*Ranunculus ficaria*			●		●			●																						
Creeping buttercup	*Ranunculus repens*			●			●																●		●			●			●
Common sorrel	*Rumex acetosa*			●																											
Curled dock	*Rumex crispus*			●																								●			
Broad-leaved dock	*Rumex obtusifolius*			●																			●		●			●			●
Wood dock	*Rumex sangineus*					●			●																	●					
Water figwort	*Scrophularia auriculata*			●																											
Common figwort	*Scrophularia nodosa*			●																											
Red campion	*Silene dioica*			●		●																									
Bittersweet	*Solanum dulcamara*			●																											
Branched bur-reed	*Sparganium erectum*			●																											
Hedge woundwort	*Stachys sylvatica*			●		●																				●					
Greater stitchwort	*Stellaria holostea*			●					●																						
Common chickweed	*Stellaria media*																											●			
Wood stitchwort	*Stellaria nemorum*							●																							
Russian comfrey	*Symphytum x uplandicum*			●																											
Tansy	*Tanacetum vulgare*			●																											
Dandelion	*Taraxacum officinalis agg.*			●																								●			
White clover	*Trifolium repens*																											●			
Colt's-foot	*Tussilago farfara*																								●						
Bulrush	*Typha latifolia*	●												●	●			●			●	●									
Common nettle	*Urtica dioica*		●	●	●	●	●	●				●				●									●	●					
Common valerian	*Valeriana officinalis*		●																												
Germander speedwell	*Veronica chamaedrys*			●																											
Thyme-leaved speedwell	*Veronica serpyllifolia*																											●			
Common vetch	*Vicia sativa*			●																											
Dog violet	*Viola riviniana*									●																●					
FERNS & ALLIES																															
Male fern	*Dryopteris filix-mas*		●			●				●																					
Field horsetail	*Equisetum arvense*			●																											
Water horsetail	*Equisetum fluviatile*																●				●		●								
Wood horsetail	*Equisetum sylvaticum*			●																											

Table 2 - Botanical Target Notes from the Main Areas of Land-take

TN #	Grid Ref.	Target Note
B1	NS 71060 57860	Dense young ash woodland with occasional hawthorn close to Bothwell Bridge monument. Groundlayer of rank vegetation comprising common nettle, hogweed, cock's-foot and upright hedge-parsley.
B2	NS 71160 57940	Open embankment with tall ruderal vegetation composed of creeping thistle, false oat-grass, common nettle, Michaelmas daisy. Also, sparsely scattered immature sycamore, ash and hawthorn.
B3	NS 71090 57870	Steep banking traversed by footpath. Vegetation is dominated by scattered hawthorn with some immature ash and birch with a shrub layer of bramble and dog rose. Groundlayer vegetation is comparable to Target Note B2.
B4	NS 71080 57830	Thicket of young, coppice-like hazel close to Bothwell Bridge Monument path.
B5	NS 71090 57970	Very dense scrub by road embankment. Composed of young ash, blackthorn, dog rose, hawthorn and broom. Also immature larch and rowan.
B6	NS 71150 58070	Mostly open scrub in flat lying ground at northern part of Bothwell Bridge site. Dominated by immature plantings of goat willow, birch, hawthorn, grey alder, broom, hazel, rowan, a native oak species, lodgepole pine and larch. The groundlayer vegetation is mainly dominated by rank stands of false oat-grass with subordinate components of creeping thistle and tufted-hair grass. Stands of reed canary-grass are locally abundant. At the northern edge of the vegetation, where the vegetation is not rank, fairy flax is locally common.
B7	NS 71130 57960	Stand of immature goat willow scrub on flat ground.
B8	NS 71110 57890	Semi-natural, open, woodland composed of a small area of mature ash with an abundant shrub layer of hawthorn. The groundlayer mainly comprises hawthorn intergrown with hedge bindweed. At the southern edge of the compartment (by the steps up to the Bothwelll Bridge monument) there is a single mature wych elm with a shrub layer of hazel (at the edge of Target Note 4 area). The groundlayer features stands of false oat-grass and hedge

