

Thornhill North Common

Habitat Survey & Habitat Management Plan – Technical Report

Thornhill Community Trust



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Document Prepared By

Matt Harding

Ecological Consultant, Harding Ecology
matt@hardingecology.com

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Executive Summary

Harding Ecology was contracted by Thornhill Community Trust, to carry out a habitat survey of the Thornhill North Common, a community owned area of land at the north side of Thornhill village. Surveys were carried out in June and August 2020, and updated a baseline habitat survey carried out in 1994.

Thornhill North Common is a small but biodiverse site, recently designated as a Local Nature Conservation Site by Stirling Council. It comprises a range of habitats, including broadleaved woodland, scrub, unimproved neutral grassland, marsh and swamp, and tall ruderal vegetation. Six of these habitat types are of conservation concern, with the marsh/marshy grassland communities present of most value due to their floral composition, supporting a significant Northern Marsh-orchid population.

This habitat diversity supports a wide range of species, with 241 plant species recorded in total since 1994 and 161 recorded during the 2020 habitat survey. The most significant species of conservation concern were Lesser Butterfly-orchid, only reported in 1999, and Greater Butterfly-orchid, which was recorded during surveys in 2010 and 2020. A sizeable proportion of the vascular plant species present were non-native, for example garden escapes, with some forming significant stands on site.

This report also provides bird, mammal, herptile and invertebrate data for the site. 73 bird species have been recorded on and around the site, with 49 species using the site itself for breeding, foraging and overwintering. Many of these are of conservation concern. Ten mammal and one herptile species have been recorded on the site, although no dedicated surveys for these taxa have been carried out. 125 invertebrate species have also been found on site, the majority of which were moths found by targeted moth trapping.

The site has undergone several changes in habitat composition since being surveyed in 1994, with the increase in scrub cover and the loss of an area of dry dwarf shrub heath the most significant. Ongoing management of neutral grassland areas may also affect the diversity of these habitats.

A draft habitat management plan has been included as part of this report, for consideration by community groups and other interested parties. This plan details management proposals to maintain marshland biodiversity, create aquatic habitat, enhance grassland biodiversity, manage scrub encroachment, and create native woodland and hedgerow. Measures to benefit birds, invertebrates and other groups are also suggested, and a future monitoring regime outlined.

Abbreviations

BSBI:	Botanical Society of the British Isles
CIEEM:	Chartered Institute of Ecology and Environmental Management
EC:	European Commission
EPS:	European Protected Species
IUCN:	International Union for Conservation of Nature
JNCC:	Joint Nature Conservation Committee
LNCS:	Local Nature Conservation Site
NCT:	North Common Trust
NVC:	National Vegetation Classification
SBL:	Scottish Biodiversity List
SWT:	Scottish Wildlife Trust
TCT:	Thornhill Community Trust
VC:	Vice-county

1. Introduction

1.1. Scope

Harding Ecology was contracted by Thornhill Community Trust (TCT) to carry out a habitat survey of the Thornhill North Common, and provide recommendations to maintain and enhance the biodiversity of the North Common.

This report presents the following:

- Results of the habitat survey;
- Species data gathered during other voluntary surveys on the North Common; and
- A draft management plan for review by the community.

The main body of the report provides a summary of the biodiversity features of the site, including habitat descriptions, whilst detailed habitat polygon and species data are included in the Appendices. This document is a second draft, made following consultation in autumn 2021 with the North Common Trust (NCT) regarding habitat management proposals.

1.2. Site Description

Thornhill North Common is located on the north side of Thornhill village, between the B822 to the west and Norrieston Place to the east (central grid reference NN66550009). It covers an area of mostly low-lying ground, just under 40 m above sea level. It is surrounded on three sides by open farmland, and is backed onto by houses and gardens to the south.

The North Common consists of a diverse mix of marsh, grassland, scrub and woodland habitats. This varied landscape is rich in biodiversity, and is particularly noted for its wonderful orchid display in the marshy meadows from the early summer onwards. It is criss-crossed by a network of grassy paths, and the water table is managed by a series of open drainage ditches. An overhead electricity line runs through the site, with some scrub and tree management ongoing to maintain the surrounding airspace.

The North Common is owned and managed by the community, through the NCT, and provides a valued amenity area for the residents of Thornhill. The path network is well-used, and a community orchard has been planted at the eastern end of the Common.

1.3. Local Nature Conservation Site Status

Due to the biodiversity value of the North Common, it was formally adopted as a Local Nature Conservation Site (LNCS) by Stirling Council in 2021. An LNCS is a non-statutory designation given by local authorities to areas of locally important natural heritage that could be damaged by development.

The designation does not affect how landowners and land managers manage the land within an LNCS on a daily basis. It is designed to flag sites with natural features of value in the planning system, and local planning policies may be used to protect LNCSSs from inappropriate development. Additional information on the LNCS system can be found at <https://www.nature.scot/professional-advice/protected-areas-and-species/protected-areas/local-designations/local-nature-conservation-sites>.

2. Methods

The habitat survey was carried out on 3rd August 2020, by Matt Harding, a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM) with relevant ecological survey experience.

Details of other relevant surveys carried out, notably an orchid count, are also summarised below.

2.1. Habitat Survey

A combined Phase 1 habitat survey and National Vegetation Classification (NVC) survey was undertaken to map and classify the habitats on site, and to identify any habitats of conservation importance. Surveys were carried out during suitable weather conditions, with good visibility and no snow cover, and at a suitable time of year to identify plant species and assign habitat classifications.

The standard Phase 1 habitat survey method (JNCC, 2010) was followed. All areas of the site were visited, and homogenous stands of vegetation mapped on to aerial photographs. Habitat types were identified using the standardised Phase 1 codes.

Habitats present were also classified to community and, where feasible, sub-community using the NVC classification system developed by Rodwell *et al.* (1991a, *et seq.*). Where a habitat was not classifiable under the NVC system, it was classified using the JNCC Phase 1 habitat classification (e.g. A1.1.2 – broadleaved plantation).

Additional information was gathered by recording dominant and constant species within the habitat types, and descriptive notes were taken for habitats of particular interest. Where several habitats occurred together in a mosaic, e.g. scattered scrub through an area of grassland, the ratio of the different NVC communities present within this area was recorded.

2.2. Habitat and Plant Conservation Status

Following the field survey, the conservation status of each habitat recorded was identified based on the following:

- Annex I habitats listed on the European Commission (EC) Habitats Directive, as translated into British and Scottish law by The Conservation (Natural Habitats, &c.) Regulations 1994 and subsequent legislation; and
- Scottish Biodiversity List (SBL) habitats of principal importance for conservation (superseding the UK Biodiversity Action Plan priority habitat classification in Scotland).

All vascular plant species encountered within the survey area were recorded, and their local and national conservation status assessed using the West Perthshire Rare Plant Register (RPR; Jones & Lavery, 2021, unpublished).

2.3. Other Surveys

A previous Phase 1 habitat survey of the site was carried out in 1994 by the Scottish Wildlife Trust (SWT, 1994). Previous plant records held for the site by the Botanical Society of the British Isles (BSBI) were also reviewed, going back to the 1994 survey, and are included in Appendix 3.

A count of orchid flowering spikes was made by the surveyor on 10th June 2020, in which the site was divided into sectors and the orchid numbers recorded in each. Results are included in Section 3.3.3.

Data from the following additional voluntary surveys at the site are also presented in Appendix 3:

- Thornhill 2019 BioBlitz, including data on birds, mammals, bumblebees and other invertebrates;
- Moth records provided by Mark Wilson of the Thornhill Biodiversity Group; and
- Bird and mammal records from between 2013 and 2021, the majority of which was made by the surveyor.

3. Habitat Survey Results

Section 3.1 summarises the Phase 1 habitats found on site, and Section 3.2 describes each NVC vegetation community present within them. Section 3.3 assesses the vascular plant species found on site.

3.1. Habitat Summary

Fourteen Phase 1 habitat types were identified and mapped across the site. These are shown on the figures in Appendix 1, and summarised in Table 1, below. Table 1 details the NVC communities recorded within each Phase 1 habitat type, and summarises the legislative/conservation status of each NVC habitat present. Full Phase 1 and NVC survey data, including NVC mosaic ratios where applicable, are presented by polygon in Table A2.1, Appendix 2.

Figure 1 in Appendix 1 presents an overview of the Phase 1 habitat mapping of the survey area. Figures 2a-b in Appendix 1 number each habitat polygon, which cross-references to the polygon numbering in Table A2.1 in Appendix 2.

Table 1: Habitats recorded on site, including an assessment of their legislative/conservation status

Phase 1 code	Phase 1 habitat type	Corresponding NVC habitats noted	Corresponding legislative/conservation status*
A1.1.1	Broadleaved woodland – semi-natural	W7c, W10, W11a	<i>Old sessile oak woods with Ilex and Blechnum in Britain and Ireland (W11)</i> ; Upland mixed ashwood (W7c); Lowland mixed deciduous woodland (W10); Upland oakwood/birchwood (W11)
A1.1.2	Broadleaved woodland – plantation	Non-NVC	
A2.1	Scrub – dense/continuous	W1, W7b/c, W7c, W11a, W23, W24, non-NVC	<i>Old sessile oak woods with Ilex and Blechnum in Britain and Ireland (W11)</i> ; Wet woodland (W1, W7b); Upland mixed ashwood (W7c); Upland oakwood/birchwood (W11)
A2.2	Scrub – scattered	W22, W23, W24, non-NVC	
A3.1	Scattered broadleaved trees	Non-NVC	Traditional orchards
B2.1	Neutral grassland - unimproved	MG1, MG1b, MG1c, MG1e	
B5	Marsh/marshy grassland	M23a, M23b, M25c, M27, M27c	Lowland fens (M27); Purple moor grass and rush pastures (M23, M25)
C3.1	Tall herb and fern – tall ruderal	OV24, OV25, OV26c, OV27, OV27b, OV27c, OV27d, non-NVC	
F1	Swamp	S5, S23, S28a, M28a, M28b	Lowland fens (S5, S23, S28, M28)
I2.4	Refuse tip (garden waste)	Non-NVC	
J1.2	Cultivated/disturbed land – amenity grassland	MG6	
J2.2.2	Defunct hedge – species-poor	W21	Hedgerows
J4	Bare ground	Non-NVC	
J5	Other habitat (grassed footpath)	Non-NVC	
*Key to Legislative/conservation status			
<i>Italicised text</i> – Annex I habitats on the EC Habitats Directive (1992) ¹			
Standard text – Scottish Biodiversity List habitats of principal importance for the purpose of conserving biodiversity ²			

¹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31992L0043:EN:HTML>

² <https://www.nature.scot/landscapes-and-habitats/habitat-types/habitat-definitions>

3.1.1. Habitats of conservation interest

When assessing the legislative and conservation designations for habitats, the distinction between upland and lowland habitats is often important. The site is under 300 m asl and enclosed by fields and fences, indicating the habitats present should be treated as lowland examples. However, some woodland stands were more upland or intermediate in character, so the approach involved both upland and lowland conservation designations.

Some fragmentary woodland stands corresponding to the W11 NVC community were present on site, which is an Annex I habitat, but were not significant examples in good condition. However, the site supported eight SBL priority habitats: Wet woodland, Lowland mixed deciduous woodland, Upland mixed ashwood, Upland oakwood/birchwood, Traditional orchard, Lowland fen, Purple Moor-grass and rush-pasture, and Hedgerow.

Significant stands of species-rich Lowland fen habitats were present on site, supporting notable orchid populations, therefore Lowland fen is considered to be the habitat type of highest conservation significance. However, the diversity of habitats present within a small site is also of significant value, particularly given the site's isolation within the wider, agricultural landscape. This diversity of habitats included those of value to wildlife such as breeding birds and pollinators, but not afforded legislative or conservation designations, for example Gorse (*Ulex europaeus*) scrub, unimproved neutral (or mesotrophic) grassland, and tall ruderal vegetation.

3.1.2. Changes in habitat composition

A comparison with the 1994 SWT survey reveals interesting changes in the habitat distribution on site. The most significant are as follows:

- Significant increase in scrub habitat on site, due to natural colonisation and succession;
- Loss of dry dwarf shrub heath (Phase 1 habitat D1.1), a Heather (*Calluna vulgaris*) dominated habitat previously found in the centre-north of the site;
- An increase in tall ruderal vegetation within the habitat mosaic, particularly in the west of the site; and
- A reclassification of semi-improved neutral and improved grassland in the east of the site to a more unimproved neutral grassland habitat.

The increase in scrub is believed to be responsible for the loss of dry heath habitat on site. Heather is still present, but very sparse, and some other species characteristic of this more acid habitat have been lost since 1994 (see Section 3.3.2). Scrub development is also likely to contribute to the increase in cover of tall ruderal vegetation, notably Rosebay Willowherb (*Chamaenerion angustifolium*) stands, through the drying of the substrate by scrub colonisation.

The reclassification of some grassland to unimproved neutral grassland may be in part a surveyor artifact, but may also have been encouraged by management actions such as mowing and wildflower seeding to enhance diversity. Perennial Rye-grass (*Lolium perenne*), a characteristic plant of improved and semi-improved grasslands, was described as frequent on site in 1994, but was much scarcer in 2020. Species more characteristic of unimproved neutral grasslands such as False Oat-grass (*Arrhenatherum elatius*) and Meadow Foxtail (*Alopecurus pratensis*) were abundant in 2020, but described as just occasional on site in 1994. This signifies a genuine shift in habitat type.

3.2. Habitat Descriptions

3.2.1. A1.1 Woodland and A2 scrub

A mosaic of scrub and broadleaved woodland was present across the site. Stands were classifiable into seven NVC communities, and several non-NVC forms. Two stands of broadleaved woodland of planted origin were present in the east of the site, and the eastern end of the site has been planted as a community orchard.

W1 *Salix cinerea*-*Galium palustre* woodland

Small stands of Grey Willow (*Salix cinerea*) dominated scrub were present in the west of the site, growing over grassy ground florals. These were assigned to the W1 community based on the canopy composition, although this community typically has a wet ground flora with Common Marsh-bedstraw (*Galium*

palustre), Water Mint (*Mentha aquatica*) and other similar marsh species, which were absent in these examples.

W7 *Alnus glutinosa*-*Fraxinus excelsior*-*Lysimachia nemorum* woodland

The most frequent form of woodland on site was the W7 *Alnus glutinosa*-*Fraxinus excelsior*-*Lysimachia nemorum* community. The canopy typically included Grey Willow and Goat Willow (*Salix caprea*), over a ground flora characteristic of damp substrates. Tufted Hair-grass (*Deschampsia cespitosa*) was constant in these stands, corresponding to the W7c *Deschampsia cespitosa* sub-community present on less saturated ground than the other W7 sub-communities. Hawthorn (*Crataegus monogyna*), Sycamore (*Acer pseudoplatanus*), Broom (*Cytisus scoparius*), Ash (*Fraxinus excelsior*), Holly (*Ilex aquifolium*) and Rowan (*Sorbus aucuparia*) were scattered in various stands, often as young regeneration.

Ground flora species present at lower frequencies included Wild Angelica (*Angelica sylvestris*), Common Nettle (*Urtica dioica*), Meadowsweet (*Filipendula ulmaria*), Bramble (*Rubus fruticosus* agg.), Broad Buckler-fern (*Dryopteris dilatata*), Yorkshire-fog (*Holcus lanatus*), Honeysuckle (*Lonicera periclymenum*), Broad-leaved Willowherb (*Epilobium montanum*), Wood Avens (*Geum urbanum*), Bifid Hemp-nettle (*Galeopsis bifida*) and Creeping Buttercup (*Ranunculus repens*).

Stands on more saturated substrates showed characteristics of the W7b *Carex remota*-*Cirsium palustre* sub-community, with Wild Angelica and Meadowsweet more prominent in the sward, along with Greater Bird's-foot-trefoil (*Lotus pedunculatus*), Tufted Vetch (*Vicia cracca*), Common Sorrel (*Rumex acetosa*) and Sharp-flowered Rush (*Juncus acutiflorus*). Where the substrates became drier, the vegetation transitioned from W7c to an oakwood-type community.

