love every drop

anglianwater

# Cambridge Waste Water Treatment Plant Relocation Project

Preliminary Environmental Information

**February 2022**

**Biodiversity**

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# Environmental information paper: Biodiversity

## Summary

The Preliminary Environmental Information (PEI) Paper has been produced to identify and understand the likely effects of the Proposed Development on biodiversity.

We have sought to address potential impacts to biodiversity through design (including carefully locating elements of the Proposed WWTP), through reducing the areas of land temporarily required for construction as much as possible, through the development of plans and procedures to govern our activities (as set out within the outline **Code of Construction Practice**) and through a carefully considered mitigation measures including habitat creation as set out within the outline **Landscape Masterplan**. Without these mitigation measures in place there could be significant effects to habitats, protected species and designated sites. Taking into account the measures we have developed, overall there is a **positive impact** on habitats across the Proposed Development.

Potential significant effects to water vole and badger have been identified due to habitat loss in the area of land required for the treated effluent outfall to the River Cam and the area of land required for the proposed waste water treatment plant (WWTP). The activities related to these impacts will controlled by regulatory licences which would be obtained separately to the Development Consent Order (DCO). These licences will include measures to mitigate impacts to these protected species will be developed through the licensing process and coordination with Natural England.

The installation of a section of the Waterbeach pipeline in land located to the east of the existing Cambridge WWTP between the railway and the River Cam there is the potential for the loss of a small area of floodplain grazing marsh. In other sections of the Waterbeach pipeline there may be small losses of hedgerow. All hedgerows removed during construction will be reinstated. The development of a multi-functional Landscape Masterplan includes mitigation for biodiversity impacts and includes the creation of new extents of hedgerow and new woodland and grassland habitats. In addition, we are making use of this location to deliver Biodiversity Net Gain (BNG). Our BNG assessment indicates that the outline **Landscape Masterplan** is expected to comfortably deliver a net gain of at least 20% for both habitat and linear features (hedgerows). We are considering how to minimise impacts to grazing marsh and the river bank and our final net gain calculation for those habitats will be presented as part of our Development Consent Order (DCO) application.

It is hoped that the new landscape and ecology habitat creation design as part of the Proposed Development can be integrated into the Cambridge Nature Network opportunity areas for nature recovery[1]. There is an opportunity for the new habitats to provide a new component and potential extension to the stepping stones, corridors and core areas

[1] The Wildlife Trust for Bedfordshire, Cambridgeshire and Northamptonshire (2021) *The Cambridge Nature Network, A Nature Recovery Network for Cambridge and its Surrounds. Summary Report.* https://www.wildlifebcn.org/sites/default/files/2021-05/CambridgeNatureNetworkSummaryDigitalVersion.pdf

(statutory designated sites) as shown in the Cambridge Nature Network document. The proposed WWTP sits within the drier areas of the southern area of the Wicken Fen Vision[2], which proposed rough grassland, new woodland and coppice belts. The landscape design proposals have incorporated these vision ideas.

The landscape and ecology design will encourage natural colonisation of habitats were possible adjacent to the Low Fen Drove Way Grasslands and Hedges CWS. Refer to the outline **Landscape Ecological and Recreational Management Plan (LERMP)** for additional detail on the **Landscape Masterplan** which provides the vision for the project and will be used later to inform the detailed design.

Similar to the existing Cambridge WWTP outfall the proposed WWTP will return treated effluent to the River Cam. The proposed limits are expected to be beneficial to water quality. Over time the quantity of treated effluent will increase and this increase could locally affect water quality with subsequent effects on aquatic ecology. Discharges to the River Cam will be regulated through permits issued by the Environment Agency, these permits are developed to meet River Quality Objectives (RQO) and through monitoring limits adjust to prevent deterioration such as through increase effluent volumes.

Construction areas and new planting can change the types of wildlife in the area including birds and small mammals. Whilst these changes are generally welcome, they can present a wildlife hazard within areas of land close to airports. In developing our proposals, we will continue to consult with Cambridge Airport operators and will develop an outline **Wildlife Hazard Management Plan** which will be included as part of the application.

Potential significant effects on internationally designated sites such as those mediated through adverse air quality emissions and hydrological connections will be examined in detail through the **Habitat Regulations Assessment (HRA).**

[2] The National Trust Wicken Fen Vision https://nt.global.ssl.fastly.net/wicken-fen-nature-reserve/documents/wicken-fen-vision-strategy-document.pdf

## Document purpose

This Biodiversity environmental information paper identifies changes to biodiversity associated with the construction and operation of the Proposed Development. The paper sets out the preliminary ecological assessment, comprising a review of the existing ecological features and potential impacts and effects on these features. It sets out how the Proposed Development intends to mitigate identified impacts to biodiversity and how it intends to develop proposals to avoid or reduce impacts and to deliver a net gain in biodiversity.

This information paper comprises:

- annotated information on designated sites, habitats, and protected species surveys;
- potential impacts to designated sites, habitats, and protected species during construction;
- potential impacts to designated sites, habitats, and protected species during operation;
- measures to avoid and minimise adverse impacts on biodiversity; and
- potential significant effects.

This information paper refers to other PEI environmental information papers for **Air Quality, Landscape and Visual Amenity, Noise and Vibration**, and **Water Resources**.

## Biodiversity overview

The land required for the construction and operation of our Proposed Development is located in a rural location dominated by arable agricultural activity to the north-east of Cambridge. The area is low lying, predominantly farmland and characterised by arable fields, small pockets of woodland, hedgerows, the River Cam, Black Ditch, Bottisham Lode along with smaller ditches together with developed areas such as roads, pathways, parks, gardens and property.

A study area of varying distances has been defined around the Proposed Development within which we have collected information on designated sites, habitats, and protected species. Information has been collected from existing data sets and from a programme of surveys dating from 2020-2022. The information collected has been used to understand the biodiversity value and study the potential impacts on biodiversity. The Draft Scheme Order Limit is shown within **the PEI Introductory Paper** within the Figure *'Permanent Features of the CWWTPR Project'*

A summary of the preliminary information for biodiversity based on the preliminary information we have acquired is provided below and supported by Figures 1 to 10.

### Internationally and Nationally Designated Sites

Internationally and nationally designated sites such as Ramsar sites, Special Areas of Conservation (SAC) and Sites of Special Scientific Interest (SSSI) within a 10km radius of the Proposed Development are shown in Figure 1.

### Non-statutory designated sites

There are non-statutory designated sites (County Wildlife Sites (CWS) and City Wildlife Sites (CiWS)) within a 5km radius of the Proposed Development as shown in Figure 2.

### Habitats

In general, the Proposed Development is of low ecological value, however, there is a disused railway line known as Low Fen Drove Way Grasslands and Hedges CWS, which borders the south of the Proposed Development. The CWS qualifying features include linear stretches of calcareous grassland and scrub, and species-rich hedgerows.

Extended Phase 1 habitat surveys were undertaken in 2020 and 2021. National Vegetation Classification (NVC) surveys of woodland and grassland were undertaken in 2021.

A summary of priority habitats[3] (previously known as Biodiversity Action Plan (BAP) habitats) within a 100m radius of the Proposed Development is shown in Figure 3 which were developed following completion of habitat surveys conducted during 2020 and 2021 and information from Multi Agency Geographic Information for the Countryside (MAGIC)[4]. In addition, ancient woodland was searched for up to 200m from the Draft Scheme Order

[3] Habitats of Principal Importance under Section 41 of the Natural Environment and Rural Communities Act (NERC) Act 2006

[4] https://magic.defra.gov.uk/

Limits. Invasive Non-Native Plant Species (INNS) were searched for during other vegetative or specie surveys and are referred to in section below.

## Grassland

Initial results of the NVC grassland survey suggest that a Breckland type sandy grassland is present within the existing Cambridge WWTP (there is a known history of Breckland sand having been brought into the area), but there were no associated notable plant species. Floodplain grazing marsh is located east and west of the River Cam within the area of land required temporarily for the Waterbeach pipeline. Semi-improved neutral grassland was recorded along the Low Fen Drove Way Grassland and Hedges CWS. The unimproved calcareous grassland that the CWS is partially designated for was not recorded during our surveys.

## Hedgerow

Hedgerow surveys were undertaken in 2021 on 47 species-rich hedgerows within and adjacent to the Draft Scheme Order Limits to determine if they are classified as important under the Hedgerow Regulations 1997. Initial results indicate that two hedgerows are classified as important under the Hedgerow Regulations. One hedgerow is north of the proposed WWTP and the other 100m north of the area of land required temporarily for the directional drilling locations for the Waterbeach pipeline where it crosses the River Cam. Both hedgerows are outside of the Draft Scheme Order Limits and will not be directly impacted by construction.

## Woodland

Initial results of the NVC woodland survey recorded no notable species (priority species, red-listed, county rare plant register) or ancient woodland indicator species. Areas of woodland included plantation woodland, which does not correspond to a NVC community.

One area of semi-natural woodland on the Waterbeach pipeline route was provisionally assessed as best fitting the NVC woodland community W8e[5]. An additional spring visit in 2022 as part of our survey programme will be required to record woodland ground flora and confirm this assessment.

## Watercourses

The River Habitat Survey (RHS) undertaken on the River Cam was completed along the stretch of the river where the proposed outfall will be located. The river was dominated by no perceptible flow. Flow diversity remained very low. The river condition assessment classified the section of the River Cam as 'Fairly Poor' due to the bank face reinforcement and bank top managed ground cover. Invasive non-native invasive species within the channel have also impacted the classification as Nuttall's waterweed *Elodea nuttallii* was recorded as present.

[5] *Fraxinus excelsior-Acer campestre-Mercurialis perennis* woodland, *Geranium robertianum* sub-community