TN #	Grid Ref.	Target Note
		woundwort.
B9	NS 71130 57870	Open stand of moderately mature larch in flat area of ground. The groundlayer vegetation is comparable to that of Target Note B2.
B10	NS 71140 57900	Fairly gently sloping banking (facing SW) mainly vegetated by dense stands of young hawthorn scrub.
B11	NS 71140 57850	Mature willow dominated semi-natural woodland dominates the banks of the river and land relatively close by. Species are osier, sycamore (young), elder and goat willow. Indian balsam dominates the groundlayer.
B12	NS 71220 58050	Low species diversity amenity grassland dominates road verge at the outer periphery of the Bothwell Bridge site.
L1	NS 71161 58371	Dense tall ruderal vegetation in fenced-off section of road embankment (mostly gently sloping). The vegetation is composed of a mostly homogeneous mix of creeping thistle, meadowsweet (A) with reed canary-grass stands (F). Also present are sparsely scattered scrub-sized oak, ash and hawthorn.
L2	NS 71177 58396	Narrow (<10m wide) strip of tall ruderal vegetation that outlines the course of a minor, shallow sided ditch. The ditch was dry at the time of survey. The vegetation is made up of creeping thistle (A), common ragwort (O), broad-leaved dock (F), cock's-foot, silverweed (A), greater plantain (F), creeping buttercup (O), wild angelica (R), meadowsweet (R), soft rush (R), reed canary-grass (R) and water forget-me-not (R). At the southern edge of the ditch there is a very disturbed small area of ground, probably caused by the movement of agricultural plant and livestock. The vegetation is heavily disturbed probably due to agricultural plant coupled with the soft nature of the soil associated with the minor ditch. However, at the edges of the disturbed ground there are large tussocks of false fox sedge.
L3	NS 71189 58409	The southern end of a broad (about 5m wide from bank to bank), steep-sided large ditch. The water flow is from north to south and the rate of flow is estimated to be moderately slow. Water quality is judged to be reasonably good from

TN #	Grid Ref.	Target Note
		visual inspection. About 50% of the channel is formed from open water with the remainder composed of emergent stands of vegetation. Species are branched bur-reed, common water-plantain and bulrush. There is abundant marginal vegetation comprising; false fox sedge, soft rush, water-cress and water forget-me-not. The banks of the ditch are dominated by tall ruderal vegetation of creeping thistle (F), meadowsweet (A), common nettle (F), common hogweed (O), bittersweet (O) and great willowherb (F). On the upper section of banks there are scattered young plants of hawthorn and dog rose. Moving north along the eastern edge of the ditch the scrub (including dense bramble) becomes very dense making the ditch inaccessible and sheltered. It is likely that the ditch has been extensively dredged at some time in the past and this may explain the steep nature of its banks. A goldfinch was recorded in the scrub by the ditch.
L4	NS 71237 58505	Uniform, well-drained flat lying field of improved grassland. The vegetation appears to be regularly cut mechanically and there is no indication of recent livestock grazing. At the time of survey the height of vegetation was very low with an average, estimated height of 15cm. The vegetation is composed of Yorkshire fog (D), perennial rye-grass (A), creeping thistle (R), common knapweed (O), ribwort plantation (F), meadow buttercup (R) and common hemp-nettle (R).
L5	NS 71245 58596	At the northern corner of a large area of improved grassland there is a small, flat-lying area of wetland vegetation. Soil conditions are judged to be quite water saturated with the ground being fairly soft and moist underfoot. It is constrained to the west by the scrubby edges of a ditch (dominated by extensive stands of bulrush, and to the east by the embankment of a motorway slip-road). The vegetation is mostly uniform in character, being dominated by large tussocks of soft rush (A), in-between which are stands of Yorkshire fog (F), tussocks of tufted hair-grass (O) and false fox sedge (F), curled dock (F), meadowsweet (abundant at the southern edge of the community), silverweed (A), meadow buttercup (F), creeping buttercup (F), creeping thistle (O) and a small