W10/W11 *Quercus robur*/*petraea* oak woodland

Where semi-mature woodland was present on drier substrates, the vegetation community became less well defined. Canopy species varied from stand to stand, with Silver Birch (*Betula pendula*), Scots Pine (*Pinus sylvestris*), Grey Willow, Hawthorn, Downy Birch (*B. pubescens*), Sycamore, Wild Cherry (*Prunus avium*), Goat Willow, Rowan, Pedunculate Oak (*Quercus robur*), Elder (*Sambucus nigra*), Gorse (*Ulex europaeus*), Holly, Ash, Sitka Spruce (*Picea sitchensis*) and Yew (*Taxus baccata*) all recorded; some apparently of planted origin.

Bramble and Honeysuckle were frequent in the field layer, with leaf litter abundant in some stands. In the more species-poor stands, Common Ivy (*Hedera helix*), Broad Buckler-fern, a little Tufted Hair-grass, Cock's-foot (*Dactylis glomerata*), Ground-elder (*Aegopodium podagraria*), Common Nettle, Cleavers (*Galium aparine*) and Broad-leaved Willowherb were recorded. These stands resembled the W10 *Quercus robur*-*Pteridium aquilinum*-*Rubus fruticosus* community, although with Bracken (*Pteridium aquilinum*) and Bluebell (*Hyacinthoides non-scripta*) absent.

Stands with a more varied ground flora were closer to the W11a *Quercus petraea*-*Betula pubescens*-*Oxalis acetosella* community, *Dryopteris dilatata* sub-community. As well as Honeysuckle and Bramble, Broad Buckler-fern, Male-fern (*Dryopteris filix-mas*), Yorkshire-fog, Creeping Soft-grass (*Holcus mollis*), Tufted Hair-grass, Rosebay Willowherb, Common Bent (*Agrostis capillaris*) and Raspberry (*Rubus ideaus*) were found in the field layer. The bryophyte layer was more developed than in other woodland stands on site, indicative of W11 upland oakwood, with Common Tamarisk-moss (*Thuidium tamariscinum*), Common Feather-moss (*Kindbergia praelonga*), Big Shaggy-moss (*Rhytidiadelphus triquetrus*) and Neat Feather-moss (*Pseudoscleropodium purum*) recorded.

W21 *Crataegus monogyna*-*Hedera helix* scrub

Hawthorn hedgerows at the west and east ends of the site were assigned to the W21 scrub community. The eastern hedgerow was of planted origin, the western one was present along a low stone wall and may be semi-natural. Hawthorn was frequent in both, with Ash, Sycamore, Dog-rose species (*Rosa canina* agg.), Sherard's Downy-rose (*R. sherardii*) and Broom present in the western hedge, and Goat Willow, Blackthorn (*Prunus spinosa*), Wild Cherry and Hazel (*Corylus avellana*) present in the eastern hedge.

W22 *Prunus spinosa*-*Rubus fruticosus* scrub

A small stand of Blackthorn scrub was present in the south of the site, in mosaic with other scrub and open ground communities. This was classed as a form of W22 *Prunus spinosa*-*Rubus fruticosus* scrub.

W23 *Ulex europaeus*-*Rubus fruticosus* scrub

This community was the most widespread form of scrub on site. It was characterised by dense or scattered Gorse or Broom, with Bramble and scattered Grey Willow and Hawthorn frequently associated. The ground flora was typically sparse or with Rosebay Willowherb frequent, not corresponding to a named sub-community. W23 scrub was often present in mosaic with W24 Bramble underscrub or OV27 Rosebay Willowherb open ground vegetation, and was sometimes found encroaching on marshy open habitats.

W24 *Rubus fruticosus*-*Holcus lanatus* underscrub

Bramble-dominated scrub was also fairly frequent on site, corresponding to the W24 underscrub community. Some stands had Rosebay Willowherb growing through the Bramble, with a transition to the OV27c Rosebay Willowherb habitat as Bramble cover decreased. Other stands were grassier in character, with Cock's-foot, False Oat-grass and Yorkshire-fog associated.

Other woodland habitats

Several other woodland habitats were present on site, but not assigned to an NVC community. An area of semi-mature woodland of planted origin was noted in the east of the site, in which Sycamore, Ash, Rowan, Oak species, Silver Birch, Sitka Spruce, Goat Willow and Wild Cherry formed a tall canopy over a ground flora dominated by introduced species and garden escapes, including Common Blue-sowthistle (*Cicerbita macrophylla*) and Garden Yellow Archangel (*Lamium galeobdolon* ssp. *argenteum*). Other species noted here were Ground-elder, Common Nettle, Wood Avens, Broad-leaved Dock (*Rumex obtusifolius*), Cock's-foot, Male-fern, Broad Buckler-fern, Russian Comfrey (*Symphytum x uplandicum*), Bramble and Common Ivy.

Scattered broadleaved trees, including a planted community orchard at the east of the site containing Apple (*Malus*), Pear (*Pyrus*) and Plum (*Prunus*) species, were also present. The orchard formed a mosaic of scattered, low trees over species-rich neutral grassland.

Small fragmentary scrub stands with frequent Elder or consisting of the naturalised Butterfly-bush (*Buddleja davidii*), were also not assigned to an NVC community.

3.2.2. B2.1 Unimproved neutral grassland

Unimproved neutral grassland was frequent in the centre and east of the site, with small fragmentary stands in the west of the site. This habitat was represented by one NVC community, with considerable variation between stands reflected by different sub-community classification.

MG1 *Arrhenatherum elatius* grassland

Tall, rank, often damp grassland habitats were frequent, with the largest areas present in the centre of the site. This vegetation corresponded most closely with the MG1 *Arrhenatherum elatius* neutral grassland community.

False Oat-grass (*Arrhenatherum elatius*), Meadow Foxtail (*Alopecurus pratensis*) and Yorkshire-fog were characteristic, with Tufted Hair-grass sometimes present at lower frequency. The majority of stands were assigned to one of two sub-communities: the more ruderal MG1b *Urtica dioica* sub-community or the damper, more marshy MG1c *Filipendula ulmaria* sub-community. MG1b stands included species such as Common Nettle, Hogweed (*Heracleum sphondylium*), Rosebay Willowherb, Cleavers, Bush Vetch (*Vicia sepium*), Meadow Vetchling (*Lathyrus pratensis*), Creeping Thistle (*Cirsium arvense*), Broad-leaved Dock and Common Sorrel. MG1c stands typically contained more Meadow Foxtail, along with frequent Meadowsweet, Wild Angelica, Lesser Stitchwort (*Stellaria graminea*), Creeping Buttercup, Meadow Buttercup (*Ranunculus acris*), Soft-rush, Sharp-flowered Rush, Meadow Vetchling, Hogweed, Tufted Vetch, Greater Bird's-foot-trefoil, and more occasionally Common Knapweed (*Centaurea nigra*), Marsh Woundwort (*Stachys palustris*), Bifid Hemp-nettle and Curled Dock (*Rumex crispus*). Where the substrate became more waterlogged, the MG1c vegetation assemblage transitioned to M27 or M23 mire, with grass cover reducing and rush and herb cover increasing.

A third form of rank neutral grassland was present in the eastern end of the site, forming the matrix in which the orchard has been planted. This species-rich assemblage contained the only Greater Butterfly-orchid (*Platanthera chlorantha*) flowering spike found in 2020, along with small numbers of Northern Marsh-orchid. Oxeye Daisy (*Leucanthemum vulgare*) and Common Knapweed were abundant, and

Greater Bird's-foot-trefoil, Meadow Vetchling, Lesser Stitchwort, Creeping Buttercup, Common Sorrel, Bush Vetch, Hogweed, Hedge Bindweed, Common Nettle, Tufted Vetch, Bifid Hemp-nettle and Hedge Woundwort (*Stachys sylvatica*) were also noted. Graminoids present included False Oat-grass, Yorkshire-fog, Common Bent, Tufted Hair-grass, Common Couch (*Elymus repens*), and rarely Oval Sedge (*Carex leporina*) and Pill Sedge (*C. pilulifera*). This habitat was classed as the MG1e *Centaurea nigra* sub-community.

3.2.3. B5 Marsh/marshy grassland

Marsh/marshy grassland was the dominant open ground habitat type in the west of the site, with stands supporting high floral diversity and good Northern Marsh-orchid (*Dactylorhiza purpurella*) populations. Smaller areas of rush-pasture and marsh were present in the centre of the site.

M23 *Juncus effusus/acutiflorus-Galium palustre* rush-pasture

An area of Soft-rush (*Juncus effusus*) marsh was present in the centre-south of the site, and along the adjacent drainage ditch. This relatively species-poor sward was dominated by Soft-rush, with a handful of associated plants, and corresponded to M23b *Juncus effusus/acutiflorus-Galium palustre* rush-pasture, *Juncus effusus* sub-community. This habitat was also present within stands of other communities in small quantities.

The more species-rich M23a *Juncus acutiflorus* sub-community, dominated by Sharp-flowered Rush and with various herbs such as Meadowsweet, Common Marsh-bedstraw, Wild Angelica and Greater Bird's-foot-trefoil associated, was noted in the east of the site, where it formed a gradation with the MG1c *Filipendula ulmaria* grassland community on slightly drier soil.

M25 *Molinia caerulea-Potentilla erecta* mire

A single small patch of Purple Moor-grass (*Molinia caerulea*) mire was noted within a large area of M27 mire in the west of the site. The presence of Purple Moor-grass indicates a pocket of peatier substrate. The vegetation sward was relatively species-rich, with Wild Angelica, Meadowsweet, Greater Bird's-foot-trefoil, Flea Sedge (*Carex pulicaris*), Compact Rush (*Juncus conglomeratus*), Marsh Thistle (*Cirsium palustre*), Tormenitl (*Potentilla erecta*), Ragged-Robin (*Silene flos-cuculi*), Northern Marsh-orchid, Heath Woodrush (*Luzula multiflora* ssp. *congesta*), Common Knapweed, Sneezewort (*Achillea ptarmica*), Carnation Sedge (*C. panicea*), Glaucous Sedge (*C. flacca*), Marsh Horsetail (*Equisetum palustre*) and Yellow-rattle (*Rhinanthus minor*) noted. This assemblage corresponds to the M25c *Angelica sylvestris* sub-community, characteristic of moist, less acidic substrate with low grazing pressure.

M27 *Filipendula ulmaria-Angelica sylvestris* mire

This vegetation community consisted of a species-rich marshy meadow, supporting a significant population of Northern Marsh-orchid. It is present in much of the open ground in the west of the site, and is the community of most conservation interest on site.

The attractive, flower-rich sward was characterised by abundant Meadowsweet and Wild Angelica, with rushes also forming a significant proportion of the vegetation cover, and was classed as M27c *Filipendula ulmaria-Angelica sylvestris* mire, *Juncus effusus-Holcus lanatus* sub-community. Other species present included frequent Northern Marsh-orchid, occasional Common Spotted-orchid (*Dactylorhiza fuchsia*) and Heath Spotted-orchid (*D. maculata*), Sneezewort, Greater Bird's-foot-trefoil, Sharp-flowered Rush, Compact Rush, Common Knapweed, Tufted Hair-grass, False Oat-grass, Ragged-Robin, Tufted Vetch, Marsh Thistle, Meadow Vetchling, Marsh Willowherb (*Epilobium palustre*), Smooth Lady's-mantle (*Alchemilla glabra*), Common Sorrel, Field Horsetail (*Equisetum arvense*), Marsh Woundwort, Creeping Soft-grass, Meadow Buttercup and Silverweed (*Potentilla anserina*). Yellow Loosestrife (*Lysimachia vulgaris*) was also recorded in one stand.

3.2.4. C3.1 Tall ruderal vegetation

Tall ruderal vegetation communities were frequent on site, with the largest homogenous stands present in the centre and east of the site. Smaller stands forming mosaics with scrub and other habitats were frequent in the west of the site.

OV24/OV25 *Urtica dioica*-*Galium aparine* / *Urtica dioica*-*Cirsium arvense* communities

Small stands of Common Nettle dominated vegetation were recorded, typically in mosaic with other tall ruderal communities. Species-poor stands with Common Nettle and sometimes Cleavers were classed as the OV24 *Urtica dioica*-*Galium aparine* community, and one stand with frequent Creeping Thistle was classed as the OV25 *Urtica dioica*-*Cirsium arvense* community.

OV26 *Epilobium hirsutum* community

The drainage ditch at the west end of the site contained a stand of Great Willowherb (*Epilobium hirsutum*), with Meadowsweet intermingled. This corresponded to the OV26c *Epilobium hirsutum* open vegetation community, *Filipendula ulmaria*-*Angelica sylvestris* sub-community.

OV27 *Chamaenerion angustifolium* community

Dense Rosebay Willowherb (*Chamaenerion angustifolium*) swards were frequent on site, with larger stands noted in the central area. This species-poor vegetation corresponded to the OV27 *Chamaenerion angustifolium* open vegetation community. Two sub-communities were dominant – the OV27b *Urtica dioica*-*Cirsium arvense* sub-community and the OV27c *Rubus fruticosus* agg.-*Dryopteris dilatata* sub-community. OV27b stands were characterised by frequent Common Nettle in the sward, with Creeping Thistle, False Oat-grass and occasional herbs such as Hogweed and Meadow Vetchling present. OV27c stands had Bramble growing throughout the Rosebay Willowherb, with Broad Buckler-fern occasional. One stand in the east of the site was classed as the OV27d *Acer pseudoplatanus*-*Sambucus nigra* sub-community, based on the presence of frequent Sycamore seedlings in the sward.

Non-NVC open vegetation habitats

Vegetation swards not corresponding to any NVC community were recorded on site, with Russian Comfrey typically dominant. Ground-elder was also abundant in some stands. Although vegetatively species-poor, these stands supported good pollinator diversity, with several bumblebee species noted.

Other plant species present in non-NVC swards included Cock's-foot, Common Couch, Broad-leaved Dock, Hedge Woundwort and Common Nettle. Several smaller stands of non-native species were also classed as non-NVC tall ruderal; these consisted of Confused Michaelmas-daisy (*Symphotrichum novibelgii*) and *Crocsmia* species.

3.2.5. F1 Swamp

Swamp habitats were frequent in the west of the site, where they dominated the most waterlogged ground, grading into B5 Marsh/marshy grassland and B2.1 Unimproved neutral grassland as the substrate became drier. Smaller fragments of swamp vegetation were found elsewhere on site.

S5 *Glyceria maxima* swamp

Swamp vegetation dominated by Reed Sweet-grass (*Glyceria maxima*) was abundant in the west of the site, with the largest swards along the path running along the southern boundary. This corresponded to the S5 *Glyceria maxima* swamp community. Although relatively species-poor, regular associates included Wild Angelica, Meadowsweet, Greater Bird's-foot-trefoil, Marsh Thistle, Common Nettle, Creeping Thistle, Hedge Bindweed (*Calystegia sepium*), False Oat-grass, Bush Vetch and Creeping Thistle. Yellow Loosestrife was recorded in a more species-rich S5 sward in the south-west of the site. This assemblage did not correspond to either of the S5 sub-communities, but reflected the fact that the S5 swamp was present on saturated ground rather than growing emergent from a waterbody or forming a floating mass of vegetation, as it often presents.

S23 Other water-margin vegetation

The drainage ditch along the western site boundary supported stands of several aquatic species, including Water-cress (*Nasturtium officinale* agg.) and Brooklime (*Veronica beccabunga*). This vegetation assemblage falls under the NVC classification S23, covering a variety of marginal aquatic vegetation.

S28 *Phalaris arundinacea* tall-herb fen

A single small stand of Reed Canary-grass (*Phalaris arundinacea*) was present in the centre-south of the site, corresponding to the species-poor S28a *Phalaris arundinacea* tall herb-fen community, *Phalaris*

arundinacea sub-community. A variegated form of Reed Canary-grass was also noted in this area, presumably a garden escape or planting.