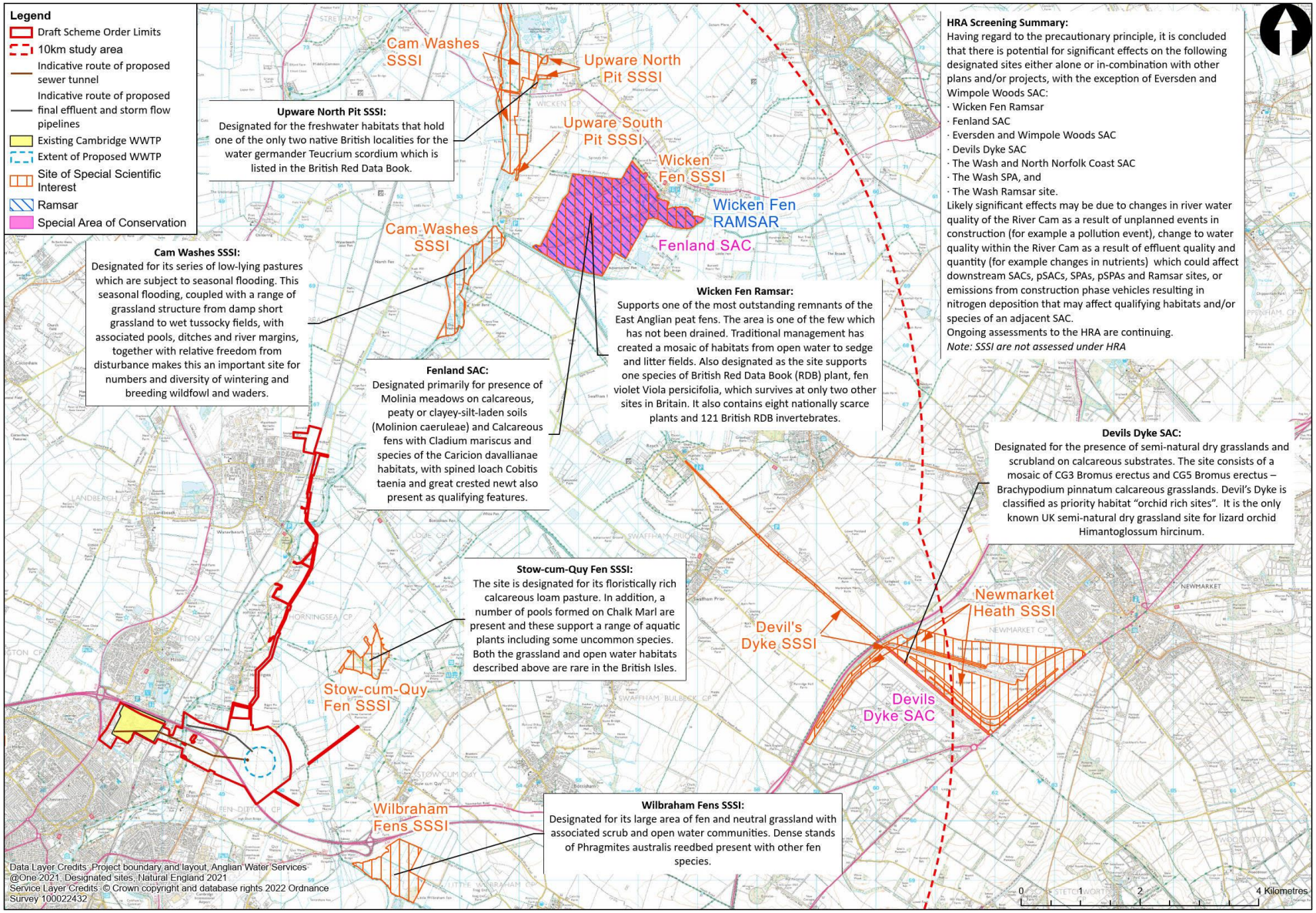


*Figure 1: Internationally and Nationally Designated Sites*

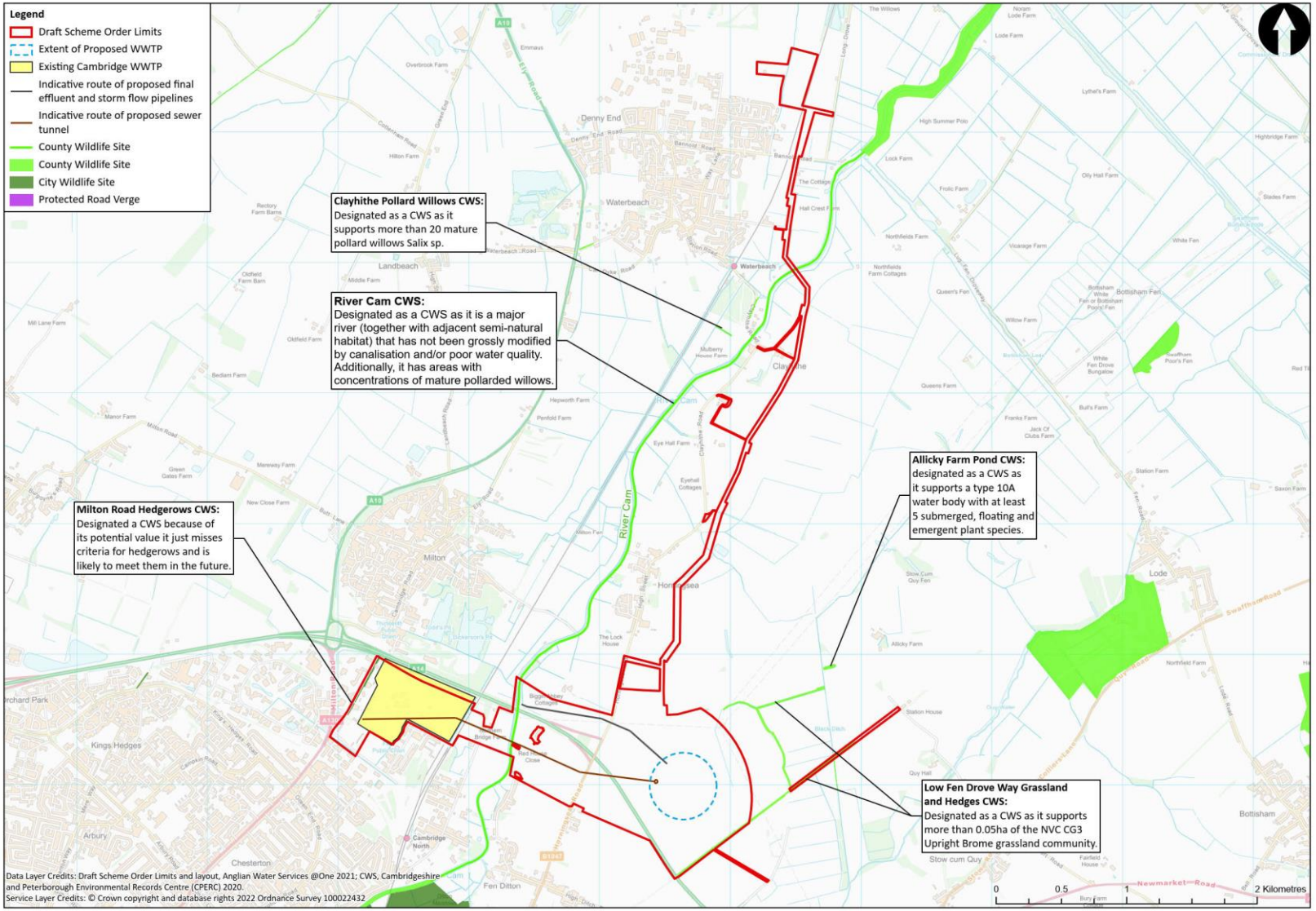


*Figure 2: Non-Statutory Designations*

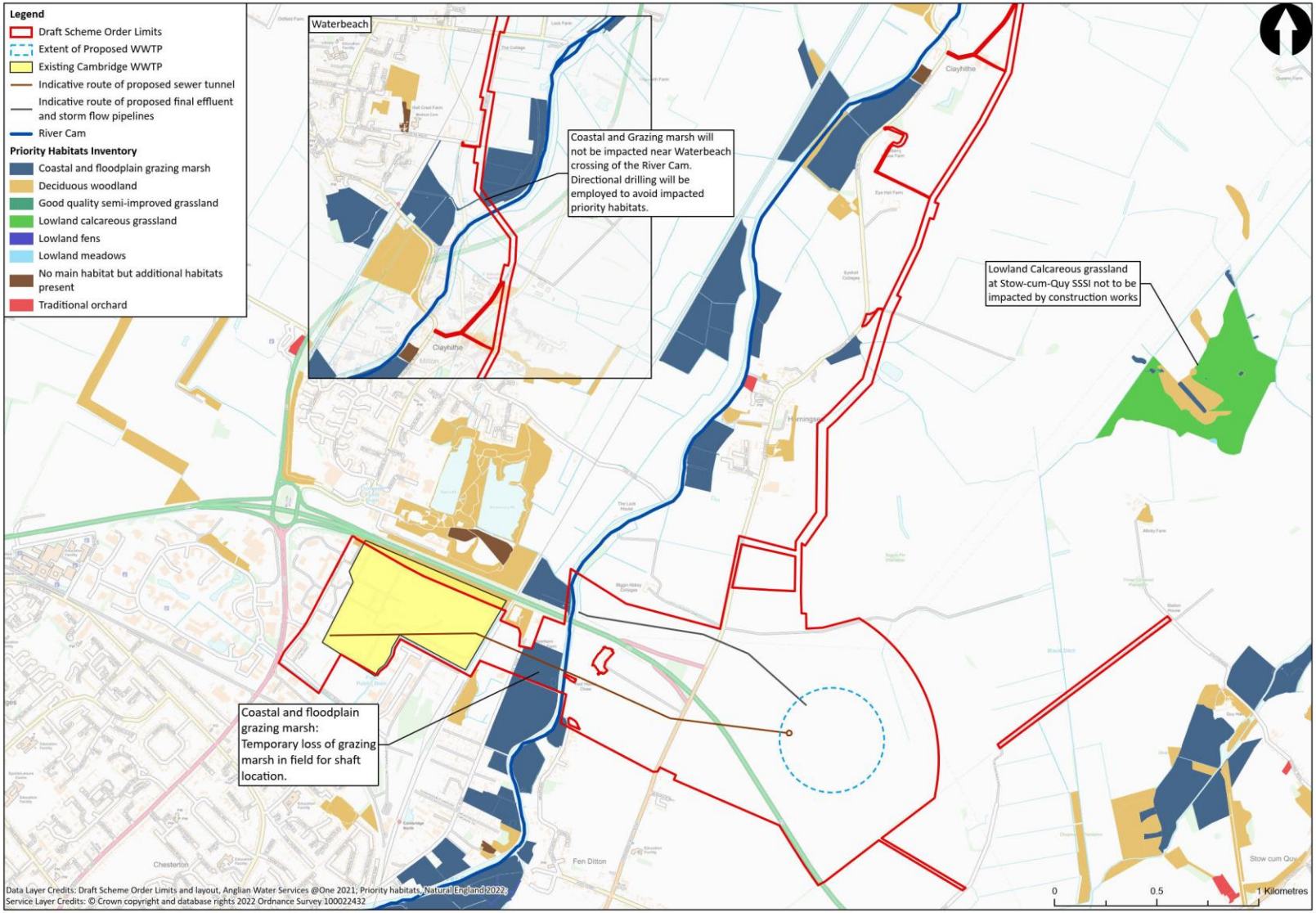


*Figure 3: Priority Habitats*

## Ancient Woodland and Veteran Trees

There are no records of ancient woodland within 200m of the Draft Scheme Order Limits. No potential ancient woodland was identified during the Preliminary Ecological Appraisal (PEA).

Two veteran pedunculate oak (*Quercus robur*) trees were identified east of Horningsea Road within the Waterbeach pipeline route. The location of these veteran trees is shown in Figure 4.