TN #	Grid Ref.	Target Note
		stand of bulrush, great willowherb (frequent at the NW edge of the community), ribwort plantain (O), smooth meadow-grass (O) and tufted vetch (R). In habitat terms the area is marshy grassland the community is judged to be a fen meadow community. There is extensive evidence of probably quite recent livestock grazing in the marsh.
L6	NS 71262 58598	The lower slopes of the embankment of a motorway slip road (gently sloping) contain marshland-associated vegetation of meadowsweet (D), creeping thistle (A), great willowherb (F), tufted hair-grass (R), false oat-grass (R), marsh willowherb (O), small tussocks of false fox sedge (R), bulrush stands (frequent in the northern part of the embankment) and wild angelica (R). There are three ash saplings within the area.
L7	NS 71267 58596	On the uppermost part of the embankment of a motorway slip road the vegetation is composed of rank grassland. Species comprise; false-oat grass (D), creeping thistle (A), meadowsweet (A), common nettle (F), ground-elder (O), common ragwort (R), and wild angelica (R). In the community there is scattered scrub composed of mainly hawthorn with subordinate levels of dog rose and broom.
L8	NS 71270 58540	Moderately steep grassy embankment, approximately 15m wide, forming the eastern edge of agricultural grassland. It is almost totally well drained in character. The embankment is unmanaged (the vegetation is neither mechanically cut nor grazed) and therefore the grassland is rank in character. The vegetation is relatively uniform in species composition and comprises false oat-grass (D), cock's-foot (F), Yorkshire fog (A), perennial rye-grass (F), red clover (A), red bartsia (O), ribwort plantain (F), creeping buttercup (O), hogweed (O), greater plantain (O), broad-leaved dock (O) and ragwort (O). Soft rush and common nettle are locally abundant but are occasional across the embankment.
R1	NS 71222 58244	Narrow strip of woodland plantation on road embankment near pronounced bend in path (that lies to the east of the woodland). Canopy is composed of silver birch (D, up to 6m tall) with rare similar-sized goat willow. There are sparse signs of natural seeding of silver birch evident. The

TN #	Grid Ref.	Target Note
		groundlayer is of low diversity being composed of rosebay willowherb (A), meadowsweet (O), creeping thistle (F), cock's-foot (F), false oat-grass (A) and bramble (O).
R2	NS 71222 58256	Approximately 7m wide dense woodland planting. Ash (A) (to 7m tall) and silver birch (F) canopy with scrub layer of dogwood (F), dog rose (A) and bramble (A). The woodland has a reasonably good age structure. Ground layer composed of bramble with common nettle (F), meadowsweet (R), broadleaved willowherb (O), rosebay willowherb (O). At the less shaded edge of the plantation there are occasional stands of cock's-foot and false oat-grass and sparse stands of broad buckler-fern and common male-fern. At the southern edge of this woodland plantation NS 71235 58296 there is an approximately 4m wide area co-dominated by rosebay willowherb and meadowsweet.
R3	NS 71227 58300	Short section of road embankment vegetated by dense hawthorn (D) scrub with frequent rowan (coppiced) and immature silver birch. The area has a restricted groundlayer due to high levels of shading, but close to the path at the eastern edge of the scrub there is common nettle (D), great willowherb (O), creeping thistle (F), meadowsweet (O), common hogweed (O) and reed canary-grass (O). The fence that separated the scrub from the path has been completely removed.
R4	NS 71230 58303	The footpath that lies east of the road embankment (with woodland plantings) has typically 0.5 to 1m wide grassy strips (the area is strimmed) of reasonable botanical diversity. The vegetation comprises cock's-foot, tufted hair-grass, Yorkshire fog, broad-leaved dock, tufted vetch, meadowsweet, greater plantain, common nettle, common hogweed, creeping buttercup, selfheal, upright hedge-parsley, dandelion, nipplewort and cut-leaved crane's-bill.
R5	NS 71240 58196	Approximately 8m wide woodland planting on road embankment. Good species and structural diversity. Canopy formed from wych elm (up to 7m tall, R), hazel (F), ash (up to 6m tall, O), hawthorn (F), and rowan (understorey sized, O). The groundlayer is varied in nature including a small stand of meadowsweet (F) near the path at the base of the plantation, common nettle (F), upright

