Wildlife Trust for Beds, Cambs & Northants

The Wellcome Trust Genome Campus, Hinxton

Baseline Biodiversity Assessment

November 2022

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1. Introduction

1.1 Background

In 2021, the Wellcome Trust launched a 10-year Sustainability Plan for the Genome Campus. Within this plan sits a target to increase biodiversity on the campus by 25%. The Wildlife Trust BCN was commissioned by The Wellcome Trust, to carry out an ecological assessment of the Genome Campus as it is and to provide recommendations for how the biodiversity value of the site can be increased.

The current ecological value of the habitats has been assessed and reported in the Preliminary Ecological Appraisal Aug 2022 and the accompanying Baseline Biodiversity Metric Report: Habitat Units Calculation Oct 2022.

In order to monitor changes in the biodiversity, The Wildlife Trust BCN has been commissioned to undertake a suite of surveys to establish the baseline status of key faunal groups. This report sets out the methodology and results of these initial surveys with the intention of them being repeated at the end of the Sustainability Plan period to determine net increase or decrease in biodiversity.

1.2 Site Location

The Wellcome Trust Genome Campus is a 52 hectare site in the parish of Hinxton in South Cambridgeshire. It is bound by the London Liverpool Street to Cambridge railway line to the west, sewage works and farmland to the south, the A1301 to the east and Hinxton village to the north. The River Cam passes through the western edge of the Campus. The Campus is centred at grid reference TL 498 445.

1.3 Site Description

The Genome Campus was officially opened in 1994 and is now home to the Wellcome Sanger Institute, EMBL-EBI and the Wellcome Trust Conference Centre. Hinxton Hall was built in 1748 and today hosts conferences, events and weddings throughout the year. The grounds are reminiscent of its history as a rural retreat with large parkland trees in expansive grasslands leading to open water. The Campus has expanded its scientific remit a great deal over the years and consequently new facilities have been built to accommodate this. In 2005 the Wetlands nature reserve was created as part of a large building project on the Genome Campus. The reserve is 6.3 hectares to the south-west of the central Campus. It is bounded by the River Cam to the east and the railway line to the west. The site was created to act as a natural flood attenuation mechanism and alongside this function, has matured into a natural area for all to enjoy and a hotspot for wildlife on the Campus.

Today, the campus buildings are interspersed with greenspaces including formal lawns, plantation woodland, flower beds, lakes and ditches.

Approximately 2,600 people work on the Campus and the footpaths are well-used for walking and jogging. There are also grassland areas for recreational sport. A permissive footpath in the western area connects the Campus to the neighbouring villages of Ickleton and Hinxton.

2. Focus of Surveys

The aim of this commission is to gather baseline data on targeted groups of species that will act as strong indicators of the ecological value of the campus site. As habitats across the campus are modified, the wildlife will respond either in a positive or negative way. The groups chosen occupy a range of ecological niches and have different requirements in terms of habitat and food. They also represent different abilities to range over large distances and the longevity of individuals will show in the speed of a group's response to changes in habitats.

The surveys will target the following groups:
Amphibians
Aquatic Invertebrates
Bats
Birds
Pollinators

3. Limitations

The surveys were designed to capture a snapshot of biodiversity on the campus and the aim was not to record everything present. Therefore, some species that use the campus outside of the survey period were not recorded e.g. over-wintering birds.

The surveys were conducted during a drought year when water levels on the Wetland nature reserve were unusually low. This meant that a relatively small area of water could be surveyed for aquatic invertebrates and amphibians. This was less of a limitation on the campus as the waterbodies are managed to retain a constant water level.

4. Amphibian Survey

4.1 Methodology

All ponds on the campus and Wetland were surveyed in accordance with current best practice guidance. Working in pairs, surveyors walked slowly around the accessible perimeter of each waterbody, recording any amphibians seen in the torchlight. Other species seen, including invertebrates, were also recorded, as an indication of the health and quality of the aquatic habitat. It was not deemed necessary to use bottle-traps for newts as this would cause undue disturbance.

Each pond was visited on four evenings between April and May 2022. Torchlight surveys commenced at a minimum of 30 minutes after sunset, but on most survey occasions this was extended, particularly on clear nights, to ensure that it was dark enough for newts to be active. Air temperatures were above 5ºC on all surveys, as measured by a thermometer brought to the site on each survey.

Common frogs and Common toads tend to be active during the daytime and earlier in the year, therefore waterbodies were checked for these species outside of the night-time surveys on 15th, 17th and 21st March 2022.

In order to give an indication of the relative abundance of species, population counts were made. The surveys were conducted using Eagtac DX30LC2-SR torches with 790 lumen output. Great Crested Newts have previously been recorded on campus and surveys were supervised by Laura Osborne who holds a Natural England licence to surveys for Great Crested Newt (licence 2016-20131-CLS-CLS).

Water bodies were numbered according to the map in Appendix A.