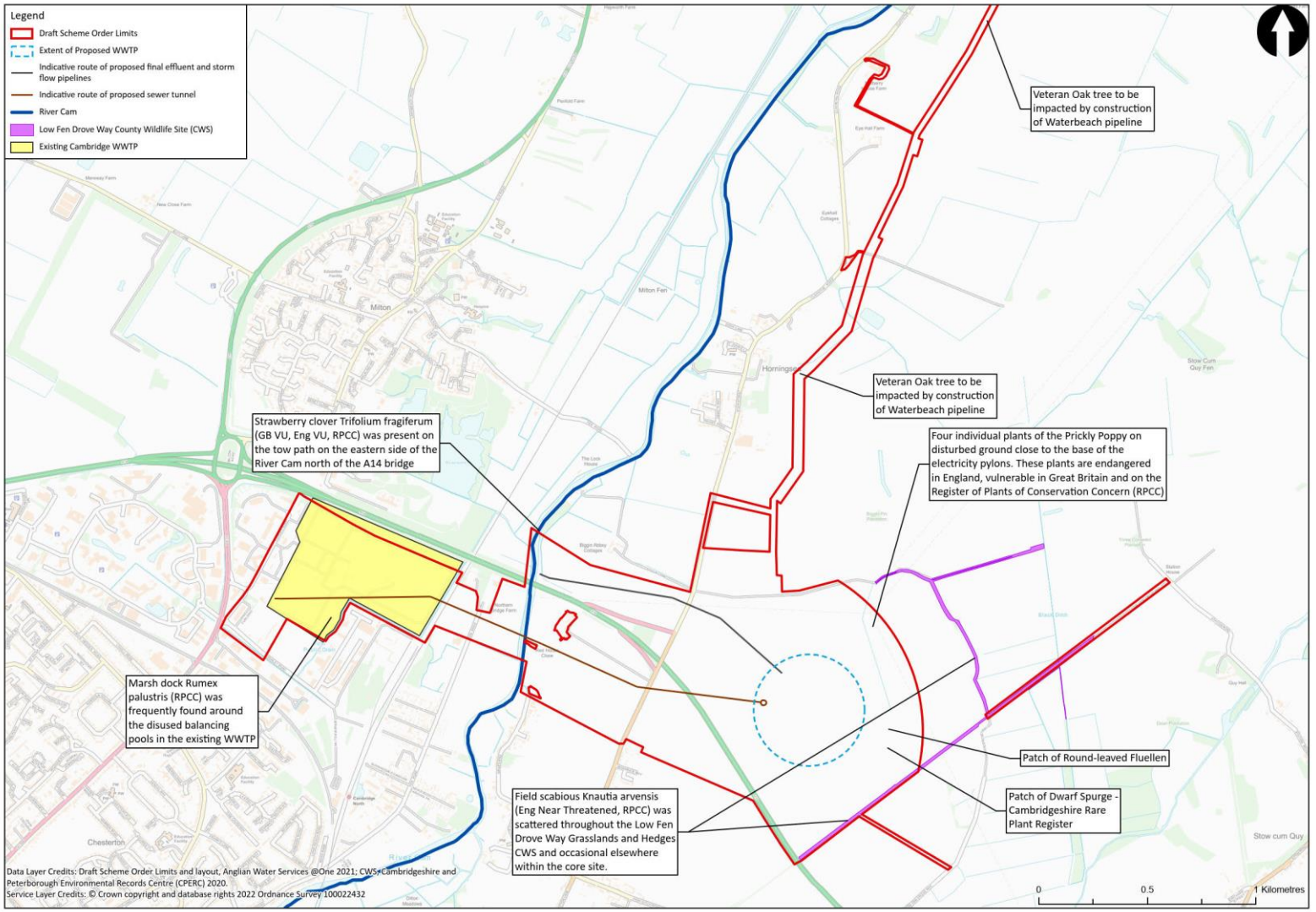


*Figure 4: Notable Plants*

## Protected and notable species

### Bats

Surveys[6] completed in 2021 identified two bat roosts one in each of two different trees.. These roosts have been categorised as pipistrelle (*Pipistrellus* spp.) day roosts and are marked on Figure 5. Any other trees, buildings, or other structures surveyed for bats during the surveys were deemed to be unsuitable for roosting bats.

The static detector and bat activity transect surveys recorded an assemblage of bats comprising common pipistrelle, soprano pipistrelle (*Pipistrellus pygmaeus*), Barbastelle bat (*Barbastella barbastellus*), brown long-eared bat (*Plecotus auritus*), noctule (*Nyctalus noctula*), serotine (*Eptesicus serotinus*), Daubenton's bat (*Myotis daubentonii*) and *Myotis* species. Figure 5 shows the location of the bat roosts, likely foraging and commuting habitat, species of interest, and the bat activity transect and static detector locations.

On the Waterbeach pipeline route and within the survey buffer area, 19 trees were assessed as having high or moderate suitability to support roosting bats during the preliminary bat roost assessment surveys. Of these, three trees were confirmed as bat roosts during the inspections. Two of the trees had natural crevices and the third an artificial bat box and all had evidence of bat droppings. Further surveys on the remaining trees will be undertaken in 2022 when our survey programme is concluded.

### Water Vole

Evidence[7] of water vole (*Arvicola amphibius*) was recorded during our surveys and these are indicated on Figure 6. Surveys were undertaken in optimal survey conditions and timings.

Construction activities, which will affect the River Cam and adjacent ditches where water voles have been recorded will need to be completed under a Natural England licence to legally displace water voles. The licence will require a commitment to the creation of a net gain in habitat suitable for water vole. Figure 7 details potential water vole mitigation and habitat creation areas.

### Otter

Evidence of otter (*Lutra lutra*) was found during surveys in 2021 which included old spraints and feeding remains indicating that otters are using the River Cam and associated ditches but in limited numbers. A single spraint was recorded south of the existing Cambridge WWTP in a ditch off Cowley Road. No breeding locations were recorded on the River Cam and the evidence suggests that otters are only dispersing and foraging along the River Cam in this location. Suitable terrestrial habitat is limited for otter holts around the proposed outfall structure. Figure 6 indicates areas where otter evidence has been found.

[6] Bat surveys included, preliminary bat roost assessment surveys, detailed climbing inspections of trees, dusk emergence and dawn re-entry surveys, bat activity transect surveys, and static detector surveys in optimal survey conditions and timings.

[7] Evidence includes latrines, footprints, burrows, feeding remains, runs.