TN #	Grid Ref.	Target Note
		hedge-parsley (R), gorse (immature, R), cock's-foot (A), false oat-grass (locally dominant), oak saplings (R), forget-me-not species (R), silverweed (F), red clover (F) and broad-leaved willowherb (F). A common field vole, robin and blue tit were sighted in the vicinity of the woodland. The woodland close to the path appears to be subjected to a fair degree of human disturbance, since the fence that separates the area from the path has been extensively vandalised.
R6	NS 71241 58345	Bridge over ditch that flow from eastwards into the SSSI. A wider area surrounding the ditch is formed from open plantation of silver birch (up to 7m tall) with ash (R, about 9m tall specimen by bridge), coppice-like crab apple, oak (to 4m tall to the east of the bridge), osier (on the banks of the ditch east of the bride), hawthorn scrub (common where the plantation adjoins the road junction to the west), and dog rose (R). The plantation's groundlayer comprises rosebay willowherb (A), creeping thistle (O), reed canary-grass (R), common nettle (A), common hogweed (F), bramble (F), tufted hair-grass (O), false oat-grass (F), broad-leaved willowherb (O), crosswort (O) and meadowsweet (R). The ditch is 1 to 1.5m wide, water depth is about 0.2m with a muddy to silty substrate. The water flow is moderate and water quality appears to be fairly good (water is quite clear). The banks are steep and composed of hard made ground. The banks are vegetated by lush vegetation composed of stands of nettles to NW of bridge; great willowherb with reed canary-grass and sparse meadowsweet to SW of the bridge; and to the E of the bridge there is a mosaic of reed canary-grass and common nettle. There is also a small stand of colt's-foot immediately next to the bridge. To the W of the bridge there is emergent common water-plantain. Tufted forget-me-not is also common on the banks.
R7	NS 71243 58151	Road verge by junction. Approximately 2m wide grassy verge that is strimmed. Sward composed of cock's-foot (D) with ribwort plantain (A), greater plantain (F), creeping thistle (A), yarrow (F), common knapweed (F), smooth sow-thistle (R), dandelion (O), clover species (O) and

TN #	Grid Ref.	Target Note
		common horsetail (R).
R8	NS 71248 58163	Small area of young woodland situated to the east of the path along the western edge of the SSSI (protected by a post and rail wooden fence and hawthorn hedging). Composed of a mixture of immature oak species and hawthorn. Sparse groundlayer of common nettle and rosebay willowherb.
R9	NS 71258 58395	Regular-spaced line of young planted silver birch forming the boundary between the path and the grassland verge of the road junction. Groundlayer of bramble (A), creeping thistle (A), common nettle (A) and reed canary-grass (O). To the east of the path there is an extensive area of dense scrub composed of hawthorn (D), silver birch (F), and oak saplings (native species, R). At the edge of the scrub by the path there is a groundlayer of rosebay willowherb (F), creeping thistle (F), bramble (A), crosswort (O) and common knapweed (O). This grades into the grassy vegetation strip that forms the path edges (strimmed). This is composed of cock's-foot, with ribwort plantain, red clover, common hogweed, selfheal, perennial rye-grass, colt's-foot, false oat-grass and upright hedge-parsley.
R10	NS 71262 58145	Mainly dense strip of woodland planting (approximately 15m wide) on road embankment with about 15° slope. Good botanical diversity and structure. Canopy is 5 to 8m high and is made up of silver birch (A), hawthorn (A), larch (O, immature), hazel (O), goat willow (F), grey willow (O), blackthorn (F), rowan (F), cherry species (R) and ash (R). There is natural regeneration of rowan, hawthorn, cherry and silver birch. The groundlayer is grassy being dominated by single species stands of false oat-grass, common bent-grass and crested dog's-tail. Low growth of bramble is locally common but not dense. There is a small stand of reed canary-grass near less shaded ground at the top of the embankment. Also present within the groundlayer are imperforate St.John's-wort (O), mosses *Rytidiadelphus squarrosus* and *Pleurozium schreberi*, broad-leaved willowherb (F), meadow vetchling (F), common knapweed and creeping thistle (both at the less shaded woodland edge), upright hedge-parsley (O) and a hawkweed species (R).

