

Packing Facility and Associated Works, Sefter Farm, Pagham Ecological Appraisal



For

Barfoots of Barfoots Ltd, Sefter Farm,
Pagham, West Sussex

FINAL REPORT dated 12th July 2016



9 Pitfold Avenue, Haslemere
Surrey, GU27 1PN

1.0 INTRODUCTION

Barfoots is seeking planning permission to construct a building for the packaging, preparation and distribution of fresh foods, along with ancillary accommodation associated with the existing horticultural business, along with revisions to internal access road, car parking and hardstanding areas, construction of a maintained reedbed washing facility, outfall into an existing reservoir and landscaping.

The proposed packing site (SZ 891 996) currently supports grassland, a small section of hedge-scrub, bare ground (shingle car-park, bare earth parking facility, existing roadways and temporary buildings within about 2.3ha. In addition 0.5km north of the proposed packing facility, a constructed wetland (SU 892 002) has been proposed covering about 0.36ha, created to clean water used within the packing process. GPM Ecology was commissioned to conduct an ecological assessment of the application site on 12th April 2016.

1.1 Protected Species and Wildlife Legislation

All species of bat are protected through the Wildlife and Countryside Act (1981) as amended, Countryside Rights of Way Act (2000) and Habitat Regulations (1994). Other European Protected Species for which this legislation relates to include dormice and great crested newts. In essence this legislation prohibits the following:

- *intentional disturbance or harm,*
- *reckless damage to a breeding site or resting place or a place used for shelter and protection*
- *intentionally obstructing a place used as shelter*

Other relevant legislation includes the Hedgerow Regulations 1997 and the Protection of Badgers Act 1992. The Wildlife and Countryside Act 1981 also provides protection to species such as water voles and widespread reptiles (such as slow-worms and grass snake) protected from *harm only* and wild birds which are protected on the nest.

1.2 Planning Guidance and Biodiversity

National Planning Policy Framework (NPPF, March 2012) provides guidance to Councils, through the Biodiversity and Geological Conservation Circular 06/2005 (ODPM¹) to ensure protected species, statutorily (nationally protected Sites of Special Scientific Interest as well as internationally protected sites) and non-statutorily designated sites (e.g. Sites of Importance for Nature Conservation, SINC) are considered during the planning process. The Natural Environment and Rural Communities (NERC) Act 2006, Section 41 (S41) requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England and must, '*take such steps as appear to the Secretary of State to be reasonably practicable to further the conservation of the living organisms and types of habitat included in any list published under this section, or promote the taking by others of such steps*'. This list relates to Priority Biodiversity Action Plan (BAP) Species and Habitats (BRIG ed. Ant Maddock 2008)², as listed in 2007 (revised 2008), including habitat features such as hedgerows and species such as water-vole.

¹ ODPM (2005) Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System, ODPM Circular 06/2005

² UK Biodiversity Action Plan: Priority Habitats Description. (BRIG ed. Ant Maddock) 2008

2.0 METHODOLOGY

Sussex Biodiversity Records Centre (SBRC) was commissioned to conduct a biological desk-study within 1km of the proposed Packing Facility (see **Appendix I**). The site was visited on 26th April, 17th May and 7th July 2016 to assess the ecological features present within the application site, with notes made on habitat features present and potential for protected and Biodiversity Action Plan species. Ecological features on site were assessed according to CIEEM guidelines (2006³), which evaluates ecological features according to their value within the geographical context (International importance; National; County; Borough; Parish or site value only), as well as other considerations such as legislation.

During the April visit the reservoir on site was assessed for the potential to support great crested newts and an egg-search was conducted to determine presence of newt eggs within the water margins. Newts lay their eggs on aquatic plant leaves between March and June period and a standard method for confirming presence is to conduct a search for newt eggs, conducting spot-checks searching for folded leaves for at least 30 minutes per water-body. In addition a water-vole survey was later conducted on 30th June and 7th July 2016 by Andrew Rothwell, across Sefter Farm land-holding (see **Appendix II** for methodology).

3.0 SURVEY RESULTS, EVALUATIONS AND IMPACTS

3.1 Biodiversity Desk-Study

The closest statutorily protected site (SSSI, SPA or SAC) to the proposed development is Pagham Harbour SPA, RAMSAR, SSSI and Local Nature Reserve about 1.75km west of the application site (www.magic.gov.uk). The LNR is described as including 'intertidal mudflats, saltmarsh, saline lagoons and vegetated shingle. Up to 10,000 waders and wildfowl winter in the harbour with Brent geese, pintail and black-tailed godwit present in national/international numbers. Spring and autumn bird migrations include osprey, marsh harrier, honey buzzard, hobby and Montagu's harrier. Passerines include redstart, wheatear, whinchat, ring ousel, pied flycatcher and occasional red backed shrike. Waders include curlew, sandpiper, little stint, wood sandpiper and little ringed plover.... Other wildlife includes purple hairstreak butterfly, Chidding pink, water voles and numerous species of dragonflies.'

The fields around the application site are noted on www.magic.gov.uk as part of a 630.89ha block under Entry and Higher Level Stewardship (dated from 2012, agreement reference AG00419968). An assemblage of three arable and two grassland farmland bird species of Conservation Concern including grey partridge, snipe, lapwing and turtle dove have been recorded (www.magic.gov.uk) in the vicinity of the site.