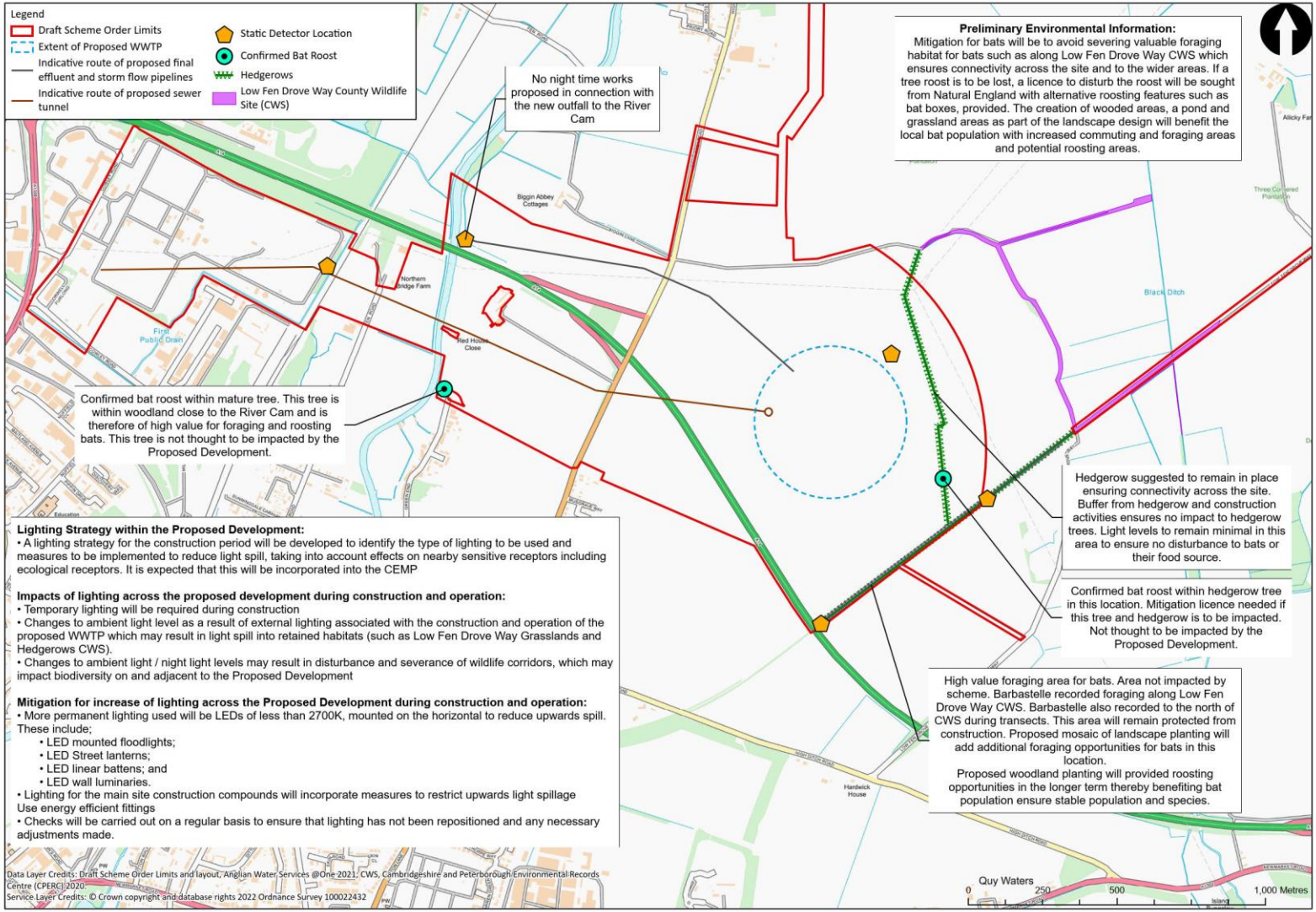


*Figure 5: Bat Activity*

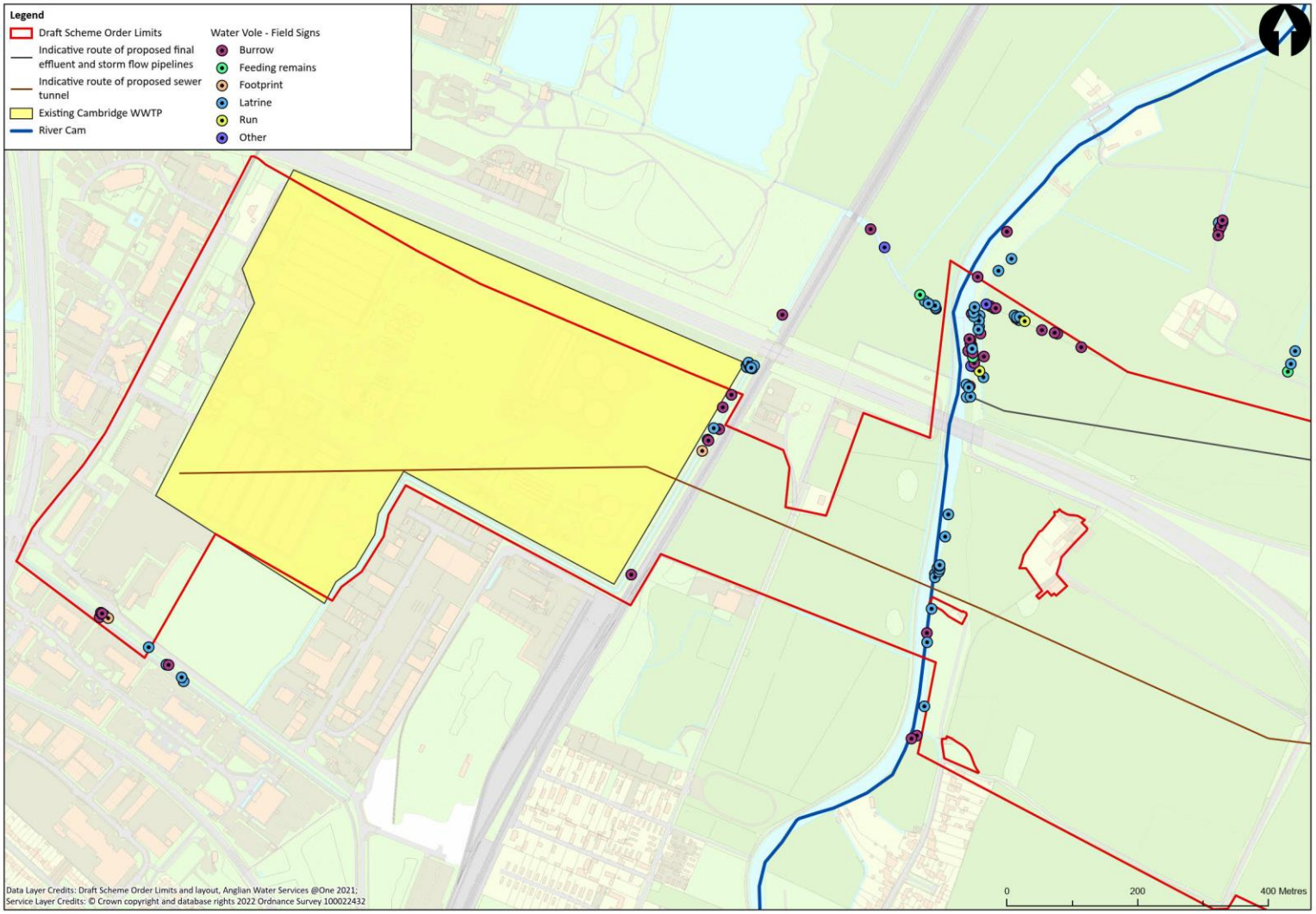


*Figure 6: Water Vole Evidence*

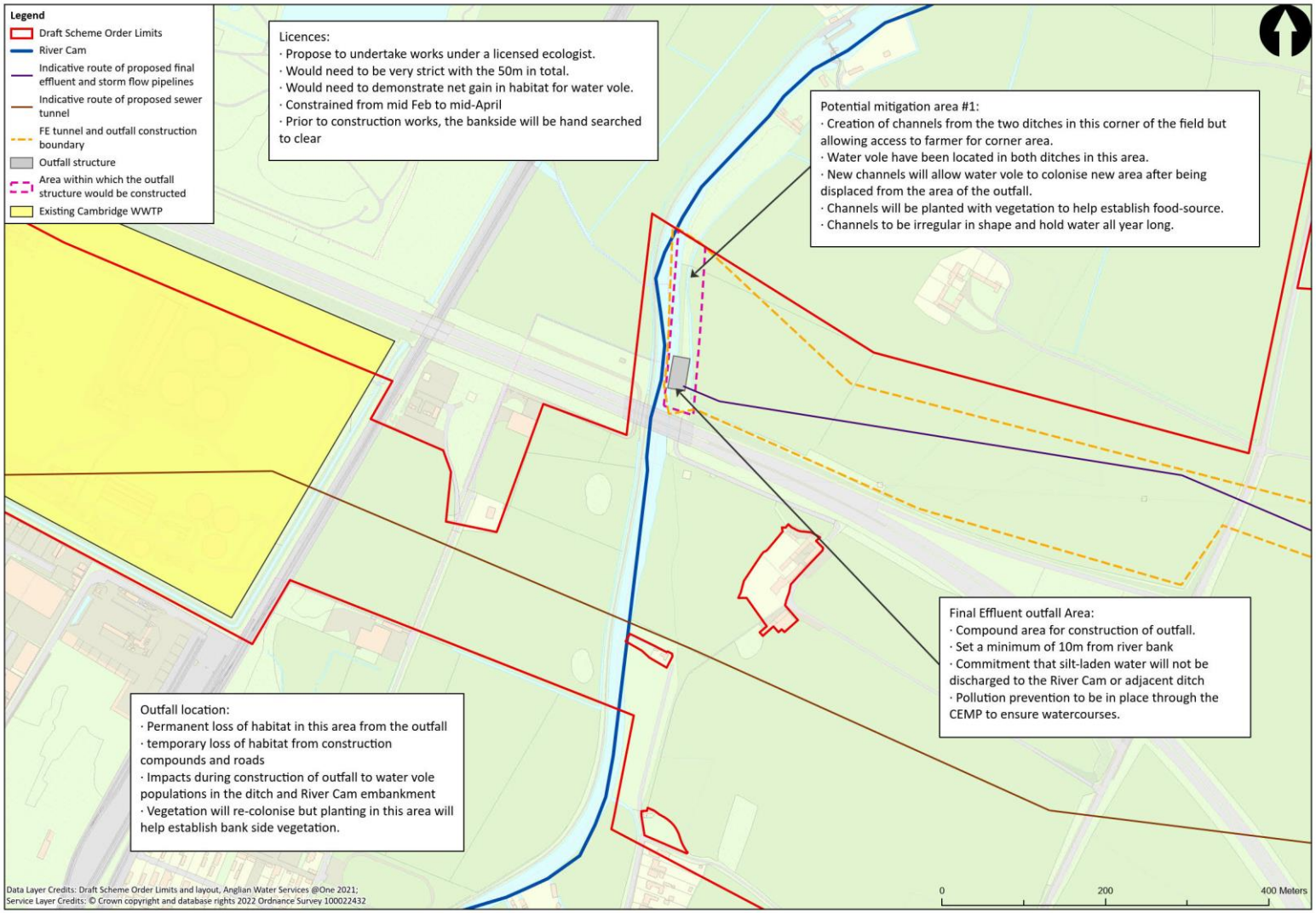


*Figure 7: Water Vole Mitigation*

### Badger

Badger (*Meles meles*) walkover surveys for setts and latrines were conducted in 2020 and 2021 with territorial bait-marking surveys completed in October 2021. Survey information is not publicly available due to sensitivities surrounding the persecution of badgers and no figures will be produced for this report.

### Great Crested Newt

Forty-three waterbodies within the Proposed Development were sampled in 2021 for the presence of great crested newts (GCN) (*Triturus cristatus)* via environmental DNA (eDNA) surveys. The results returned back negative indications for the presence of GCN.

### Reptile

Nine areas within the Proposed Development and one area within the existing Cambridge WWTP were surveyed for reptiles in 2021. Grass snake (*Natrix helvetica*) and common lizard (*Zootoca vivipara*) were recorded in low numbers at two locations. The reptiles were recorded within the Low Fen Drove Way Grassland and Hedges CWS and in a field to the north of the A14 adjacent to the River Cam and proposed outfall structure. Given the low numbers recorded it is likely that the habitats surveyed do not support significant populations of grass snake and common lizard and these species are likely to be dispersing through the habitats surveyed.

High numbers of common lizard were recorded in one location along the Waterbeach pipeline route with a maximum count of 51 during one survey visit and a maximum count of one grass snake in a second location close to the River Cam.

Figure 8 (area of land required for the proposed WWTP, access road, and Landscape Masterplan) and Figure 9 (Waterbeach pipeline corridor north of the proposed WWTP) shows the reptile survey locations and mitigation.

### Schedule 1 Breeding Birds

Breeding bird surveys have been undertaken in 2021, which targeted turtle dove (*Streptopelia turtur*), grasshopper warbler (*Locustella naevia),* barn owl (*Tyto alba*), kingfisher (*Alcedo atthis*) and Cetti's warbler (*Cettia cetti*) in suitable river, hedgerow, scrub, woodland, and building habitats within the Proposed Development.

Schedule 1 bird species recorded within the Proposed Development are shown in Figure 10. (Note that sensitive species will be presented in a confidential appendix to the Environmental Statement (ES)).

