

Appendix 10.2a

National Vegetation Classification (NVC) Surveys of SINCS



M8 BAILLIESTON TO NEWHOUSE

NATIONAL VEGETATION CLASSIFICATION (NVC) SURVEY

OF

SITES OF IMPORTANCE FOR NATURE CONSERVATION

(SINCS)

Final Report

Prepared for: Mouchel Fairhurst
Prepared by: David Knox
Approved by: Karen Atkins
Date: February 2006
Young Associates Ref: B4400/R2/Rev2

TABLE OF CONTENTS

	Page No
1. INTRODUCTION _____	1
1.1 Background	1
1.2 Study Area	1
1.3 Aims and Objectives	1
2. METHODS _____	2
2.1 Survey Methods	2
2.2 Limitations of the NVC System	3
3. RESULTS _____	4
3.1 Data Presentation	4
3.2 Sites of Importance for Nature Conservation (SINCs)	4
3.3 Plant Community Descriptions	9
4. SUMMARY _____	27
5. REFERENCES _____	28

LIST OF FIGURES (included in Part 1 Environmental Statement - Volume 1)

Figure 10.1a – 10.1e Sites of Importance for Nature Conservation (SINCs) NVC Plan

APPENDICES

Appendix 1 : NVC Data Tables (3 data sheets)

1. INTRODUCTION

1.1 Background

As part of the DMRB Stage 2 environmental assessment for the M8 Baillieston to Newhouse scheme, Young Associates (Environmental Consultants) Ltd carried out a National Vegetation Classification (NVC) survey of all sites designated as being of at least local ecological importance within the study area. The study area is shown in Figures 10.1 a - e. Consultations and desk studies undertaken as part of the EIA process indicate that there are no statutory designated sites (e.g. Sites of Special Scientific Interest) in the study area. However, there are 19 non-statutory designated Sites of Importance for Nature Conservation (SINCs), two of which are also designated by the Scottish Wildlife Trust as Wildlife Sites (WS) in the study area, and these are all covered by the NVC survey.

1.2 Study Area

The SINC NVC study area is shown in Figures 10.1 a - e. Following discussions with the statutory agency Scottish Natural Heritage (SNH), the study area extends approximately 500m out from the centre line of the proposed alignment where land is rural in character. In the case of urban areas, the study area extends 250m out from the road centre line.

The location and boundaries of existing SINC sites were confirmed through desk study and consultation with Glasgow City Council and North Lanarkshire Council. Of the 19 SINCs within the study area, only the westernmost site lies within Glasgow City Council area; with the remaining 18 being in North Lanarkshire.

1.3 Aims and Objectives

The aim of the NVC study is to provide additional baseline detail on the botanical structure and composition of plant communities within the SINCs in the study area. It is, however, important to note that some of the SINCs only fall partly within the study area and the plant communities of these sites are not as comprehensively described and assessed as those SINCs that lie wholly within the study area.

2. METHODS

2.1 Survey Methods

A NVC survey was carried out on the SINC sites within the study area in July and August 2004. This consisted of a general walkover survey of plant communities and a detailed assessment of species present at representative sampling points within each different plant community.

The boundaries of all plant communities were mapped as accurately as possible and a handheld Global Positioning System (GPS) was used to ensure that the representative plant community locations were accurately recorded. There were, however, 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. Furthermore, 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 *et al*, 1991) was adopted for NVC survey. As the majority of the communities were determined to be either sufficiently small or botanically homogenous (or both), one representative sample of each community was studied (avoiding edges or other areas where the typical community was not reflected). In each detailed sample, the domin scale was used to quantify the cover of each plant species (Rodwell *et al*, 1991; page 6).

Higher plant identification and nomenclature followed Stace (1997). Watson (1981) was used for the identification and nomenclature of mosses. Background information on the general botanical status and the nature conservation value of the survey area was obtained through consultations with the groups listed in Appendix 10.1, of which the Botanical Society for the British Isles (BSBI) was a particular source of local botanical records. The study also benefited from the surveyor's knowledge and experience of surveying NVC communities throughout Central Scotland over more than a decade.

It must be noted that due to the long period of time over which the survey was completed, it may be possible that further plant species are present and have not been recorded in some of the SINCS, for example early-flowering species present in the spring that have died back during the later summer months. However, as far as practicably possible, surveys were carried out at optimal times for each habitat type, with all woodland communities surveyed in spring and the majority of open habitats, grasslands and aquatic communities surveyed in mid-summer.

Dense scrub vegetation and steep banks along parts of the incised valley of the North Calder Water restricted complete access to all parts of the study area. However, these limitations are considered to be minor, and it is the professional opinion of the experienced surveyors that additional survey of the site would not materially alter the conclusions drawn from the survey work.

2.2 Limitations of the NVC System

Much of the study area comprises quite recently used industrial land, which is being extensively colonised, initially by scrub and then by woodland, and is thus in the transitional stages of ecological succession. Unlike grassland, open habitat and aquatic communities, woodland plant 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 trees take many years to mature and grow to their maximum size, where they are capable of maintaining the moist sheltered microclimate suitable to maintain specialist “woodland” ground flora. Most specialist woodland herb species, dog’s mercury *Mercurialis perennis* and bluebell *Hyacinthoides non-scripta* (also generally known as “wild hyacinth” in Scotland) are poor colonisers and, even if present in the general locality, may take many years to become established in new woodlands.

Taking this into consideration, the study principally aims to describe the current nature of the SINC’s plant communities. NVC information is provided where affinities with the published information (Rodwell, 1991, 1992, 1995 and 2000) can be reasonably made. Botanical data are used in conjunction with geographic data (such as soil conditions), gathered during the survey.

3. RESULTS

3.1 Data Presentation

As the ecological survey area is large and geographically diverse, it is divided into sections (Sheets 1 to 5, Figures 10.1 a - e) that each contain a varied number of SINC. Grid references are used to indicate the locations of all sites and North Lanarkshire Council's SINC coding system is given in parenthesis. From west to east the sections are:

The Baillieston Interchange (Sheet 1 of 5, Figure 10.1a). North and south of the M73 is mainly an undulating rural landscape, with Baillieston Interchange itself intensively landscaped.

Bargeddie and Kirkshaws (Sheet 2 of 5, Figure 10.1b). The river valley of the North Calder Water, including minor tributaries, is the main ecological feature of this section. Undulating farmland lies around the river valley south of the A8. North of the A8 is predominantly built-up.

Shawhead (Sheet 3 of 5, Figure 10.1c). This section is mainly farmland and contains also the North Calder Water and Shirrel Burn. Urban areas lie north of the A8 (Shawhead) and south of the river (Viewpark Industrial Estate and Bellshill).

Eurocentral and Chapelhall Junction (Sheet 4 of 5, Figure 10.1d). This is an area of flat-lying land and includes the Eurocentral Industrial Area south of the A8, a short stretch of the North Calder Water and the Kennel Burn.

Newhouse Junction (Sheet 5 of 5, Figure 10.1e). This section is the easternmost part of the study area and is mainly gently undulating, agricultural land.

3.2 Sites of Importance for Nature Conservation (SINC)

Glasgow City and North Lanarkshire Councils confirmed that there are 19 Sites of Importance for Nature Conservation (SINC), a non-statutory designation applied by the local planning authority to sites considered to be of local ecological importance, within the study area. These sites are listed (from west to east, approximately) in Table 1, and their locations and a brief summary of each provided below and in Figures 10.1 a - e. SINC are afforded a degree of protection under planning policy guidance in NPPG14 and PAN 60, which are implemented through Glasgow City Local Plan policy ENV 5 and North Lanarkshire Local Plan¹ policy ENV 14.

There are seven SINC, highlighted with an asterisk in Table 1, which will be directly affected by the proposed improvements.