M28 *Iris pseudacorus-Filipendula ulmaria* mire

A small stand of Yellow Iris (*Iris pseudacorus*) mire was recorded in the west of the site, with Meadowsweet, Greater Bird's-foot-trefoil, Wild Angelica and Soft-rush also present in the sward. This corresponded to the M28a *Iris pseudacorus-Filipendula ulmaria* mire community, *Juncus effusus-Juncus acutiflorus* sub-community.

In the east of the site, another small stand of Yellow Iris was much more ruderal in character, with Common Nettle, Creeping Buttercup, Creeping Thistle, Cock's-foot and Common Couch associated. This corresponded to the M28b *Urtica dioica-Galium aparine* sub-community.

3.2.6. J1.2 Amenity grassland

A single area of neutral grassland, classed as amenity grassland and kept mown short, was present in the south-west of the site.

MG6 *Lolium perenne-Cynosurus cristatus* grassland

The stand corresponded to a Perennial Rye-grass (*Lolium perenne*) ley. The mixture of grasses included Perennial Rye-grass, Crested Dog's-tail (*Cynosurus cristatus*) and Common Bent, with herbs such as Ribwort Plantain (*Plantago lanceolata*), White Clover (*Trifolium repens*) and Lesser Trefoil (*T. dubium*) present. It was classed as the MG6 semi-improved neutral grassland community.

3.2.7. Other Phase 1 habitats

Phase 1 habitats I2.4, J4 and J5 were also recorded on site. A small area of garden waste and cuttings from the Common in the east of the site was classed as I2.4 Refuse tip. The track along the south of the site was classed as J4 Bare ground, and the network of grassy paths around the site were classed as J5 Other habitat.

3.3. Vascular Plants

Based on the 2020 habitat survey and a review of the records from 1994 onwards held by the BSBI, a total of 241 vascular plant species have been recorded on the site. The habitat survey itself recorded 161 vascular plant species on site, a good total for a small site in Central Scotland.

A full species list is provided in Table A3.1 in Appendix 3. Photographs of some of the species found on the North Common are provided in Appendix 4.

3.3.1. Species of conservation concern

Four vascular plant species recorded on site are of conservation concern:

- Lesser Butterfly-orchid (*Platanthera bifolia*): one was recorded in 1999, at NN665001 in the centre-north of the site. No records exist for this species on site since. Lesser Butterfly-orchid is assessed as Vulnerable in Great Britain, based on the updated Vascular Plant Red List for Great Britain (<https://bsbi.org/taxon-lists>);
- Greater Butterfly-orchid (*P. chlorantha*): one was recorded in 2020 in the east of the site, at NN6682800073. Two flowering spikes were reported in 2010 at NN66610007, in an area of damp MG1c neutral grassland that is currently relatively species-poor. No evidence of these plants was found in 2021. Greater Butterfly-orchid is assessed as Near Threatened in Great Britain, based on the Vascular Plant Red List;
- Bifid Hemp-nettle (*Galeopsis bifida*): this was recorded in two areas in the centre and east of the site. It is locally scarce (recorded from 4-15 sites)³ in West Perthshire (Vice-county (VC) 87, in which the site is located); and
- Yellow Loosestrife (*Lysimachia vulgaris*): this was recorded in marsh and swamp habitat in the south-west of the site. It is locally scarce in VC87.

³ Jones & Lavery (2021) West Perthshire Rare Plant Register; unpublished update

Based on this assessment, the habitats supporting the most important vascular plant species within the survey area from a conservation perspective are marsh and unimproved neutral grassland.

3.3.2. Changes in species composition

The loss of some species recorded in 1994 is of interest. The following eight species appear to have been lost since 1994, along with the Lesser Butterfly-orchid reported in 1999: Wavy Hair-grass (*Avenella flexuosa*), Marsh Hawk's-beard (*Crepis paludosa*), Cross-leaved Heath (*Erica tetralix*), Hawkweed (*Hieracium* agg.), Heath Rush (*Juncus squarrosus*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Sheep's Sorrel (*Rumex acetosella*) and Common Vetch (*Vicia sativa*). Of these species, several are indicative of more acidic conditions (e.g. Wavy Hair-grass, Cross-leaved Heath and Heath Rush), and were present in the dry dwarf shrub heath now lost from the site.

Orchid numbers also appear to have fluctuated over time. For example, Common Spotted-orchid (*Dactylorhiza fuchsii*) and Heath Spotted-orchid (*D. maculata*) populations were described as "many" in 2010, along with Northern Marsh-orchid. In 1994 both Spotted-orchid species were described as occasional on site, whereas in 2020 the two Spotted-orchids were rare on site. This change could be related to natural population cycles, the result of scrub encroachment and drying, influenced by current management regimes, or resulting from a combination of these factors.

Of the 241 species recorded on site, 55 are non-native or occurring as garden escapes in this area. The 1994 dataset includes just four of these, suggesting that the number of non-native species present has increased substantially on site in the past 25 years. This increase is likely to be down to a number of factors: colonisation from nearby gardens or the surrounding area, colonisation as a result of dumping of garden waste, and intentional planting by residents. Some non-native species have formed areas of homogenous ground cover, for example Russian Comfrey, Confused Michaelmas-daisy and Common Blue-sowthistle. These species can have biodiversity benefits, e.g. for pollinators, but can also reduce the cover and diversity of the native flora in the area as they spread.

3.3.3. Orchid populations in 2020

Counts of orchids on site are summarised in Table 2, below, and the count sectors are shown on Figure 3 in Appendix 1. The count was carried out at the optimum time to record Northern Marsh-orchid, the most abundant species on site and the characteristic purple flower recognised and enjoyed by members of the community. The survey is likely to have under-counted some of the other orchid species present on site, which tend to flower fully later in the season.

A total of 207 Northern Marsh-orchid flowering spikes were recorded, with the majority present in marshy habitats in the west of the site. Common Spotted-orchid and Heath Spotted-orchid were also present in damp habitats in the west of the site, but the only Greater Butterfly-orchid spike was found in dry neutral grassland in the east of the site. No orchids were found in Sector 7 in the centre of the site, where Greater Butterfly-orchid was recorded in 2010.

Table 2: Orchid populations on site in June 2020

Sector no.	Habitat summary	Species	No. of plants recorded
1	Marsh	Northern Marsh-orchid	62
		Common Spotted-orchid	2
2	Marsh and swamp	Northern Marsh-orchid	77
3	Marsh	Northern Marsh-orchid	32
		Heath Spotted-orchid	5
4	Marsh and encroaching scrub	Northern Marsh-orchid	7
5	Grassy track verges	Northern Marsh-orchid	10
6	Grassy track verges	Northern Marsh-orchid	4
7	Swamp and unimproved neutral grassland	None	0
8	Unimproved neutral grassland	Northern Marsh-orchid	11

Sector no.	Habitat summary	Species	No. of plants recorded
9	Marsh and unimproved neutral grassland	Northern Marsh-orchid	3
10	Unimproved neutral grassland	Northern Marsh-orchid	1
		Greater Butterfly-orchid	1
Total counts		Northern Marsh-orchid	207
		Heath Spotted-orchid	5
		Common Spotted-orchid	2
		Greater Butterfly-orchid	1

4. Records of Other Taxa

Records of other taxa on site – birds, mammals, herptiles and invertebrates – are summarised here. More details are provided below and in Tables A3.2 and A3.3 in Appendix 3.

4.1. Birds

Seventy-three bird species have been recorded on the site or in the immediate surrounding area between 2013 and 2021. Forty-nine of these were present on the site itself; the remainder were recorded overflying the site or foraging on adjacent ground. Full details of these species and their local status is provided in Table A3.2 in Appendix 3.

Of the species recorded on site, the following are protected or of high conservation concern:

- Quail (*Coturnix coturnix*), Fieldfare (*Turdus pilaris*), Redwing (*T. iliacus*) and Brambling (*Fringilla montifringilla*) are all listed on Schedule 1 of the Wildlife and Countryside Act, as amended in Scotland. This legislative designation affords special protection during breeding. However, none of these species were breeding on site: a single Quail was recorded in 2013, and the other three species are winter visitors;
- Swift (*Apus apus*), Greenfinch (*Chloris chloris*) and Linnet (*Linaria cannabina*) are assessed as Endangered in Great Britain (Stanbury *et al.*, 2017). Swift breed in Thornhill village, and forage over the site; Greenfinch breed in the area, and Linnet breed in the wider landscape and forage on site;
- Woodcock (*Scolopax rusticola*), House Martin (*Delichon urbicum*), Starling (*Sturnus vulgaris*), Mistle Thrush (*T. viscivorus*) and Tree Sparrow (*Passer montanus*) are assessed as Vulnerable in Great Britain (Stanbury *et al.*, 2017). Woodcock is a winter visitor, but the other species breed on site and in Thornhill village. A flock of Tree Sparrow use the site during the winter, with the drainage ditches providing access to water during periods of cold weather for a range of finch, sparrow and bunting species; and
- Grasshopper Warbler (*Locustella naevia*), Song Thrush (*T. philomelos*), House Sparrow (*P. domesticus*), Lesser Redpoll (*Acanthis cabaret*) and Yellowhammer (*Emberiza citrinella*) are red-listed in the UK (Eaton *et al.*, 2015). Grasshopper Warbler is a summer migrant recorded singing on site; the other species are resident and breed on site and in the wider area.

Several species of moderate conservation concern are also present on site:

- Sparrowhawk (*Accipiter nisus*) and Tawny Owl (*Strix aluco*) are assessed as Near Threatened in Great Britain (Stanbury *et al.*, 2017). They forage on site and in the wider area;
- Willow Warbler (*Phylloscopus trochilus*), Dunnock (*Prunella modularis*), Meadow Pipit (*Anthus pratensis*) and Bullfinch (*Pyrrhula pyrrhula*) are amber-listed in the UK (Eaton *et al.*, 2015). Meadow Pipit uses the site margins; the other three species use scrub habitats on site; and
- Siskin (*Spinus spinus*) is listed on the SBL as a priority species. It is a coniferous woodland specialist that breeds in the wider area and forages on site.

4.2. Mammals and Herptiles

No detailed mammal surveys have been carried out on site. However, the following species have been recorded on site, or in the wider area:

- Otter (*Lutra lutra*): one was seen in the village in 2020, coming from the site, and Otters have been reported from nearby watercourses and waterbodies. Otter is a European Protected Species (EPS), listed on Annex IV of the EC Habitats Directive, and assessed as Vulnerable in Scotland (Mathews *et al.*, 2018);
- Common Pipistrelle (*Pipistrellus pipistrellus*) and Soprano Pipistrelle (*P. pygmaeus*) were recorded foraging on site during the 2019 BioBlitz. Both species are EPS;
- Pine Marten (*Martes martes*): not recorded on site, but an individual was seen at the Doune turn-off at the east end of the village in 2021, and others have been seen in the wider area. Pine Marten is protected under Schedule 5 of the Wildlife and Countryside Act, as amended;
- Red Squirrel (*Sciurus vulgaris*): not recorded on site, but individuals have been seen at the edges of the village, and may use the hedgerow and woodland network around the village for foraging

and communifying. Red Squirrel is also protected under Schedule 5 of the Wildlife and Countryside Act;

- Badger (*Meles meles*): not recorded on site, but present in the wider area and may use the site. Badger is protected under the Protection of Badgers Act (1992);
- Hedgehog (*Erinaceus europaeus*): signs found on site, and present in the village. Hedgehog is assessed as Vulnerable in Scotland (Mathews *et al.*, 2018);
- Brown Hare (*Lepus europaeus*): recorded on site. It is an SBL priority species;
- Red Fox (*Vulpes vulpes*): recorded on site. It is assessed as Near Threatened in Scotland (Mathews *et al.*, 2018), based on recent population declines;
- Rabbit (*Oryctolagus cuniculus*), Roe Deer (*Capreolus capreolus*), Wood Mouse (*Apodemus sylvaticus*) and Brown Rat (*Rattus norvegicus*) were also recorded on site, along with an unknown shrew species. These species are not of significant conservation concern.

Common Frog (*Rana temporaria*) breeds on site in the drainage ditches. This species is afforded partial protection under the Wildlife and Countryside Act, as amended in Scotland. Suitable habitat to support other herptile species is present on site, for example Palmate Newt (*Lissotriton helveticus*) and Common Toad (*Bufo bufo*).

4.3. Invertebrates

Invertebrate recording has been ongoing on site since 2019, in a non-systematic fashion. Moth trapping has been carried out by Mark Wilson of the Thornhill Biodiversity Group since 2019, and is ongoing. Other invertebrate records were made during the 2019 BioBlitz by the Bumblebee Conservation Trust, the surveyor and Niall Currie of Caledonian Conservation. Full species lists are provided in Table A3.3 in Appendix 3, comprising:

- Six bumblebee species;
- Eight butterfly species;
- Ninety-two moth species; and
- Nineteen other invertebrates, e.g. beetle and spider species.

5. Conclusion

Thornhill North Common is a small but biodiverse site, deserving of its recent designation as a LNCS, and of considerable importance to the local community. It comprises a range of habitats, including broadleaved woodland, scrub, unimproved neutral grassland, marsh and swamp, and tall ruderal vegetation. Six of these habitat types are of conservation concern, with the marsh/marshy grassland communities present of most value due to their floral composition, supporting a significant Northern Marsh-orchid population (207 flowering spikes counted in June 2020).

This habitat diversity supports a wide range of species, with 241 plant species recorded since 1994 and 161 recorded during the 2020 habitat survey. The most significant species of conservation concern were Lesser Butterfly-orchid, only reported in 1999, and Greater Butterfly-orchid, which was recorded in 2010 and 2020. A sizeable proportion of the vascular plant species present were non-native, for example garden escapes, with some forming significant stands on site.

In addition, 73 bird species have been recorded on and around the site, with 49 species using the site itself for breeding, foraging and overwintering. Many of these are of conservation concern. Ten mammal and one herptile species have been recorded on the site, although no dedicated surveys for these taxa have been carried out. 125 invertebrate species have also been found on site, the majority of which were moths found by targeted moth trapping. Further survey effort would be likely to reveal many more invertebrates and other taxa using the site.

The site has gone through several changes in habitat composition since being surveyed in 1994, with the increase in scrub cover and the loss of an area of dry dwarf shrub heath the most significant. Ongoing management of neutral grassland areas may also affect the diversity of these habitats.

6. Habitat Management Plan

Management proposals to maintain and enhance the biodiversity value of the site are presented in this section of the report. The existing management plan is summarised, and then actions to enhance the site for habitats of conservation value and for species diversity are proposed.

This habitat management plan is intended as a working document, to be circulated to the community and developed and implemented with other community groups, including the TCT, NCT and the Thornhill Biodiversity Group.

6.1. Current Management Plan

An existing management plan is being implemented by the NCT. This document identifies nine issues of key importance to the management of the site for recreation, biodiversity and other benefits to the community. These are summarised here:

- Issue 1: Water – waterlogged paths and occasional flooding;
- Issue 2: Paths – maintenance, including drainage and cutting, and introduction of boardwalks, culverts and bridges;
- Issue 3: Trees and scrub – thinning and coppicing, scrub control, maintenance of wayleave under powerline, and removal and usage of cut material;
- Issue 4: Ground level vegetation – loss of floral diversity due to thatch of grasses and problem species;
- Issue 5: Boundaries and hedges – boundary maintenance, mixed species hedgerow planting;
- Issue 6: Thornhill Orchard – planted in 2012, ongoing maintenance required;
- Issue 7: Monitoring – old/incomplete species records, undersurveyed groups of taxa;
- Issue 8: Community involvement – communication issues and lack of community involvement; and
- Issue 9: Funding – lack of resources, fundraising requirements and increasing community volunteer inputs.

All nine issues are important to the successful management of the site for the benefit of the community. However, this habitat management plan will focus on the biodiversity value of the site – namely Issues 3, 4, 5 and 7. Other issues, for instance drainage and path maintenance, will be addressed where they are directly relevant to biodiversity benefit. This focus on biodiversity is intended to complement the existing work of the NCT.