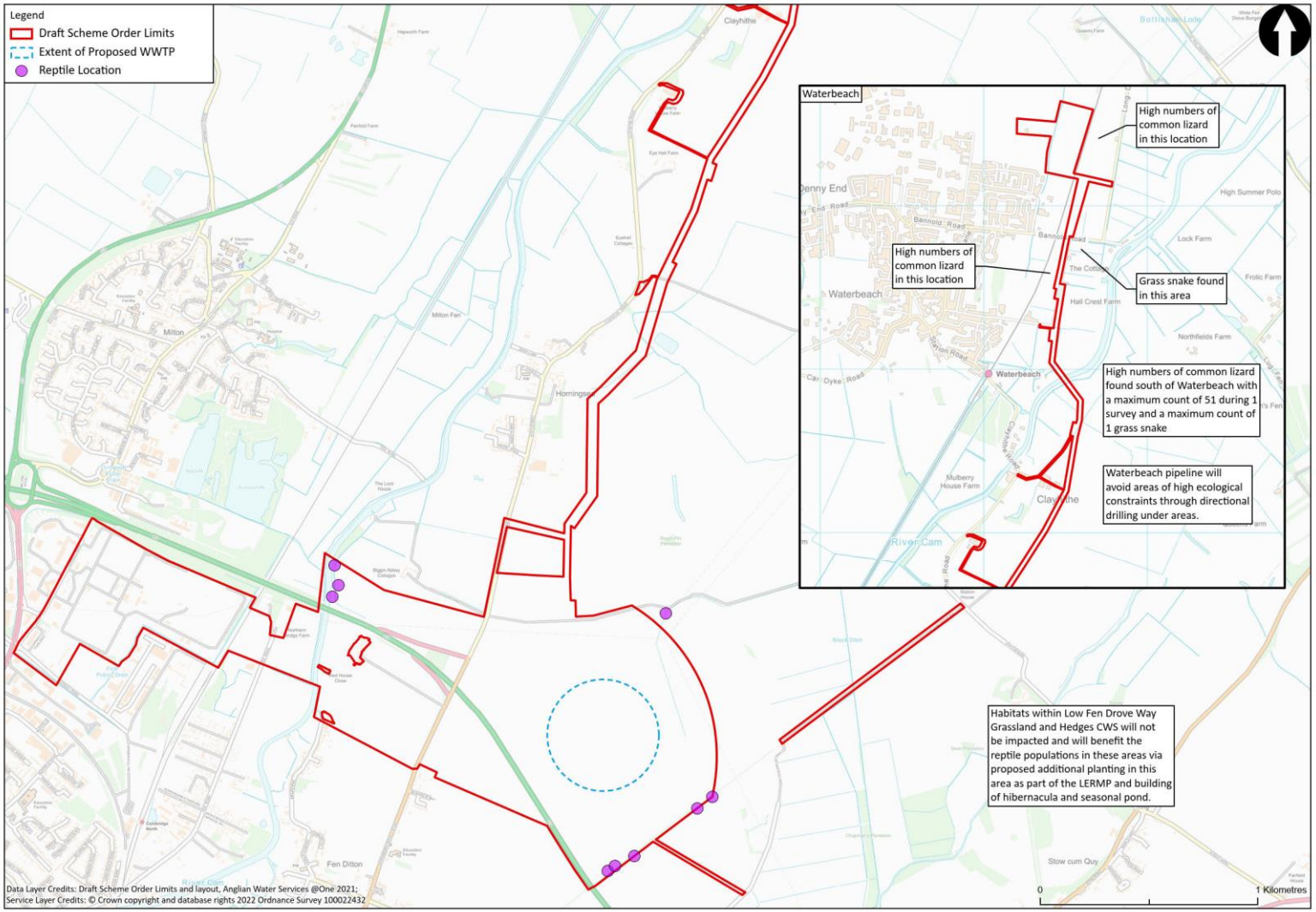


*Figure 7: Reptile Location and Mitigation South*

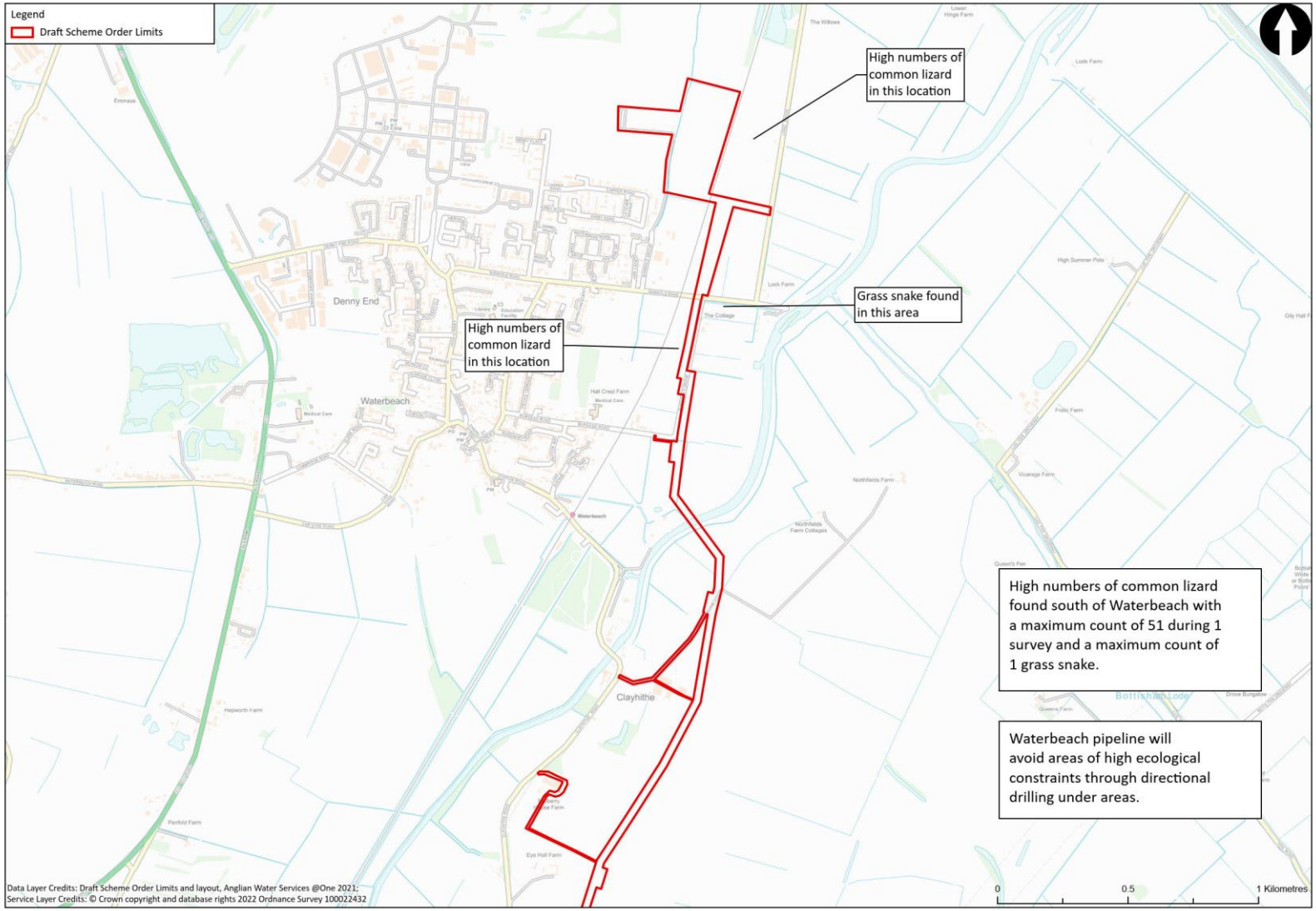


*Figure 8: Reptile Location and Mitigation Waterbeach*

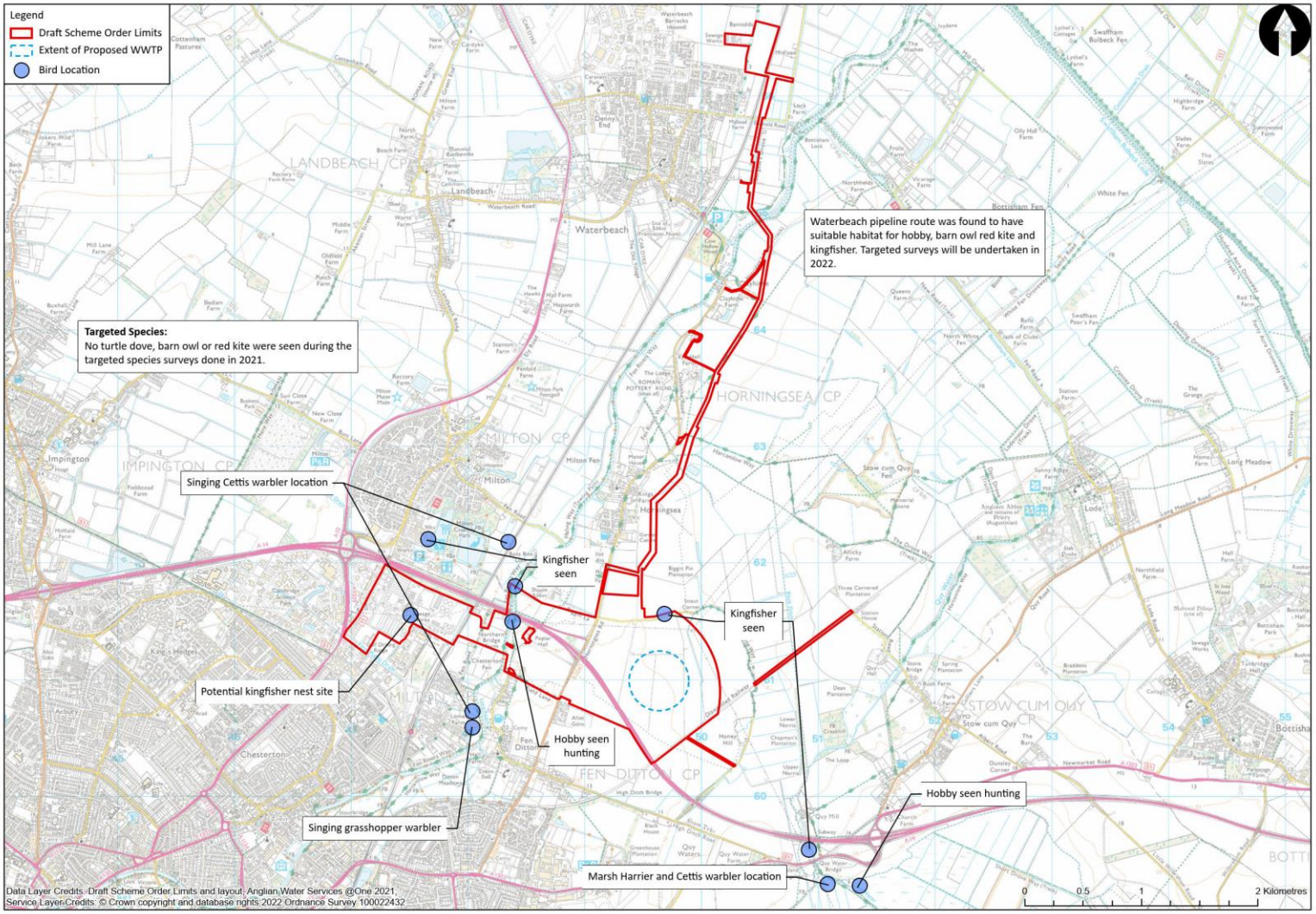


*Figure 9: Schedule 1 Birds*

## Terrestrial Invertebrates

Our survey programme included specialist surveys to understand terrestrial invertebrate[8] populations in areas potentially affected by our proposals. These surveys recorded a total of 666 invertebrate species (not including aggregates of species) within the survey area. Forty of these species are considered Nationally Scarce[9] and seven are considered Nationally Rare[10].

The survey demonstrated the importance of the grassland habitats and dead and decaying wood habitats at Honey Hill, Low Fen Drove Way Grasslands and Hedges CWS, and Low Fen Drove Way, in supporting associated invertebrate assemblages. The survey area comprised areas (compartments) surrounding Honey Hill (Compartment A, B, C, D) and the existing Cambridge WWTP (Site 3) and are shown in Figure 11 along with habitats typical of each compartment. A breakdown of British rarities by compartments is represented in Table 1.

*Table 1: British rarity-designated (nationally scarce and nationally rare) invertebrates recorded on the 2021 survey*

| Survey area | Compartment and habitat type | Number of British rarity-designated species |
|---|---|---|
| Honey Hill Complex | Compartment A- arable | 4 |
| | Compartment B – roadside hedgerows | 27 |
| | Compartment C - CWS | 20 |
| | Compartment D – pasture grassland/meadow | 8 |
| Existing Cambridge Water Treatment Plant | Site 3 – grassland and settling ponds | 13 |

*Source: Mott MacDonald 2021*

[8] Land living animals that lack a backbone such as bees, butterflies, moths, snails, slugs and spiders

[9] 'Nationally Scarce', originally coined for plants, was applied to invertebrate species that were known to occur in 16 to 100 10km squares (hectads). Since 2010, IUCN Reviews have been produced for many invertebrate groups and these are continuing to be written. These Reviews deal primarily with threat status, but they also re-evaluate existing British Rarity (restricted distribution) statuses to bring them up-to-date. In the recent IUCN Reviews, the restricted distribution categories have now been standardised to 'Nationally Rare' (NR) and 'Nationally Scarce' (NS) without further subdivision. The GB system of assessing rarity based solely on distribution is used alongside IUCN criteria which, although they also use measures of geographical extent, are primarily concerned with assessing National and International Threat in terms of decline of species populations.

[10] A further category used was 'Red Data Book' which equates to 'Nationally Rare'. This category was used for species that occurred in 15 or fewer hectads in Britain.

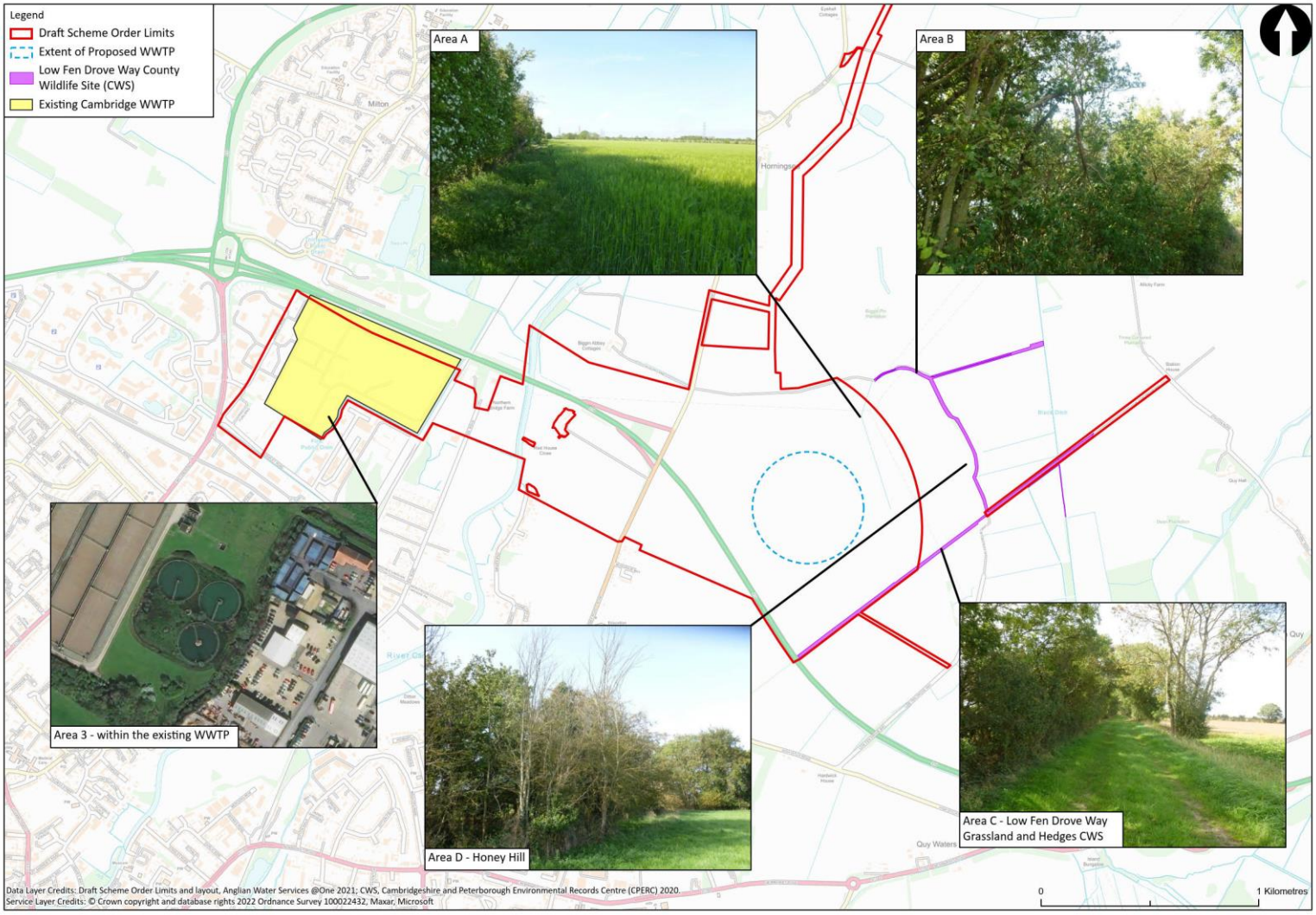


*Figure 10: Terrestrial Invertebrate Survey Locations*

## Notable Plant Species

Several notable plants were recorded in the arable field margins of the proposed WWTP Low Fen Drove Way Grasslands and Hedges CWS and around the disused balancing ponds in the existing Cambridge WWTP. These are shown in Figure 4.