4.2 Results

Date	Water Body No.	Smooth Newt		Common Frog	Common Toad	Other
		Male	Female			
27/04/22	1	3	4	0	0	SN seen egg laying Water scorpion, water beetle larvae, caddisfly larvae
	2	0	0	0	0	Caddisfly larvae, Ramshorn snail
	3	0	0	0	0	Clear water
	4	0	2	0	0	Algae on submerged leaves, turbid water Water boatmen
	5	0	0	0	0	Almost dry
	6	3	6	0	0	Water scorpion, water beetles, pond snails
	7	0	0	0	0	Reedbed, no visible open water
	8	0	0	0	0	Reedbed, no visible open water
10/05/22	1	0	0	0	0	
	2	0	0	0	0	
	3	0	0	0	0	
	4	0	0	0	0	
	5	0	0	0	0	Dried out
	6	0	0	0	0	
	7	0	0	0	0	Reedbed, no visible open water
	8	0	0	0	0	Reedbed, no visible open water
18/05/22	1	0	0	0	0	
	2	0	0	0	0	
	3	0	0	0	0	
	4	0	0	1	0	
	5	0	0	0	0	Dried out
	6	0	12	1	0	
	7	0	0	0	0	Reedbed, no visible open water
	8	0	0	0	0	Small section of open water found 2 Dytiscidae water beetles seen
26/05/22	1	0	0	0	0	
	2	0	0	0	0	
	3	0	0	0	0	
	4	0	0	0	0	
	5	0	0	0	0	Dried out
	6	0	0	0	0	Water levels dropped so open water inaccessible
	7	0	0	0	0	Reedbed, no visible open water
	8	0	0	0	0	Reedbed, no visible open water

No amphibians were observed during the daytime surveys.

4.3 Discussion

Smooth newt and common frog were the only amphibian species observed during these surveys. Smooth newts were found in water bodies 1, 4 and 6 on the same night with a total count of 19 individuals. The greatest count of smooth newts was 12 females in the large wetland pond (waterbody 6) on 18th May.

Single common frogs were observed in waterbodies 4 and 6 on 18th May. The peak breeding season for common frogs is February/March so it is not expected to find many individuals late in the season as they disperse soon after breeding. The ditches on campus held water in February/March but had dried out by the summer. They were checked during daytime visits in March and no amphibians were observed. If the water levels could be retained for longer in the year then the ditches would be more valuable as a breeding site for amphibians.

Fountains are present in water bodies 1, 2 and 4 and, although they were turned off during the survey sessions, they cause constant movement of the water at other times and this is not preferred conditions for amphibians. The purpose of the fountains is not clear – they are often believed to improve water quality. Pond ecosystems are a delicate balance between animals, plants and the environment. The Wetland ponds are rain-fed and not closely managed and have achieved their own balance that supports many species of animal and plant and has good water quality. Rather than employ mechanical means of changing the balance, the ponds could be managed sympathetically to enhance them for wildlife.

The water bodies on the Wetland nature reserve have well established zones of submerged and emergent vegetation providing good shelter for amphibians. The varied habitat structure attracts many invertebrates which are amphibians' main food source. The two smaller ponds are dominated with Common Reed and have small areas of open water in the centre. The dense reed limits growth of submerged plants and therefore there are few places for newts to lay their eggs in these ponds, however they are a valuable part of the habitat mosaic on the Wetland and amphibians will use the ponds even if they don't breed there.

All of the waterbodies, except number 4, have good terrestrial habitat surrounding them. Amphibians seek damp, dark areas such as long grass, woodlands, log piles and marginal vegetation to shelter them from predators, protect them from the sun and heat and to provide food. Waterbody 4 is surrounded by close mown grass and has a limited amount of marginal vegetation. It also supports a large population of Carp and attracts a Grey Heron regularly; these predators have undoubtedly had an impact on the number of amphibians present.

Waterbody 5 is filled from run-off from the Ickleton Road and therefore does not have good water quality. It is also very shaded by trees and has a deep layer of leaf litter and silt in the base. Drying out early in the year, the dirty water and lack of aquatic plants makes this pond unsuitable for amphibians in its current condition.

5. Aquatic Invertebrates

5.1 Methodology

Aquatic invertebrates are short-lived creatures that are greatly affected by their environment. For these reasons they are good indicators of the quality and condition of waterbodies and have been selected for baseline assessment. Many flying insects (mosquitos, mayflies, damselflies) have aquatic larvae and therefore surveying the waterbodies will also provide information on the food supply for bats and birds.

Aquatic invertebrates is an enormous group and requires a high level of knowledge to identify creatures to species level. However, for the purposes of this project, identification to family level is sufficient to provide information on the composition of the invertebrate community giving an indication of the water quality and condition of habitats.

The perimeter of the waterbodies was sampled using a pond net with 0.5mm gauge mesh bag. Each sample was taken by gently disturbing the sediment and vegetation in the water and sweeping through the water. All accessible perimeter was sampled with areas of diverse vegetation targeted. The catch was immediately examined in trays and creatures returned to the water. Only water beetles were preserved and taken from site for identification to species level.

Waterbodies 1, 2, 3, 4 and 6 were sampled on 28th September 2022. It was not possible to sample pond 5 as it was dry and ponds 7 and 8 were densely vegetated so inaccessible. It's likely that they had also dried out due to the summer drought.

The family groups were assigned a letter according to their abundance:

A = 1-10 individuals
B = 11-100 individuals
C = 101-1000 individuals
D = 1001+ individuals

The Biological Monitoring Working Party (BMWP) scoring system was applied as a means of assessing water quality using the families present in each waterbody. Each family is assigned a value from 1 to 10 depending on its known tolerance of organic pollution, a higher score indicates a lower tolerance. From this, an Average Score Per Taxon (ASPT) was calculated.

Water bodies were numbered according to the map in Appendix A.

5.2 Results

Aquatic invertebrates were sampled from a total of 39 families across the 5 waterbodies (see Table 1 below). Pond 2 had the greatest diversity with 23 families recorded whereas pond 4 had the lowest diversity and 16 families represented. Pond 4 had the highest ASPT score, 5.4.