¹ North Lanarkshire Council (June 2001). **Southern Area Local Plan Finalised Draft (Modified June 2001) Written Statement.**

Table 1 Non-statutory Sites of Importance for Nature Conservation

Site Name	Closest Distance from M8 Improvement Scheme	Designating Authority	Known Features of Interest
Greenwells SINC	460 m	Glasgow City Council	Hawthorn scrub.
North Calder Water : Newlands Glen – Ravel Burn SINC	270 m	North Lanarkshire Council	Block of Ancient Woodland and wetland habitats. UK and Local BAP priority wet and ash woodland habitat. European protected species – otter.
North Calder Water : Braehead/Aitkenhead (west section) SINC	70 m	North Lanarkshire Council	UK and Local BAP wet woodland priority woodland habitat. European protected species – otter.
North Calder Water : Braehead / Aitkenhead (east section) SINC	190 m	North Lanarkshire Council	UK and Local BAP priority ash woodland habitat. European protected species – otter.
Luggie Glen SINC	400 m	North Lanarkshire Council	Stream habitat with ravine woodland, including wet woodland UK and Local BAP priority habitat. European protected species – otter. This site also benefits from designation as a Scottish Wildlife Trust Wildlife Site.
North Calder Water : Bankhead to Viewpark Glen SINC	30 m	North Lanarkshire Council	Ancient mixed woodland including UK and Local BAP priority ash woodland habitat. European protected species – otter.
Crowflat Pond SINC*	Lies directly on alignment of new M8	North Lanarkshire Council	Wet woodland, swamp and open water, including UK and Local BAP priority habitat.
			West Section - Ancient Woodland site, replanted. European protected species – otter.

Site Name	Closest Distance from M8 Improvement Scheme	Designating Authority	Known Features of Interest
North Calder Water : The Wilderness – Rosehall Bridge SINC	70 m	North Lanarkshire Council	East Section - Long-established, mixed plantation. European protected species – otter.
North Calder Wood SINC*	Lies directly on alignment of new M8	North Lanarkshire Council	UK and Local BAP wet woodland priority habitat.
North Calder Water : Rosehall Bridge – Carnbroe Mains SINC*	Linear site is crossed by alignment of the new M8	North Lanarkshire Council	Ancient Woodland, including UK and Local BAP ash woodland priority habitat. European protected species – otter.
North Calder Water : Carnbroe Mains – Greenend SINC	220 m	North Lanarkshire Council	UK and Local BAP ash woodland priority habitat. European protected species – otter.
South Carnbroe Wood SINC	170 m	North Lanarkshire Council	Woodland, including wet woodland UK and Local BAP priority habitat. A pond on this site had been recently drained when surveyed during 2004.
Orchard Farm Pool SINC*	Directly adjacent to existing A8 highway boundary.	North Lanarkshire Council	Transition from open water, through swamp and tall-herb fen to rush-pasture and wet woodland. UK and Local BAP priority habitats. This site also benefits from designation as a Scottish Wildlife Trust Wildlife Site.
Faskine Estate Woodland and Pond SINC*	Mixed plantation directly affected by Eurocentral Junction. Pond 120 m away.	North Lanarkshire Council	Mixed woodland and wetland habitats, including open water, small reedbed and wet woodland UK and Local BAP habitat.

Site Name	Closest Distance from M8 Improvement Scheme	Designating Authority	Known Features of Interest
Greenend to Maggieshaugh SINC	290 m	North Lanarkshire Council	Mixed plantation woodland.
Blacklands Plantation* and Roundel Pond SINC	Corner of broadleaved plantation only, directly affected by slip road embankments. Pond 350 m away.	North Lanarkshire Council	Block of broadleaved and mixed plantation woodland, and a nearby pond with transition habitats from open water through swamp and wet woodland UK and Local BAP habitat.
North Calder Water : Maggieshaugh – Calderbank SINC	10 m	North Lanarkshire Council	Ancient Woodland, replanted. UK and Local BAP wet and ash woodland priority habitat. European protected species – otter.
O Wood SINC	20 m	North Lanarkshire Council	Broadleaved and mixed plantation, including young stands. Small fragment of rush-pasture and stand of swamp marking site of late successional pond.
Shotts Burn SINC*	Directly crossed by existing A8 where on-line improvements proposed.	North Lanarkshire Council	Stream habitat with ravine woodland and a mixture of habitats in area subject to historic disturbance from industrial activity. European protected species – otter.

SINC 1 Greenwells (Figure 10.1a) lies immediately west of the M73 (NGR NS695651). The site is listed by Glasgow City Council as a SINC not meeting its “City Wide Significant SINC” criteria, but nevertheless of some value in the context of the locality.

The North Lanarkshire SINC's listed below are not graded, but are all considered by the Council to be of value in the context of the Council area. This level of value is described as “local” value in this Appendix.

SINC 2 North Calder Water : Newlands Glen – Ravel Burn (east section) (North Lanarkshire Council ref. 66/8; grid ref: NS698632) is an elongated woodland site that lies to the west of A752 and south from the North Calder Water. It includes two tributary valleys of the North Calder Water.

SINC 3 North Calder Water : Braehead/Aitkenhead (west section) (NLC ref: 76/5b; grid ref: NS703633) is a small woodland site that lies north of the North Calder Water and immediately west of the A752. It includes the riparian zone where the site adjoins the river.

SINC 4 North Calder Water : Braehead/Aitkenhead (east section) (NLC ref: 76/5a; grid ref: NS705629) is a small, elongated woodland site that lies south of a meander in the North Calder Water. It includes the riparian zone where the site adjoins the river.

SINC 5 Luggie Glen (NLC ref: 76/10b; grid ref: NS705639) is a woodland dominated site situated at the northern edge of the study area.

SINC 6 North Calder Water : Bankhead to Viewpark Glen (NLC ref: 76/18; grid ref: NS710629 – NS719616) is a substantial elongated woodland site that follows a 1 km stretch of the North Calder Water river valley and the Red Burn to the northeast of Viewpark. Crowflat Wood lies within the site (grid ref: NS717625).

SINC 7 Crowflat Pond (NLC ref: 76/21; grid ref: NS721828) is a small wetland site with open water that is contiguous with adjacent SINC 6 woodland.

SINC 8 North Calder Water : The Wilderness – Rosehall Bridge (NLC ref:76/26; grid ref: NS719620 – NS732620) is an elongated woodland site that follows about a 1 km stretch of the North Calder Water. Easterwood lies at the east of the site (grid ref: NS730622).

SINC 9 North Calder Wood (NLC ref: 76/25; grid ref: NS725625) is a moderately small secondary woodland site.

SINC 10 North Calder Water : Rosehall Bridge – Carnbroe Mains (NLC ref: 76/31) is a small, elongated woodland site that follows the North Calder Water (and a small area of land to the south) from the east of the A725 (grid ref: NS731615) to the south of the A8 at Shawhead (grid ref: NS738625).

SINC 11 North Calder Water : Carnbroe Mains - Greenend (NLC ref: 76/32) is an elongated woodland site that follows the North Calder Water river valley north of the A8 at Shawhead (grid ref: NS741626) to the border of the study area (grid ref: NS743629).

SINC 12 South Carnbroe Wood (NLC ref: 76/35; grid ref: NS745627) is a small woodland site that lies about 200 m south of Carnbroe.

SINC 13 Orchard Farm Pool (NLC ref: 76/39; grid ref: NS753624) is a substantial wetland site that lies immediately to the north of the existing A8.

SINC 14 Faskine Estate Woodland and Pond (NLC ref: 76/48; grid ref: NS757624) is a moderately large woodland and wetland site. Only its southern half lies within the study area.

SINC 15 Greenend – Maggieshaugh (NLC ref: 76/40; grid ref: NS757627) is a moderately large woodland site but only a small part of it lies within the study area.

SINC 16 Blacklands Plantation and Roundel Pond is separated into two sites, namely the moderate sized woodland (NLC ref: 76/52a - Blacklands Plantation; grid ref: NS767617) and the much smaller sized wetland (NLC ref: 76/52b - Roundel Pond; grid ref: NS764615).

SINC 17 North Calder Water : Maggieshaugh - Calderbank (NLC ref:76/44; grid ref: NS766624) comprises a moderately large, elongated woodland site.

SINC 18 O Wood (NLC ref: 76/55; grid ref: NS769612) is a woodland SINC situated at the south edge of the study area.

SINC 19 Shotts Burn (grid ref: NS805625) is a small burn, in a semi-natural channel through woodland and areas of former industrial disturbance, which is crossed by the existing A8 at the easternmost end of the scheme.

3.3 Plant Community Descriptions

SINC 1 Greenwells

There is a Glasgow City SINC at the site of an old railway, to the west of the M73 at Greenwells. The abundance of hawthorn *Crataegus monogyna*, with a reasonably high cover of elder *Sambucus nigra* and bramble *Rubus fruticosus* agg. confirms it to be W21 *Crataegus monogyna* - *Hedera helix* scrub. Furthermore, the abundance of common nettle *Urtica dioica* and the community's low botanical diversity suggests it has close affinities with the W21a *Hedera helix* – *Urtica dioica* sub-community. Apart from a small cover of the woodland plant, lesser celandine *Ranunculus ficaria*, almost all the plants of the SINC are colonisers of heavily disturbed soils (most notably common nettle and rosebay willowherb *Chamerion angustifolium*). The site is overall of low botanical interest.