The Estate in general provides habitat features for a range of farmland and wetland birds with the following species noted on the farm, within the desk-study report (**Appendix I**): grey partridge *Perdix perdix*, lapwing *Vanellus vanellus* and gadwall *Anas strepera* (recorded at SZ 892 998 on 30/06/2000); several records of barn owl *Tyto alba* (for example, at SU 892 005 on 03/11/2008); corn bunting *Emberiza calandra* (at SZ 890 998 on 13/05/2000); and garganey *Anas querquedula* (at SU 890 004 on 02/04/2004). In addition to this range of

³ CIEEM (Chartered Institute of Ecology and Environmental Management) (2006), Guidelines for Ecological Impact Assessments in the UK - Approved version 26 June 2006

farmland birds the Pagham Rife that runs through the Estate also supports European eel *Anguilla anguilla* (recorded at SU 89166 00324 by Environment Agency on 31/07/2015).

Sussex Biodiversity Record Centre report includes a record of great crested newts at SU 880 003 (2002), about 1km west of the development and west of Pagham Rife (**Appendix I**). The only other European protected species recorded in the vicinity of the site are bats. There are eleven water vole records (from 1999 to 2014), mainly from the Pagham Rife west of the proposed Packing Facility. However, there are records in close vicinity to the constructed wetland (SU 892 002), at SU 8921 0028 in 2014 (by Jane Reeve at *Stone Bridge, Pagham Rife, Lagness*) and SU8925 0030 in 2013 (by John Dewey and Jane Reeve at *Pagham Rife near Barfoots*). Few notable plant and invertebrate records had been recorded for the area.

Early edition OS Maps (www.old-maps.co.uk) show that the Rife and general field layout within Sefter Farm Estate appear to have changed little in 150 years and the ditch adjacent the reservoir present on 1877 plans. In addition a footbridge and track (now a Public Right of Way) just north of the location of the proposed constructed wetland was also present on the 1877 OS plan, although the drain at this location first appears on 1965 OS Maps.

3.2 Habitat Evaluation and Impacts

The application site covers an area of about 2.3ha supporting grassland (about 0.75ha), a small section of hedge, but is dominated by bare ground (over 1.5ha of gravel car-park, hard-standing and temporary buildings (see **Figure 1**). The site of the constructed wetland is located on vegetated bare ground adjacent Pagham Rife and a hedgerow. Habitats and features recorded are described in more detail below:

3.2.1 Marshy Grassland

About one third of the main application site consists of species-poor marshy grassland (see **Photo 1**), dominated by marsh foxtail *Alopecurus geniculatus* in damp areas, with Yorkshire fog *Holcus lanatus* and meadow-grasses *Poa* spp becoming frequent to abundant elsewhere. Clumps of greater pond sedge *Carex riparia*, young willows *Salix* spp and rushes *Juncus* spp were also present on impeded ground. Other species included cock's-foot *Dactylis glomerata*, clover *Trifolium* spp, willowherb *Epilobium* spp, creeping buttercup *Ranunculus repens*, dock *Rumex obtusifolius*, and cut-leaved crane's-bill *Geranium dissectum* occasional or rare.

The vegetation community was characteristic of coastal floodplain grazing marsh, a frequently occurring priority BAP habitat (BRIG ed. Ant Maddock 2008²) along the Coastal Plain and a remnant habitat of former meadows that may have been present on the site in the past. A small flock of Starling *Sternus vulgaris* was observed feeding within the sward at the time of the April visit. However, this discrete (~0.75ha) area of grassland was surrounded by active heavy plant and buildings, relatively isolated and thus considered an ecological feature of Parish value. The development will have a high impact upon this habitat feature, which will need to be removed to accommodate the packing facility.

3.2.2 Ditches and Reservoir

A dry ditch adjacent the arable field and site entrance will need to be culverted as a result of development (see **Photo 2**). The ditch was sparsely vegetated supporting willowherb, willow saplings and rushes, with a verge dominated by a species-poor sward of red fescue *Festuca*

rubra and Yorkshire fog, with creeping thistle *Cirsium arvense*, cut-leaved crane's-bill, prickly lettuce *Lactuca serriola* and knapweed *Centaurea* spp rare in occurrence.

The reservoir (see **Photo 3**) had a wooded fringe to the west, north and south, largely willow with dense hawthorn *Crataegus monogyna* scrub in the north-east corner. A mown path was maintained around the perimeter of the wooded screen and small fishing bays scattered around the water's edge. It is understood that the water-body supports a carp fishery and is fished by farm-workers who live adjacent the reservoir. At the time of the visit a pair of mute swans *Cygnus olor*, coots *Fulica atra*, moorhen *Gallinula chloropus*, tufted duck *Aythya fuligula* and shelduck *Tadorna tadorna* were observed on the water-body, although providing little impact upon macrophyte vegetation. The reservoir supported 10% macrophyte cover growing around the pond margins, with species including gipsywort *Lycopus europaeus*, water mint *Mentha aquatica* and water forget-me-not *Myosotis scorpioides*, which were systematically checked for newt eggs, with no eggs observed during the April visit.

The habitat suitability index was recorded for great crested newts (GCN), calculated as 'Poor' suitability for GCN (see **Table 1**). The presence of fish was considered a key limiting factor for GCN and therefore the species was considered likely to be absent from the site.