Waterbody #	**1**	**2**	**3**	**4**	**6**
BMWP	58.5	81.2	58.7	53.9	48.7
ASPT	4.5	5.1	4.9	5.4	4.1
Families	19	23	17	16	18

Table 1: Aquatic Invertebrate Survey Results 2022

Common Name	Family Name (species)	WB# 1	WB# 2	WB# 3	WB# 4	WB# 6
Flatworm	Dugesiidae		A	A	A	
Flatworm	Planariidae (Polycelis)	A				
Snail	Bithyniidae	A	A	A		
Snail	Lymnaeidae	A	A	B		B
Snail	Planorbidae	A				A
Snail	Valvatidae			B		
Limpet	Acroloxidae	A	A		A	
Mussel	Sphaeriidae		B			
Worm	Oligochaeta	B				
Leech	Glossiphoniidae		A		A	A
Leech	Piscicolidae				A	
Crustacean, water hoglouse	Asellidae	B	B	A		B
Crustacean, shrimp	Crangonyctidae	B	B	A		A
Crustacean, seed shrimp	Ostracoda		A	A		A
Mayfly	Baetidae	C	C	B	B	C
Mayfly	Caenidae		A		B	
Mayfly	Ephemeridae			A		
Mayfly	Leptophlebidae	A	A	B	B	
Damselfly	Calopterygidae		A			
Damselfly	Coenagrionidae	B	B	A	A	B
Dragonfly	Anisoptera (sub-order)					A
Bug, Water boatman	Corixidae			A		
Bug, Pond skater	Gerridae					A
Bug, Water measurer	Hydrometridae				A	
Bug, Water boatman	Micronectidae	B	B	D	B	B
Bug, Saucer bug	Naucoridae					A
Bug, Water stick insect	Nepidae (Ranatra linearis)	A				
Bug, Water boatman	Notonectidae (Notonecta glauca)					A
Beetle	Dytiscidae (Colymbetes fuscus)	A				
Alderfly	Sialidae		A	A		
Caddisfly	Hydropsychidae		A			
Caddisfly	Leptoceridae	A	A		A	A
Caddisfly	Limnephilidae		A	A		
Fly	Ceratopogonidae		A	A	A	A
Fly, non-biting midge	Chironomidae	B	B		C	A
Fly, mosquito	Culicidae	B			A	
Fly, hoverflies	Syrphidae		A			
Water Flea	Daphniidae	D	D	D	D	C
Water Mite	Hydrachnidia	A			A	B

Specimen water beetles and bugs were taken from waterbodies 1, 4 and 6 for identification to species level. This data is not yet available. Each of the sampled species was present in low numbers (1-10 individuals).

5.3 Discussion

This survey of campus aquatic invertebrates has provided an indication of the water quality and habitat condition. The results were assigned a score according to the creatures' tolerance of organic pollution, however there was very little difference between the waterbodies. All waterbodies were shown to support invertebrates known for their low tolerance of pollution and therefore the evidence suggests that water quality is good. Indeed the ponds all had clear

water with no obvious signs of contamination, except waterbody four. This lake contains a large population of Carp and consequently the water is turbid and submerged plants are covered in algae. However, on this site organic pollution seems to have a lesser influence than the structure of the habitat and predation on the presence of aquatic invertebrates. Fish are aggressive predators that can greatly reduce the biomass in a waterbody. In this case waterbody 4 supports 16 families, slightly fewer than nearby waterbodies, and the number of individuals is very low. Aquatic invertebrates are highly mobile, most capable of flying as adults, so with many families present on site it is not too surprising that some find themselves in the less than optimal waterbody even if they can't establish a healthy population there.

The quality of the aquatic habitat has a strong influence on the species present. Waterbodies with a diverse range of plants in marginal, emergent, submerged and floating positions offer more niches for creatures to exploit. Submerged plants not only help with increasing the dissolved oxygen levels but also provide cover for creatures and protection from predation. Unfortunately fish often consume submerged plants thus removing this element of the habitat.

The waterbodies on campus have a uniform character – deep centre, steep sides and relatively stable water level. A body of deep water with few plants will not support many species in comparison to a shallow pond rich with plants and with a fluctuating water level. Changes in the water level result in a drawdown zone or muddy edges to the pond which is a haven for burrowing invertebrates and consequently a good source of food for birds. The Wetland ponds have a better profile and the water level does fluctuate a great deal throughout the year. Unfortunately the invasive *Crassula helmseii* has dominated the base of the large pond and formed a lawn across the drawdown zone thus limiting the value of this area. The systematic vegetation clearance on the Wetland is helping to create open areas and promote natural regeneration. A similar approach is required for waterbodies 1 and 2 as the marginal vegetation (mostly branched bur-reed, reed canary-grass and bulrush) has hidden the pond edge and out-competed any smaller growing plants.

The ideal solution to providing this habitat, would be to create a series of small waterbodies at the northern end of the campus. These ponds would be shallow, fed by rainwater and contain a diversity of plants. Locating them at the northern end would reduce the risk of contamination by *Crassula helmseii* from the Wetland. It is recognised that waterbodies that occasionally dry out are far better for wildlife than those that retain water permanently. The process of drying out is a check on predator levels and therefore maintains a well-balanced ecosystem.

Whilst surveying waterbodies 1 and 2, it was observed that the perimeter of the pond wasn't loose sediment but in fact a man-made material such as coir. Coir is often used when planting aquatic plants and, although it helps to stabilise the new plants, it does create an artificial base that is not as permeable to wildlife. If any aquatic plants are to be introduced to site through habitat enhancements, the means of doing this and future consequences must be considered.

It is recommended that the waterbodies are surveyed for aquatic invertebrates a few times per year in order to target different seasons and different water levels. The Wetland ponds were very low during this survey and consequently only a small area could be sampled. It is expected that this part of the site would generate data representative of what could be found elsewhere on site if the habitats are improved.