## Fish

Fish surveys[11] were completed in locations upstream and downstream from the proposed treated effluent discharge outfall structure during in the spring and autumn of 2021 on the River Cam. The following species of fish were caught: nine-spined stickleback (*Pungitius pungitius)*, bullhead (*Cottus gobio*), gudgeon (*Gobio gobio*), roach (*Rutilus rutilus*), bitterling (*Rhodeus sericeus*), sunbleak (*Leucaspius delineatus*), spined loach (*Cobitis taenia*), and three-spined stickleback (*Gasterstreus aculeatus*). Fish of conservation value include bullhead and spined loach[12].

The Schedule 9[13] invasive fish species bitterling was recorded in a ditch adjacent to the River Cam during the macroinvertebrate surveys in April 2021 and also caught during the fish surveys.

## Macroinvertebrates

In April and September 2021 macroinvertebrate[14] surveys were completed upstream and downstream of the proposed treated effluent discharge outfall structure on the River Cam, and in seven suitable ditches within 100m of the Draft Scheme Order Limits, excluding the Waterbeach pipeline.

Two invasive non-native species were recorded during our survey programme within the River Cam, these were the Florida crangonyx (*Crangonyx pseudogracilis/floridanus agg.)* a freshwater amphipod, and the demon shrimp (*Dikerogammarus haemobaphes*).

Several invertebrate species of local importance were recorded within multiple ditches and included a beetle (*Agabus didymus*), a valve snail (*Valvata piscinalis*) and mayfly species (*Caenis luctuosa*). A ditch was found to have the presence of a non-native crustacean species Florida crangonyx .

Additionally, outside of the Draft Scheme Order Limits, another snail species of local importance *Bathyomphalus contortus* was recorded in the ditch network. Both *Caenis luctuosa, Agabus paludosus and Bathyomphalus contortus* were also recorded outside the Draft Scheme Order Limits in the ditch network.

[11] Surveys completed using micro-seine netting. A seine is long rectangular shaped net with a float line at the top and a lead line on the bottom with a central bag (cod-end) or bunt (extra material incorporated into the build of the net), that is typically set in a broadly circular shape and then hauled by people or machine.
[12] Both species are listed on Annex II of the European Commission Habitats Directive (3) with spined loach listed on Appendix III of the Bern Convention.
[13] Schedule 9 of the Wildlife & Countryside Act 1981 (as amended) covers certain species of plants and animals that do not naturally occur in Great Britain but have become established in the wild and represent a threat to the natural fauna and flora.
[14] Animals without a backbone that live in or on the surface of surface water bodies.

## Macrophytes

Macrophyte[15] surveys were conducted on the River Cam in September 2021 at two locations, one upstream of the proposed treated effluent discharge outfall structure and one downstream. The surveys indicated that the macrophyte community had adapted to tolerate moderate nutrient concentrations. Nutrient concentrations were slightly higher than expected in both locations. The surveys support the view that the condition of the macrophyte community indicates a moderate change from natural conditions because of human activity.

Within the Draft Scheme Order Limits, invasive plant species have been recorded at several ditches, including Nuttall's waterweed and Least duckweed (*Lemna minuta*) which have a negative impact on native flora. There was one plant of local species conservation status recorded which was the hairlike pondweed (*Potamogeton trichoides*).

One plant of local species conservation status, Blunt-fruited water-starwort (*Callitriche obtusangula),* was recorded outside of the Draft Scheme Order Limits to the south-east in a waterbody that flows into Quy Water.

[15] Aquatic plants growing in or near water.

## How could the construction of the proposed relocation of Cambridge Waste Water Treatment Plant change biodiversity during construction?

Construction works have the potential to impact designated sites, habitats and protected species. We have completed a preliminary assessment of the potential construction phase impacts on biodiversity. These impacts do not account for the application of mitigation measures that we are developing in consultation with our stakeholders, and which will be set in place through the DCO application. Mitigation is discussed in the section below *How will we manage our development activities to avoid, reduce or offset adverse changes to biodiversity and maximise habitat gain?*

Our preliminary assessment has identified the following potential impacts:

- water quality impacts to surface water (also see **Environmental Information Paper: Water Resources**):
    - Accidental spillages or leaks of some materials used in construction could give rise to contamination of surface water features including the River Cam and the Black Ditch. Discharge of silt-laden water from dewatering of pits and excavations, or in run-off from construction areas, may also affect surface water quality and affect aquatic ecology. Silt may temporarily reduce visibility and affect predation by aquatic animals. Silt in the water column can also clog gills of fish and also settle on gravels used for fish spawning. Habitats and species downstream (including designated sites) may be damaged or disturbed by deposition of particles and chemical changes in water quality). These potential impacts would be temporary however the effect on aquatic ecology could be temporary or permanent depending on the type of chemical or magnitude of the spill;
- hydrological impacts on groundwater:
    - dewatering and accidental spillages or leaks of potentially contaminating materials to land could affect groundwater. As for surface water the potential for changes to groundwater quality is temporary with the effects to aquatic receptors reliant on groundwater varying depending on the type and extent of accidental spills or leaks.
    - In construction a minor reduction in groundwater flows in the chalk may occur during dewatering. No significant changes to water levels or flows are expected in local watercourses, or to water levels in ponds or other water bodies in designated sites which are supported by chalk groundwater, accordingly no effects to ecological receptors dependant on steady groundwater levels are expected.
- air quality impacts (also see **Environmental Information Paper for Air Quality**) occurring through increase in air emissions and dust generation from construction activities (operation of equipment, excavation, removal of habitats, movement of construction traffic) could impact sensitive botanical species, habitats, and designated sites. The occurrence of these emissions would be temporary however effects could be variable in their duration depending on the sensitivity of the receptor and the magnitude and source of air quality impact.

- noise and vibration impacts from the movement of construction traffic, the operation of static and mobile equipment and ground works (excavation and piling) (also see **Environmental Information Paper for Noise and Vibration)** could result in noise impacts to wildlife including protected species. Changes in noise levels could:
    - affect normal feeding, foraging and breeding behaviours of birds such as through temporary displacement as they move away from the noise source.
    - affect normal feeding, foraging and breeding behaviours of small mammals (including protected species) such as through temporary displacement as they move away from the noise source.

  The occurrence of these impacts would be temporary; some species will habituate to noise changes and continue to use the area and others would return to the area once the noise impacts have ceased.

- habitat loss through ground clearance:
    - temporary removal of habitats in relation to the use of land temporarily required during construction (such as for laydown areas, compounds, pipeline corridors, haul roads and temporary accesses) which would result in habitat loss, fragmentation, severance of wildlife corridors, and disturbance to species using these habitats. Temporary loss is expected at the Milton Road Hedgerows CiWS where there will be a need to remove a small section of hedgerow. Elsewhere there will be a temporary loss of small areas of priority habitats including floodplain grazing marsh, deciduous woodland, and hedgerows;
    - permanent removal of habitats in relation to the permanent use of land such as for the proposed WWTP, access roads, the new outfall and ventilation structures. This removal could also result in in habitat loss, fragmentation, severance of wildlife corridors, and disturbance to species using these habitats.
- direct mortality through vegetation removal/ground clearance where less mobile species, or animals that are young or hibernating, are likely to be those most vulnerable during construction (e.g. reptiles, water vole, badger)
- habitat loss through construction of the new outfall:
    - will result in the loss of river bank habitat within the River Cam CWS;
    - will result in a permanent loss of a small area of river bank including reedbed which is a priority habitat;
    - will result in the temporary loss of a small area of fallow field and arable fields for the construction compound and access roads;
    - will result in the temporary loss of a small area of fallow arable field for the storm flow pipelines and final effluent pipeline; and
    - will result in the temporary disturbance to the drainage ditch including to water vole habitat.
    - Will result in the loss of water vole habitat as a result of the construction of the outfall and bank stabilisation works (refer to the Figure *'Permanent Features – Outfall Area'* within the **PEI Introductory Paper**).

- severance (including temporary severance during construction) of existing wildlife corridors (such as field margins, and hedgerows) could have an adverse impact upon species' ability to disperse, forage and use the local area;
- potential spread of invasive species, including those recorded in the ditches and River Cam, during works that disturb these areas and the subsequent movement of people and equipment elsewhere;
- tree removal and direct impacts to species through
    - the loss of bat roosts from tree removal
    - the loss of vegetation for nesting birds.
- temporary change in ambient light levels and temporary introduction of lighting from construction traffic or compounds which may cause displacement of nocturnal species such as bats, badgers, and birds.
- temporary changes to bird assemblages within the airport safeguarding area as a result of a large area of bare ground during construction. The principal risks associated with the creation of areas of open soil are:
    - provision of new feeding opportunities, as birds may also gather to forage on invertebrates such as earthworms exposed by the removal of soils, and on recently seeded landscaped areas ;
    - gull species are attracted to bare loose soil which would be exposed during ground works and excavation. This is similar to when fields are ploughed however the area would be exposed for longer. No known gull breeding habitat currently exists within the area of land required for the proposed WWTP.
    - creation of areas of open terrain suitable for daytime loafing; and
    - creation of areas of temporary standing water (such as through temporary lagoons) which would be suitable for bathing, and as temporary wetland habitat.
- temporary changes to bird assemblages within the airport safeguarding area as a result of the presence of food waste. If not properly disposed of by site staff, this can attract a range of scavenging birds, including corvids, starlings and gulls.
- sudden disturbance to birds in construction areas, which can be either accidental (such as from a sudden loud noise or from vehicle movements) or deliberate (such as through any practices to disperse flocks not associated with wildlife hazard), can cause simultaneous movements of large numbers of birds. which can lead to an increased risk of bird strike.

## Once operational, how will the proposed relocation of Cambridge Waste Water Treatment Plant change biodiversity?

Once operational, the Proposed Development will have potential impacts (both positive[16]/ beneficial and negative[11]/adverse) on biodiversity. Through a multi-functional **Landscape Masterplan** our proposals have embedded landscape screening and habitat creation to deliver an overall benefit to biodiversity. Please refer to the **Phase Three Community Consultation Leaflet**, outline **Landscape masterplan** and the outline **Landscape Ecological and Recreation Management Plan (LERMP)** included as part of the PEI for more information on these proposals.