SINC 2 North Calder Water : Newlands Glen – Ravel Burn (east section)

SINC 2 is categorised as a woodland site, although a significant proportion of it is formed of grassland and tall-herb fen communities.

Woodland

Continuous woodland cover is not a feature in the riparian zone of this SINC due to river erosion and livestock grazing. There is nevertheless a reasonable abundance of scattered trees and shrubs by the riverbank but the ground layer vegetation is of low diversity and characteristic of mesotrophic grassland (see below). At most, there are small stands of common nettle. Crack willow *Salix fragilis* is a common tree species in

this community. The presence of both these species and the alluvial floodplain setting suggests a community of W6 *Alnus glutinosa* - *Urtica dioica* woodland and in particular the W6b *Salix fragilis* sub-community.

High forest native woodland fringes the north facing, steep river terrace slope of the SINC 2 and the western tributary side valley that adjoins it. The canopy, undercanopy and ground layer are floristically diverse. Species that are characteristic of this woodland are ash (*Fraxinus excelsior*), wych elm *Ulmus glabra* (limited to the undercanopy and shrub layer), sycamore *Acer pseudoplatanus*, wood anemone *Anemone nemorosa*, dog's mercury, wood-sorrel *Oxalis acetosella* and creeping soft-grass *Holcus mollis*. Floristics indicate that the community has affinities with W9 *Fraxinus excelsior* - *Sorbus aucuparia* - *Mercurialis perennis* woodland. The community is typical of base rich, quite poorly draining soils, on steep sloping land, in river valleys of NW Britain (Rodwell, 1991). In the UK, W9 comprises only two sub-communities but no definite sub-community correlation could be made for this SINC. The botanical diversity of the woodland is relatively high considering that the general area is subject to frequent livestock grazing and soil-poaching levels are extensive in places. Conversely, human disturbance levels are low as the SINC is quite remote and there is no vehicle access to the area.

The eastern tributary valley of the SINC is narrow, steep and extensively wooded. However, poaching by livestock and the low water quality of the Ravel Burn has adversely affected the ecology of this part of the SINC. A community of W9 *Fraxinus excelsior* - *Sorbus aucuparia* - *Mercurialis perennis* woodland dominates the tributary valley with a community that approximates to W21 *Crataegus monogyna* - *Hedera helix* scrub at the southern edge of the W9 woodland. The woodland's ground layer is only botanically interesting (with small stands of bluebell, dog's mercury and lesser celandine) where the ground is inaccessible to livestock. The northernmost part of the Ravel Burn, immediately south of where the burn falls steeply down through W9 woodland to the North Calder Water, is composed of mature beech plantation of low botanical interest.

Mesotrophic Grassland

The floodplain that lies between the above described woodland and the riparian zone of the North Calder Water is predominantly poorly draining ground that is also quite heavily poached by livestock (this hampered the botanical survey). The abundance of soft rush *Juncus effusus*, Yorkshire fog *Holcus lanatus* and tufted hair-grass *Deschampsia cespitosa* most likely indicates that a community of MG10 *Holcus lanatus* - *Juncus effusus* rush-pasture dominates this part of the SINC.

Tall-herb Fen

Immediately north of the western tributary watercourse of the SINC's side valley (at the foot of the steep slope that is vegetated by W9 woodland, described above) there is a roughly elongated tall-herb fen community. The vegetation is homogenous in nature, being composed of a good diversity of species. The characteristic species are marsh cinquefoil *Potentilla palustris*, water horsetail *Equisetum fluviatile*, yellow iris *Iris pseudacorus* and bottle sedge *Carex rostrata*. Floristics suggest the presence of S27 *Carex rostrata* - *Potentilla palustris* tall-herb fen. This community is a typical vegetation

type of northwest Britain (Rodwell, 1995). It is possible that the fen has colonised what was once an area of standing open water.

SINC 3 North Calder Water : Braehead/Aitkenhead (west section)

Woodland

The riparian zone of the north side of the North Calder Water forms an important part of the SINC. However, as this part of the SINC is very steep and heavily vegetated it was inaccessible for close survey. Consequently, taking into account health and safety considerations, the community could only be surveyed from the top of the steep slope. The woodland is formed from open canopy woodland, dominated by ash and low levels of sycamore and an undercanopy and shrub layer dominated by hawthorn, with a reasonable cover of wych elm. While these layers of the community are natural in character, the ground layer vegetation contains virtually no cover of plants associated with native woodland. It is possible that the seepage of nutrient rich surface water from farmland to the south, coupled with appreciable levels of human disturbance (such as dumping), have resulted in rank ground layer vegetation, dominated by colonising species such as rosebay willowherb and common nettle. Furthermore, there are extensive stands of Indian balsam *Impatiens glandulifera* and Japanese knotweed *Fallopia japonica* in the woodland. Floristics suggest a modified and impoverished community derived from W6 *Alnus glutinosa* - *Urtica dioica* woodland.

Scrub is abundant in the SINC, mostly at its northern and western edge where it covers fairly steep sloping banking. The community is predominantly composed of dense, uniform hawthorn with lesser amounts of gorse *Ulex europaeus*, bramble and raspberry *Rubus idaeus* at its margins. The scrub's ground layer is on the whole very poorly developed due to heavy shading. The community has affinities with W21 *Crataegus monogyna* - *Hedera helix* scrub.

Mesotrophic Grassland

The central part of the SINC is mainly vegetated by unimproved, well drained, mesotrophic grassland of moderate botanical diversity, with a mainly open sward. However, there is a relatively large area of bare ground in the centre of the site that is only starting to be recolonised by vegetation. The main grassland community is dominated by false oat-grass *Arrhenatherum elatius*, cock's-foot *Dactylis glomerata*, common bent-grass *Agrostis capillaris* and tufted hair-grass. The most important herbaceous species in the sward are common knapweed *Centaurea nigra*, ribwort plantain *Plantago lanceolata* and creeping thistle *Cirsium arvense*. A few plants of common spotted-orchid (*Dactylorhiza fuchsii*) are present. Taken together, floristics indicate that the community is MG1 *Arrhenatherum* grassland, which is typical of such neglected grasslands on areas of soft, well-draining soil.

SINC 4 North Calder Water : Braehead/Aitkenhead (east section)

Woodland

The riparian zone of the north bank of the North Calder Water (just outside the northern edge of the SINC) mainly comprises crack willow dominated carr woodland with large stands of Indian balsam and Japanese knotweed. This is most closely associated with the W2 *Salix cinerea* - *Betula pubescens* - *Phragmites australis* woodland community.

Carr woodland is not present on the south riparian zone of the river as the ground is steeply sloping and consequently the soil is well-drained. High forest native woodland is present in the western part of the SINC, that is characterised by pedunculate oak *Quercus robur*, sycamore, hawthorn, bluebell, ivy *Hedera helix* and bramble. Floristics indicate that the community is within the range of W10 *Quercus robur* - *Pteridium aquilinum* - *Rubus fruticosus* woodland.

In the central part of SINC 4, the native oakwood described above is replaced by ash and wych elm dominated woodland, with a much lower abundance of bluebell (although hybrid bluebell *Hyacinthoides non-scripta* x *H. hispanica* is present along with a much higher abundance of dog's mercury. Floristics suggest affinity with W9 *Fraxinus excelsior* - *Sorbus aucuparia* - *Mercurialis perennis* woodland.

A large stand of W21 *Crataegus monogyna* - *Hedera helix* scrub with a moderately good botanical diversity characterises the eastern part of the SINC. Hawthorn dominates the community, with abundant bramble, gorse and some ivy.

SINC 5 Luggie Glen

The woodland along Luggie Burn has been subject to considerable "edge effects" and other disturbance associated with human activities, e.g. fly tipping that has probably been ongoing for a long time (including dumping burnt out cars). There has been some woodland planting at the edges of the woodland to deter disturbance and appropriate native species have been used. Even so, the ground layer vegetation is poorly developed with sparse stands of colonising species (such as rosebay willowherb). The canopy layer mainly comprises naturalised species (sycamore is dominant) and native trees (ash, birch and oak species). Disturbed and heavily modified communities are often not amenable to description in terms of the NVC, however, the abundance of sycamore and oak suggests that the community approximates to W10 *Quercus robur* – *Pteridium aquilinum* – *Rubus fruticosus* woodland.