Table 1: Great Crested Newt Habitat Suitability Index for Reservoir

1. Location	1	6. Presence of waterfowl	0.67
2. Area	N/A	7. Presence of fish	0.01
3. Permanence	0.9	8. Pond density	0.75
4. Water quality	0.67	9. Suitable terrestrial habitat	1
5. Shading	1	10. Macrophyte contact	0.4
Habitat Suitability Index	0.49		

Directly west and downstream of the reservoir was a small ditch (present on early 1877 edition OS maps) that fed into Pagham Rife. South-west of the reservoir the ditch supported dense reeds *Phragmites australis* with nesting Warblers. No water-vole activity was observed within this ditch or the reservoir (see **Appendix II**). The impact upon these features as a result of development and the installation of an outfall into the reservoir will be low.

The constructed wetland is located directly south a dry-ditch (see **Photo 5**), with some reeds at the entrance of the footpath closest to Pagham Rife. However, further east away from the Rife this ditch section rises above the flood-plain parallel with the constructed wetland, becoming heavily encroached bramble beneath which no true aquatic species able to grow. Pagham Rife, 15m west of the site, consisted of a deep-cut (over 1.5m bank height) supported dense reeds either side (see **Photo 6**). These ecological features are considered of Parish to Borough value (supporting water-voles, eel and riparian birds), with the impact upon them considered to be low.

3.2.3 Hedgerows

The only significant shrub species to be impacted are those associated with a 5-10m wide tree-belt (see **Figure 1**) recently planted along the site entrance within the last 10 to 15 years, otherwise no significant trees will be directly impacted by development. The tree-belt supported hawthorn, field maple *Acer campestre*, hazel *Corylus avellana* and guelder-rose *Viburnum opulus*, with several blackbirds *Turdus merula* observed using and possibly nesting in

the tree-belt. Associated with this tree-belt was a seeded wildflower verge. The western end of the tree-belt will be directly impacted by this development and the tree-belt could be used by breeding-birds, such as blackbird and other passerines.

A further hedge was located (see **Figure 1**) between the proposed packing facility development and the reservoir. This mature hawthorn hedge supported a large house sparrow *Passer domestica* colony with numerous (5+) nests observed within the hedge. This hedge will not be directly impacted, as it is about 5-10m from the application site boundary.

A hedge located north of the proposed location for the constructed wetland (see **Photo 5**), present on early edition 1877 OS Maps and located parallel to a footpath, supported a diverse range of native shrubs, including hazel, field maple, hawthorn, blackthorn *Prunus spinosa* and wild rose *Rosa* spp., with a dry ditch adjacent this hedge. The desk-study indicated evidence of water-vole in the vicinity of this hedge (SU8925 0030 in 2013, see **3.1 Biodiversity Desk-study**), although no evidence was observed during the water-vole survey (see **Appendix II**) and it was considered to represent low foraging potential for water-voles.

This hedgerow feature is a priority BAP habitat and potentially an 'Important' hedgerow, as defined under the Hedgerow Regulations 1997. This hedge will not be directly impacted by development, although if the shrub landscape screen north of the constructed wetland is planted too close to the hedge (and in the event fill-material is utilised), the hedge could be impacted and therefore works are currently considered a medium level impact upon this hedge. The hedgerow features on site are all considered ecological features of Parish-value.

3.2.4 Arable Verge (site of proposed Constructed Wetland)

This area proposed for the Constructed Wetland is within arable verge and farmland under Entry and Higher Level Stewardship (dated from 2012, agreement reference AG00419968). As noted in the desk-study (**Appendix I**) there are water-vole records in close vicinity to the constructed wetland (SU 892 002), at SU 8921 0028 in 2014 (from the adjacent Pagham Rife) and SU8925 0030 in 2013 (possibly the hedge north of the proposed constructed wetland).

The area of the site proposed for the constructed wetland (see **Photo 4**) supported vegetated bare earth dominated by germinating bristly oxtongue *Picris echioides*, with creeping thistle, scented mayweed *Matricaria recutita* and melilot *Melilotus* spp. frequent, shepherd's-purse *Capsella bursa-pastoris*, scarlet-pimpernel *Anagallis arvensis* and amphibious bistort *Persicaria amphibia* occasional in occurrence. Species growing on the margins of the vegetation bare earth included groundsel *Senecio vulgaris*, selfheal *Prunella vulgaris*, and field bindweed *Convolvulus arvensis* all rare in occurrence.

A track and grass-verge (dominated by the Yorkshire fog) separated the vegetated bare ground from the hedgerow to the north (about 8m distance). The site of the constructed wetland is about 15m east of Pagham Rife, separated by a farm access track and grass verge.

3.2.5 Bare ground, buildings

The majority of the main application site (>1.5ha) consisted of bare ground, including bare earth in which lorry trailers were parked, car-parking consisting of loose gravel, temporary buildings and roadways.

3.3 Protected Species Evaluation and Impacts

3.3.1 Water-voles

A site survey conducted on 30th June 2016 confirmed that water-voles are active south of the Sefton Farm, but no activity was registered within the reservoir or the adjacent ditch-outfall close to the proposed packing facility (see **Appendix II**). The desk-study (**Appendix I**) confirmed that water-voles have been recorded on the section of Rife in close vicinity to the constructed wetland, with records at SU 8921 0028 in 2014 (by Jane Reeve at *Stone Bridge, Pagham Rife, Lagness*) and SU8925 0030 in 2013 (by John Dewey and Jane Reeve at *Pagham Rife near Barfoots*). However, no activity was registered on 7th July directly adjacent the constructed wetland (see **Appendix II**), with signs of water-vole observed about 50 to 100m north and south of the proposed site. This development activity is currently considered to result in a low impact upon water-voles with the works about 15m from the Rife (separated by a farm track). The impact upon the dry ditch (low potential for water-vole foraging) as a result of the wetland construction in the absence of detailed design is considered a low to medium level impact, with potential for damage during construction in the event fill material is utilised along the northern side of the constructed wetland and unsympathetic tree-planting over time could over-shade this hedge and ditch feature.