6. Bats

6.1 Methodology

Bats use high-frequency echolocation calls for navigation and to find food. These calls can be heard with the use of hand-held bat detectors as used on guided bat walks on the campus. Previous visits to the campus and Wetland have provided an indication of where bats are most active however, to date, no overnight survey has been conducted. This survey aims to address that gap in knowledge and to explore areas of the campus not covered by previous visits.

Six Audiomoth static recording devices were used to undertake the monitoring for this taxa. The units turn themselves on 15 minutes before sunset and turn themselves off 15 minutes before sunrise and record any high frequency sounds during that period. These recordings are downloaded and, using Audiomoth software, the high frequency sounds are converted to sonograms. These sonograms are used to identify what species of bat are present on site and an index for the population can be formulated from the frequency of calls and feeding sounds. These are particularly valuable for those areas where changes in management have been suggested.

The Audiomoths were positioned on trees on the campus for 4-5 nights at a time. There were two recording periods, 29th July to 3rd August and 30th September to the 4th October 2022. The weather during each recording period was dry and warm.

12 locations were chosen across the campus and Wetland (see map in Appendix B). They were chosen to cover habitats where management changes are likely to occur and sites where management will continue as is. These latter sites will provide any evidence of general changes in bat populations throughout the campus and the local area rather than specifically related to interventions. It should be noted that all of the recording and monitoring on the campus should not be seen in isolation as the surrounding landscape will affect the biodiversity of the campus and vice versa.

6.2 Results

Due to technical issues no data was collected on the two recording sessions that took place.

6.3 Discussion

The failure to record any data is disappointing and the survey will be repeated next year in order to obtain the baseline information. Using the equipment has prompted a review of the survey methodology and a revised schedule is proposed. Every month from April to September the Audiomoth equipment will be put out on site at the 12 points already selected, with each point surveyed every other month. This will generate 3 sets of data for each point. This data will provide a greater understanding of the population of bats found on site and also how the different habitats are used by these bats. From previous evening walks, we know that the following species use the site – Soprano Pipistrelle, Common Pipistrelle, Noctule, Serotine and Daubenton's bat.

Bats are great indicators for habitat quality – their insect prey species are quick to respond to changes in habitats and this is reflected by the presence and behaviour of bats. Bats are long-lived (approximately 15-20 year lifespan) and can adapt to the availability of resources between years. As insect-rich habitat is lost, the bats may find they have to travel further from the roost to feed and this can be up to 10km for Noctule and Daubenton's bats. The greater the abundance and diversity of invertebrates within the landscape, the greater the opportunity bats have for finding food without having to travel too far. This reduction in flying means a

reduction in potential predation and an increase in the health of the individual bat. This in turn reduces individual mortality, and for females, increases the successful weaning of pups. Within the Campus the freshwater habitats, the ponds and the river with adjacent bankside vegetation, contain the greatest potential for large numbers of invertebrates. Managing these features to increase invertebrate populations will greatly enhance the value of these sites for bats, as well as many other species. The bats that use the campus for foraging do not necessarily also roost on campus and therefore increased food supply on campus will support the bat population in the local area. The nearby villages of Hinxton and Ickleton contain many older buildings and churches with suitable roosting sites for bats.

In the breeding season (April-August) bat populations consist of females forming maternity roosts, with males roosting singly or in loose groups. The maternity roosts consist of pregnant or lactating females that move to different suitable roosting sites throughout the season, to exploit different food sources in other areas and to reduce predation and parasites within the roost sites. This main aggregation will split and reform throughout the season, using different roost sites and different feeding areas. The continued provision of these existing roosts and the establishment of new ones is key to maintaining and increasing the local bat population.

Provision of roosting sites within trees and buildings on campus is relatively high. A bat roost is essential whether it is for one sole male or a maternity roost of several hundred. The retention and appropriate management to prolong the life of trees with potential roost features is essential for the bat populations within the campus and the surrounding area.

There are already a good number of maturing trees around the campus that provide many features that show suitability for a bat roost. A landscape with ample suitable roosting opportunities and habitats rich in invertebrate abundance and diversity will support a healthy population of a number of different species of bats.

The campus has a good array of habitats (of varying quality) so the potential for feeding bats is already quite high. It may be that even with changes in invertebrate diversity and abundance there is no marked increase in bat populations. It will be interesting to see, over the years, if there is anything limiting the bats populations of the campus and surrounding area.

7. Birds

7.1 Methodology

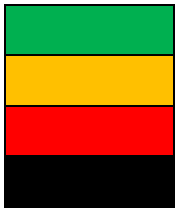
The survey of birds on campus was undertaken following the BTO/JNCC/RSPB Breeding Bird Survey (BBS) methodology. This involves walking a transect through the campus 15 minutes after sunrise, between mid-April and early-June. This is done twice during the time period. The survey took place on 3rd May and 31st May 2022. The transect route (shown in Appendix C) covered a variety of habitats on the campus and Wetland Nature Reserve and was 3.9km in length.

Whilst walking the transect at an even pace, all birds that were seen or heard were noted down and where possible their behaviour recorded. Observed behaviours included flying overhead, singing, carrying food and feeding fledged young. The aim of the survey was to determine how many species use the campus for breeding. The noting of fledged young is obviously the best indicator, but this can be difficult to record. The number of singing males (this indicates a potential breeding territory) is used as the baseline number. Doing this on two separate dates increases the chances of observing the more elusive species and covers different points of the breeding season when behaviours will vary i.e. surveying early in the season will pick up more singing males whereas a later visit could witness fledged young.

The inclusion of the Conservation Concern Status in the results table is to show the status of bird populations in Britain as detailed in the report Birds of Conservation Concern 5. The designation highlights declines in both breeding and wintering populations of the 250 species native to Britain. There are various matrices which bird species are classified against. For simplicity it can be generalised as Red list species have declined by >50%, Amber list species declined by 25-50%, Green list species declined by <25%, stable or increasing population.