A community of young riparian woodland is evident beside the Luggie Burn. Goat willow is dominant with a reasonable cover of oak and sycamore. The ground is wet but like the high canopy woodland to the west (see above), only colonising plant species are evident in the ground flora and Indian balsam dominates. Also, similar to the woodland to the west, the riparian woodland has been subject to too much disturbance to make NVC a useful tool for describing it.

There is an extensive stand of Indian balsam by the culvert on the Luggie Burn. This monoculture of an invasive alien species conforms to no NVC community type.

A community of unimproved, neutral grassland dominates the eastern side of the SINC within the survey area. Fairly recent landscaping in the Luggie Glen has created a species-poor MG6 *Lolium perenne* – *Cynosurus cristatus* grassland that is developing a degree of naturalness. The community has an abundance of crested dog's-tail *Cynosurus cristatus*, Yorkshire fog and red clover *Trifolium repens* with an appreciable cover of red fescue *Festuca rubra* and meadow buttercup *Ranunculus acris* in a short and fairly open sward on soils that are mostly poorly draining.

SINC 6 North Calder Water : Bankhead to Viewpark Glen

Woodland

A reasonably uniform community of native, high forest dominates SINC 6. There is also an area of mature broad-leaved plantation at Viewpark Glen (NS719619) and several extensive areas of open habitat in floodplains by the North Calder Water. The canopy of the native woodland is composed of a mix of species that include oak, downy birch *Betula pubescens*, beech and ash. Sycamore is only common in the eastern part of the SINC (most notably in Crowflat Wood, NS718624). Alder *Alnus glutinosa* is a reasonably common component of the canopy layer of woodland to the south of the North Calder Water. Hawthorn is common in the shrub layer, with hazel *Corylus avellana* present at lower levels of abundance. The ground layer is mainly characterised by large stands of bluebell, with frequent stands of bramble, bracken *Pteridium aquilinum* and creeping soft-grass. Woodland, with a particular abundance of creeping soft-grass, is present at the westernmost part of the SINC. Floristics indicate the presence of W10 *Quercus robur* - *Pteridium aquilinum* - *Rubus fruticosus* woodland, and the abundance of sycamore and ash suggest the presence of W10e *Acer pseudoplatanus* - *Pteridium aquilinum* - *Rubus fruticosus* sub-community.

As noted above, the woodland in the Viewpark Glen part of the SINC (which mainly lies outside the study area) is mature, broad-leaved plantation woodland, with a canopy layer dominated by beech. Although the ground layer species composition is roughly comparable with the native woodland of the SINC described above, there is a lower abundance of woodland ground flora species, such as bluebell. Furthermore, this is the only part of the section that contains invasive species such as rhododendron *Rhododendron ponticum* and pick-a-back plant *Tolmiea menziesii*. In conclusion it is likely that the Viewpark Glen woodland retains strong affinities with the W10 *Quercus robur* - *Pteridium aquilinum* - *Rubus fruticosus* woodland community but inappropriate management in past times (encouraging beech) and ongoing high levels of human disturbance (such as dumping and burning) result in the area having a considerably lower level of naturalness than the rest of the SINC. Consequently, the species composition of the open habitat areas is dominated by rosebay willowherb, with large stands of common nettle, Yorkshire fog and creeping thistle.

A high forest woodland community that is significantly botanically different from the typical woodland community type of the SINC (i.e. W10) is located to the north of Crowflat Wood (NS718627) and borders the southern edge of SINC 7 (Crowflat Pond). This is a community of secondary woodland that has colonised a large area of flattened industrial spoil. However, the community is most notably scrub-like at its western margin. Ash,

sycamore and downy birch dominate the canopy, with abundant hawthorn and wych elm in the scrub layer. The ground layer is quite sparsely vegetated, with low levels of cover of woodland herbs, e.g. enchanter's-nightshade *Circaea lutetiana*, moschatel *Adoxa moschatellina*, bluebell and dog's mercury and colonising herb species, e.g. rosebay willowherb and common nettle. The presence of ash, wych elm and enchanter's-nightshade are indicative of W9 *Fraxinus excelsior* – *Sorbus aucuparia* – *Mercurialis perennis* woodland.

Open Habitat

Several areas of extensive open habitat are present in the floodplain areas that lie within meanders of the North Calder Water. High forest woodland and even scrub has not readily colonised these areas due to natural factors (river erosion that results in channel migration), coupled with appreciable levels of human disturbance, such as dumping and burning. Consequently, the vegetation of these areas is characteristically that of colonising open habitat. Nevertheless, there are scattered trees, e.g. sycamore and beech, shrubs, e.g. willow *Salix* species and hawthorn, and small stands of woodland herbs, e.g. lesser celandine, dog's mercury and bluebell, in the riparian zone of these open habitats, suggesting the areas were once wooded. Floristics suggest that the area is predominately OV27 *Epilobium angustifolium* community (note that Rodwell (2000) uses the genus *Epilobium* for rosebay willowherb but current classification places it in the genus *Chamerion*; Stace, 1997). Furthermore, the abundance of common nettle and creeping thistle suggests OV27b *Urtica dioica* - *Cirsium arvense* sub-community is dominant.

Grassland

Within a large meander in the North Calder Water at NS718623, much of the land is amenity grassland. Only the margins of the grassland lie within the SINC. Perennial ryegrass *Lolium perenne* characterises the sward and the community is MG6 *Lolium perenne* - *Cynosurus cristatus* grassland.

SINC 7 Crowflat Pond

A reasonably large pond dominated by swamp vegetation forms the most characteristic vegetation of SINC 7. There is only a limited area of open water. Woodland and mesotrophic grassland forms the southern part of the site.

Swamp

Bottle sedge, bulrush *Typha latifolia* and water plantain *Alisma plantago-aquatica* swamp dominates Crowflat Pond. Floristics suggest that the community is S12 *Typha latifolia* swamp. Furthermore, it is considered that bottle sedge dominated stands are S12d *Carex rostrata* sub-community and that stands with high levels of water plantain are S12c *Alisma plantago-aquatica* sub-community.

Open Habitat

To the west of the pond an extensive area of dumped spoil (forming a dam that resulted in the formation of the pond) is vegetated by open habitat community dominated by rosebay willowherb, with a good diversity of herbs and a low number of common bryophyte species. Floristics suggest this is an OV27 *Epilobium angustifolium* community.

Woodland

Scrubby wet woodland is present at the southern margins of the SINC, dominated by birch and willow species. The community is best developed at the southeast of the site (NS723626) and there is a very small area of mature willow carr woodland that fringes a minor watercourse. Floristics suggest the community is within the range of W1 *Salix cinerea* - *Galium palustre* woodland.

Mesotrophic Grassland

To the north and east of Crowflat Pond lies an extensive area of rush pasture grassland, which merges into neutral agricultural grasslands that fringe the SINC. Soft rush, tufted hair-grass and Yorkshire fog dominate the sward. The community is MG10 *Holcus lanatus* - *Juncus effusus* rush-pasture.

To the south of Crowflat Pond, and surrounded by the scrubby woodland mentioned above, there is an area of made ground (a partially flattened spoil area), where mesotrophic grassland has been created through seeding and there has been recent planting of a wide variety of broad-leaved and coniferous trees. The sward is rather open and composed of Yorkshire fog, tufted hair-grass and sweet vernal-grass *Anthoxanthum odoratum* and containing a good diversity of herbaceous species; bird's-foot trefoil *Lotus corniculatus*, common-spotted orchid, colt's-foot *Tussilago farfara*, common ragwort *Senecio jacobaea*, meadow buttercup, creeping buttercup *Ranunculus repens*, dandelion *Taraxacum officinale* agg., clover *Trifolium* species, oxeye daisy *Leucanthemum vulgare*, rosebay willowherb, creeping thistle and daisy *Bellis perennis*. The open nature of the sward and its botanical composition suggest similarities to the MG9a *Poa trivialis* sub-community of MG9 *Holcus lanatus* – *Deschampsia cespitosa* grassland.