3.3.2 Birds

In summary a range of red status farmland birds have been recorded by the SBRC (**Appendix I**). During the survey visits a large colony of house sparrows (a red status Bird of Conservation Concern) was observed breeding within a hedge 5-10m west of the main application site; blackbirds and other passerines are likely to breed within the tree-belt near the site entrance; water-fowl (such as mute swan, coots and moorhen) are likely to breed on the reservoir; and starling were observed feeding within the marshy grassland. The proposals include removal of areas of grassland (about 1ha), which will reduce the amount of foraging habitat for farmland birds associated with the Estate, although the majority of the marshy grassland is within a highly active part of the Estate. However, the creation of the reed-bed is likely to have a positive impact, by increasing the breeding and foraging area for warblers on the Estate, many of which are red status birds of conservation concern.

In general impact upon birds breeding and foraging on site is considered to be low, especially when considering the extent of development and surrounding landscape. The farm estate is under Stewardship with elements of management required to encourage farmland birds. All wild birds are protected from harm and disturbance at the nest under the Wildlife and Countryside Act 1981 and any scrub and hedge areas on the application site impacted or disturbed by development could result in a breach of wildlife legislation.

3.3.3 Other protected species

No evidence of other protected species was recorded on the site. The assessment and egg search of the reservoir considered GCN unlikely to be present. The habitats in general were not suitable for reptiles and a concurrent reptile survey about 200-250m south of the application site, concluded an absence of reptiles within sub-optimal habitat. A badger sett has been identified about 200-250m south of the site, but no evidence of badgers was noted within the application site associated with the packing facility. Other BAP species such as hedgehog and brown hare have been recorded by the desk-study and maybe present on the Estate, although these species are also unlikely to be impacted by development proposals.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Water-voles are known to utilize the Pagham Rife and associated water-bodies within the Estate, with evidence observed on a ditch about 250 to 300m south of the main application site and along Pagham Rife, about 15m west of the proposed constructed wetland. Pagham Rife and associated ditches are considered ecological features of Parish to Borough value due to the presence of water-vole, eels and riparian birds. However, impacts as a result of development upon the Rife and associated ditches is considered to be low.

A number of birds of conservation concern utilize the farmland Estate and maybe impacted both through removal of the tree-belt (nesting and foraging habitat) and grassland associated with the development. In general the features observed on site were of site to Parish-value (i.e. native hedge and marshy grassland) and while the impacts upon the marshy grassland will be high this area is heavily disturbed throughout the year, therefore unlikely to be utilized by breeding-birds. It is recommended that the following mitigation and enhancements should be considered (see **Figure 2**):

4.1 Breeding birds and Hedgerows

It is recommended that the tree-belt near the site entrance is removed outside of the bird-breeding season (October to February) and if they need to be removed during spring-summer period then a breeding bird survey will need to be conducted. A tool box talk should be provided to contractors not to disturb scrub and hedges during breeding period, highlighting the hedge 10m west of the main application site which supports a large house sparrow colony and the potentially 'Important' hedgerow north of the constructed wetland.

4.2 Water-voles and Ditches

Although impact upon water-vole populations is considered to be low, if any further works are required to Pagham Rife or associated ditches (such as installation of any outfalls), then further water-vole surveys would need to be conducted in the area of works.

4.3 Constructed Wetland, Scrub Planting and Grassland Creation

During construction storage compounds and pollutant materials (such as fuel) should be located away from water-courses. A tool-box talk on biodiversity interest on the site should be conducted to make contractors aware of sensitive ecological features on site and the need to avoid damaging ecological features such as hedges and water-courses.

The constructed wetland may present breeding and foraging opportunities for warblers. The landscape proposals (see **Figure 2**) include the provision of planting native shrubs and trees around the west and northern boundaries of the wetland feature, which will more than mitigate for the loss of a discrete area of scrub at the site entrance.