TN #	Grid Ref.	Target Note
R11	NS 71262 58290	Rank grassland dominates flat-lying ground. False oat-grass (D), rosebay willowherb (F), common nettle (O) and common hogweed (O). There are scattered young hawthorns present.
R12	NS 71265 58343	Close to the south bank of the ditch there is an approximately 6m tall pedunculate oak tree with extensive, dense vegetation of raspberry to the south-east and an extensive stand of bramble to the north of the tree (extending north to the banks of the ditch) where there is an immature osier.
R13	NS 71271 58333	Approximately 5m wide strip of bankside and marginal vegetation on north side of wide ditch (channel is about 3m wide). There is an extensive stands of reed canary-grass (A) on the bank extending down to the margins of the channel, with large stands also of soft rush (A), and meadowsweet (O), tufted vetch (O), creeping thistle (A, towards top of bank), common nettle (O) and false oat-grass (F). On the north bank of the ditch there are also sparsely scatted immature hawthorns. Within the channel of the ditch (shallow water with moderately fast flow) there are stands of reed canary-grass with subordinate growth of great willowherb. There are sparse small stands of reed sweet-grass in the channel.
R14	NS 71273 58325	Rank grassland dominated south bank of ditch. False oat-grass (D), rosebay willowherb (F), meadowsweet (O) and great willowherb (O). Marginal and channel vegetation in the ditch in this location is formed from extensive stands of branched bur-reed (intergrowing with water forget-me-not (O)) surrounded by less extensive stands of reed canary-grass (A), great willowherb (F), and soft rush (O).
R15	NS 71293 58341	Flat-lying area of rank grassland. False oat-grass (D), common nettle (F), rosebay willowherb (F), broad-leaved dock (O), common ragwort (R).
R16	NS 71294 58410	Two straight lines of overgrown hawthorn-dominated hedges (running ESE) with goat willow (O), silver birch (O), elder (O) and ash (O, mature and scrub-sized). There is a groundlayer of bramble (A), common nettle (A) with occasional false oat-grass and common hogweed. There is an approximately 5m wide, open area between

TN #	Grid Ref.	Target Note
		the hedges with considerable recent hawthorn growth and an oak sapling (R). The vegetation main comprises; false oat-grass (F), cock's-foot (F), common bent-grasss (F), crested dog's-tail (O), colt's-foot (O), common spotted-orchid (R), yarrow (O), crosswort (O), hawkweed species (R), and common ragwort (R). At NS 71332 58393 there is a single burrow at base of a hedge with a round opening about 0.25m in diameter. Fox scat at entrance. Probably a fox den.
R17	NS 71297 58321	Small, reasonably mature broad-leaved plantation composed of cherry tree species (up to 8m tall). Broom forms a sparse shrub layer. The groundlayer is dominated by extensive stands of common nettle with false oat-grass (F), common male-fern (O), broad-leaved willowherb (O), colt's-foot (R), tufted hair-grass (O) and upright hedge-parsley (O).
R18	NS 71316 58331	Rank grassland dominates the north side of the ditch. False oat-grass (D), common nettle (A), creeping thistle (A) and meadowsweet (abundant close to the ditch).
R19	NS 71341 58366	Woodland plantation formed from moderately mature stands of Norway maple (planted) with understorey of hawthorn (A) and ash (F) with cherry species (R) and cotoneaster underscrub (R). There is virtually no groundlayer present due to high levels of shading.
R20	NS 71355 58340	Flat-lying area of grassland that lies a few metres above the main section of the SSSI to the south. The vegetation is dominated by rank growth of false oat-grass with wild angelica (F), creeping thistle (F), bramble (R), common hogweed (O), crested dog's-tail (O) and broad-leaved willowherb (O). The bank that slopes down at moderate steepness to the land to the south is vegetated by similar vegetation except for scattered hawthorn (O) and dog rose (R).
R21	NS 71356 58355	Eastern edge of hawthorn scrub dominated area formed from dense scrub of hawthorn, broom and rhododendron. Dilapidated old brick building in area, with much dumping caused by youths nearby. One large wych elm lies close to the shed. There is virtually no groundlayer vegetation in this area due to high levels of shading (and human