SINC 8 North Calder Water : The Wilderness – Rosehall Bridge

Woodland

In contrast to SINC 6, to the west, this SINC predominantly comprises plantation woodland, which forms an area called the Douglas Support Estate. These woodlands have been created by extensive underplanting with conifer species that include Scot's pine *Pinus sylvestica* and yew *Taxus baccata*. Mature mixed plantation is present at the western end of the site (NS719620 to NS722621) and north of an avenue of common lime *Tilia x vulgaris* (NS724624 to NS727624). Non-native broad-leaved tree species have also been underplanted in woodland compartments of the SINC. The most common planted species are common lime, beech, Norway maple *Acer plantanoides*

and, less common, horse chestnut *Aesculus hippocastanum*, cherry *Prunus* and poplar *Populus* species.

Invasive tree/shrub species comprising sycamore; rhododendron and invasive herbaceous species, e.g. pick-a-back-plant and Algerian ivy *Hedera algeriensis* are commonplace throughout the site. The most obvious man-made feature of the estate woodland is an east to west trending avenue of mature lime, that lies to the north of the SINC but only part of it lies within the site (NS724624 to NS726624) at the western end of the avenue (NS720623). Mature beech plantation is present at a small outlying part of the SINC at NS723623 and covers a sizeable section of the western part of Easter Wood (NS726623 to 728622). Throughout most of the SINC, ground layer vegetation is not particularly diverse and woodland herbs that typify semi-natural woodland, e.g. lesser celandine, are either locally rare or absent. However, there are small stands of bluebell within the mostly grass, e.g. creeping soft-grass, or tall ruderal, e.g. common nettle and creeping thistle dominated ground layer vegetation, and the hybrid bluebell is as common as native bluebell in most of the site. In general the artificial nature of the woodlands within the SINC makes NVC analysis inappropriate.

Open Habitat and Mesotrophic Grassland

Only a minor section of the site lies south of the North Calder Water. Most of the woodlands of this section are extensively managed as part of the landscaping of Viewpark Industrial Estate development (most evident within a meander of the river at NS724621). Extensive felling of native woodland has occurred in this part of the SINC and young broad-leaved woodland plantings are common in the area (just outside the SINC). However, some remnant mature trees have been retained and species include ash, beech, horse chestnut and sycamore. Due to extensive felling, the ground layer vegetation is complex and difficult to analyse. Woodland associated herbs remain quite common, e.g. lesser celandine, but generally open habitat associated species dominate this felled area, e.g. rosebay willowherb, Yorkshire fog, common nettle, cleavers *Galium aparine* and cow parsley *Anthriscus sylvestris*. This is considered most closely allied to the OV27 *Epilobium angustifolium* community and the OV27b *Urtica dioica* - *Cirsium arvense* sub-community.

To the north of the North Calder Water there are two areas of non-woodland vegetation, in mostly flat lying ground beside the river (i.e. floodplain). One is a small area of open habitat at NS723621 and there is a larger, elongated area of grassland (to the north of the floodplain) and open habitat from NS724623 to NS727622. This area comprises large stands of rosebay willowherb and common nettle, with similarly large stands of Indian balsam. This is OV27 *Epilobium angustifolium* community. The larger non-wooded area to the east comprises a long neglected field of fairly low diversity Yorkshire fog and tufted hair-grass dominated grassland (most like MG9 *Holcus lanatus* – *Deschampsia cespitosa* grassland) and open habitat of a vegetation type essentially like the smaller non-wooded area to the west (i.e. OV27).

SINC 9 North Calder Wood

Woodland

The northeast part of SINC 9 is vegetated by secondary woodland communities that have colonised a large area of mostly flattened spoil. Woodland to the east of this section is wet in character, as it has developed on poorly drained soil. In comparison woodland to the west has formed on good draining soil and is dry in character. In general the woodland of the site is composed of a rather scrubby canopy layer (but is mainly greater than 5m in height) that is typically coppice-like in appearance (*i.e.* multi-stemmed trees and shrubs). Habitat survey suggests that these woodlands have been at least partially created by planting and hence they are classed as broad-leaved plantation.

The canopy and shrub layers of wet woodland to the east of the site are dominated by downy birch with moderate levels of sycamore, goat willow, beech, hawthorn and a lower abundance of aspen *Populus tremula* and black poplar *Populus nigra*. Ground layer flora is present only at low levels of cover with bluebell, woodland ferns, e.g. broad buckler-fern *Dryopteris dilatata*, wetland associated species, e.g. marsh hawk's-beard *Crepis paludosa*, and colonising species, e.g. common nettle, cleavers and foxglove *Digitalis purpurea*. A few plants of common spotted orchid are present in the community. The artificial nature of the woodland community makes correlation with NVC types inappropriate. However, floristics and the wetness of most of the ground layer suggest that the woodland is developing with some of the characteristics of fen woodland W6 *Alnus glutinosa* – *Urtica dioica*. Moreover, the abundance of birch suggests the woodland currently approximates to the W6b *Betula pubescens* sub-community.

The canopy of the western section of woodland within SINC 9 is composed of a mixture of common lime, beech, sycamore and aspen. Trees are uniform in size in the woodland and this indicates the majority of the community has been planted. However, the woodland contains some degree of natural ground layer vegetation. This is dominated by broad buckler-fern with low cover of enchanter's-nightshade, bluebell, bramble and moss species *Eurhynchium praelongum*. Most notably a single plant of the orchid species common twayblade *Listera ovata* was recorded on the edge of a small spoil heap in the woodland (NS72666.62570), which is frequent in such habitats in the UK (Stace, 1997), but not known elsewhere in North Lanarkshire.

Grassland and Wetland

The southern section of the SINC comprises a moderately small area of wetland (with a small amount of open water) that is fed by an east to west flowing land drain that crosses a field of mesotrophic grassland. The grassland is of low botanical diversity and the sward is composed of sweet vernal-grass, creeping soft-grass and tufted hair-grass. This is a community of MG9 *Holcus lanatus* – *Deschampsia cespitosa* grassland. The vegetation at the fringes of the open water is characterised by rush-pasture. This community is of fairly low botanical diversity and is mainly composed of soft rush and red fescue, with moderate cover of meadow buttercup, marsh willowherb *Epilobium palustre*, cuckooflower *Cardamine pratensis*, common horsetail *Equisetum arvense* and greater

bird's-foot-trefoil *Lotus pedunculatus*. These floristics indicate a community of MG10 *Holcus lanatus* – *Juncus effusus* rush-pasture.

SINC 10 North Calder Water : Rosehall Bridge – Carnbroe Mains

Woodland

A community of high forest woodland characterises two sections of steeply sloping riparian zone (NS731619 to NS734620 and NS736625 to NS738626). Ash dominates the canopy, undercanopy and shrub layer of both sections, although beech, birch and hawthorn are also present. Honeysuckle *Lonicera periclymenum* and ivy are occasionally present. Stands of bluebell (including hybrid bluebell stands) are locally prevalent, with subordinate stands of dog's mercury. Large areas of the invasive species pick-a-back-plant are common close to the river. Tufted hair-grass is common in the southern section of woodland, whilst the woodland that lies closer to the A8 is more botanically rich, e.g. with stands of lesser celandine and wood anemone *Anemone nemorosa*. In wet areas close to the river, opposite-leaved golden saxifrage *Chrysosplenium oppositifolium* is present. Also, hart's tongue fern *Phyllitis scolopendrium* is relatively common in the community. Floristics suggest that the community has affinity with W9 *Fraxinus excelsior* – *Sorbus aucuparia* – *Mercurialis perennis* woodland.

Moderately large areas of beech dominated mature plantation are present in the SINC at two locations close to the North Calder Water (NS733621 and NS736623). Even though beech of uniform age dominates these plantations, woodland herbs, e.g. dog's mercury, wood anemone, lesser celandine and bluebell, have been retained. This suggests that in past times the mature beech plantations were of similar composition to the adjacent semi-natural woodland community (described above).

The southern 300m of the SINC is located in a very constricted riparian zone in the northern suburbs of Bellshill, between the A725 and B70770. This area includes the confluence of the Shirrel Burn and the North Calder Water (NS731619). Dense scrub of low botanical diversity has colonised most of this part of the SINC. The community approximates to W21 *Crataegus monogyna* – *Hedera helix* scrub.

A small area of floodplain bordered by scrub lies in a meander to the east of the North Calder Water (NS734622). A mesotrophic grassland community dominated by tufted hair-grass is present in the floodplain. This community is MG9 *Holcus lanatus* – *Deschampsia cespitosa* grassland.