The impacts described in this section do not account for the application of mitigation measures that we are developing in consultation with our stakeholders, and which will be set in place through the DCO application. Mitigation is discussed in the section below *How will we manage our development activities to avoid, reduce or offset adverse changes to biodiversity and maximise habitat gain?*

Our preliminary assessment of the potential impacts on biodiversity as a result of land permanently required for the Proposed Development and/or from the operation of the proposed WWTP are:

- habitats:
  - overall, a positive impact on habitats through BNG;
  - the increase in landscape and ecological habitat creation (and detailed within the (LERMP) of habitats surrounding the Proposed waste water treatment plant will be beneficial to a variety of species overall. The newly planted areas will provide foraging and shelter habitats for a wide range of species such as invertebrates and birds whilst once the created woodland is mature, this may provide roosting habitats for bat species; and
  - The detailed landscape design (and detailed within the outline **LERMP**) will also improve the Low Fen Drove Way Grasslands and Hedges CWS through habitat connectivity from the CWS to the wider landscape through the newly planted areas.
- potential hydrological impacts:
  - increases or decreases in effluent volumes discharged to the River Cam or changes to water levels. The River Cam CWS and water dependent qualifying features of designated sites downstream of the proposed treated effluent outfall structure could be adversely impacted if there are water quality changes; and
  - the effluent flow from the existing Waterbeach Water Recycling Centre (WRC) to Bannold Drain will cease, which may affect water levels within the

[16] Characterising Ecological Impacts: Positive and negative impacts and effects should be determined according to whether the change is in accordance with nature conservation objectives and policy. CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland v1.1: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

ditch (refer to the **Environmental Information Paper: Water Resources**) these changes could affect aquatic ecology within the ditch;

- water quality:
  - water quality in Bannold Drain could be expected to improve overall without the final effluent discharge which may have a positive impact on species associated with the water environment;
  - potential for leakage (due to operational failure) of waste water from the treatment plant leading to contamination of groundwater, which could adversely affect Stow-cum-Quy Fen SSSI (due to its connection with Black Ditch) and Allicky Farm Pond CWS; and
  - treated effluent discharge may affect aquatic species at the outfall location and downstream.
- operational lighting:
  - changes to ambient light level as a result of external lighting associated with the operation of the proposed Cambridge waste water treatment plant which may result in light spill/ into retained habitats (such as Low Fen Drove Way Grasslands and Hedges CWS). Changes to ambient light / night light levels may result in disturbance and severance of wildlife corridors, which may impact biodiversity on and adjacent to the Proposed Development.
- air quality:
  - changes such as from traffic movements and industrial processes within the proposed Cambridge WWTP may impact sensitive botanical species and habitats, particularly within designated sites. Further assessment work is required to fully assess the potential for significant effects on designated sites due to air quality changes because of emissions from the energy plant.
- recreational pressure:
  - changes to visitor numbers to designated sites (e.g. Stow-cum-Quy Fen SSSI and Low Fen Drove Way Grasslands and Hedges CWS) through new public access opportunities. Visitor footfall and recreational pressure within Stow-cum-Quy Fen SSSI could result in an increase in vegetation trampling and soil compaction, dog-fouling, littering, fires and conflicts with livestock grazing management of the SSSI, resulting in impacts on the grassland and aquatic features the SSSI is designated for.
- changes to avian assemblages due to new habitat creation and presence of the proposed WWTP and risk of mortality through bird strike due to proximity to the existing Cambridge airport. The Proposed Development is identified within DfT / ODPM Circular 1/2003 as a type of development with the potential to create new or increased bird strike hazards (waste water treatment plants and planting of trees and bushes). Potential impacts in relation to changes in bird assemblages:
  - during the operation phase foraging habitat availability for gulls would be reduced as some areas which are currently arable land would become built development. No known gull breeding habitat currently exists on within the area of land required for the proposed WWTP and landscaping plans, and none would intentionally be created;

- flat or shallow-sloping roofs within the proposed WWTP could be used by birds including lesser black-backed and herring gulls and would present an unacceptable risk if colonies were to form.
- the creation of grasslands and woodlands (while they become established) have the potential to attract small mammal populations that could increase the use by buzzard and barn owl. No known nesting sites of buzzard and barn owl has been identified within the area of land required for the proposed WWTP and landscaping plans.
- uncovered waste water tanks can attract birds in particular gulls and starlings[17].
- woodland planting could present a risk new rook and starling roosts forming. This is unlikely as there are already existing woodland stands nearby.
- solar installation, depending on their design, can through the frameworks of the panels be utilised by birds for nesting, roosting and loafing

It is expected Cambridge Airport will be relocated and that in operation the proposals will present no wildlife hazard risk however as the relocation plans are not yet confirmed, our assessment will continue to consider these risks, and we will continue to consult with the operators of Cambridge Airport.

[17]Civil Aviation Authority (2017) Wildlife hazard management at aerodromes CAP 772 Available at: https://publicapps.caa.co.uk/docs/33/CAP772_Issue2.pdf

## How will we manage our development activities to avoid, reduce or offset adverse changes to biodiversity and maximise habitat gain?

We have progressed our Proposed Development to identify and retain features of biodiversity value wherever possible. The protection of biodiversity not only relates to the siting and design of the proposed WWTP but also to how we will manage our activities in construction, and ultimately how we intend to operate the proposed WWTP.

The **PEI Introductory Paper** sets out how the Development Consent Order (DCO) would secure mitigation in both construction and operation. In relation to construction this includes the use of a **COCP** and subsequent plans that the appointed contractors (s) would be required to prepare and implement. These provide a consistent approach to the management of construction activities.

Furthermore, our activities would be subject to specific regulations for some activities in construction as well as the Environmental Permits required in operation.

The following sets out how we intend to mitigate our development proposals during construction (including commissioning and decommissioning activities) and once the proposed WWTP is operational.

Our proposals for mitigation comply with the National Policy Statement (NPS) requirements for waste water, with the Landscape Ecological and Recreational Management Plan (LERMP) and .

This section sets out our proposed mitigation proposals for biodiversity.

### In construction

Construction activities such as site clearance, excavation and the construction of haul routes have the potential to impact negatively on habitats and species through habitat removal, injury and/or death of species or the degradation and fragmentation of habitats.

The severity of these potential impacts during construction will depend on how the work will be delivered and managed through mitigation routes.

#### Primary mitigation (inherent mitigation)

Measures we have already taken to avoid direct impacts to biodiversity are:

- minimising the footprint of the Proposed Development through design (such as the avoidance of Low Fen Drove Way Grasslands and Hedges CWS, re-use excavated material on-site and adopting narrow construction widths where possible to reduce construction footprint);
- the demarcation of buffer areas (within the emerging works plans) which account for known constraints such as ditches, county wildlife sites and root protection zones. Works will not be permitted in these areas;
- the use of horizontal directional drilling in some sections around sensitive receptors such as River Cam at both crossings; and

- retaining ecological features where possible by the siting or micrositing of the areas within which temporary compounds, laydown areas, haul roads and access are defined; and
- the provision of a buffer between the Proposed WWTP and Low Fen Drove Way Grasslands and Hedges CWS. This will comprise of a sufficient habitat buffer (species-rich grassland habitat creation adjacent to the CWS to avoid shading of the existing CWS grassland habitats, hedgerow planting, and woodland habitat creation).

In construction there will also be a requirement to review and adjust layouts when developing detailed plans for temporary compounds, laydown areas, haul roads and accesses.

Secondary mitigation (foreseeable)

In construction the CoCP and associated management plans will document the range of measures that would be in place to avoid and minimise impacts that may occur in construction. In relation to the protection of biodiversity, this will also require the appointed contractor to have in place appropriate consents or permits for works that could affect protected species, and water courses.

These mitigation activities will be presented in the form of management plans and will include the following:

- Construction Environment Management Plan (CEMP);
- Wildlife Hazard Plan (WHP) in relation to Cambridge Airport;
- Construction Traffic Management Plan (CTMP);
- Construction Flood Risk/Water Quality Management Plan;
- Soils Management Plan (SMP); and
- Landscape Ecological and Recreational Management Plan (LERMP).

Measures to protect soils during construction are detailed within the **Environmental Information Paper: Agricultural Land and Soil Resources**. This includes controls to prevent dust from soil stockpiles will serve to prevent deposition effects on vegetation and controls to prevent run off that could affect surface water features.

Measures to prevent dust in construction are detailed within the **Environmental Information Paper: Air Quality**. Controls to prevent dust and emissions (such as oxides of nitrogen and sulphur) will serve to prevent effects as a result of deposition on vegetation.

Measures to control noise and vibration in during construction are detailed within the **Environmental Information Paper: Noise and Vibration**. These controls will serve to reduce noise levels so as to prevent effects on sensitive species.

Measures to prevent a deterioration in water quality are detailed within the **Environmental Information Paper for Water Resources**. Controls to prevent change in water quality within surface water and groundwater will serve to prevent effects on aquatic ecology reliant on these features.

Measures not covered by other topic specific papers to avoid impacts that would affect biodiversity during construction include the following:

- timing of site clearance works to mitigate potential impacts on protected and or notable species (e.g. reptiles, breeding birds, water vole, badger). An Ecological Clerk of Works (ECoW) will be present once construction begins and will be available to check areas of habitats prior to removal. If feasible, suitable habitat for breeding birds will be cleared between October and mid-February (outside of the breeding bird season). Where this is not feasible, vegetation will only be removed after it has first been inspected by a suitably qualified ecologist. Any active nests will be retained along with a suitable buffer around them.
- the production of agreed protected species working methodologies for works associated with the Proposed Development;
- sensitive management of construction lighting to prevent and limit light spill into the River Cam, ditches, hedgerows, and Low Fen Drove Way Grasslands and Hedges CWS, which are used by commuting and foraging bats. A Temporary Lighting Strategy will be developed as part of the CEMP. This will have regard to the Institute of Lighting Engineers (2021, 2018) *Guidance Note 1 for the Reduction of Obtrusive Light* and *Guidance Note 8 Bats and Artificial Lighting* in order to seek to minimise any adverse impact on sensitive receptors;
- the management of invasive species and biosecurity measures will be included in the CoCP;
- early planting (details within the outline **LERMP**) to provide screening with secondary benefits to ecological receptors. Enhancement of existing hedgerows by increasing species diversity through new planting in species-poor hedgerows and infilling gaps in hedgerows;
- potential translocation[18] of species-rich hedgerows into areas of advanced planting, creating scrub patches or hedgerows. Species-rich grassland turf will be stripped and temporarily stored during works, followed by reinstatement in areas of temporary works; and
- the protection of existing and newly planted hedgerows and trees during construction avoid the Root Protection Areas[19] (RPAs).

Tertiary mitigation (inexorable - regulation)

In addition to the requirements of the CoCP, construction will also be subject to specific regulatory requirements, those of relevance to biodiversity are:

- temporary discharge permits to watercourses such as required for the disposals of final treated effluent used in testing the Waterbeach waste water transfer pipelines. This would be agreed with the Environment Agency.

[18] Habitat translocation should be the last resort and habitats should be maintained in situ as evidence shows the condition of habitats is often not retained after translocation. Translocation should not be regarded as a mitigation for loss through development and may only offer partial compensation.

[19] This is a calculated area of ground that lies immediately under a tree and just beyond the extent of its crown. It is intended to help avoid damage to the tree's rooting system. It is calculated using a standard method set out with the British Standard 5837:2012.

- protected species licences from Natural England (e.g. badger) and works under a Class Licence for water vole. Our preliminary assessment indicates that the Proposed Development should not require the application for a Natural England bat mitigation licence as the confirmed tree roosts are thought to be retained and protected.
- regulatory measures that will be followed such as the production of species working method statements (such as breeding birds, reptiles and water vole) for construction works associated with transfers and treated effluent pipeline and treated effluent discharge outfall structure.