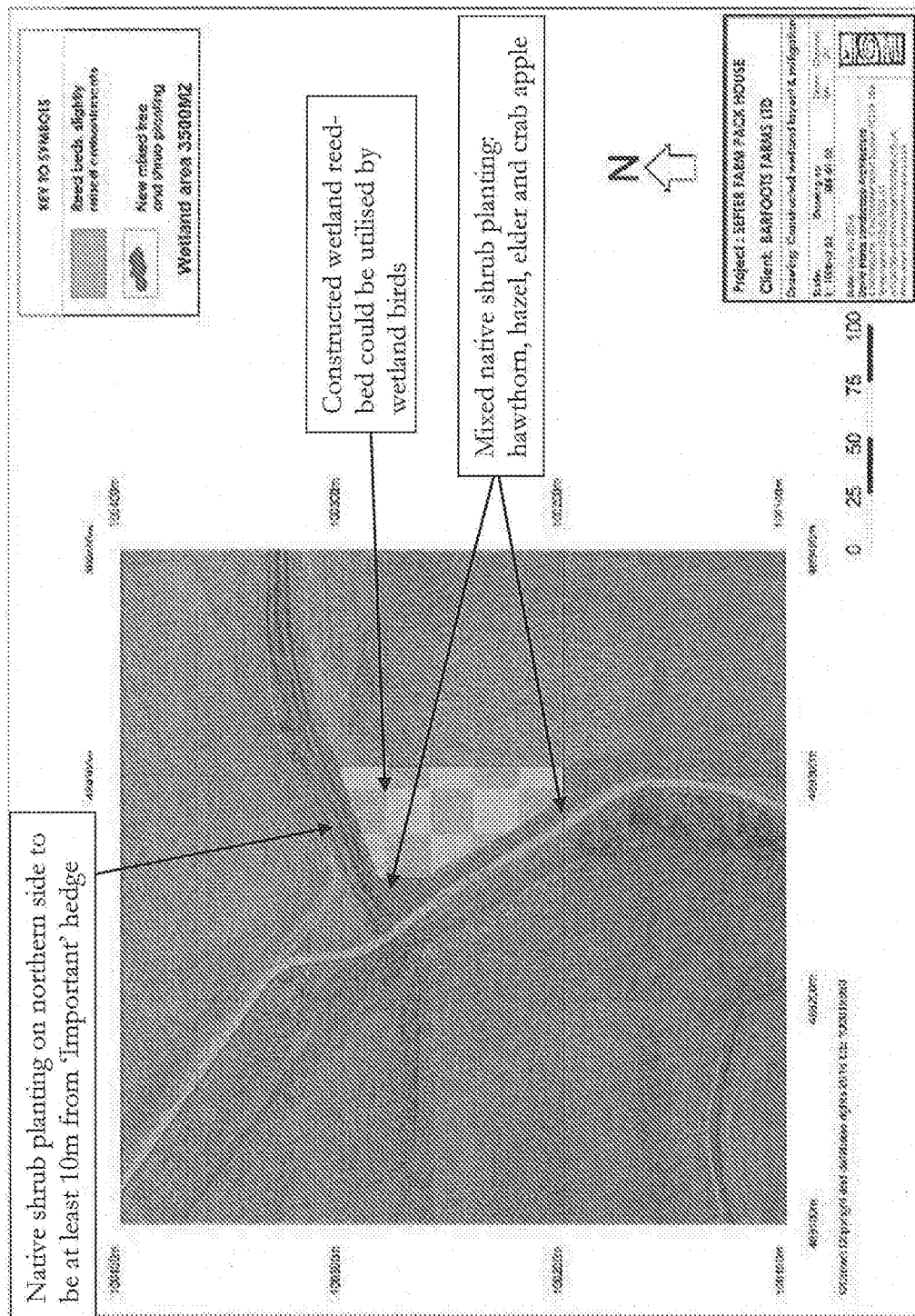
The provision of shrub planting north of the Constructed Wetland should be restricted as hedge-planting to a minimum distance of 10m from the existing hedge and ditch. Over-shading of the existing ditch and potentially 'Important' hedge (as defined under Habitat Regulations 1997) will reduce development of hedge under-storey along the ditch, impacting this ecological feature and associated wildlife.

5.0 SUMMARY OF RECOMMENDATIONS

Table 1: Summary of features, impacts, further surveys required and appropriate mitigation.

Feature	Value	Impact	Mitigation / Enhancement	Further Surveys
Pagham Rife and associated ditches	Parish to Borough	Low	Storage of pollutant materials away from water-courses	Monitor storage arrangements (ongoing)
Marshy grassland	Parish	High	Create 0.5ha of grassland within Estate, where space permits	None required
Hedgerows	Parish	Low to Medium	Wetland shrub planting screen 10m from hedge. Tool box talk. Remove scrub in winter and avoid disturbance to hedges and scrub during bird-breeding.	Breeding-bird survey if scrub removed in breeding period.
Water-voles	Parish to Borough	Low	Tool-box talk	None required

Figure 2: Constructed Wetland Landscape Scheme
 Packing Facility, Sefter Farm, Pagham
 Ecological Assessment GPM Ecology, July 2016



Document reference: P2003/01/02, Status: Final

Photographs: Sefter Farm, Proposed Packing Facility (2016)



Photo 1: Grassland at Packing Facility site (GPM Ecology, 17th May 2016)



Photo 2: Dry ditch within Packing Facility site (GPM Ecology 26th April 2016)



Photo 3: Reservoir to receive outfall adjacent proposed Packing Facility (17th May)



Photo 4: Vegetated bare ground of proposed Constructed Wetland site, next to hedge verge and Pagham Rife below (7th July 2016)