7.2 Results

LEGEND



Green – Species population slight decrease, stable or increasing

Amber – Species population in moderate decline

Red – Species population in severe decline

Black – Feral, non-native species

P – The species was recorded during the survey, but was not displaying territorial or breeding behaviour ie. singing. carrying food, feeding young

The numbers in columns 3 and 4 indicate the number of singing males recorded on each survey visit.

Species	Latin	03/05/22	31/05/22	Breeding	Conservation Concern status	Comments
Mallard	Anas platyrhynchos	P		Possible		Resident population on the larger water bodies
Pheasant	Phasianus colchicus	1		Possible		Recently released birds
Stock Dove	Columba oenas	P	P	Probable		No doubt breeds within suitable holes within trees on campus
Woodpigeon	Columba palumbus	4	5	Probable		A ubiquitous species in wooded areas
Collared Dove	Streptopelia decaocto	P		Probable		Not noted in great frequency.
Moorhen	Gallinula chloropus	P	P	Young seen		Young were seen in the northern pond.
Coot	Fulica atra	P				Recorded from the larger pond in the Wetlands
Little Grebe	Tachybaptus ruficolli	1		Probable		Has bred in the larger pond in the Wetlands in the past
Kingfisher	Alcedo atthis	P				Breeding site known just outside campus boundary along the river.
Great Spotted Woodpecker	Dendrocopos major	P	P	Probable		Suitable trees present to support breeding on campus.
Green Woodpecker	Picus viridis	P	P	Probable		Suitable trees to support breeding and anthills to support feeding on campus and Wetland.
Magpie	Pica pica	P	P	Probable		Sufficient habitat on campus to support breeding.
Jackdaw	Coloeus monedula	P	1	Probable		Sufficient trees to support breeding on campus.
Rook	Corvus frugilegus	4	P	Young heard begging from nests		Rookery with 5+ nests in trees between the Sulston Laboratories and the Morgan Building.
Carrion Crow	Corvus corone	P	P	Probable		Sufficient habitat on campus to support breeding.

Coal Tit	Periparus ater	1		Possible		Found in coniferous trees north east of the Hall
Blue Tit	Cyanistes caeruleus	P		Young seen		Ubiquitous in woodland and scrub areas
Great Tit	Parus major	7		Young seen		Ubiquitous in woodland and scrub areas
Sedge Warbler	Acrocephalus schoenobaenus		1	Possible		Suitable habitat present but species becoming scarcer nationally.
Reed Warbler	Acrocephalus scirpaceus	3	3	Probable		Sufficient habitat on the Wetlands and adjacent to the railway
Swallow	Hirundo rustica	P				Uses site for feeding. Breeds in Ickleton
Chiffchaff	Phylloscopus collybita	6	4	Probable		Sufficient breeding habitat on campus
Long-tailed Tit	Aegithalos caudatus	P	1	Probable		Sufficient breeding habitat on campus
Blackcap	Sylvia atricapilla	12	11	Probable		Sufficient breeding habitat on campus
Whitethroat	Curruca communis	4	6	Probable		Suitable habitat present on site but will disappear as habitat matures. Requires early successional scrub/regrowth. Coppicing in plantation woodlands will help.
Treecreeper	Certhia familiaris	1	1	Probable		Sufficient trees to support breeding on campus.
Wren	Troglodytes troglodytes	23	24	Probable		Ubiquitous throughout campus where scrub and thick vegetation found, but no evidence of breeding recorded.
Starling	Sturnus vulgaris	P	P	Possible		There are suitable trees for nesting, but no nests were noted during the survey.
Mistle Thrush	Turdus viscivorus	2	1	Probable		Suitable habitat on campus.
Song Thrush	Turdus philomelos	6	3	Probable		Plenty of suitable habitat on campus.
Blackbird	Turdus merula	2	7	Probable		Plenty of suitable habitat on campus.
Robin	Erithacus rubecula	14	11	Probable		Plenty of suitable habitat on campus.

Dunnock	Prunella modularis	3	4	Probable		Plenty of suitable habitat on campus.
Pied Wagtail	Motacilla alba	P	P	Probable		The buildings provide substantial nesting and feeding opportunities
Chaffinch	Fringilla coelebs	1	4	Probable		Plenty of suitable habitat on campus.
Greenfinch	Chloris chloris	2	4	Probable		Plenty of suitable habitat on campus.
Linnet	Linaria cannabina	P	2	Possible		Suitable habitat for nesting present on site but will disappear as habitat matures. Similar requirements to Whitethroat above. Disturbed ground is valuable for feeding so is essential for this to be created on Campus.
Goldfinch	Carduelis carduelis	1	2	Probable		Plenty of suitable habitat on campus.
Reed Bunting	Emberiza schoeniclus		1	Probable		Habitat on the Wetlands but being lost to succession. The current scrub and tree clearance in the Wetlands is not sufficient at keeping succession at bay.

The survey recorded a total of 39 species including 4 from the Red List and 11 from the Amber List of Conservation Concern and 1 feral species.

7.3 Discussion

This survey was undertaken to gather baseline data on bird species present prior to any changes to habitat management. It is not intended to record every bird on site but rather it is setting up an index of bird species/number, to be compared in future years. The two visits were a snap shot in time and just because evidence of breeding was not recorded for many species, this does not mean that pairings were not successful. For example, the large number of singing Wren but no evidence of breeding does not mean that no young were raised on campus. It is highly likely that a large number of juvenile were fledged.