### In operation

We have approached the landscape and ecology design of the area around the Proposed WWTP with biodiversity as a central consideration. In completing a range of surveys and collecting information from various sources, we have built up an understanding of the biodiversity features to support the development of our landscape design proposals. The ambitious landscaping proposals surrounding the proposed WWTP will include extensive areas of habitat creation, to give a legacy of a more biodiverse environment than is currently present whilst also providing multifunctional benefits including landscape visual screening and recreational opportunities. Details of landscape screening and integration are discussed in the **Environmental Information Paper: Landscape and Visual Amenity**.

The outline **Landscape Masterplan** within the outline **LERMP** provides the vision for the project and should also be referred to with our integrated proposals for landscape, biodiversity and recreation. The **Landscape Masterplan** will be used later to inform detailed design. The commitments to deliver and maintain the **Landscape Masterplan** will be secured through the DCO.

#### Primary mitigation (embedded mitigation)

The landscape design proposals create a range of new habitats, including grassland, woodland, tree belts, and hedgerows. It is hoped that the new landscape and ecology habitat creation design as part of the proposed WWTP can be integrated into the Cambridge Nature Network opportunity areas for nature recovery[1]. There is an opportunity for the new habitats to provide a new component and potential extension to the stepping stones, corridors and core areas (listed as Quy Hall, Little Wilbraham Fen, Stow-cum-Quy Fen SSSI) as shown in the Cambridge Nature Network document[20]. The proposed WWTP falls within the southern area of the Wicken Fen Vision[2]. The Proposed Development sits within the drier areas of the Vision, which proposed more rough grassland, new woodland and coppice belts. The Proposed Development, although featuring expanses of tree planting, will include grassland with the proposal to create a calcareous loam meadow community.

Once operational the design of the landscape and ecological habitat creation proposals defined in the **LERMP** will provide a minimum of 10% BNG following the management and monitoring of these habitats to achieve their target condition. The multifunctional approach

[20] The Wildlife Trust for Bedfordshire, Cambridgeshire and Northamptonshire (2021) *The Cambridge Nature Network, A Nature Recovery Network for Cambridge and its Surrounds. Summary Report.* https://www.wildlifebcn.org/sites/default/files/2021-05/CambridgeNatureNetworkSummaryDigitalVersion.pdf

to the landscaping proposals provides both mitigation for potential environmental impacts we have identified through the Environmental Impact Assessment (EIA) process and enhancement of the local environment.

The BNG[21] requirement will apply to Nationally Significant Infrastructure Projects (NSIPs) no later than 2025. We have completed preliminary calculations of BNG using the Biodiversity Metric 3.0, a tool published by Natural England[22]. Following the requirements set out in the Environment Act 2021, our proposals will require a plan setting out how BNG will be delivered in the 30 years proceeding completion of construction. This will be covered in the **LERMP**.

The following sets out features that we have built into our landscape design proposals to increase biodiversity, by taking advantage of the opportunities arising within the Scheme Order Limits:

- incorporation of planting proposals defined in the **LERMP** to provide a minimum 10% BNG by setting aside space for habitat creation within the land required for the Proposed WWTP and as shown within the outline **Landscape Masterplan**. The final **LERMP** will also include information on planting mixes, soils, ecological connectivity, and the long-term management of actions to ensure the successful establishment of new habitats. The DCO will require the LERMP to be implemented and provide for the establishment and maintenance of its features. The proposed habitat creation is shown in the outline **Landscape Masterplan** and Ecology Area Plan in the outline **LERMP** included within the PEI material;
- the creation of habitat targeted to benefit Cambridgeshire and Peterborough Local Biodiversity Action Plan (LBAP) species such as turtle dove. Areas of bare soil will be created along field margins in the east of the site around the proposed areas of calcareous loam meadow grassland (as shown in the outline **Landscape Masterplan** and Ecology Area Plan in the **LERMP**). The management of these areas will require annual cultivation in spring. This type of management will also benefit invertebrates. Scrub and hedgerows will be created close to suitable areas for foraging, the woodland habitat creation will include ride, glade and woodland edge planting pattern designs. Further information will be provided in the **LERMP**;
- the creation of habitat to benefit invertebrates, including small seasonal ponds, species-rich grassland, log piles and hibernaculum, and bee banks;
- the creation of new habitat for reptiles[23]. This will include the incorporation of enhancement features such as log piles and hibernaculum within the outline **Landscape Masterplan** and Ecology Area Plan to contribute to increasing biodiversity value and to provide more resources for reptiles, which were recorded within Low Fen Drove Way Grasslands and Hedges CWS. These will be positioned in areas

[21] Biodiversity net gain is an approach which aims to leave the natural environment in a measurably better state than beforehand.
[22] The Biodiversity Metric 3.0 is available online here: http://publications.naturalengland.org.uk/publication/6049804846366720
[23] Common lizard is a Cambridgeshire and Peterborough LBAP species and has been recorded within Low Fen Drove Way Grasslands and Hedges CWS.

adjacent to the CWS, whilst ensuring no loss in the grassland habitats the CWS has been designated for; and
- new foraging habitat for bats through the creation of woodland such as in areas adjacent to the proposed WWTP.

The following sets out further opportunities beneficial impacts to biodiversity that we have identified but that would require agreement with stakeholders and landowners:

- opportunity to improve the condition of Low Fen Drove Way Grasslands and Hedges CWS through habitat management proposals, which could include clearing scrub in areas to restore the areas of proposed semi-improved neutral grassland and unimproved calcareous grassland. Enhancement and potential extension of the CWS by the creation of a new area of grassland buffering the northern boundary of the CWS as shown in the Ecology Area Plan with the outline **LERMP**; and
- opportunity to install bird boxes within the Low Fen Drove Way Grasslands and Hedges CWS; and
- opportunity to install bat roosting features via the provision of bat boxes on retained trees and within the CWS.

The following sets out features we have built into our landscape design proposals intended to distribute future recreational users so as to avoid pressures on existing sites and PRoWs :

- new footpaths and bridleways which will connect with existing footpaths have the potential to increase visitor footfall and recreational pressures within Stow-cum-Quy Fen SSSI and Low Fen Drove Way Grasslands and Hedges CWS. Impacts on these designated sites should be avoided, through measures such as diverting pressure elsewhere (signage and interpretation) such as along the River Cam, creating alternative accessible greenspace as shown in the outline **Landscape Masterplan** in the outline **LERMP**, and or buffering and enhancing the resilience of these designated sites by directing people to different areas and safeguarding other areas. Hedgerow planting will also be used in places to deter visitors from accessing ecological sensitive areas such as the CWS to maintain 'quite spaces' for wildlife and prevent trampling of grassland. This will also be detailed in the final **LERMP**; and
- the proposed new pedestrian route and bridleway creates a walking loop between Horningsea and communities to the east. This connection provides an additional recreational route and together with the landscape proposals may provide an alternative open space contributing to spreading out recreational pressure on existing sites (such as Stow-cum-Quy Fen SSSI) and existing PRoW in the area.

For mitigation measures to avoid, reduce and remedy impacts to the water environment (which could result in effects to aquatic macrophytes, macroinvertebrates, and fish) refer to the **Environment Information Paper: Water resources**.

Further opportunity for embedded mitigation will be explored for the following:

- design of the treated effluent outfall to embed finish where possible that may encourage biodiversity (subject to discussions with the Environment Agency); and

- design of the permanent site drainage to prevent any discharge of pollutants to surface water bodies including the Black Ditch.

Secondary mitigation (management activities)

Ongoing management plans to manage operational activities not covered by the **Landscape Masterplan** and or the **LERMP** are:

- the preparation of an outline **Wildlife Hazard Management Plan** in consultation with Cambridge Airport operators.
- plans and procedures describing measures to avoid, reduce and eliminate potential environmental impacts as a requirement of the Environmental Permit (see below).

Tertiary mitigation (inexorable - regulation)

Regulatory requirements that also serve as mitigation to prevent biodiversity impacts are the following:

- creation of additional water vole habitat for net conservation gain to compensate for loss of river bank and ditch disturbance. See Figure 8; and
- as per the LERMP, the creation of additional planting proposals around the Low Fen Drove Grasslands and Hedges CWS will see a net gain in badger foraging habitats through connectivity to the wider landscape.
- adherence of the Sludge Treatment Centre (STC) to our Industrial Emissions Directive (IED) permit to reduce airborne emissions and water emissions.
- operational controls as conditions of permits which may include wildlife management within our licensed facility. Any conditions will be set by the Environment Agency and may include but not be limited to control of open tanks and controls on the use of sustainable drainage to prevent use by birds, and requirements to control pests and vermin (which could attract other species including birds).

## What might the likely significant effects (LSE) to biodiversity be in relation to the proposed relocation of Cambridge Waste Water Treatment Plant?

The preliminary assessment of potential negative/adverse effects on biodiversity due to the Proposed Development on protected species are presented below in order of impact magnitude, sensitivity and geographic context of receptor are provided below:

- likely **Minor** impact magnitude and **low** sensitivity predicted on the water vole population at the **local** level. There will be a loss of river bank habitat during the construction of the treated effluent discharge outfall to the River Cam. Impacts predicted to be short term during the construction period only with potential positive impacts to water vole. **No negative/adverse effects predicted**.
- likely **Minor** impact magnitude and **low** sensitivity predicted on the badger population at the **local** level. There will be a loss of badger sett and foraging habitat during the construction of the proposed WWTP. Impacts predicted to be short term during the construction period only with positive habitat gain for badgers. **No negative/adverse effects predicted**.

The preliminary assessment of potential negative/adverse effects on biodiversity due to the Proposed Development on habitats are presented below in order of impact magnitude, sensitivity and geographic context of receptor:

- potential significant effects on ecological features associated with internationally designated sites will be examined in detail in the ES and the Habitat Regulations Assessment (HRA). The HRA will assess in detail the likely adverse effects on Wicken Fen Ramsar, Fenland SAC, Eversden and Wimpole Woods SAC, Devils Dyke SAC, The Wash and North Norfolk Coast SAC, The Wash SPA, and The Wash Ramsar. We have completed a **screening stage for HRA** which is included as part of PEI. Likely significant effects on international sites cannot be ruled out and will be considered within an Appropriate Assessment step of the HRA. This will consider impacts from the project alone and in-combination with other plans or projects.
- likely **Negligible** impact magnitude and **Low** sensitivity predicted at the Regional level on Stow-cum-Quy SSSI. With mitigation our preliminary assessment indicates that there should be **no negative/adverse effects predicted.**
- likely **Negligible** impact magnitude and **Low** sensitivity at the Local level on Low Fen Drove Grasslands and Hedges CWS. With mitigation our preliminary assessment indicates that there should be **no negative/adverse effects predicted**.
- likely **Moderate** impact magnitude and Low sensitivity over at the Local level on water quality. Impacts predicted to be long-term. Negative/adverse effects without mitigation measures in place include changes to water quality and flows along the River Cam through increased effluent and storm water discharges which may affect aquatic species. With mitigation our preliminary assessment indicates that there should be **no negative/adverse effects predicted**.
- likely **Minor** impact magnitude and **Low** sensitivity predicted at the Local level on the priority habitat floodplain grazing marsh to land permanently required for the construction of the outfall structure and hedgerows for the proposed Waterbeach pipeline. Impacts predicted to be short-term. With mitigation our preliminary assessment indicates that there should be **no negative/adverse effects predicted.**

With the application of mitigation measures no likely significant effects to protected species and habitats have been identified. These preliminary impacts consider a reasonable worst-case scenario and have supported continued development of mitigation. Likely significant effects to SPA, SAC and Ramsar sites will be assessed through the HRA. All preliminary impacts and effects identified at this stage would be verified through our ongoing assessments and reported in the ES.

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