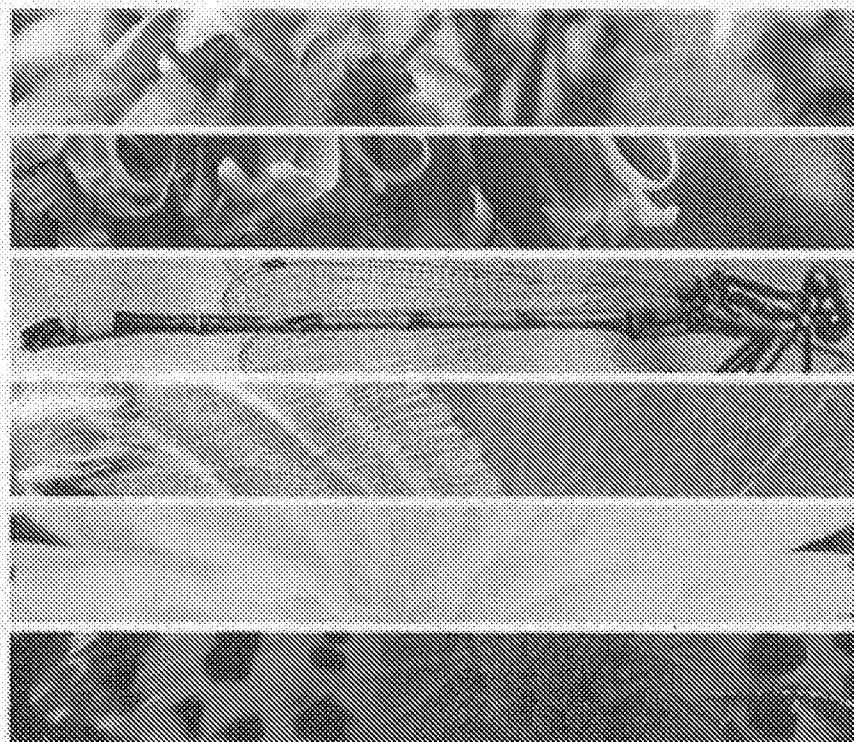
Photo 5: Hedge, dry ditch and verge adjacent Constructed Wetland (7th July 2016)



Photo 6: View south of Pagham Rife, 15m west of Constructed Wetland (7th July)

**APPENDIX I: Sussex Biodiversity Record Centre Desk Search
Sefter Farm, Bognor Regis + 1km radius, 4th May 2016**

EXTRACT OF MAPS ONLY (DATA SUMMARISED IN ECOLOGY REPORT)



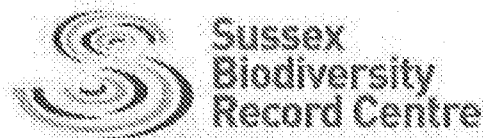
Desktop Biodiversity Report

Sefter Farm, Bognor Regis + 1km radius

SxBRC/16/063

Prepared for Gareth Matthes (GPM Ecology)

4th May 2016



Designated Site Map (SxSRC/16/063)

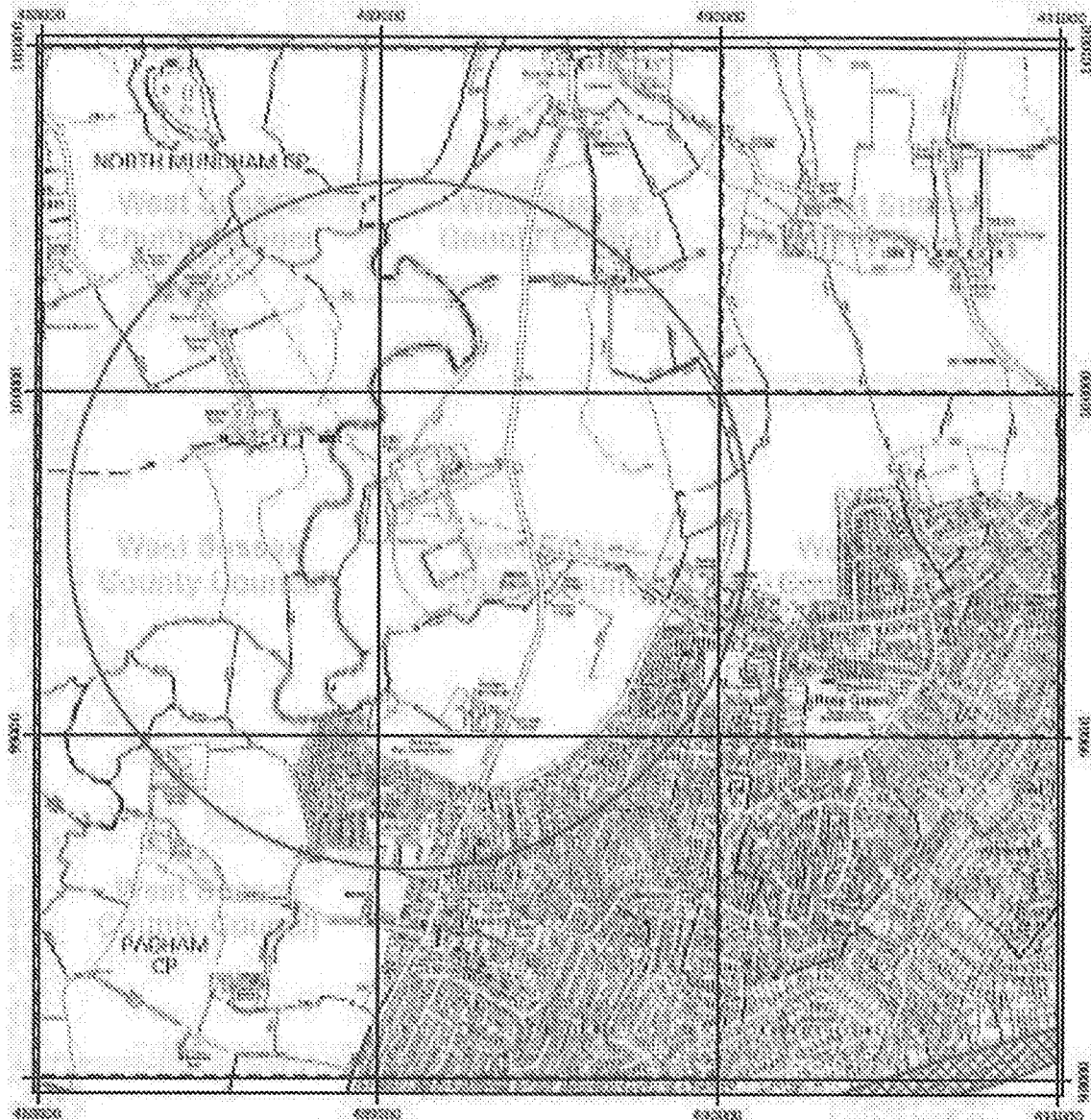
Land at Selter Farm, Bignor Regis + 1km radius