The surveys did not, and would not, record all of the bird species that use the site as part of their breeding territory. For example, there were no birds of prey recorded. Kestrel (amber), Sparrowhawk (amber), Common Buzzard (green) and Red Kite (green) are regularly recorded over the campus and will no doubt use the relevant habitats to look for prey. In some years, parts of the woodland around campus could well be used for nesting as the habitat is suitable.

The timing of the survey also reduces the chance of recording certain species that feed on flying insects. These insects will not become active until later in the day, when the air

temperature increases. The most notable of these species are House Martin (red) and Swift (red). There are no suitable nesting sites for these two species on campus but there are relatively healthy breeding populations in Hinxton and adults, and later juveniles, regularly feed over the campus.

The mix of bird species recorded is what would be expected on a site in this part of the lowlands with the habitats present. A similar survey carried out 20-30 years ago may well show a considerable change in species assemblage, as well as abundance of those species. Bird populations can change rapidly due to habitat changes or stochastic events and the species themselves being relatively easy to see/hear and to identify make them very valuable as indicators for the general quality of habitats.

The fortune of most, if not all, breeding species on Campus will be determined not just by the quality of habitats found on site but by those found in the immediate surrounding landscape and also the condition of habitats in their wintering grounds and on their migrations routes. Swallows (green) over-winter in southern Africa so rely on habitats far beyond the influence of The Wellcome Trust. There will not be one bird that would not move outside of the campus boundary during their life.

That is where having the 'traffic light' system for each species helps understand the severity in change over recent years beyond the campus boundary. The survey recorded a total of 4 red and 11 amber species out of a total of 39 species. All of these 15 listed species would have been considered common 30 or more years ago, but due to continued habitat loss affecting breeding and feeding, these once common species are declining. It shows how important the campus and its habitats are for local bird populations.

Increasing the habitats' structure and complexity across the campus will provide greater opportunities for bird species to find suitable habitat. One example is regular coppicing within the plantation woodlands. This will provide suitable habitat to encourage Willow Warbler (amber) back as a breeding species on Campus. It breeds in young, dense scrub growth/regrowth and has been severely declining in lowland Britain.

However, creating the habitat may not guarantee the appearance of the desired species. The Turtle Dove (red) has been recorded on campus in recent years and requires scrub to nest in. There is plenty of scrub of suitable structure but the population has declined nationally so much (98% in the past 30 years) that the chances of a Turtle Dove finding the campus is severely reduced.

It should be noted that the campus is also valuable for wintering birds, something that this survey is unable to record. Certain species will stay throughout the year on campus and greater numbers of resident species will also make use of the campus as they move south to survive the winter months, whether for food or for roosting sites. The commoner (and more obvious) species in this group are the thrushes, Redwing (amber), Fieldfare (red), Blackbird (green) and Song Thrush (amber). Finch numbers are boosted by wintering Siskin (green) and Redpoll (red) making use of the seeds of alder and birch, primarily on The Wetlands but also throughout the Campus. Water Rail (green) and Woodcock (red) make use of The Wetlands and wooded areas respectively in Winter. The beds of marshy vegetation within The Wetlands have been valuable winter roosting sites for a number of bunting species, notably Reed Bunting (amber).

Increasing the amount of insect life within the campus will provide a greater food source for breeding birds (most species found on site are insectivores). Relatively small changes to the habitat management approaches will also provide greater nesting opportunities for certain species. But it should be again noted that the species number and composition is greatly

influenced by the surrounding landscape as well as those habitats in far distant lands. No amount of positive management work can help if the surrounding landscape is devoid of similar habitats. That is why it is essential to constantly look beyond the boundaries of the campus to the surrounding landscape to see how species fare. If possible there needs to be partnership work throughout the surrounding landscape encouraging landowners/managers to work together to improve feeding and breeding habitats for birds. In doing this the needs of many other species will be met.

8. Pollinators

8.1 Methodology

To generate a baseline assessment for the pollinators on site, the Flower-Insect Timed Count methodology from the UK Pollinator Monitoring Scheme (POMS) was used. This is a nation-wide scheme gathering data from around the country and therefore the findings could contribute to a wider survey.

These counts focus on a number of plots across the site that are monitored for 10 minutes at a time between 1 April and 30 September. Each plot is 50x50cm and should contain a target plant species from the POMS list such as White Clover, Dandelion or Black Knapweed. The surveyor records the number of the target plant in the plot and any pollinators that interact with that plant species. It uses relatively crude classification of pollinators in order not to require expert knowledge - honey bee, bumble bee, wasp, solitary bee, solitary wasp, hoverfly, 'other' fly, beetle and bug. The counts take place in good weather, that is when it is dry and with an air temperature of at least 13°C in sunny conditions or at least 15°C when cloudy.

This method was planned for 10 plots though-out the site, in different habitats, including the more formal beds, and through-out the season. It would be repeated 3 times.

8.2 Results

Unfortunately, it was found that this method of surveying pollinators was not producing the quality of data that could be used as a baseline for the campus. The methodology was chosen because it provided a means of engaging the public (employees and local parishioners), with no expertise and was a recognised approach. This monitoring, done thousands, if not tens of thousands, of times throughout Britain would produce a very useful amount of data. This wasn't the case for the campus and therefore no results are available.

8.3 Discussion

The value of invertebrate pollinators and the public's understanding of their value has increased enormously within recent years. And with good reason, they are essential for all terrestrial plant-based ecosystems.

Unfortunately, after anticipating that this method of surveying would be successful, it was discovered that it would not produce suitable data for the intended result. It is now clear that the method is more suited to a larger scale survey where broad trend data is useful.

Walking around the campus in Summer can give an indication of where the pollinators are concentrated – in the flower-rich Wetlands rather than the shown grass lawns. However, the value of the ditches near the car parks is not clear. These ditches are regularly mown and support a short wildflower turf suitable for many invertebrates. Similarly, the value of the

flower beds is not fully understood. Further survey work will focus on building up data on the range of habitats across the site including those with less obvious value for pollinators.