The north part of the SINC, to the north side of the river, has a long-disused spoil heap composed of slag that is mainly colonised by unimproved mesotrophic grassland. However, the lower slopes of the spoil heap are fringed by scattered scrub composed of ash and oak saplings. The grassland has a typically short and fairly open sward composed of a mixture of grasses and herbaceous species, including red fescue, creeping bent *Agrostis stolonifera*, devil's-bit scabious *Sucissa pratensis*, barren strawberry *Potentilla sterilis* and creeping buttercup. These species suggest the development of an MG11 *Festuca rubra* – *Agrostis stolonifera* – *Potentilla anserina* grassland.

SINC 11 North Calder Water : Carnbroe Mains - Greenend

Woodland

Steeply sloping, high forest woodland is prevalent at the southern part of this SINC (from the A8 to NS743627) from the riparian zone to the upper slopes of the North Calder Water valley. Woodland cover is greatest on the extremely steep and inaccessible east side of the river, which contains some small sections of cliff. Ash dominates the canopy, which is open in character. The only other canopy species is beech, which is rare in the SINC. In comparison, the understorey and scrub layers are dense and botanically diverse, being composed of hawthorn, willow species, rowan *Sorbus aucuparia*, hawthorn, beech, elder, dog rose *Rosa canina* agg., bramble and immature ash and sycamore. Ivy is abundant in the canopy and undercanopy. Ground layer vegetation is mostly lush and diverse with stands of woodland herbs such as dog's mercury, bluebell, herb-Robert *Geranium robertianum* and lesser celandine. However, there are also extensive areas of disturbed ground (mainly caused by fly tipping) colonised by rosebay willowherb. In the riparian zone common comfrey *Symphytum officinalis* is particularly common. Floristics indicate W9 *Fraxinus excelsior* – *Sorbus aucuparia* – *Mercurialis perennis* woodland.

At the western edge of the high forest woodland, on flat lying land, there is an area of hawthorn and willow scrub (NS738627). This has been planted alongside a public footpath that extends from Kirkshaws Industrial Estate north along the western edge of the river valley. This community approximates to W21 *Crataegus monogyna* – *Hedera helix* scrub.

At the western border of the SINC, north of the high forest woodland, on the less steeply sloping west bank of the valley, young broad-leaved plantations are present. Willow species have predominantly been planted.

Mostly scattered scrub has colonised flat lying land to the east of the river valley (see the paragraph on mesotrophic grassland below) and this is characterised by hawthorn, willow species, birch, gorse and broom *Cytisus scoparius*. At NS742629 a moderately small area of dense scrub is present. This community approximates to W21 *Crataegus monogyna* – *Hedera helix* scrub.

Open Habitat

North of the high forest woodland on a small floodplain to the west of the North Calder Water there is a small area of open habitat dominated by rosebay willowherb and common nettle. Floristics suggest that OV27 *Epilobium angustifolium* community dominates the area.

Mesotrophic Grassland

Except for a moderately small area of dense scrub (NS742629), the flat lying land that lies at the east side the North Calder Water's valley is colonised by unimproved neutral

grassland. This is an area of extensively landscaped former industrial land (most recently used as a landfill site). Only the western edge of this community lies within the SINC. The grassland is not botanically rich, comprising mainly tufted hair-grass and cock's-foot with low cover of common clover species, creeping buttercup, meadow buttercup and colt's-foot. These species suggest that the community is MG9 *Holcus lanatus* – *Deschampsia cespitosa* grassland.

SINC 12 South Carnbroe Woodland

This SINC is divided into two woodland communities. High canopy long-established woodland has developed on gently sloping, undisturbed ground to the south of the site and younger woodland has more recently colonised poorly draining, flat-lying disused industrial land at the northern margin of the SINC. Also present at the northern edge of the SINC is a totally drained large pond that contains no vegetation.

Floristics indicate that the woodland to the south is W10 *Quercus robur* – *Pteridium aquilinum* – *Rubus fruticosus*. Characteristic canopy species are oak, birch and sycamore. Furthermore, the abundance of sycamore and moderate abundance of wood sorrel, broad-buckler fern and dog violet *Viola riviniana* are suggestive of the W10e *Acer pseudoplatanus* – *Oxalis acetosella* sub-community.

The northern woodland community is co-dominated by downy birch and goat willow. The ground conditions are very wet, the ground layer vegetation is not well developed and no woodland-associated plants are present in the community. It is considered that the community is W1 *Salix cinerea* – *Galium palustre* community, which is typical of woodland in the early stages of colonising wet sites (carr woodland) in lowland areas with minerotrophic (non-peaty) soils. It is possible that goat willow has developed instead of grey willow *Salix cinerea*, as the latter is closely associated with heavily disturbed, former industrial sites such as this.

SINC 13 Orchard Farm Pool

A small variety of species-poor swamp and tall-herb fen communities fringe the northern edge of Orchard Farm Pool, although none of them cover particularly large areas and they are of low species diversity. The substrate is predominantly minerotrophic soil and soil and water conditions are neutral in character. As cattle are allowed access to the site it is extensively poached, which has greatly disturbed the fragile wetland vegetation. Consequently, analysis in terms of NVC is problematic. However, the following communities have been identified:

- bottle sedge swamp, S9 *Carex rostrata* - most closely reflecting the S9a *Carex rostrata* sub-community as bottle sedge is dominant;
- water horsetail swamp, S10 *Equisetum fluviatile* - most likely the S10a *Equisetum fluviatile* sub-community due to the dominance of water horsetail;

- stands of common S19 *Eleocharis palustris* (common spike-rush) swamp are an important community of the SINC; and
- small stands of reed canary-grass *Phalaris arundinacea* are present at the margins of the swamp communities, also with abundant meadowsweet *Filipendula ulmaria*. They are S28 *Phalaris arundinacea* tall-herb fen.

Beyond the tall-herb fen and swamp communities, the outer margins of the SINC comprise rush pasture and young broad-leaved plantation. Yorkshire fog and soft rush *Juncus effusus* are co-dominant in the rush pasture (MG10 *Holcus lanatus* – *Juncus effusus* rush-pasture). The woodland plantation at the north edge of Orchard Farm Pool comprises a variety of native willow species interspersed with alder and birch. The plantation is at a fairly early stage in its development and the processes of natural regeneration have yet to become established. Consequently, it is difficult to correlate the plantation with NVC communities. However, it is possible that it could, in time, develop into W1 *Salix cinerea* – *Galium palustre* woodland, which is commonplace at the margin of lowland wetlands on minerotrophic soils.

SINC 14 Faskine Estate Woodland and Pond

Orchard Farm Pool (see above) is fed by a small watercourse to the north, of which only a small portion lies within the study area. This forms the eastern margin of Faskine Estate Woodland and Pond SINC. The banks of the watercourse are vegetated by mature broad-leaved woodland plantation. Canopy species are sycamore, beech and oak species. The ground layer is not particularly species rich and tall ruderal colonising species, e.g. rosebay willowherb and common nettle, dominate.

A large north-south trending ditch divides the main Orchard Farm Pool SINC (west of the ditch) from reed-bed and scrubby native woodland at the eastern part of Faskine Estate Woodland and Pond SINC. The latter mentioned SINC has developed on an old spoil heap and poorly draining land that lies immediately to the south of the spoil. Most of the spoil heap is vegetated by open scrub co-dominated by hawthorn and downy birch. The ground layer vegetation is typically acid in nature with calcifugous species such as wavy-hair grass *Deschampsia flexuosa* and heath bedstraw *Galium saxatile* evident in the sward, which contains abundant common bent-grass and sweet vernal-grass. Floristics suggest some affinity with W17 *Quercus petraea* – *Betula pubescens* – *Dicranium majus* community and possibly the W17c *Anthoxanthum odoratum* - *Agrostis capillaris* sub-community. Within the spoil heap there is a large depression with a small unvegetated pond. At the southern base of the spoil heap is a moderately large area of reed-bed, dominated by common reed *Phragmites australis*, correlating with S4 *Phragmites australis* swamp and reed-bed.