6.2. Habitat Management Proposals

Management proposals to preserve and enhance the marshland, aquatic, grassland, scrub, woodland and hedgerow habitats are described here. Proposed management areas are shown on Figure 4 in Appendix 1.

6.2.1. Marshland management

A minimal intervention approach is recommended for the areas of marsh in the west of the site, which support species-rich habitats with good Northern Marsh-orchid populations. Management actions in these areas should be restricted to control of any significant colonising scrub through hand cutting and removal of brash, to ensure the open character is maintained.

Trial management plots could be undertaken in these areas to assess whether a partial mowing regime could be of benefit to biodiversity. This would involve mowing small areas of the main habitat types here (M27 mire and S5 swamp NVC communities) and following up with botanical monitoring quadrats in mown and unmown areas over several years to identify any changes in floral diversity.

6.2.2. Pond creation

Open water habitat is largely absent from the site, being restricted to several drainage ditches. An area of species-poor Soft-rush (*Juncus effusus*) mire (M23b NVC community) in the centre-south of the site would be suitable for pond creation, involving minimal loss of existing conservation interest and easy access for creation and maintenance. This area is often waterlogged through the winter, and has an

adjacent drainage ditch which could assist in developing a wetland here. The lowering of an area of ground here to create a pond could also help improve drainage of the adjacent path.

Pond creation has numerous biodiversity benefits, providing suitable habitat for amphibians, dragonflies and damselflies, aquatic invertebrates, and a drinking area for birds and other wildlife. It could also be of benefit to the community, with educational activities such as pond dipping made available for the local school and other interested parties.

When locating and designing a pond, issues to consider include structuring the pond to maximise biodiversity benefit (e.g. creating shallow margins, shelves of differing depths etc.), health and safety considerations, and safe access (e.g. via a boardwalk, as done at Doune Ponds and Kippen Common). Community consultation is important prior to creating a pond habitat.

6.2.3. Grassland management

The unimproved neutral and marshy grassland present in the centre and east of the site is relatively species-poor in comparison to the marshland in the west of the site. It is dominated by rank grasses such as False Oat-grass (*Arrhenatherum elatius*) and Meadow Foxtail (*Alopecurus pratensis*), and rushes in damper areas, which form a dense thatch that prevent less robust wildflowers from establishing.

In the absence of grazing by stock, grassland management for biodiversity should allow existing wildflowers to seed successfully, help reduce and vary sward and thatch density to provide opportunities for establishment of additional plant species, and reduce nutrient inputs. This helps to prevent a handful of robust grass species from becoming dominant (or maintaining dominance).

The timing of mowing or cutting is especially important on site, as early or mid-summer mowing will prevent sensitive species such as Lesser Butterfly-orchid (*Platanthera bifolia*) and Greater Butterfly-orchid (*P. chlorantha*) from successfully setting seed. The following management regime is recommended, based on the principles of grassland management in Blakesley & Buckley (2016):

- Full mowing of grassland areas should be delayed until August (or late July at the earliest), to ensure successful seed setting. Cutting in May or June will prevent many desirable species from flowering, and lead to a reduction in their populations;
- If necessary, rare species such as the Butterfly-orchids should be mown around to give them as much time as possible to seed;
- An optional second cut can be carried out in early spring (March) or in the autumn (September or October), to mimic the effect of light grazing over the winter and help develop a more open thatch;
- Varying the cutting regime between years will help different plants colonise, develop and seed. For instance, a second cut could be carried out in one area of grassland one year, and in a different area the following year. Leaving areas fallow, i.e. without a late summer cut, every five years or so will also help vary the sward conditions, and can be of benefit to invertebrates;
- Cuttings should always be removed from the grassland areas following mowing, to prevent nutrient enrichment. This helps inhibit the growth of more aggressive grasses, which can take over the sward.

Following consultation with the NCT, two areas have been selected to begin trialling this more biodiversity-friendly mowing regime. These are shown on Figure 4 in Appendix 1.

Maintaining paths around the site through mowing is necessary to enable use of the site by the community, and requires earlier cutting than recommended above. Narrow verges should be mown, particularly in the west of the site, to minimise any negative effects of the early cutting time on wildflowers, with any mid-summer (June/July) verge cuts restricted to a single machine run centred along the path. This will help to encourage Northern Marsh-orchid (*Dactylorhiza purpurella*) populations.

Another tool often used by conservation managers to help reduce robust grass cover and increase opportunities for wildflowers in the sward is seeding with Yellow-rattle (*Rhinanthus minor*). This is a native, semi-parasitic species that takes nutrients from other plants, primarily grasses, and can help suppress grass cover. It is common in Stirlingshire, found in a variety of habitats from meadows to track verges through commercial forestry, and is already present naturally in the west of the site. Sowing Yellow-rattle in orchard area in the east of the site could help develop that as a species-rich neutral grassland, and encourage latent seed germination of desirable species such as orchids in the sward. This area was

assessed as improved grassland in 1994, but is now developing a much more diverse sward. Yellow-rattle was sown around some of the orchard trees in 2020 to help reduce grass vigor around the tree bases, helping to keep the trees clear of vegetation. More details on meadow management using Yellow-rattle can be found on the Plantlife website: <https://www.plantlife.org.uk/uk/discover-wild-plants-nature/how-to-grow-yellow-rattle-rhinanthus-minor>.

6.2.4. Scrub control

Scrub forms a valuable part of the habitat mosaic on site, with even species-poor stands of Gorse (*Ulex europaeus*) or Grey Willow (*Salix cinerea*) being of significant benefit to breeding birds. However, scrub encroachment has reduced the area of high conservation value habitats on site, such as marsh in the west of the site and dry heath in the centre of the site. Scrub control is therefore recommended in the centre of the site, and in small areas in the west of the site, to maintain open habitats and floral diversity. Scrub removal is already undertaken in the centre of the site to help maintain the powerline wayleave.

Scrub removal should focus on removing new and establishing plants, and leave older willows that themselves form valuable habitats. Cut material should not be left in situ, which would suppress vegetation growth below and cause nutrient enrichment of the habitat (potentially reducing floral diversity). Some cut material can be used to create log piles in areas of semi-mature woodland, benefiting invertebrates, small mammals and other wildlife.

6.2.5. Woodland and hedgerow creation

One area in the south-west of the site has been identified for woodland creation through planting of native tree species. This area consists of a bank of relatively low floral diversity, with existing scattered scrub, on relatively dry substrates suitable for planting.

Tree and shrub species that form a relatively low canopy are recommended, to avoid impacting views from the houses overlooking the Common at this point: Rowan (*Sorbus aucuparia*), Hazel (*Corylus avellana*), Crab Apple (*Malus sylvestris*), Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Bird Cherry (*P. padus*), Guelder-rose (*Viburnum opulus*) and Wild Privet (*Ligustrum vulgare*). Birch (*Betula*) species are also suitable, but tend to seed voraciously, and could create scrub encroachment issues in the future. Larger tree species suitable for planting on the Common, should suitable locations be identified, include Sessile/Pedunculate Oak (*Quercus petraea/robur*), Alder (*Alnus glutinosa*), Aspen (*Populus tremula*), Wych Elm (*Ulmus glabra*), Wild Cherry (*P. avium*) and Goat Willow (*Salix caprea*). Ash (*Fraxinus excelsior*) should not be planted at this time, due to the prevalence of Ash die-back disease.

Hedgerow creation is also recommended, along the east and north site boundaries. Suitable species could include Hazel, Hawthorn, Blackthorn, Guelder-rose, Dog-rose (*Rosa canina*), Crab Apple and Bird Cherry. Other tree species could be scattered through to create standards and help develop structural diversity.

6.2.6. Non-native species and garden waste

Non-native species already form a significant proportion of the site flora, with some areas dominated by single species. The extent of these areas should be monitored, and active management interventions carried out if habitats of conservation significance appear to be threatened by their spread.

Disposal of garden waste and planting out of non-native garden species on the site should be avoided. Establishment of these can have negative impacts on native plant populations, for example Bluebell (*Hyacinthoides non-scripta*). Garden bluebells are usually the Spanish Bluebell (*H. hispanica*) or the hybrid between the two (*H. x massartiana*); these are more robust, can spread quickly, and hybridise with the native Bluebell in the wild.

Some of the proposed management measures to benefit biodiversity on the North Common will generate brash and cuttings, which should be removed. A strategy will need to be agreed to handle and dispose of this material off-site.

6.3. Other Management Measures

In addition to habitat management and creation, the following additional measures could be taken to benefit species on site:

- Installation of passerine nestboxes (several have already been erected). This provides nesting sites for birds, and could also provide educational and community benefits (e.g. through nestbox building and/or supervised nestbox checking events);
- Installation of Barn Owl (*Tyto alba*) and/or Kestrel (*Falco tinnunculus*) nest boxes. One or two could be sited at the north edge of the site, overlooking adjacent agricultural land with easy access for flying birds;
- Installation of bat boxes for roosting bats; and
- Creation of hibernacula for herptiles and invertebrates (e.g. log or stone piles), and installation of other structures for invertebrates (e.g. invertebrate houses). These could be created and installed by the community; one such invertebrate house already exists in the north-west of the site.

Erection of information boards highlighting some of the key biodiversity features of the site (as well as local history) would be of benefit to the community, in addition to the educational opportunities afforded by pond creation and nestbox installation.

6.4. Monitoring Regime

Ongoing monitoring is essential to assess the impact of any habitat management regimes, and to properly understand the biodiversity of an area. The following monitoring is suggested to help inform the site management for biodiversity, and to enhance our knowledge of the site:

- Orchid counts could be carried out annually, using the sectors counted in 2020 as a baseline. This could be carried out as a group activity, to help build community engagement;
- Plant species diversity should be monitored in grassland management areas, to assess the impact of the revised mowing regime and help tailor future management;
- Under-recorded taxa such as invertebrates and bryophytes should be surveyed, to improve understanding of the biodiversity on site; and
- A resurvey of the site should be carried out, for example after ten years of habitat management, to allow longer-term effects to be identified.

Opportunities also exist for study projects on site, which could be developed with members of the Thornhill Biodiversity Group. Examples include trial mowing plots in different habitats to look at the impact on floral diversity, small mammal trapping and use of camera traps to investigate an unstudied group on site, moth trapping in different habitats to explore the use of different habitats by invertebrates, and use of static audio-recorders to gather data on nocturnal species such as bats and nocturnally migrating birds.

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Appendix 1: Figures

Figure 1: Phase 1 habitat survey results – overview

Figure 2a: Phase 1 habitat survey results – west

Figure 2b: Phase 1 habitat survey results - east

Figure 3: Orchid count sectors

Figure 4: Proposed habitat management zones

Appendix 2: Habitat Survey Data

Table A2.1: Habitat survey data

Polygon no.	Phase 1 code	Phase 1 habitat type	NVC code	NVC ratio	Notes
1	J2.2.2	Hedge - defunct, species-poor	W21:MG1	60:40	Hedge and low stone wall, with Hawthorn (<i>Crataegus monogyna</i>), Ash (<i>Fraxinus excelsior</i>), Sycamore (<i>Acer pseudoplatanus</i>), Dog-rose species (<i>Rosa canina</i> agg.), Sherard's Downy-rose (<i>R. sherardii</i>) and Broom (<i>Cytisus scoparius</i>)
2	B5	Marsh/marshy grassland	M27:OV26c:OV27:S23	40:30:20:10	Drainage ditch line, with Meadowsweet (<i>Filipendula ulmaria</i>), Great Willowherb (<i>Epilobium hirsutum</i>), Water-cress (<i>Nasturtium officinale</i> agg.) and Brooklime (<i>Veronica beccabunga</i>)
3	F1/C3.1	Swamp/tall ruderal	S5:OV27c:C3.1	55:25:20	C3.1 - non-NVC assemblage, with Russian Comfrey (<i>Symphytum x uplandicum</i>), Ground-elder (<i>Aegopodium podagraria</i>), Hedge Woundwort (<i>Stachys sylvatica</i>) and Common Nettle (<i>Urtica dioica</i>)
4	F1	Swamp	M28a	-	Yellow Iris (<i>Iris pseudacorus</i>) stand, with Meadowsweet, Greater Bird's-foot-trefoil (<i>Lotus pedunculatus</i>), Wild Angelica (<i>Angelica sylvestris</i>) and Soft-rush (<i>Juncus effusus</i>)
5	A2.2	Scrub - scattered	W23:OV27c:M27c	70:15:15	Gorse (<i>Ulex europaeus</i>), Broom and Eared Willow (<i>Salix aurita</i>) scrub
6	A2.1	Scrub - dense/continuous	W7b/c	-	Large Grey Willow (<i>Salix cinerea</i>) over Tufted Hair-grass (<i>Deschampsia cespitosa</i>), Wild Angelica, Greater Bird's-foot-trefoil, Tufted Vetch (<i>Vicia cracca</i>), Common Sorrel (<i>Rumex acetosa</i>) and Meadowsweet
7	A1.1.1	Broadleaved woodland - semi-natural	W7c	-	Goat Willow (<i>Salix caprea</i>), Grey Willow, Hawthorn and Broom, over Tufted Hair-grass, Common Nettle, Wild Angelica and Bramble (<i>Rubus fruticosus</i> agg.)
8	B5	Marsh/marshy grassland	M27c	-	Species-rich marshy meadow, with Meadowsweet, Wild Angelica, Sneezewort (<i>Achillea ptarmica</i>), Northern Marsh-orchid (<i>Dactylorhiza purpurella</i>) - 62 flowering spikes, Common Spotted-orchid (<i>D. fuchsii</i>) - two flowering spikes, Greater Bird's-foot-trefoil, Sharp-flowered Rush (<i>Juncus acutiflorus</i>), Compact Rush (<i>J. conglomeratus</i>), Common Knapweed (<i>Centaurea nigra</i>), Tufted Hair-grass, False Oat-grass (<i>Arrhenatherum elatius</i>), Ragged-Robin (<i>Silene flos-cuculi</i>), Tufted Vetch, Marsh Thistle (<i>Cirsium palustre</i>), Meadow Vetchling (<i>Lathyrus pratensis</i>), Marsh Willowherb (<i>Epilobium palustre</i>), Smooth Lady's-mantle (<i>Alchemilla glabra</i>), Meadow Buttercup (<i>Ranunculus acris</i>) and Silverweed (<i>Potentilla anserina</i>)
9	A2.1	Scrub - dense/continuous	W7c:W23:M27c:OV27c:W24	40:30:10:10:10	W7c with Grey Willow, Gorse and Broom scrub, over Tufted Hair-grass, Compact Rush, Wood Aven (<i>Geum urbanum</i>), Meadowsweet and Bramble