New methodology

8 fixed quadrats are to be selected throughout the campus in locations that will reflect a range of habitats and where management or condition is likely to change and those that will remain the same. It is suggested that they are located as follows: in the grassland north of the conference centre, in the grassland north of the Sulston Building, in the grassland adjacent to the River Cam and Ickleton Road, in a small grassland area near the EBI building, in a formal flower bed, in the dry ditch alongside car park A, in the grassland south of the wooden bridge and on the Wetland. The exact locations will need to be determined on the ground and will be referenced to enable repeat surveys to be conducted.

The quadrats will be 2m by 2m and monitored monthly from April to September. There will be two recording periods 10am -1pm and 1pm – 4pm. In order to record species with differing activity periods, each quadrat will be monitored 2 times a day. To take into account time to travel between plots, each monitoring session will be for 18 minutes. At the end of the season each quadrat will have been monitored 12 times for a total of 216 minutes. Please see below the suggested start times for each quadrat.

	Recording Session Start Time	
Quadrat	Session 1	Session 2
1	10.00	13.00
2	10.22	13.22
3	10.44	13.44
4	11.06	14.06
5	11.28	14.28
6	11.50	14.50
7	12.12	15.12
8	12.34	15.34

Monitoring will take place when ambient temperature is at least 13°C and sunny. If the weather is cloudy but the temperature is at least 15°C the monitoring can go ahead.

Only invertebrates that visit a flower for a second or longer (indicating a feeding event) will be recorded. The different categories of invertebrate to be recorded are as follows; butterflies, bumblebees, solitary bees, hoverflies, flies, day-flying moths and other invertebrates. The 'other invertebrates' will include beetles, hemipteran (true bugs), wasps etc. Honeybees will not be included in the monitoring as the majority of honeybees are artificially housed and there are hives on Campus. They are valuable pollinators but they are not wild pollinators. This level of classification is suitable for non-experts to undertake.

The number and species of flowers will also be recorded for each quadrat on each monitoring day as this will provide context to the invertebrate count data.

The data gained will show general trends in pollinator abundance on campus and specific changes relating to enhancing the campus environment.

One could assume that a site with a large number of different flowering species will support a large number of pollinating insects. This can be the case but as well as food from flowers, insects require somewhere to lay their eggs/build a nest. This is where a suitable area of bare ground/dead wood/hollow bramble stalk becomes essential. Making sure these features are present within the campus is essential if there is to be any improvement in this group of

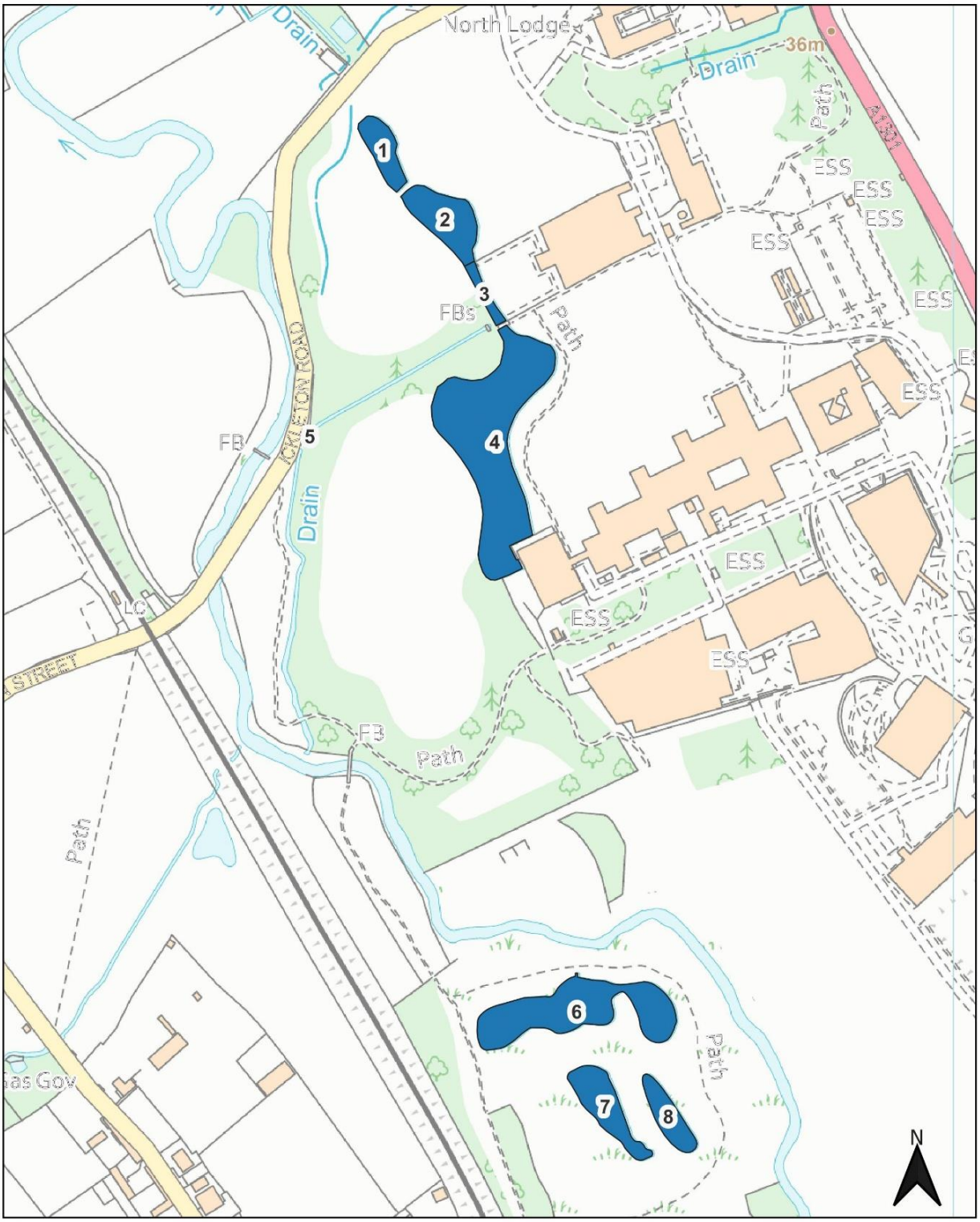
invertebrates. A grassland with varied density and height of the sward and diverse species composition will provide more opportunities for sheltering invertebrates and food for caterpillars and larvae.