Prepared for Gareth Matthews (GFM Ecology) - 04/05/2016



Sussex
Biodiversity
Record Centre

Shoreline 1990, modified
West Sussex 2000-2010
info@sbrc.org.uk
www.sussex.gov.uk
01243 855555



Key to Map:

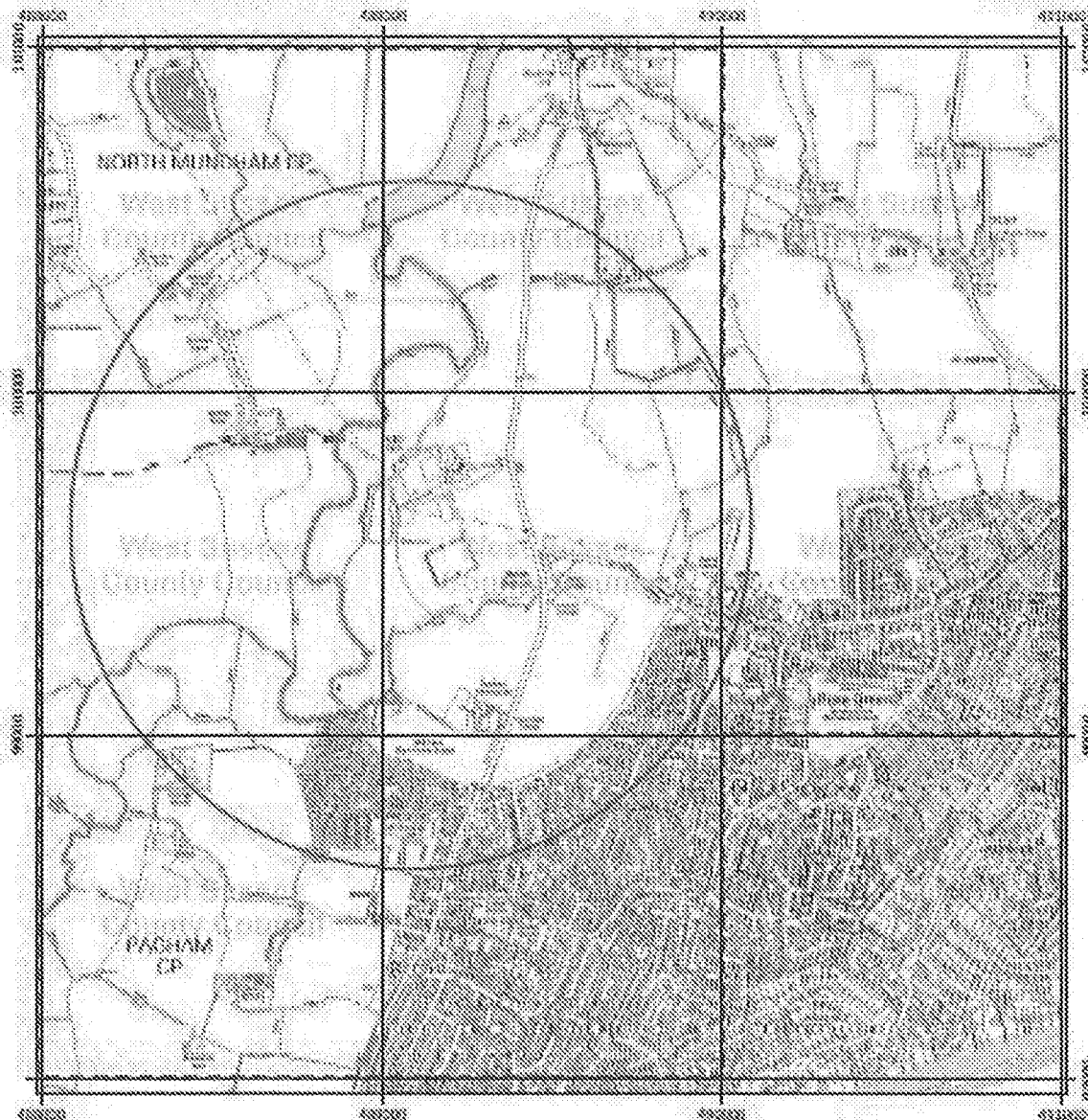
- Shaded area
- Species search area
- Site of Special Scientific Interest
- Local Geological Site



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Map data: Special Area of Conservation (SAC), Special Protection Area (SPA), National Park, Area of Outstanding Natural Beauty (AONB), National Nature Reserve (NNR), Site of Special Scientific Interest (SSSI), Local Nature Reserve (LNR) and Country Park. Data reproduced with permission of Natural England, Site of Nature Conservation Importance (SNCI), Area of Outstanding Natural Beauty (AONB) and West Sussex County Council, and Brighton & Hove City Council. Relative final large data supplied by GFM and West Sussex County Council. Map designed by GFM. Data created by GFM. All rights reserved 2016.