Polygon no.	Phase 1 code	Phase 1 habitat type	NVC code	NVC ratio	Notes
10	A2.1	Scrub - dense/continuous	W1:W23:MG1c	40:40:20	
11	A2.1	Scrub - dense/continuous	W23	-	Gorse, Broom, Grey Willow and Hawthorn scrub
12	A2.1	Scrub - dense/continuous	W11a:W23	60:40	Grey Willow over Bramble, Common Nettle, Rosebay Willowherb (<i>Chamaenerion angustifolium</i>) and a drainage ditch line
13	A2.1	Scrub - dense/continuous	W23	-	Gorse, Broom and Grey Willow scrub
14	A1.1.1	Broadleaved woodland - semi-natural	W7c	-	Goat Willow and Grey Willow, over Tufted Hair-grass, Wild Angelica, False Oat-grass, Bramble, Hawthorn seedlings, Field Horsetail (<i>Equisetum arvense</i>), Broad-leaved Willowherb (<i>Epilobium montanum</i>), Marsh Thistle, Reed Sweet-grass (<i>Glyceria maxima</i>), Creeping Buttercup (<i>Ranunculus repens</i>) and Wood Avens
15	B2.1	Neutral grassland - unimproved	MG1b/c	-	False Oat-grass, Hogweed (<i>Heracleum sphondylium</i>), Common Nettle, Rosebay Willowherb, Cleavers (<i>Galium aparine</i>), Bush Vetch (<i>Vicia sepium</i>), Meadow Vetchling and Creeping Thistle (<i>Cirsium arvense</i>)
16	A2.1	Scrub - dense/continuous	W24:OV27c:W23	65:25:10	
17	C3.1	Tall herb and fern - tall ruderal	OV27b	-	Rosebay Willowherb, with Common Nettle, Hogweed, False Oat-grass and Meadow Vetchling
18	A2.1	Scrub - dense/continuous	W7c	-	Grey Willow over Tufted Hair-grass, Reed Sweet-grass, Common Nettle, Hogweed, Meadowsweet, Wild Angelica, False Oat-grass, Cock's-foot (<i>Dactylis glomerata</i>), American Willowherb (<i>Epilobium ciliatum</i>) and Hawthorn
19	F1	Swamp	S5	-	Reed Sweet-grass sward, with Wild Angelica, Meadowsweet, Bush Vetch, Greater Bird's-foot-trefoil, Marsh Thistle, Common Nettle and False Oat-grass
20	B2.1	Neutral grassland - unimproved	MG1b/c:OV27b	70:30	
21	A2.1	Scrub - dense/continuous	W7c	-	Grey Willow and Hawthorn
22	B5	Marsh/marshy grassland	M27c:S5:M25c:W1:W23	75:13:5:5:2	Species-rich marshy meadow. M27c with Meadowsweet, Wild Angelica, Common Sorrel, Creeping Soft-grass (<i>Holcus mollis</i>), False Oat-grass, Field Horsetail, Marsh Woundwort (<i>Stachys palustris</i>), Sneezewort, Greater Bird's-foot-trefoil, Northern Marsh-orchid - 60 flowering spikes, Creeping Thistle, Tufted Hair-grass, Sharp-flowered Rush, Meadow Vetchling, Tufted Vetch, Compact Rush, Common Knapweed and Marsh Thistle, plus Yellow Loosestrife (<i>Lysimachia vulgaris</i>) in the south-west corner of the polygon. S5 with Reed Sweet-grass, Creeping Thistle, Meadowsweet, Common Knapweed and Wild Angelica. M25c with Purple Moor-grass (<i>Molinia caerulea</i>), Wild Angelica, Meadowsweet, Greater Bird's-foot-trefoil, Flea Sedge (<i>Carex pulicaris</i>),

Polygon no.	Phase 1 code	Phase 1 habitat type	NVC code	NVC ratio	Notes
					Compact Rush, Marsh Thistle, Tormential (<i>Potentilla erecta</i>), Ragged-Robin, Northern Marsh-orchid, Heath Woodrush (<i>Luzula multiflora</i> ssp. <i>congesta</i>), Common Knapweed, Sneezewort, Carnation Sedge (<i>C. panicea</i>), Glaucous Sedge (<i>C. flacca</i>), Marsh Horsetail (<i>Equisetum palustre</i>) and Yellow-rattle (<i>Rhinanthus minor</i>)
23	F1	Swamp	S5:W23	90:10	S5 with Reed Sweet-grass, Russian Comfrey, Creeping Thistle, Hedge Bindweed (<i>Calystegia sepium</i>), Meadowsweet, Wild Angelica, Marsh Woundwort, Common Nettle and Yellow Loosestrife
24	A2.1	Scrub - dense/continuous	W7b/c	-	Grey Willow, over Tufted Hair-grass, Wild Angelica, Meadowsweet, Sharp-flowered Rush, Common Nettle, Field Horsetail and Bramble
25	F1	Swamp	S5	-	Reed Sweet-grass sward, with Wild Angelica, Broad-leaved Dock (<i>Rumex obtusifolius</i>), Hedge Bindweed, Tufted Vetch, Rosebay Willowherb, Creeping Thistle, Meadowsweet, False Oat-grass, Greater Bird's-foot-trefoil, Cleavers and Hogweed
26	A2.1	Scrub - dense/continuous	W7c	-	Grey Willow
27	F1	Swamp	S5	-	
28	B5	Marsh/marshy grassland	M27c	-	Species-rich marshy meadow, with scrub encroachment. Northern Marsh-orchid (39 flowering spikes) and Heath Spotted-orchid (<i>Dactylorhiza maculata</i>) - 5 flowering spikes, recorded
29	A2.1	Scrub - dense/continuous	W23	-	
30	B2.1	Neutral grassland - unimproved	MG1c:M27c	80:20	MG1c - Meadow Foxtail (<i>Alopecurus pratensis</i>) frequent, along with Yorkshire-fog (<i>Holcus lanatus</i>), False Oat-grass, Common Knapweed, Tufted Hair-grass, Marsh Woundwort, Hogweed, Wild Angelica, Soft-rush, Lesser Stitchwort (<i>Stellaria graminea</i>), Creeping Buttercup, Common Nettle, Broad-leaved Dock, Common Sorrel and Rosebay Willowherb
31	F1	Swamp	S5	-	
32	F1	Swamp	S5	-	
33	A1.1.1	Broadleaved woodland - semi-natural	W7c	-	Grey Willow, Sycamore, Rowan (<i>Sorbus aucuparia</i>), Broom and Hawthorn seedlings, Bramble, Honeysuckle (<i>Lonicera periclymenum</i>), Tufted Hair-grass, Broad Buckler-fern (<i>Dryopteris dilatata</i>), Yorkshire-fog, Common Nettle, Bifid Hemp-nettle (<i>Galeopsis bifida</i>), Wild Angelica and leaf litter
34	B2.1	Neutral grassland - unimproved	MG1c	-	False Oat-grass, Wild Angelica, Bifid Hemp-nettle, Sharp-flowered Rush, Common Sorrel, Greater Bird's-foot-trefoil, Bramble, Creeping Buttercup,

Polygon no.	Phase 1 code	Phase 1 habitat type	NVC code	NVC ratio	Notes
					Hogweed, Yorkshire-fog, Tufted Vetch, Common Knapweed, Silverweed, Meadow Buttercup, Broad-leaved Dock, Curled Dock (<i>Rumex crispus</i>) and Meadow Vetchling
35	A2.1	Scrub - dense/continuous	W23:W24:W11a:MG1c	50:30:15:5	Gorse, Grey Willow, Hawthorn, Silver Birch (<i>Betula pendula</i>), Scots Pine (<i>Pinus sylvestris</i>), Bramble, Raspberry (<i>Rubus idaeus</i>), Rowan, Honeysuckle, Broad Buckler-fern, Male-fern (<i>Dryopteris filix-mas</i>), Tufted Hair-grass and Rosebay Willowherb present. Big Shaggy-moss (<i>Rhytidiadelphys triquetrus</i>), Common Tamarisk-moss (<i>Thuidium tamariscinum</i>) and Neat Feather-moss (<i>Pseudoscleropodium purum</i>) noted
36	B2.1	Neutral grassland - unimproved	MG1b	-	
37	A1.1.1	Broadleaved woodland - semi-natural	W11a:W7c	70:30	Silver Birch, Downy Birch (<i>Betula pubescens</i>), Grey Willow, Sycamore, Hawthorn, Gorse, Broom, Wild Cherry (<i>Prunus avium</i>) and Goat Willow present. Honeysuckle, Bramble, Male-fern, Broad Buckler-fern, Broad-leaved Willowherb, Yorkshire-fog, Creeping Soft-grass, Tufted Hair-grass, Common Nettle, Meadowsweet, Soft-rush, Rosebay Willowherb, Common Bent (<i>Agrostis capillaris</i>), Creeping Buttercup, Greater Bird's-foot-trefoil, Raspberry, Common Knapweed, Field Horsetail, Cleavers, Bush Vetch, Common Tamarisk-moss and Common Feather-moss (<i>Kindbergia praelonga</i>) in field layer
38	A2.1	Scrub - dense/continuous	W7c:M27:W24	85:10:5	Grey Willow, plus Hawthorn, Sycamore seedlings, Ash and Holly. The field layer contained a mix of Tufted Hair-grass, Soft-rush, Herb-Robert (<i>Geranium robertianum</i>), Honeysuckle, Bramble, Creeping Buttercup, Broad-leaved Willowherb, Meadowsweet, Wild Angelica, False Oat-grass, Common Nettle, Field Horsetail, Buckler-fern (<i>Dryopteris</i>) species and Common Feather-moss
39	F1	Swamp	S5:OV27	97:3	
40	B2.1	Neutral grassland - unimproved	MG1	-	
41	C3.1	Tall herb and fern - tall ruderal	C3.1	-	Russian Comfrey, Cock's-foot, Common Couch (<i>Elymus repens</i>) and Ground-elder
42	A2.2	Scrub - scattered	A2.2:OV27b	70:30	Scattered scrub consisting of Scots Pine, Goat Willow and Butterfly-bush (<i>Buddleja davidii</i>). Garden plants including Masterwort (<i>Astrantia</i> agg.) and Soft Lady's-mantle (<i>Alchemilla mollis</i>) here
43	A2.2	Scrub - scattered	A2.2:C3.1:OV27c:W24:W22	30:25:20:20:5	Scattered scrub consisting of Grey Willow, Goat Willow and Butterfly-bush
44	J1.2	Amenity grassland	MG6	-	

Polygon no.	Phase 1 code	Phase 1 habitat type	NVC code	NVC ratio	Notes
45	A2.2	Scrub - scattered	MG1/MG1e:A2.2:W24:OV24/ OV25:OV27:MG6	30:20:20:10:10:10	
46	A2.2	Scrub - scattered	W24:MG1:C3.1	60:35:5	<i>Crocasmia</i> sp.
47	A3.1	Scattered broadleaved trees	A3.1	-	
48	A2.2	Scrub - scattered	W24:C3.1:OV24	60:30:10	<i>Crocasmia</i> sp.
49	F1	Swamp	S5	-	
50	A2.1	Scrub - dense/continuous	W1	-	
51	A3.1	Scattered broadleaved trees	MG1:A3.1:C3.1:OV24	50:35:10:5	Goat Willow, Holly, Apple (<i>Malus</i> agg.) and Gooseberry (<i>Ribes uva-crispa</i>)
52	F1	Swamp	S28a	-	Reed Canary-grass (<i>Phalaris arundinacea</i>) stand
53	B5	Marsh/marshy grassland	M23b:MG1c	60:40	
54	B2.1	Neutral grassland - unimproved	MG1	-	
55	A2.1	Scrub - dense/continuous	A2.1	-	Goat Willow and Elder (<i>Sambucus nigra</i>), over Common Nettle, Cleavers and Ground-elder
56	B2.1/C3.1	Neutral grassland - unimproved/tall ruderal	MG1:C3.1:OV24:M28b	55:35:5:5	C3.1 - non-NVC assemblage with Russian Comfrey and Ground-elder. M28b sward of Yellow Iris, with Common Nettle, Creeping Buttercup, Creeping Thistle, Cock's-foot and Common Couch associated
57	A1.1.2	Broadleaved woodland - plantation	A1.1.2	-	Silver Birch, Wild Cherry and Grey Willow
58	A1.1.2	Broadleaved woodland - plantation	A1.1.2	-	Sycamore, Ash, Rowan, Oak (<i>Quercus</i>) species, Rowan, Sitka Spruce, Goat Willow and Wild Cherry. Ground flora with garden escapes and introduced species, including Common Blue Sowthistle (<i>Cicerbita macrophylla</i>) and Garden Yellow Archangel (<i>Lamiastrum galeobdolon</i> ssp. <i>argentatum</i>). Other species noted were Ground-elder, Common Nettle, Wood Avens, Broad-leaved Dock, Cock's-foot, Male-fern, Broad Buckler-fern, Russian Comfrey, Bramble and Common Ivy (<i>Hedera helix</i>)
59	B2.1/C3.1	Neutral grassland - unimproved/tall ruderal	OV27d:MG1b/c:W24	45:35:20	Sycamore seedlings present in OV27
60	A1.1.1	Broadleaved woodland - semi-natural	W7c:W11	80:20	Canopy and shrub layer with Rowan, Pedunculate Oak (<i>Quercus robur</i>) of planted origin, Hawthorn, Broom and Honeysuckle. Ground flora varied, including Tufted Hair-grass, Common Ivy, Broad Buckler-fern, Scaly Male-fern (<i>Dryopteris affinis</i>), Wild Angelica, Sycamore seedlings, Bramble, Bifid Hemp-nettle, Yorkshire-fog, Raspberry and Creeping Buttercup

Polygon no.	Phase 1 code	Phase 1 habitat type	NVC code	NVC ratio	Notes
61	A2.2	Scrub - scattered	A2.2	-	Holly, Elder and Hawthorn
62	B2.1	Neutral grassland - unimproved	MG1c:M23a	70:30	
63	C3.1	Tall herb and fern - tall ruderal	C3.1	-	Confused Michaelmas-daisy (<i>Symphyotrichum novi-belgii</i>) sward, with Wild Angelica
64	C3.1	Tall herb and fern - tall ruderal	OV27c:OV24	90:10	
65	C3.1	Tall herb and fern - tall ruderal	OV27c	-	
66	B2.1	Neutral grassland - unimproved	MG1:W23/W24:OV27c	70:20:10	
67	A2.1	Scrub - dense/continuous	W23/W24	-	
68	A1.1.1	Broadleaved woodland - semi-natural	W10	-	Sycamore, Hawthorn, Elder, Broom, Holly and Bramble
69	B5	Marsh/marshy grassland	M27c:W24:C3.1:M23b	60:20:10:10	
70	A1.1.1	Broadleaved woodland - semi-natural	W10	-	Sycamore, Rowan, Holly and Hawthorn, over Common Ivy, Honeysuckle, Broad-leaved Willowherb, Wall Lettuce (<i>Mycelis muralis</i>), Ground-elder, Cock's-foot, Bramble, Common Nettle, Tufted Hair-grass, Cleavers and Creeping Buttercup
71	A2.1	Scrub - dense/continuous	W23:MG1	80:20	Electricity pole ride. Broom, Hawthorn, Bramble and Rowan seedlings growing
72	A2.1	Scrub - dense/continuous	W23:MG1:W24:OV27c:M23b	35:30:20:10:5	
73	A1.1.1	Broadleaved woodland - semi-natural	W10	-	Pedunculate Oak, Ash, Rowan Holly, Broom, Snowberry (<i>Symphoricarpos albus</i>), Common Ivy, Bramble, Broad Buckler-fern, Ground-elder, Common Nettle, Honeysuckle, Cleavers, a little Tufted Hair-grass, Confused Michaelmas-daisy, Broad-leaved Willowherb, False Oat-grass, Yorkshire-fog, Foxglove (<i>Digitalis purpurea</i>) and Wild Angelica present
74	B2.1	Neutral grassland - unimproved	MG1	-	
75	A1.1.1	Broadleaved woodland - semi-natural	W10	-	Rowan, Holly, Common Ivy, Hawthorn, Sitka Spruce, Ash, seedlings, Grey Willow, Wild Cherry, Honeysuckle, Yew (<i>Taxus baccata</i>), Elder and Sycamore present
76	C3.1	Tall herb and fern - tall ruderal	C3.1:MG1:OV27c	70:25:5	C3.1 - Russian Comfrey, Ground-elder and Broad-leaved Dock
77	A2.1	Scrub - dense/continuous	W23:OV27:MG1:W24	50:30:10:10	Hedge Bindweed (<i>Calystegia sepium</i>) noted
78	A1.1.1	Broadleaved woodland - semi-natural	A1.1.1	-	Ash and Pedunculate Oak, over Ground-elder and Russian Comfrey