Long-established, high forest, mixed plantation forms the core habitat of this SINC and surrounds the large pond of Faskine Estate (located in the east of the SINC). This woodland has been planted on flat-lying well-drained ground. Tree regeneration levels are very low and the age structure of the plantation is mostly very uniform. Typically the canopy is closed in character and dominated by sycamore with occasional lime, oak,

birch, a large cypress *Chamaecyparis* species and limited amounts of Scot's pine and horse chestnut. A native species shrub layer is mostly poorly developed with holly, elder and honeysuckle recorded only rarely within the community. In comparison, moderately large areas of rhododendron are evident to the west of the large pond where there are also bushes of Portugal laurel *Prunus lusitanica*. A large stand of snowberry *Symphoricarpos albus* is present in the woodland close to the north end of the pond. The ground layer vegetation is sparse with occasional bramble and wood sorrel in a sward dominated by creeping soft-grass with frequent cock's-foot. Correlations with NVC woodland communities cannot be convincingly made for this plantation. However, the woodland that lies to the south of the pond contains a lower amount of non-native canopy species and oak cover levels are slightly increased and it is possible that some of the trees are relics of semi-natural woodlands. This suggests that at least parts of the plantation have some affinity with W10 *Quercus robur* - *Pteridium aquilinum* – *Rubus fruticosus* woodland.

Semi-natural woodland, with a canopy height of approximately 5m, has quite recently colonised poorly-draining land to the west, east and south of the mature mixed plantation of the SINC. It is probable that the woodland's canopy is only starting to become closed in nature. Tree species are predominantly birch, goat willow and grey willow. The woodland's ground layer is poorly developed, most likely as it is at an early stage of development and non-woodland species (such as Yorkshire fog) predominate. The woodland's floristics and colonising character indicate development towards W1 *Salix cinerea* – *Galium palustre* woodland.

Marginal wetland vegetation communities are present at the large pond in Faskine Estate. Open water forms roughly 70% of the total area of the pond. The marginal vegetation demonstrates a good degree of zonation with stands of bottle sedge in the deeper outer margins of the pond and a more diverse tall herb-fen community present at the outermost edge of the pond. The latter is S9 *Carex rostrata* swamp. There are also small uniform stands of common spike-rush that conform to S19 *Eleocharis palustris* swamp. The tall herb-fen comprises occasional bottle sedge, meadowsweet, soft rush, yellow iris, marsh bedstraw, ragged robin *Lychnis flos-cuculi*, great willowherb *Epilobium hirsutum* and a locally important species, water dock *Rumex hydrolapathum*. It potentially conforms to S27 *Carex rostrata* – *Potentilla palustris* tall-herb fen. A large stand of yellow iris is present at the southern outer margins of the pond. The island in the centre of the pond is densely vegetated by bulrush and this is S12 *Typha latifolia* swamp and the aquatic margins of the island are extensively fringed by S9 *Carex rostrata* swamp.

A willow carr community with grey willow is present at the western edge of the pond and is identified as W1 *Salix cinerea* – *Galium palustre* woodland.

Species poor, tall ruderal habitat dominated by rosebay willowherb is present in the old walled garden to the northwest of Faskine Estate pond and is identified as OV27 *Epilobium angustifolium* open habitat community.

SINC 15 Greenend - Maggieshaugh

This a homogenous block of mature, mixed plantation (referred to as Fox Covert on ordnance survey maps) composed of an equal cover of Scot's pine and sycamore. The ground layer vegetation is not well developed but there are some stands of native bluebell. Consequently, it is possible that the plantation is the site of former semi-natural woodland but, at the present time, the community is too artificial to correlate with any NVC woodland types.

SINC 16 Blacklands Plantation & Roundel Pond

Blacklands Plantation

Blacklands Plantation lies in an area of flat-lying ground. Survey indicates that forestry operations have extensively changed the Blacklands Plantation from semi-natural woodland to plantation woodland. However, the reasonable maturity of the plantation indicates that these operations occurred quite some time ago. Planting has created mixed woodland of Sitka spruce *Picea sitchensis* and beech in the western "third" of the area and much more diverse broad-leaved plantation in the eastern "two thirds". The latter contains beech, alder, oak species, goat willow, sycamore and ash. Such a plantation does not conform to the NVC woodland classification system. However, the presence of abundant bramble and occasional bluebell and bracken suggests that the ground layer of W10 *Quercus robur* – *Pteridium aquilinum* – *Rubus fruticosus* woodland have survived the felling of the previous semi-natural woodland canopy layer.

Roundel Pond

This is a small site whose principal feature is a shallow, naturalised pond with aquatic and swamp vegetation communities. The main open water part of the pond is vegetated by pondweed *Potamogeton* species and ivy-leaved duckweed *Lemna triscula*. This is probably A2 *Lemna minor* community and the abundance of ivy-leaved duckweed suggests a positive correlation with A2b *Lemna triscula* sub-community. At the margins of the floating vegetation community is another aquatic community that contains abundant mare's-tail *Hippuris vulgaris* and yellow water-lily *Nuphar* sp.. This suggests the presence of A7 *Nymphaea alba* community and the abundance of mare's-tail indicates the A7b *Juncus bulbosus* – *Potamogeton polygonifolius* sub-community. The margins of the pond are interspersed, species poor, communities of S9 *Carex rostrata* swamp and S19 *Eleocharis palustris* swamp. Much of the edges of the wetland are fringed by scrub, comprising willow species, alder and hawthorn, which potentially correlates with the common carr community W1 *Salix cinerea* – *Galium palustre* woodland.

SINC 17 North Calder Water : Maggieshaugh - Calderbank

Woodland

The southern edge of a high forest woodland community, within the easternmost section of the North Calder Water SINC, lies within the study area. The woodland's canopy layer is open and the woodland does not have good structural diversity. In terms of species, the community is diverse as it contains oak, sycamore, beech and elm. The ground layer vegetation includes woodland herbs, e.g. lesser celandine, broad buckler-fern and greater wood rush *Luzula sylvatica*. Colonising species are also commonplace in the ground layer and include common nettle and rosebay willowherb. Floristics suggest that the community is W10 *Quercus robur* – *Pteridium aquilinum* – *Rubus fruticosus* woodland.

To the west of the B802 road that crosses over the North Calder Water, lying to the south of the river, there is extensive mature broad-leaved woodland on the mostly steep sided valley sides. It is typically botanically diverse in terms of its canopy and ground layer vegetation and also has a good level of structural diversity. Species that are characteristic of the woodland are ash and sycamore, with fairly extensive stands of dog's mercury and a small amount of lords-and-ladies *Arum maculatum*. The character of this woodland indicates the community has affinities with W9 *Fraxinus excelsior* – *Sorbus aucuparia* – *Mercurialis perennis* woodland.

Woodland that fringes the north side of the North Calder Water is open and scrubby in nature and is botanically uninteresting compared with the rest of this SINC. Goat willow dominates the canopy layer and the ground layer is typified by colonising species, e.g. rosebay willowherb. These species suggest the woodland is W1 *Salix cinerea* – *Galium palustre* community.

Grassland

A large area of fairly gently sloping ground borders the southern margins of Calderbank. The area is composed of soft, well-drained ground mostly colonised by rank, mesotrophic grassland. False-oat grass dominates a species-poor sward, indicating a community of MG1 *Arrhenatherum elatius* grassland.

Swamp

The aquatic margins of a remnant stretch of the Monklads Canal are vegetated by a species-poor, tall-herb fen community dominated by reed canary-grass. This indicates the presence of S28 *Phalaris arundinacea* tall-herb fen.

SINC 18 O Wood

O Wood lies in a flat-lying area. Young broad-leaved plantation dominates the northern half of the site up to the east to west trending powerline. A wayleave has been fairly recently cut under the powerline leaving only ground layer vegetation. Well-established, mixed plantation woodland is located south of the powerline, with a subordinate area of young mixed plantation at its southwest periphery. Numerous drainage ditches traverse the area and they have been created to reduce the prevalence of water saturated soil conditions in the area and thus make it suitable for woodland.

The broad-leaved plantation is predominantly birch with a lesser amount of willow species and rowan. It has been planted on neutral grassland (to the northwest) and rush-pasture (to the northeast) communities. The former is dominated by tufted-hair grass with frequent soft rush and marsh thistle. Bramble is frequently present in the ground layer between the trees in this community. The ground layer approximately correlates with MG9 *Holcus lanatus* – *Deschampsia cespitosa* grassland. To the northeast the rush-pasture community is wetter than the grassland to the west and trees are considerably more sparsely planted. The dominance of rush species (soft rush) indicates that it is MG10 *Holcus lanatus* - *Juncus effusus* rush-pasture. Within the rush-pasture community there is a small pond (NS770612) that is mostly vegetated by swamp, with only a very small area of open water. Bulrush dominates the community with low cover of floating sweet-grass *Glyceria fluitans* and great willowherb.