TN #	Grid Ref.	Target Note
		disturbance).

Table 3 - Summary Description of Vegetation Types - Land-take Areas in Hamilton Low Parks SSSI and Laighland

TN#	Vegetation Community
R1	Silver birch – goat willow planting with MG1c *Arrhenatherum elatius* grassland fieldlayer.
R2	Ash – silver birch planting with MG1b *Arrhenatherum elatius* grassland fieldlayer.
R3	Hawthorn planting with S26a *Phragmites australis – Urtica dioica* fen fieldlayer.
R4	OV23c *Loilium perenne – Dactylis glomerata* community.
R5	Mixed native tree/shrub plantings and MG1b *Arrhenatherum elatius* grassland fieldlayer.
R6	Silver birch plantation with S26b *Phragmites australis – Urtica dioica* fen fieldlayer.
R7	OV23 *Loilium perenne – Dactylis glomerata* community.
R8	Oak – hawthorn plantation with fieldlayer of OV27 *Epilobium angustifolium* community.
R9	Planted young birch with fieldlayer of OV24 *Urtica dioica – Cirsium arvense* community. At the edge of the footpath there is also a stand of OV27 *Epilobium angustifolium* community. The verge of the footpath is composed of MG1b *Arrhenatherum elatius* grassland.
R10	Mixed species native broad-leaved planting. Fieldlayer is dominated by MG1b *Arrhenatherum elatius* grassland.
R11	MG1b *Arrhenatherum elatius* grassland.
R12	NA for NVC.
R13	Marginal vegetation of S28a *Phalaris arundinacea* tall-herb fen. Also marginal vegetation stands of M2 *Filipendula ulmaria – Angelica sylvestris* mire and S26b *Phragmites australis – Urtica dioica* fen and OV26 *Epilobium hirsutum* community. The is an emergent community of S14 *Sparganium erectum* swamp.
R14	Mainly OV26 *Epilobium hirsutum* community. Emergent communities of S14a *Sparganium erectum* swamp and S5 *Glyceria maxima* swamp.

R15	MG1b *Arrhenatherum elatius* grassland. Although there is a strong influence of OV27 *Epilobium angustifolium* community.
R16	W21a *Crataegus monogyna – Hedera helix* scrub.
R17	Plantation of cherry species. Fieldlayer of MG1b *Arrhenatherum elatius* grassland.
R18	MG1b *Arrhenatherum elatius* grassland. Except for margins of ditch which has affinity with S26 *Phragmites australis – Urtica dioica* fen.
R19	Norway maple plantation.
R20	MG1b *Arrhenatherum elatius* grassland also with affinity with S26b *Phragmites australis – Urtica dioica* fen.
L1	S26a *Phragmites australis – Urtica dioica* fen
L2	MG10a *Holcus lanatus - Juncus effusus* rush-pasture
L2a	MG6 *Lolium perenne – Cynosurus cristatus* grassland
L3	Emergent vegetation – S12c *Typha latifolia* swamp Marginal vegetation – S18a *Carex otbrubae* swamp Bank vegetation – OV26e *Epilobium hirsutum* community
L4	MG6 *Lolium perenne – Cynosurus cristatus* grassland
L5	MG10 *Holcus lanatus – Juncus effusus* rush-pasture
L6	OV26e *Epilobium hirsutum* community
L7	S26b *Phragmites australis – Urtica dioica* fen
L8	OV23c *Lolium perenne – Dactylis glomerata* community