Polygon no.	Phase 1 code	Phase 1 habitat type	NVC code	NVC ratio	Notes
79	A1.1.1	Broadleaved woodland - semi-natural	W7c	-	Goat Willow, Elder, Blackthorn (<i>Prunus spinosa</i>) and Broom, and Beech (<i>Fagus sylvatica</i>) at edge of Common. Tufted Hair-grass, False Oat-grass, Common Nettle, Bramble, Meadow Vetchling, Broad-leaved Willowherb, Cleavers, Ground-elder and Wild Angelica present
80	A3.1	Scattered broadleaved trees	W7c	-	Goat Willow, Hawthorn and Downy Birch, over False Oat-grass, Yorkshire-fog, Broad-leaved Willowherb, Creeping Buttercup, Hogweed, Common Sorrel, Soft-rush, Common Nettle and Ground-elder
81	A3.1	Scattered broadleaved trees	MG1:A3.1	65:35	Orchard
82	B2.1	Neutral grassland - unimproved	MG1e	-	Oxeye Daisy (<i>Leucanthemum vulgare</i>), Common Knapweed, one flowering spike of Greater Butterfly-orchid (<i>Platanthera chlorantha</i>) present. Small more acidophilous patch of vegetation noted
83	A3.1	Scattered broadleaved trees	MG1e:A3.1:C3.1	55:30:15	Greater Bird's-foot-trefoil, Meadow Vetchling, Common Knapweed, Compact Rush, Lesser Stitchwort, Creeping Buttercup, Common Sorrel, Tufted Hair-grass, False Oat-grass, Yorkshire-fog, Common Bent, Bush Vetch, Hogweed, Soft-rush, Hedge Bindweed, Common Nettle, Broad-leaved Dock, Russian Comfrey, Common Couch, Tufted Vetch, Bifid Hemp-nettle, Hedge Woundwort and Rosebay Willowherb noted
84	J2.2.2	Hedge - defunct, species-poor	W21	-	Planted hedge, with Goat Willow, Hawthorn, Blackthorn, Wild Cherry and Hazel
85	I2.4	Refuse tip (garden waste)	I2.4	-	
86	B5	Marsh/marshy grassland	M23b:M27c	60:40	Around drainage ditches
87	J4	Bare ground (track)	J4	-	
88	J5	Other habitat - footpath	J5	-	
89	J5	Other habitat - footpath	J5	-	
90	J5	Other habitat - footpath	J5	-	
91	J4	Bare ground (track)	J4	-	
92	J5	Other habitat - footpath	J5	-	

Appendix 3: Species Lists

Table A3.1: Vascular plant species records for Thornhill North Common. Data provided by BSBI, SWT and the surveyor

Scientific name	Common name	Status	Conservation designations	Years recorded	Comments
<i>Acer pseudoplatanus</i>	Sycamore	Non-native; now widely naturalised		1994; 2017; 2019; 2020	
<i>Achillea millefolium</i>	Yarrow	Native		2017; 2019; 2020	
<i>Achillea ptarmica</i>	Sneezewort	Native		2017; 2020	
<i>Aegopodium podagraria</i>	Ground-elder	Archeophyte		2017; 2019; 2020	
<i>Aesculus hippocastanum</i>	Horse-chestnut	Non-native; planted		2017; 2020	
<i>Agrostis capillaris</i>	Common Bent	Native		1994; 2017; 2019; 2020	
<i>Agrostis stolonifera</i>	Creeping Bent	Native		1994; 2017; 2020	
<i>Ajuga reptans</i>	Bugle	Native		2019	
<i>Alchemilla conjuncta</i>	Silver Lady's-mantle	Non-native; garden escape		2020	
<i>Alchemilla glabra</i>	Smooth Lady's-mantle	Native		2017; 2019; 2020	
<i>Alchemilla mollis</i>	Soft Lady's-mantle	Non-native; garden escape		2017; 2019; 2020	
<i>Alopecurus geniculatus</i>	Marsh Foxtail	Native		1994; 2017; 2020	
<i>Alopecurus pratensis</i>	Meadow Foxtail	Native		1994; 2017; 2018; 2019; 2020	
<i>Angelica sylvestris</i>	Wild Angelica	Native		1994; 2017; 2019; 2020	
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	Native		1994; 2019; 2020	
<i>Anthriscus sylvestris</i>	Cow Parsley	Native		2017; 2019; 2020	
<i>Aquilegia vulgaris</i>	Columbine	Native; probably of garden origin here		2017	
<i>Arabidopsis thaliana</i>	Thale Cress	Native		2017; 2019; 2020	
<i>Arrhenatherum elatius</i>	False Oat-grass	Native		1994; 2017; 2019; 2020	
<i>Arum maculatum</i>	Lords-and-ladies	Native; probably of garden origin here		2020	
<i>Athyrium filix-femina</i>	Lady-fern	Native		2017; 2019; 2020	
<i>Avenella flexuosa</i>	Wavy Hair-grass	Native		1994	
<i>Bellis perennis</i>	Daisy	Native		1994; 2017; 2019; 2020	
<i>Berberis</i> sp.	a Barberry	Non-native; probably bird-sown from garden		2017; 2020	
<i>Betula pendula</i>	Silver Birch	Native		1994; 2017; 2019; 2020	

Scientific name	Common name	Status	Conservation designations	Years recorded	Comments
<i>Brassica rapa</i>	Turnip	Archeophyte		2020	
<i>Buddleja davidii</i>	Butterfly-bush	Non-native; garden escape		2017; 2020	
<i>Callitriche stagnalis</i>	Common Water-starwort	Native		2017	
<i>Calluna vulgaris</i>	Heather	Native		1994; 2020	
<i>Caltha palustris</i>	Marsh-marigold	Native		2019; 2020	
<i>Calystegia sepium</i>	Hedge Bindweed	Native		2017; 2019; 2020	
<i>Capsella bursa-pastoris</i>	Shepherd's-purse	Archeophyte		2017; 2019; 2020	
<i>Cardamine flexuosa</i>	Wavy Bitter-cress	Native		2017; 2019; 2020	
<i>Cardamine hirsuta</i>	Hairy Bitter-cress	Native		2017; 2019; 2020	
<i>Cardamine pratensis</i>	Cuckooflower	Native		1994; 2019; 2020	
<i>Carex flacca</i>	Glaucous Sedge	Native		2017; 2019; 2020	
<i>Carex hostiana</i>	Tawny Sedge	Native		2020	
<i>Carex leporina</i>	Oval Sedge	Native		1994; 2017; 2020	
<i>Carex nigra</i>	Common Sedge	Native		1994; 2019; 2020	
<i>Carex panicea</i>	Carnation Sedge	Native		1994; 2020	
<i>Carex pilulifera</i>	Pill Sedge	Native		2020	
<i>Carex pulicaris</i>	Flea Sedge	Native		2020	
<i>Centaurea nigra</i>	Common Knapweed	Native		1994; 2017; 2020	
<i>Cerastium fontanum</i>	Common Mouse-ear	Native		2017; 2019; 2020	
<i>Cerastium glomeratum</i>	Sticky Mouse-ear	Native		2019; 2020	
<i>Chamaenerion angustifolium</i>	Rosebay Willowherb	Native		1994; 2017; 2019; 2020	
<i>Chrysosplenium oppositifolium</i>	Opposite-leaved Golden-saxifrage	Native		2017; 2019; 2020	
<i>Cicerbita macrophylla</i>	Common Blue-sowthistle	Non-native; garden escape		2017; 2020	
<i>Cirsium arvense</i>	Creeping Thistle	Native		1994; 2017; 2019; 2020	
<i>Cirsium palustre</i>	Marsh Thistle	Native		1994; 2017; 2020	
<i>Cirsium vulgare</i>	Spear Thistle	Native		2019; 2020	
<i>Comarum palustre</i>	Marsh Cinquefoil	Native		2020	
<i>Conopodium majus</i>	Pignut	Native		2019; 2020	
<i>Corylus avellana</i>	Hazel	Native		2019; 2020	
<i>Crataegus monogyna</i>	Hawthorn	Native		1994; 2017; 2020	
<i>Crepis paludosa</i>	Marsh Hawk's-beard	Native		1994	

Scientific name	Common name	Status	Conservation designations	Years recorded	Comments
<i>Crocsmia paniculata</i>	Aunt-Eliza	Non-native; garden escape		2017; 2020	
<i>Crocsmia x crocosmiiflora</i>	Montbretia	Non-native; garden escape		2020	
<i>Crocus</i> agg.	a Crocus	Non-native; planted		2020	
<i>Cupressus</i> sp.	a Cypress	Non-native; planted		2020	
<i>Cynosurus cristatus</i>	Crested Dog's-tail	Native		1994; 2017; 2020	
<i>Cytisus scoparius</i>	Broom	Native		1994; 2017; 2019; 2020	
<i>Dactylis glomerata</i>	Cock's-foot	Native		1994; 2017; 2019; 2020	
<i>Dactylorhiza fuchsii</i>	Common Spotted-orchid	Native		1994; 2010; 2020	R. Sexton described 'many' in 2010
<i>Dactylorhiza maculata</i>	Heath Spotted-orchid	Native		1994; 2010; 2020	R. Sexton described 'many' in 2010
<i>Dactylorhiza purpurella</i>	Northern Marsh-orchid	Native		1994; 2010; 2019; 2020	R. Sexton described 'many' in 2010
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	Native		1994; 2017; 2019; 2020	
<i>Digitalis purpurea</i>	Foxglove	Native; may be garden varieties naturalised here		2019; 2020	
<i>Dryopteris affinis</i>	Scaly Male-fern	Native		2020	
<i>Dryopteris dilatata</i>	Broad Buckler-fern	Native		1994; 2017; 2019; 2020	
<i>Dryopteris felix-mas</i>	Male-fern	Native		1994; 2017; 2019; 2020	
<i>Elymus repens</i>	Common Couch	Native		2017; 2019	Both forms (<i>aristata</i> and <i>repens</i>) noted
<i>Epilobium brunnescens</i>	New Zealand Willowherb	Non-native; widely naturalised		2020	
<i>Epilobium ciliatum</i>	American Willowherb	Non-native; widely naturalised		2020	
<i>Epilobium hirsutum</i>	Great Willowherb	Native		2017; 2019; 2020	
<i>Epilobium montanum</i>	Broad-leaved Willowherb	Native		2017; 2019; 2020	
<i>Epilobium palustre</i>	Marsh Willowherb	Native		1994; 2020	
<i>Equisetum arvense</i>	Field Horsetail	Native		2017; 2020	
<i>Equisetum palustre</i>	Marsh Horsetail	Native		2020	
<i>Erica tetralix</i>	Cross-leaved Heath	Native		1994	
<i>Euphorbia characias</i>	Mediterranean Spurge	Non-native; garden escape		2020	Horticultural species; identity probable
<i>Fagus sylvatica</i>	Beech	Native; widely naturalised in Scotland from historic plantings		2017; 2020	
<i>Festuca rubra</i>	Red Fescue	Native		1994; 2019; 2020	
<i>Ficaria verna</i>	Lesser Celandine	Native		2017; 2019	
<i>Filipendula ulmaria</i>	Meadowsweet	Native		1994; 2017; 2019; 2020	
<i>Fraxinus excelsior</i>	Ash	Native		2017; 2019; 2020	

Scientific name	Common name	Status	Conservation designations	Years recorded	Comments
<i>Galanthus nivalis</i>	Snowdrop	Native; widely naturalised and of planted origin here		2017; 2020	
<i>Galeopsis bifida</i>	Bifid Hemp-nettle	Native	Locally Scarce (VC87 Rare Plant Register)	2020	
<i>Galeopsis tetrahit</i>	Common Hemp-nettle	Native		2017	
<i>Galium aparine</i>	Cleavers	Native		2017; 2020	
<i>Galium palustre</i>	Common Marsh-bedstraw	Native		2020	
<i>Galium saxatile</i>	Heath Bedstraw	Native		1994; 2020	
<i>Geranium robertianum</i>	Herb-Robert	Native		2019; 2020	
<i>Geranium x oxonianum</i>	Druce's Crane's-bill	Non-native; garden escape		2020	
<i>Geum urbanum</i>	Wood Avens	Native		2017; 2019; 2020	
<i>Glechoma hederacea</i>	Ground-ivy	Native		2020	
<i>Glyceria fluitans</i>	Floating Sweet-grass	Native		2017	
<i>Glyceria maxima</i>	Reed Sweet-grass	Native		1994; 2017; 2019; 2020	
<i>Gnaphalium uliginosum</i>	Marsh Cudweed	Native		2017; 2020	
<i>Hedera helix</i>	Common Ivy	Native		2017; 2019; 2020	
<i>Hemerocallis lilioasphodelus</i>	Yellow Day-lily	Non-native; garden escape		2020	
<i>Heracleum sphondylium</i>	Hogweed	Native		2017; 2019; 2020	
<i>Hieracium</i> agg.	Hawkweed	Native		1994	
<i>Holcus lanatus</i>	Yorkshire-fog	Native		1994; 2017; 2019; 2020	
<i>Holcus mollis</i>	Creeping Soft-grass	Native		1994; 2017; 2020	
<i>Hosta</i> sp.	a Hosta	Non-native; garden escape		2020	
<i>Hyacinthoides hispanica</i>	Spanish Bluebell	Non-native; garden escape		2019; 2020	
<i>Hyacinthoides x massartiana</i>	Hybrid Bluebell	Non-native; garden escape		2017; 2020	
<i>Hylotelephium telephium</i>	Orpine	Native		2020	
<i>Hypericum androsaemum</i>	Tutsan	Native; garden escape here		2020	
<i>Hypericum tetrapterum</i>	Square-stalked St John's-wort	Native		2020	
<i>Hypochaeris radicata</i>	Cat's-ear	Native		2017; 2019; 2020	
<i>Ilex aquifolium</i>	Holly	Native		2017; 2019; 2020	
<i>Iris pseudacorus</i>	Yellow Iris	Native		2017; 2019; 2020	
<i>Juncus acutiflorus</i>	Sharp-flowered Rush	Native		1994; 2017; 2019; 2020	
<i>Juncus articulatus</i>	Jointed Rush	Native		1994; 2017; 2020	
<i>Juncus bufonius</i>	Toad Rush	Native		2017	

Scientific name	Common name	Status	Conservation designations	Years recorded	Comments
<i>Juncus conglomeratus</i>	Compact Rush	Native		2017; 2020	
<i>Juncus effusus</i>	Soft-rush	Native		1994; 2017; 2019; 2020	
<i>Juncus squarrosus</i>	Heath Rush	Native		1994	
<i>Kerria japonica</i>	Kerria	Non-native; planted		2017; 2019	
<i>Lamiastrum galeobdolon</i> ssp. <i>argentatum</i>	Garden Yellow Archangel	Non-native; garden escape		2017; 2019	
<i>Lapsana communis</i>	Nipplewort	Native		2020	
<i>Lathyrus pratensis</i>	Meadow Vetchling	Native		1994; 2017; 2019; 2020	
<i>Leucanthemum vulgare</i>	Oxeye Daisy	Native; presumably result of wildflower seeding		2017; 2020	
<i>Ligustrum ovalifolium</i>	Garden Privet	Non-native; garden escape		2017; 2020	
<i>Lilium martagon</i>	Martagon Lily	Non-native; garden escape		2017	
<i>Lolium perenne</i>	Perennial Rye-grass	Native		1994; 2017; 2019; 2020	
<i>Lonicera periclymenum</i>	Honeysuckle	Native		2017; 2019; 2020	
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil	Native		1994	
<i>Lotus pedunculatus</i>	Greater Bird's-foot-trefoil	Native		1994; 2017; 2019; 2020	
<i>Lunaria annua</i>	Honesty	Non-native; garden escape		2019; 2020	
<i>Luzula campestris</i>	Field Wood-rush	Native		1994; 2019; 2020	
<i>Luzula multiflora</i>	Heath Wood-rush	Native		1994; 2020	
<i>Lysimachia nummularia</i>	Creeping-Jenny	Native; presumably garden escape here		2017; 2020	
<i>Lysimachia punctata</i>	Dotted Loosestrife	Non-native; garden escape		2010; 2017; 2020	
<i>Lysimachia vulgaris</i>	Yellow Loosestrife	Native	Locally Scarce (VC87 Rare Plant Register)	2020	
<i>Malus pumila</i>	Apple	Non-native; various varieties planted		2017; 2019; 2020	
<i>Malus sylvestris</i>	Crab Apple	Native; planted here		2019	
<i>Matricaria discoidea</i>	Pineappleweed	Non-native; widely naturalised		2017; 2020	
<i>Mentha x villosa</i>	Apple-mint	Non-native; garden escape		2020	
<i>Molinia caerulea</i>	Purple Moor-grass	Native		2020	
<i>Mycelis muralis</i>	Wall Lettuce	Native		2020	
<i>Myosotis arvensis</i>	Field Forget-me-not	Archeophyte		2017; 2019	
<i>Myosotis discolor</i>	Changing Forget-me-not	Native		2020	