9. Future Surveys

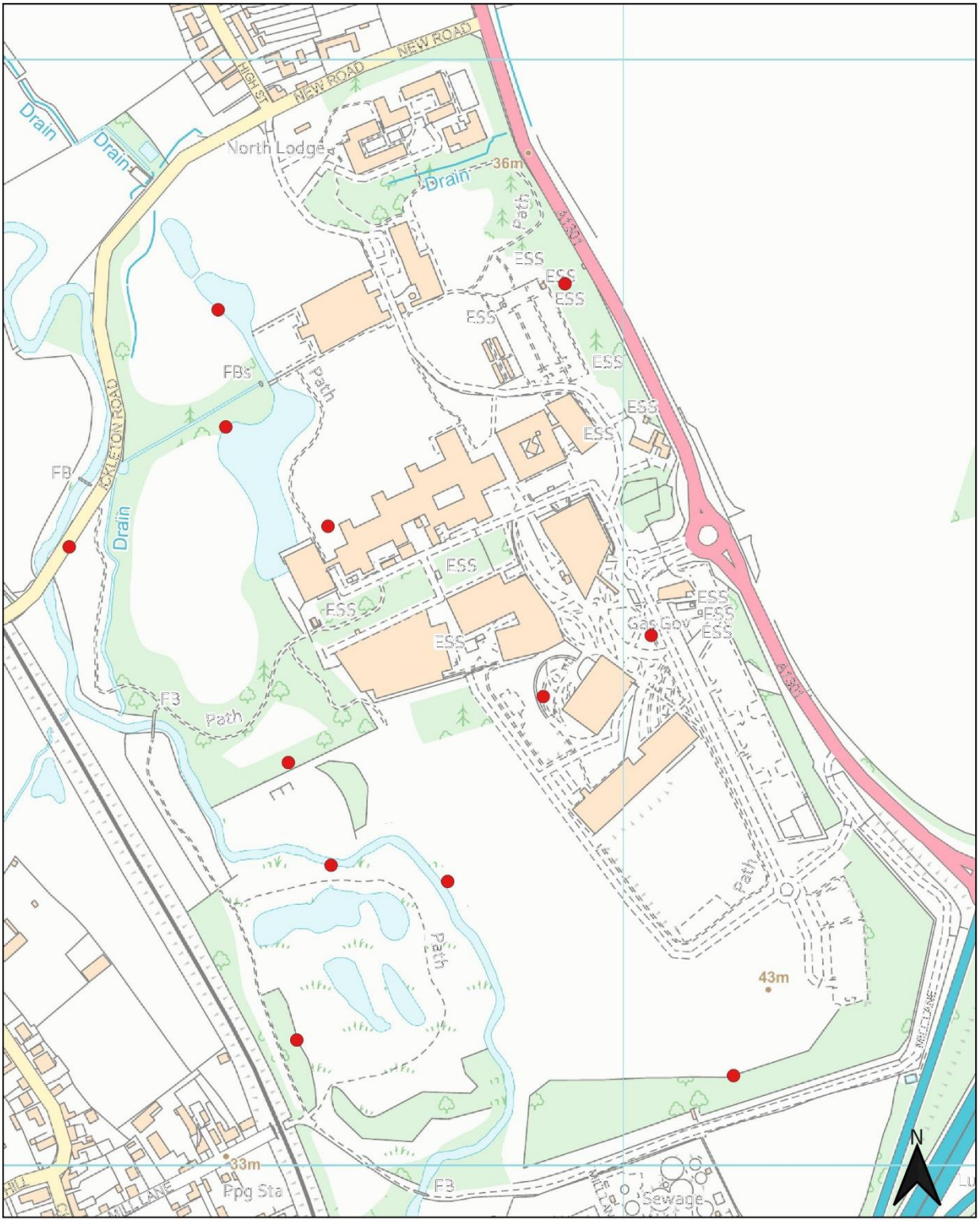
This survey programme has gathered baseline data on some key taxonomic groups for the campus and Wetland environments. It is envisaged that the surveys will be repeated at the end of the Sustainability Strategy period to determine how biodiversity on the site has changed. However, it should not be left until this date to review the status of these groups and adjust habitat management accordingly. In the interim years a scaled down version of the surveys could be undertaken by non-expert individuals such as staff from the campus or local residents. Such volunteers could also be engaged in gathering additional information such as presence of amphibians early in Spring or which species of bird over-winter on site.

Conducting surveys is not just to gather ecological data though, as involving local people will help to educate them about the local environment and its importance in the wider context. This direct contact with nature often inspires people to take further action to benefit themselves and wildlife.

Appendix A: Wellcome Genome Campus Waterbodies Map



Appendix B: Location of Audiomoth Units for Bat Survey



Appendix C: Bird Transect Route Map