A community of well-established mixed woodland (canopy height is approximately 6m) dominates O Wood south of the powerline. Canopy species include birch, rowan, willow species, alder, oak species and pine. The ground layer vegetation is similar in character to the younger plantation to the north as it has close affinities to MG9 *Holcus lanatus* – *Deschampsia cespitosa* grassland. However, the southern edge of O Wood (including most notably an area of young mixed plantation at its southwest periphery) contains occasional stands of heather *Calluna vulgaris*. This implies that the area may have had heathland or raised bog vegetation characteristics in past times but draining and tree planting has left only a relic of the area's former vegetation. The floristics of the woodland suggest that it approximates to W9 *Fraxinus excelsior* – *Sorbus aucuparia* – *Mercurialis perennis* woodland.

SINC 19 Shotts Burn

Most of the Shotts Burn area contains evidence of past industrial activity (such as local-scale mining and quarrying) although wildlife habitats have re-colonised what would have been primary woodland prior to this. It is also likely that sections of the woodland (i.e. more accessible woodland edges) have been subject to livestock grazing pressure at times, causing botanical degradation.

Young broad-leaved plantation woodland dominates the southern edge of the Fairybank woods, north of the M8. The ground on which the plantation is situated slopes fairly gently to the east. However, there is a mature lime by the Bothwellshields Road. A variety of tree species have been planted, most notably including birch, alder, cherry, oak and ash. The plantation is in the order of 5 m high and is mainly open in nature. Ground layer vegetation is virtually absent due to both high levels of shading and the very poorly draining nature of the soil across most of the plantation.

Bordering the plantation woodland, described above, is a mixture of semi-natural broad-leaved woodland and scrub that has developed in a small river gorge (the Shotts Burn). There are sporadic rock exposures through the gorge, mainly situated close to the riverbank, much of which is poorly vegetated due to very high levels of shading. The species and structural composition of the woodland is very varied, even on a very local scale. Hawthorn scrub dominates the upper section of the gorge, bordering farmland to

the west (principally used for horses). On the steep ground of the gorge the canopy species are birch, goat willow and beech, with sporadic occurrences of oak and alder. Hawthorn is frequent in the scrub layer of the woodland, giving the woodland a dense and mostly impenetrable character. The ground layer is poorly developed with stands of grass-dominated vegetation, soft rush and occasional growths of common woodland mosses. It is likely that the poor ground layer is a consequence of factors of heavy shading and a predominantly poorly-draining heavy clay soil (resulting in acid conditions). Herbaceous species that tend to indicate the presence of ancient, or at least well-established, woodlands are rare. Monotonous stands of greater woodrush are well developed where the woods are more open. There is also an abundance of common nettle in areas of woodland that have, in past times, been subject to human disturbance (the woodlands include the remnants of past industrial activity). There are occasional stands of lesser celandine in the more open woodland edges by the top of the gorge. The common woodland ferns, broad buckler-fern and hard-fern are reasonably common throughout the woodland. There is also a small stand of common dog violet on the road verge at the very southern edge of the Fairybank woods on the steep verge of the Bothwellshields Road.

Semi-natural broad-leaved woodlands on the eastern side of the gorge are less extensive due to the very steep (in places near vertical) ground and the presence of rock exposures by the riverbank. At the southeast margin of the gorge, there is a large private woodland garden that forms the extensive grounds of Fairybank Cottage. This woodland is much more open and subject to long-term management compared with the woodland and scrub that typifies the Fairybank Woods.

The very steep southern side of a wooded gorge-like valley is the principal area of the SINC, to the south of the M8. Intensive pasture borders the woodland to the south and there is less intensively managed pastureland and scattered trees and scrub to the north side of the Shotts Burn. Near vertical cliffs and associated talus (accumulations of fallen boulders) are commonplace, especially at the western margin of this section of the SINC. The ground is typically poorly draining and formed from heavy clay soil. Soil conditions are very acid in nature and as a result the valley has been colonised by birch-dominated woodland, much of which is immature and dense in character. This is typical of birch, which is a low growing tree (the canopy is at very most 10 m high), with a limited lifespan. An abundant scrub layer mainly composed of goat willow and hawthorn is present, resulting in dense and fairly impenetrable woodland. The ground layer vegetation is poorly developed due to high levels of shading coupled with the acidic and poor-draining nature of the soil. There are occasional occurrences of tormentil *Potentilla erecta*, water avens *Geum rivale* and greater woodrush. Common nettle is fairly common in the woodland, probably indicating ground disturbance in past times due to industrial activity.

4. SUMMARY

The vegetation communities of the SINC's within the survey area show general vegetative patterns that are the product of natural and man-made factors. The more inaccessible and therefore undisturbed SINC's tend to contain the most naturalised vegetation. Woodland is the predominant habitat type that forms natural successions within the survey area. Natural succession has mainly occurred on steep, unusable land within the North Calder Water river valley and this has occurred over many years, resulting in highly stable ecological conditions. Thus, several woodlands of the area's SINC's are climax communities. In the case of SINC's that contain the most natural, high forest woodlands (i.e. the majority of sites that form The North Calder Water Valley SINC's and SINC 5, Luggie Glen), they are either W10 (oak wood with bluebell) or W9 (ash wood with dog's mercury). The former community is characteristic of fairly gently sloping land where soils are deep and rather nutrient poor, whereas W9 typifies steep sloping areas with soils that are thin and base rich (i.e. calcium rich).

Native elm (wych elm) is rare in the SINC's of the survey area and no mature elm trees are present. Where the species is present in the district, it rarely lives beyond immaturity due to Dutch elm disease which is caused by a fungus, *Ophiostoma ulmi*.

SINC's with mature woodland communities that are less natural in character (most notably SINC's 8, 14, 15, 16 and 18) have been intensively managed, as they are more amenable for recreation, (most notable in the case of SINC 10 and SINC 14). Such management has involved the cultivation of non-native species, such as beech, sycamore and conifer species. The former two species cause higher shading levels of ground layer vegetation compared with native species, such as ash and oak. The effect of most conifers is even greater, as they cause ground layer shading throughout the year, except for larch *Larix*, which is a deciduous species of conifer. Consequently, beech, sycamore and mixed woodlands contain a much lower cover of woodland herbs (such as bluebell) and colonising ground layer species (such as common nettle) tend to dominate the ground layer. Furthermore, the formation of non-native woodland plantation has created ecological conditions that encourage invasive species (e.g. Japanese knotweed, Indian balsam, snowberry, hybrid bluebell and pick-a-back-plant).

Several of the SINC's in the survey area are found on land that was formerly industrial and also on agricultural land that has been (and probably still is being) colonised by natural vegetation (notably SINC's 1,3, 4, 7, 9 and part of 11, 12 and 13). For example, the formation of the wetland communities at SINC 13 (Orchard Farm Pool) has probably occurred as a consequence of mining subsidence, coupled with the initial construction of the A8 in the 1960s. North Calder Wood is typical of secondary woodland and scrub that colonised long disused industrial sites. The vegetation of the SINC represents a serial stage in the eventual formation of a climax woodland community. At present such colonising communities (woodland and wetland) are generally of lower botanical interest compared with ancient or long-established woodland, although they support flora and fauna of conservation value.

5. REFERENCES

Dickson, J.H., 1991, **The Changing Flora of Glasgow: Conservation in the City and Countryside**, Aberdeen University Press.

Dickson, J.H., Macpherson, P., Watson, K., Hammerton, D., Jardine, W.G. & Jarvis, M.C., 2000, **The Changing Flora of Glasgow – Urban and Rural Plants Through the Centuries**, Edinburgh University Press Ltd.

Rodwell, J. S., ed., 1991. **British Plant Communities. Volume 1. Woodlands and scrub**. Cambridge University Press.

Rodwell, J. S., ed., 1992. **British Plant Communities. Volume 3. Grassland and montane communities**. Cambridge University Press.

Rodwell, J. S., ed., 1995. **British Plant Communities. Volume 4. Aquatic communities, swamps and tall-herb fens**. Cambridge University Press.

Rodwell, J. S., ed., 2000. **British Plant Communities. Volume 5. Maritime communities and vegetation of open habitats**. Cambridge University Press.

Scottish Office, 1998. **National Planning Policy Guidelines, NPPG 14: Natural Heritage**, <http://www.scotland.gov.uk/library/nppg/npg14-00.htm>

Stace, C., 1997. **New Flora of the British Isles** (2nd Edition), Cambridge University Press.

Watson, E.V., 1981. **British Mosses and Liverworts** (3rd Edition). Cambridge University Press.

APPENDIX 1 : NVC Data Tables