Scientific name	Common name	Status	Conservation designations	Years recorded	Comments
<i>Myosotis sylvatica</i>	Wood Forget-me-not	Native; probably of garden origin here		2017	
<i>Narcissus</i> agg.	Cultivated Daffodil	Non-native; planted		2017; 2018; 2019; 2020	
<i>Nasturtium officinale</i> agg.	Water-cress	Native		2017; 2019; 2020	
<i>Odontites vernus</i>	Red Bartsia	Native		2017; 2020	
<i>Oxalis</i> sp.	a Wood-sorrel	Non-native; garden escape		2020	
<i>Papaver cambricum</i>	Welsh Poppy	Native; widely naturalised from garden escapes in Scotland		2019; 2020	
<i>Persicaria maculosa</i>	Redshank	Native		2017; 2020	
<i>Phalaris arundinacea</i>	Reed Canary-grass	Native; cultivar 'Variegata' present and of garden origin		1994; 2017; 2019; 2020	Presumably present as a native in 1994
<i>Phleum pratense</i>	Timothy	Native		1994; 2017; 2020	
<i>Picea sitchensis</i>	Sitka Spruce	Non-native; planted		2017; 2020	
<i>Pilosella aurantiaca</i>	Fox-and-cubs	Non-native; widely naturalised		1994; 2020	
<i>Pinus sylvestris</i>	Scots Pine	Native; planted	Nationally Scarce (when not of planted origin)	2017; 2020	Of planted origin on site
<i>Plantago lanceolata</i>	Ribwort Plantain	Native		1994; 2017; 2020	
<i>Plantago major</i>	Greater Plantain	Native		1994; 2017; 2019; 2020	
<i>Platanthera bifolia</i>	Lesser Butterfly-orchid	Native	Vulnerable in Great Britain (VC87 Rare Plant Register)	1999	Grid reference given as NN665001
<i>Platanthera chlorantha</i>	Greater Butterfly-orchid	Native	Near Threatened in Great Britain (VC87 Rare Plant Register)	2010; 2020	Two at NN66610007 in 2010. One at NN6682800073 in 2020
<i>Poa annua</i>	Annual Meadow-grass	Native		1994; 2017; 2019; 2020	
<i>Poa pratensis</i> sens. lat.	Smooth Meadow-grass	Native		2017; 2020	Not determined to species
<i>Poa trivialis</i>	Rough Meadow-grass	Native		1994; 2020	
<i>Polemonium caeruleum</i>	Jacob's-ladder	Native; garden escape here		2020	
<i>Polygonatum x hybridum</i>	Garden Solomon's-seal	Non-native; garden escape		2017; 2019; 2020	
<i>Polygonum aviculare</i>	Knotgrass	Native		2017; 2020	
<i>Polypodium vulgare</i>	Polypody	Native		2017; 2020	
<i>Populus nigra</i> 'Italica'	Lombardy-poplar	Non-native; planted		2017; 2020	
<i>Populus tremula</i>	Aspen	Native; presumably planted		2017; 2019; 2020	
<i>Potentilla anserina</i>	Silverweed	Native		1994; 2017; 2019; 2020	

Scientific name	Common name	Status	Conservation designations	Years recorded	Comments
<i>Potentilla erecta</i>	Tormentil	Native		1994; 2019; 2020	
<i>Primula vulgaris</i>	Primrose	Native		2020	
<i>Prunus avium</i>	Wild Cherry	Native; presumably planted		2017; 2019; 2020	
<i>Prunus cerasifera</i>	Cherry Plum	Non-native; presumably planted		2017	
<i>Prunus cerasus</i>	Dwarf Cherry	Non-native; planted		2017	
<i>Prunus domestica</i>	Wild Plum	Archeophyte; planted		2017; 2020	
<i>Prunus spinosa</i>	Blackthorn	Native		2017; 2020	
<i>Pyrus communis</i>	Pear	Archeophyte; planted		2017	
<i>Quercus petraea</i>	Sessile Oak	Native; presumably planted		1994; 2017	
<i>Quercus robur</i>	Pedunculate Oak	Native; presumably planted		2017	
<i>Ranunculus acris</i>	Meadow Buttercup	Native		1994; 2017; 2019; 2020	
<i>Ranunculus flammula</i>	Lesser Spearwort	Native		1994; 2017; 2019; 2020	
<i>Ranunculus repens</i>	Creeping Buttercup	Native		1994; 2017; 2019; 2020	
<i>Rhinanthus minor</i>	Yellow-rattle	Native		2020	Present in west of Common; also recently seeded in east
<i>Rhododendron</i> sp.	a Rhododendron	Non-native; planted		2017; 2020	
<i>Ribes nigrum</i>	Black Currant	Non-native; garden escape		2019; 2020	
<i>Ribes sanguineum</i>	Flowering Currant	Non-native; garden escape		2019; 2020	
<i>Ribes uva-crispa</i>	Gooseberry	Non-native; garden escape		2017; 2019; 2020	
<i>Rosa canina</i>	Dog-rose	Native		2017; 2019; 2020	
<i>Rosa canina</i> agg.	a Dog-rose	Native		1994; 2020	Not determined to species
<i>Rosa sherardii</i>	Sherard's Downy-rose	Native		2020	
<i>Rubus fruticosus</i> agg.	Bramble	Native		1994; 2017; 2019; 2020	
<i>Rubus idaeus</i>	Raspberry	Native		2017; 2019; 2020	
<i>Rumex acetosa</i>	Common Sorrel	Native		1994; 2017; 2019; 2020	
<i>Rumex acetosella</i>	Sheep's Sorrel	Native		1994	
<i>Rumex crispus</i>	Curled Dock	Native		2020	
<i>Rumex obtusifolius</i>	Broad-leaved Dock	Native		1994; 2017; 2019; 2020	
<i>Rumex sanguineus</i>	Wood Dock	Native		2019; 2020	
<i>Sagina procumbens</i>	Procumbent Pearlwort	Native		2019; 2020	
<i>Salix aurita</i>	Eared Willow	Native		2020	
<i>Salix caprea</i>	Goat Willow	Native		2017; 2019; 2020	

Scientific name	Common name	Status	Conservation designations	Years recorded	Comments
<i>Salix cinerea</i>	Grey Willow	Native		2017; 2019; 2020	
<i>Helianthus annuus</i>	Sunflower	Non-native; garden escape		2021	
<i>Sambucus nigra</i>	Elder	Native		1994; 2017; 2019; 2020	
<i>Senecio vulgaris</i>	Groudsel	Native		2017; 2019	
<i>Silene dioica</i>	Red Campion	Native		2017; 2019; 2020	
<i>Silene flos-cuculi</i>	Ragged-Robin	Native		1994; 2020	
<i>Solanum tuberosum</i>	Potato	Non-native; garden escape		2020	
<i>Solidago gigantea</i>	Early Goldenrod	Non-native; garden escape		2017; 2020	
<i>Sonchus oleraceus</i>	Smooth Sowthistle	Native		2019; 2020	
<i>Sorbus aucuparia</i>	Rowan	Native		1994; 2017; 2019; 2020	
<i>Sorbus</i> sp.	a Rowan	Non-native; garden escape		2020	
<i>Spiraea</i> agg.	Bridewort	Non-native; garden escape		2017; 2020	
<i>Stachys palustris</i>	Marsh Woundwort	Native		2017; 2020	
<i>Stachys sylvatica</i>	Hedge Woundwort	Native		2017; 2019; 2020	
<i>Stellaria alsine</i>	Bog Stitchwort	Native		2019	
<i>Stellaria graminea</i>	Lesser Stitchwort	Native		2020	
<i>Stellaria holostea</i>	Greater Stitchwort	Native		2020	
<i>Succisa pratensis</i>	Devil's-bit Scabious	Native		2017	
<i>Symphoricarpos albus</i>	Snowberry	Non-native; garden escape		1994; 2017; 2019; 2020	
<i>Symphotrichum novi-belgii</i>	Confused Michaelmas-daisy	Non-native; garden escape		2017; 2020	
<i>Symphytum x uplandicum</i>	Russian Comfrey	Non-native; now widely naturalised		1994; 2017; 2019; 2020	
<i>Symphytum tuberosum</i>	Tuberous Comfrey	Native		2020	
<i>Taraxacum</i> agg.	Dandelion	Native		1994; 2017; 2019; 2020	
<i>Taxus baccata</i>	Yew	Native; planted or bird-sown here		2017; 2019; 2020	
<i>Trifolium dubium</i>	Lesser Trefoil	Native		2020	
<i>Trifolium repens</i>	White Clover	Native		1994; 2017; 2019; 2020	
<i>Tulipa gesneriana</i>	Garden Tulip	Non-native; garden escape		2017	
<i>Tussilago farfara</i>	Colt's-foot	Native		2019; 2020	
<i>Ulex europaeus</i>	Gorse	Native		1994; 2017; 2019; 2020	
<i>Urtica dioica</i>	Common Nettle	Native		1994; 2020	
<i>Veronica beccabunga</i>	Brooklime	Native		1994; 2017; 2019; 2020	

Scientific name	Common name	Status	Conservation designations	Years recorded	Comments
<i>Veronica chamaedrys</i>	Germander Speedwell	Native		1994; 2017; 2019; 2020	
<i>Veronica persica</i>	Common Field Speedwell	Non-native; now widely naturalised		2017	
<i>Veronica serpyllifolia</i>	Thyme-leaved Speedwell	Native		2020	
<i>Viburnum opulus</i> 'Roseum'	Snowball-tree	Non-native; planted		2020	
<i>Vicia cracca</i>	Tufted Vetch	Native		1994; 2017; 2019; 2020	
<i>Vicia sativa</i>	Common Vetch	Native		1994	
<i>Vicia sepium</i>	Bush Vetch	Native		2017; 2019; 2020	
<i>Viola riviniana</i>	Common Dog-violet	Native		2019; 2020	

Table A3.2: Bird species recorded on North Common and surrounding land (2017-2021, plus one record from 2013)

Scientific name	Common name	Legislative/ conservation status*	Site status
<i>Coturnix coturnix</i>	Quail	Sch 1; AL	Vagrant; summer migrant, one record from 2013 (Scottish Ornithologists' Club)
<i>Phasianus colchicus</i>	Pheasant		Resident in wider area; occasionally seen on site
<i>Branta canadensis</i>	Canada Goose		Resident in wider area; birds overflying site
<i>Anser anser</i>	Greylag Goose	AL	Resident in wider area; birds overflying site
<i>Anser brachyrhynchus</i>	Pink-footed Goose	AL	Winter visitor; foraging in surrounding fields and overflying site
<i>Anas platyrhynchos</i>	Mallard	NT(b); AL	Resident in wider area; birds overflying site
<i>Apus apus</i>	Swift	EN(b); AL; SBL	Resident in wider area; breeding in Thornhill village and foraging over site
<i>Columba livia</i>	Feral Pigeon		Resident in wider area; birds overflying site
<i>Columba palumbus</i>	Woodpigeon		Resident
<i>Streptopelia decaocto</i>	Collared Dove		Resident
<i>Rallus aquaticus</i>	Water Rail		Vagrant; nocturnal migrant, one recorded flying over Main Street in 2020
<i>Haematopus ostralegus</i>	Oystercatcher	AL	Resident in wider area; birds overflying site
<i>Vanellus vanellus</i>	Lapwing	EN(b); VU(w); RL; SBL	Winter visitor; foraging in surrounding fields and overflying site
<i>Pluvialis apricaria</i>	Golden Plover	Ann I; SBL	Winter visitor; foraging in surrounding fields (not seen over site)
<i>Numenius arquata</i>	Curlew	G-NT; EN(b); RL; SBL	Resident in wider area; foraging in surrounding fields (not seen over site)
<i>Scolopax rusticola</i>	Woodcock	VU(b); RL; SBL	Winter visitor; recorded on site in 2021
<i>Chroicocephalus ridibundus</i>	Black-headed Gull	VU(w); AL; SBL	Resident in wider area; birds overflying site
<i>Larus canus</i>	Common Gull	AL	Resident in wider area; birds overflying site
<i>Larus argentatus</i>	Herring Gull	EN(w); DD(b); RL; SBL	Resident in wider area; birds overflying site
<i>Larus fuscus</i>	Lesser Black-backed Gull	DD(b); AL	Resident in wider area; birds overflying site
<i>Ardea cinerea</i>	Grey Heron	NT(b)	Resident in wider area; birds overflying site. Occasionally foraging in Thornhill gardens
<i>Accipiter nisus</i>	Sparrowhawk	NT(b)	Resident in wider area; seen foraging on site
<i>Milvus milvus</i>	Red Kite	G-NT; Ann I; Sch 1; SBL	Resident in wider area; birds overflying site
<i>Buteo buteo</i>	Buzzard		Resident in wider area; birds overflying site
<i>Tyto alba</i>	Barn Owl	Sch 1; SBL	Resident in wider area; not seen on site but suitable foraging habitat present
<i>Strix aluco</i>	Tawny Owl	NT(b); AL	Resident in wider area; heard on site
<i>Dendrocopos major</i>	Great Spotted Woodpecker		Resident in wider area; foraging on site
<i>Falco tinnunculus</i>	Kestrel	VU(b); AL; SBL	Resident in wider area; birds overflying site
<i>Falco peregrinus</i>	Peregrine	Ann I; Sch 1; SBL	Present in wider area; birds seen foraging over outskirts of village (not on site)
<i>Pica pica</i>	Magpie		Resident
<i>Coloeus monedula</i>	Jackdaw		Resident

Scientific name	Common name	Legislative/ conservation status*	Site status
<i>Corvus frugilegus</i>	Rook		Resident
<i>Corvus corone</i>	Carrion Crow		Resident
<i>Corvus corax</i>	Raven		Resident in wider area; birds overflying site
<i>Bombicilla garrulus</i>	Waxwing		Rare winter visitor to wider area; recorded in the village some winters, not reported on site
<i>Periparus ater</i>	Coal Tit		Resident
<i>Cyanistes caeruleus</i>	Blue Tit		Resident
<i>Parus major</i>	Great Tit		Resident
<i>Alauda arvensis</i>	Skylark	VU(b) – Scotland only; RL; SBL	Resident in wider area; birds overflying site
<i>Hirundo rustica</i>	Swallow		Resident
<i>Delichon urbicum</i>	House Martin	VU(b); AL	Resident (breeding along Main Street)
<i>Aegithalos caudatus</i>	Long-tailed Tit		Resident
<i>Phylloscopus trochilus</i>	Willow Warbler	AL	Summer migrant
<i>Phylloscopus collybita</i>	Chiffchaff		Summer migrant
<i>Acrocephalus schoenobaenus</i>	Sedge Warbler		Summer migrant
<i>Locustella naevia</i>	Grasshopper Warbler	RL; SBL	Summer migrant
<i>Sylvia atricapilla</i>	Blackcap		Summer migrant
<i>Sylvia borin</i>	Garden Warbler		Summer migrant
<i>Sylvia communis</i>	Whitethroat		Summer migrant
<i>Regulus regulus</i>	Goldcrest		Resident
<i>Troglodytes troglodytes</i>	Wren		Resident
<i>Certhia familiaris</i>	Treecreeper		Resident
<i>Sturnus vulgaris</i>	Starling	VU(b); RL; SBL	Resident
<i>Turdus merula</i>	Blackbird		Resident
<i>Turdus pilaris</i>	Fieldfare	Sch 1; CR(b); RL; SBL	Winter visitor
<i>Turdus iliacus</i>	Redwing	Sch 1; CR(b); RL; SBL	Winter visitor
<i>Turdus philomelos</i>	Song Thrush	RL; SBL	Resident
<i>Turdus viscivorus</i>	Mistle Thrush	VU(b); RL	Resident
<i>Erithacus rubecula</i>	Robin		Resident
<i>Passer domesticus</i>	House Sparrow	RL; SBL	Resident
<i>Passer montanus</i>	Tree Sparrow	VU(b); RL; SBL	Resident
<i>Prunella modularis</i>	Dunnock	AL; SBL	Resident
<i>Motacilla alba</i>	Pied Wagtail		Resident in wider area; birds overflying site

Scientific name	Common name	Legislative/ conservation status*	Site status
<i>Anthus pratensis</i>	Meadow Pipit	AL	Resident in wider area; birds overflying site and recorded at margins
<i>Fringilla coelebs</i>	Chaffinch		Resident
<i>Fringilla montifringilla</i>	Brambling	Sch 1; SBL	Scarce winter visitor; recorded in village and site
<i>Pyrrhula pyrrhula</i>	Bullfinch	AL; SBL	Resident
<i>Chloris chloris</i>	Greenfinch	EN(b)	Resident
<i>Linaria cannabina</i>	Linnet	EN(b); RL; SBL	Resident in wider area; occasionally seen foraging on site
<i>Acanthis cabaret</i>	Lesser Redpoll	RL; SBL	Resident
<i>Carduelis carduelis</i>	Goldfinch		Resident
<i>Spinus spinus</i>	Siskin	SBL	Resident
<i>Emberiza citrinella</i>	Yellowhammer	RL; SBL	Resident
*Key to Legislative/conservation status			
Ann I – European Protected Species, listed on Annex I			
Sch 1 – Protected species listed on Schedule 1 of the Wildlife and Countryside Act, as amended			
G-NT – Near Threatened on the IUCN Global Red List			
CR – Critically Endangered on UK Red List (Stanbury <i>et al.</i> , 2017)			
EN – Endangered on UK Red List (Stanbury <i>et al.</i> , 2017)			
VU – Vulnerable on UK Red List (Stanbury <i>et al.</i> , 2017)			
NT – Near Threatened on UK Red List (Stanbury <i>et al.</i> , 2017)			
(b) – designation applies to breeding population			
(w) – designation applies to wintering population			
RL – Red-listed species on Birds of Conservation Concern 4 (Eaton <i>et al.</i> , 2015)			
AL – Amber-listed species on Birds of Conservation Concern 4 (Eaton <i>et al.</i> , 2015)			
SBL – Scottish Biodiversity List species of principal importance for the purpose of conserving biodiversity			

Table A3.3: Invertebrate species recorded on site

Scientific name	Common name	Comments
BUMBLEBEES		
<i>Bombus hortorum</i>	Garden Bumblebee	2019 Bioblitz
<i>Bombus lucorum</i>	White-tailed Bumblebee	2019 Bioblitz
<i>Bombus pascuorum</i>	Common Carder Bee	2019 Bioblitz
<i>Bombus pratorum</i>	Early Bumblebee	2019 Bioblitz
<i>Bombus sylvestris</i>	Forest Cuckoo-bee	2019 Bioblitz
<i>Bombus terrestris</i>	Buff-tailed Bumblebee	2019 Bioblitz
BUTTERFLIES		
<i>Aglais io</i>	Peacock	M. Harding (2019)
<i>Aglais urticae</i>	Small Tortoiseshell	M. Harding (2019)
<i>Anthocharis cardamine</i>	Orange-tip	M. Harding (2019)
<i>Aglais urticae</i>	Small Tortoiseshell	M. Harding (2019)
<i>Pieris napi</i>	Green-veined White	M. Harding (2019)
<i>Pieris rapae</i>	Small White	M. Harding (2019)
<i>Polyommatus icarus</i>	Common Blue	M. Harding (2019)
<i>Vanessa cardui</i>	Painted Lady	M. Harding (2019)
MOTHS		
<i>Hepialus hecta</i>	Gold Swift	M. Wilson (2019-20)
<i>Hepialus fusconebulosa</i>	Map-winged Swift	M. Wilson (2019-20)
<i>Euthrix potatoria</i>	The Drinker	M. Wilson (2019-20)
<i>Idaea aversata</i>	Riband Wave	M. Wilson (2019-20)
<i>Idaea biselata</i>	Small Fan-footed Wave	M. Wilson (2019-20)
<i>Scotopteryx chenopodiata</i>	Shaded Broad-bar	M. Wilson (2019-20)
<i>Xanthorhoe designate</i>	Flame Carpet	M. Wilson (2019-20)
<i>Xanthorhoe montanata</i>	Silver-ground Carpet	M. Wilson (2019-20)
<i>Epirrhoe alternata</i>	Common Carpet	M. Wilson (2019-20)
<i>Eulithis pyraliata</i>	Barred Straw	M. Wilson (2019-20)
<i>Ecliptopera silaceata</i>	Small Phoenix	M. Wilson (2019-20)
<i>Colostygia pectinataria</i>	Green Carpet	M. Wilson (2019-20)
<i>Hydriomena furcata</i>	July Highflyer	M. Wilson (2019-20)
<i>Perizoma alchemillata</i>	Small Rivulet	M. Wilson (2019-20)
<i>Eupithecia assimilate</i>	Currant Pug	M. Wilson (2019-20)
<i>Eupithecia trisignaria</i>	Triple-spotted Pug	M. Wilson (2019-20)
<i>Eupithecia pusillata</i>	Juniper Pug	M. Wilson (2019-20)
<i>Chloroclystis v-ata</i>	V-Pug	M. Wilson (2019-20)
<i>Lomaspilis marginate</i>	Clouded Border	M. Wilson (2019-20)
<i>Epione repandaria</i>	Bordered Beauty	M. Wilson (2019-20)
<i>Chiasmia clathrate</i>	Latticed Heath	M. Wilson (2019-20)
<i>Crocallis elinguaris</i>	Scalloped Oak	M. Wilson (2019-20)
<i>Peribatodes rhomboidaria</i>	Willow Beauty	M. Wilson (2019-20)
<i>Alcis repandata</i>	Mottled Beauty	M. Wilson (2019-20)
<i>Cleorodes lichenaria</i>	Brussels Lace	M. Wilson (2019-20)
<i>Bupalus piniaria</i>	Bordered White	M. Wilson (2019-20)
<i>Cabera exanthemata</i>	Common Wave	M. Wilson (2019-20)
<i>Campaea margaritata</i>	Light Emerald	M. Wilson (2019-20)
<i>Laothoe populi</i>	Poplar Hawkmoth	M. Wilson (2019-20)
<i>Deilephila elpenor</i>	Elephant Hawkmoth	M. Wilson (2019-20)
<i>Pterostoma palpina</i>	Pale Prominent	M. Wilson (2019-20)
<i>Phalera bucephala</i>	Buff-tip	M. Wilson (2019-20)

Scientific name	Common name	Comments
<i>Cybosia mesomella</i>	Four-dotted Footman	M. Wilson (2019-20)
<i>Spilosoma lubricipeda</i>	White Ermine	M. Wilson (2019-20)
<i>Axylia putris</i>	Flame	M. Wilson (2019-20)
<i>Ochropleura plecta</i>	Flame Shoulder	M. Wilson (2019-20)
<i>Agrotis exclamationis</i>	Heart and Dart	M. Wilson (2019-20)
<i>Noctua pronuba</i>	Large Yellow Underwing	M. Wilson (2019-20)
<i>Noctua janthe</i>	Lesser Broad-bordered Yellow Underwing	M. Wilson (2019-20)
<i>Noctua comes</i>	Lesser Yellow Underwing	M. Wilson (2019-20)
<i>Diarsia mendica</i>	Ingrailed Clay	M. Wilson (2019-20)
<i>Diarsia rubi</i>	Small Square-spot	M. Wilson (2019-20)
<i>Xestia baja</i>	Dotted Clay	M. Wilson (2019-20)
<i>Xestia triangulum</i>	Double Square Spot	M. Wilson (2019-20)
<i>Xestia sexstrigata</i>	Six-striped Rustic	M. Wilson (2019-20)
<i>Naenia typica</i>	Gothic	M. Wilson (2019-20)
<i>Cerapteryx graminis</i>	Antler Moth	M. Wilson (2019-20)
<i>Mythimna pallens</i>	Common Wainscot	M. Wilson (2019-20)
<i>Mythimna impura</i>	Smoky Wainscot	M. Wilson (2019-20)
<i>Rusina ferruginea</i>	Brown Rustic	M. Wilson (2019-20)
<i>Apamea monoglypha</i>	Dark Arches	M. Wilson (2019-20)
<i>Oligia strigilis</i> agg.	Marbled Minor agg.	M. Wilson (2019-20)
<i>Oligia fasciunculua</i>	Middle-barred Minor	M. Wilson (2019-20)
<i>Mesapamea secalis</i> agg.	Common Rustic agg.	M. Wilson (2019-20)
<i>Photedes minima</i>	Small Dotted Buff	M. Wilson (2019-20)
<i>Chortodes pygmina</i>	Small Wainscot	M. Wilson (2019-20)
<i>Hydraecia micacea</i>	Rosy Rustic	M. Wilson (2019-20)
<i>Autographa pulchrina</i>	Beautiful Golden Y	M. Wilson (2019-20)
<i>Autographa gamma</i>	Silver Y	M. Harding (2020)
<i>Diachrysia chrysis</i>	Burnished Brass	M. Wilson (2019-20)
<i>Abrostola tripartite</i>	Spectacle	M. Wilson (2019-20)
<i>Rivula sericealis</i>	Straw Dot	M. Wilson (2019-20)
<i>Yponomeuta evonymella</i>	Bird-cherry Ermine	M. Wilson (2019-20)
<i>Paraswammerdamia albicapitella</i>		M. Wilson (2019-20)
<i>Ypsolopha sequella</i>	Pied Smudge	M. Wilson (2019-20)
<i>Blastobasis lacticolella</i>		M. Wilson (2019-20)
<i>Agonopterix nervosa</i>		M. Wilson (2019-20)
<i>Metzneria metzneriella</i>		M. Wilson (2019-20)
<i>Acleris effractana</i> agg.		M. Wilson (2019-20)
<i>Nesophaleroptera nubilana</i>		M. Wilson (2019-20)
<i>Pandemis cerasana</i>	Barred Fruit-tree Tortrix	M. Wilson (2019-20)
<i>Pandemis heparana</i>	Dark Fruit Tree Tortrix	M. Wilson (2019-20)
<i>Bactra lancealana</i>		M. Wilson (2019-20)
<i>Orthotaenia undulana</i>		M. Wilson (2019-20)
<i>Celypha rufana</i>		M. Wilson (2019-20)
<i>Celypha lacunana</i>	Dark Strawberry Tortrix	M. Wilson (2019-20)
<i>Epinotia nisella</i>		M. Wilson (2019-20)
<i>Eucosma cana</i>		M. Wilson (2019-20)
<i>Gypsonoma dealbana</i>		M. Wilson (2019-20)
<i>Aphomia sociella</i>	Bee Moth	M. Wilson (2019-20)
<i>Scoparia ambigualis</i>		M. Wilson (2019-20)
<i>Eudonia lacustrata</i>		M. Wilson (2019-20)

Scientific name	Common name	Comments
<i>Eudonia pallida</i>		M. Wilson (2019-20)
<i>Eudonia mercurella</i>		M. Wilson (2019-20)
<i>Chrysoteuchia culmella</i>		M. Wilson (2019-20)
<i>Agriphila straminella</i>		M. Wilson (2019-20)
<i>Catoptria margaritella</i>		M. Wilson (2019-20)
<i>Catoptria falsella</i>		M. Wilson (2019-20)
<i>Acentria ephemerella</i>	Water Veneer	M. Wilson (2019-20)
<i>Elophila nymphaeata</i>	Beautiful China Mark	M. Wilson (2019-20)
<i>Udea lutealis</i>		M. Wilson (2019-20)
<i>Udea prunalis</i>		M. Wilson (2019-20)
OTHER INVERTEBRATES		
<i>Oedothorax gibbosus</i>	Spider sp.	2019 BioBlitz
<i>Walckenaeria acuminata</i>	Spider sp.	2019 BioBlitz
<i>Nebria brevicollis</i>	Ground beetle sp.	2019 BioBlitz
<i>Auchomenus dorsalis</i>	Ground beetle sp.	2019 BioBlitz
<i>Agonum fuliginosum</i>	Ground beetle sp.	2019 BioBlitz
<i>Pterostichus nigrita/rhaeticus</i>	Ground beetle sp.	2019 BioBlitz
<i>Anacaena globulus</i>	Water scavenger beetle sp.	2019 BioBlitz
<i>Platybunus triangularis</i>	Harvestman sp.	2019 BioBlitz
<i>Metellina menzei</i>	Orb weaver sp.	2019 BioBlitz
<i>Metelina segmentata</i>	Orb weaver sp.	2019 BioBlitz
<i>Pardosa pullata</i>	Wolf spider sp.	2019 BioBlitz
<i>Porrhomma pygmaeum</i>	Spider sp.	2019 BioBlitz
<i>Quedius sp.</i>	Rove beetle sp.	2019 BioBlitz
<i>Leistus terminatus</i>	Ground beetle sp.	2019 BioBlitz
<i>Bembidion guttula</i>	Ground beetle sp.	2019 BioBlitz
<i>Sitona lineatus</i>	True weevil sp.	2019 BioBlitz
<i>Sitona sp.</i>	True weevil sp.	2019 BioBlitz
<i>Phyllobius pomaceus</i>	True weevil sp.	2019 BioBlitz
<i>Anacaena globulus</i>	Water scavenger beetle sp.	2019 BioBlitz

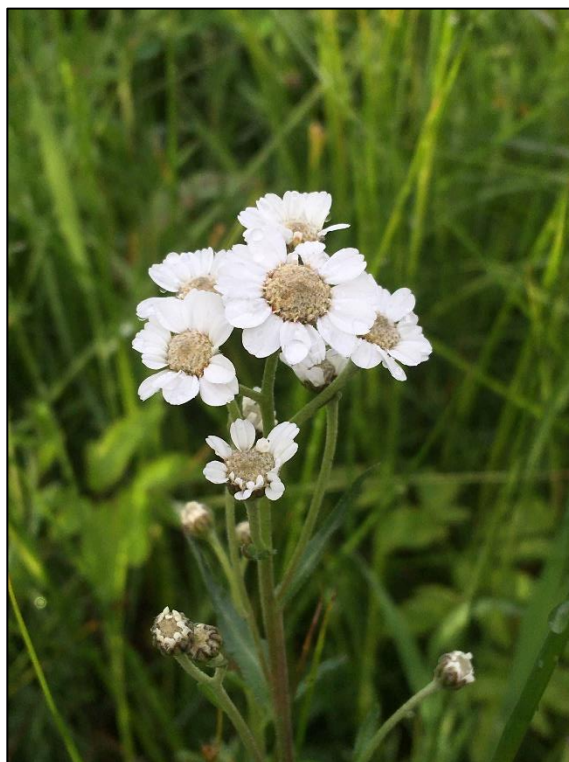
Appendix 4: Photographs



Greater Butterfly-orchid (*Platanthera chlorantha*), left, and Northern Marsh-orchid (*Dactylorhiza purpurella*) right



Heath Spotted-orchid (*Dactylorhiza maculata*), left, and Common Spotted-orchid (*Dactylorhiza fuchsii*), right



Greater Bird's-foot-trefoil (*Lotus pedunculatus*), left, and Sneezewort (*Achillea ptarmica*), right



Ragged-Robin (*Silene flos-cuculi*), left, and Tufted Vetch (*Vicia cracca*), right



Honeysuckle (*Lonicera periclymenum*), left, and Marsh Cinquefoil (*Comarum palustre*), right



Yellow Loosestrife (*Lysimachia vulgaris*)