Revised for Science Matters 1998 Energy, 04-05-2000

[illegible]

Abstract

- | | |
|---|------------------------------------|
|  | Foraging area |
|  | Species search area |
|  | Intertidal mudflat |
|  | Coastal vegetated dingle |
|  | Open Water |
|  | Coastal & floodplain grazing marsh |

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[illegible]

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Ownership & Management Map (SxBRC/16/06a)

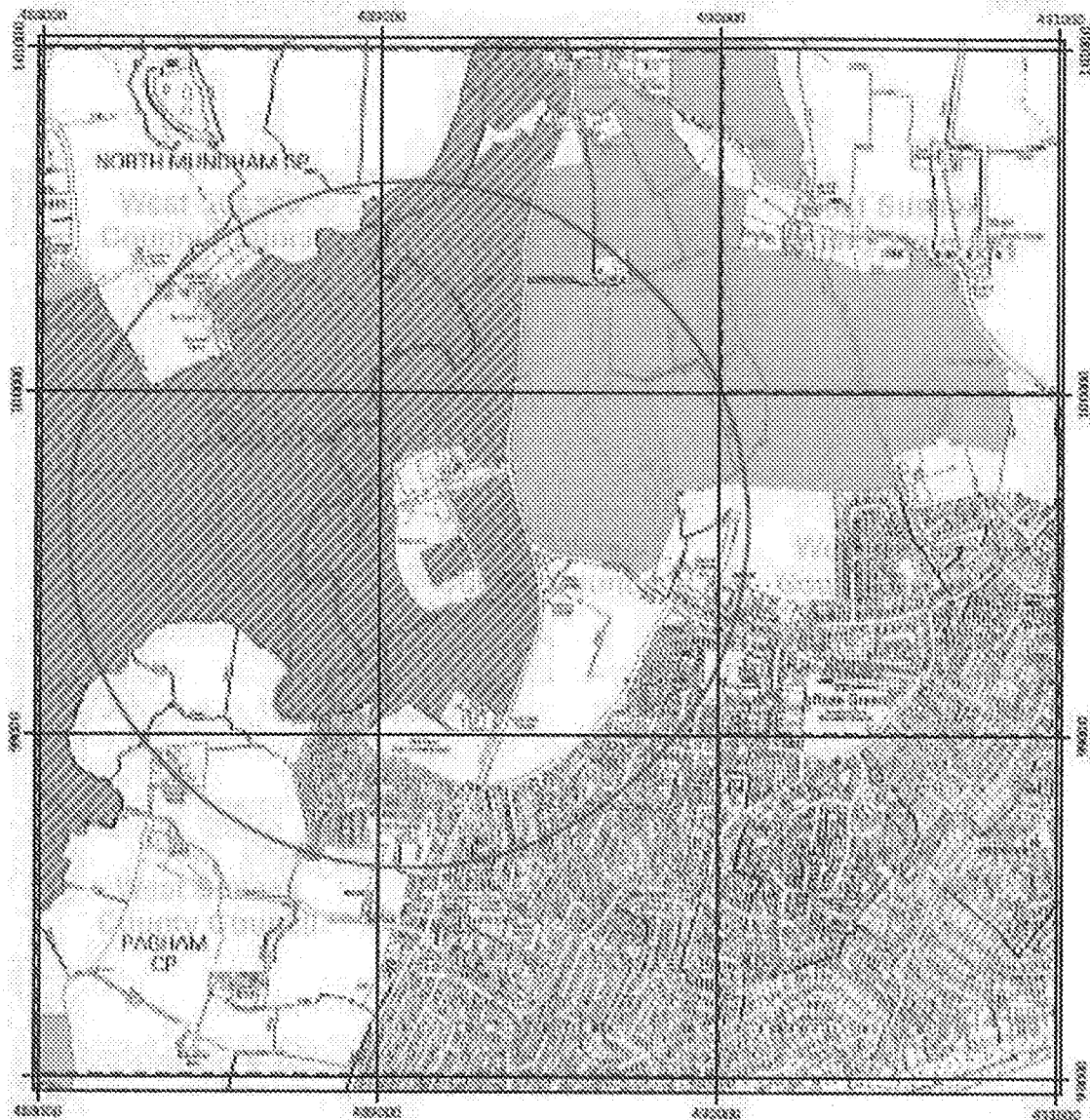
Land at Selter Farm, Bognor Regis + 1km radius

Revised for Sussex Wildlife (SWM Ecology) - 04/05/2018



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Key to Map:

- Grassland area
- Species search area
- Environmental Stewardship Agreements:**
 - Higher Level Stewardship (HLS)
 - Entry Level Stewardship (ELS)
 - Organic ELS
 - Organic ELS plus HLS
 - HLS plus HLS

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APPENDIX II: Sefton Farm Water-Vole Survey, Field Report
Andrew Rothwell 30th June and 7th July 2016

**A Water Vole Survey of Seftor Farm, Pagham Rd, Bognor Regis,
West Sussex.**

30th June 2016

&

7th July 2016

Field Report

(Amended 12-7-16)

Andrew Rothwell

**Zoological Surveyor for and on behalf of
GPM Ecology**

Introduction

The Packhouse development proposal at Seftor Farm aims to include the existing western reservoir and its associating outflow ditch for surface water disposal. Furthermore a separate independent development proposal of an addition reservoir is planned to be installed at the southern end of the site on the current arable land. A third development proposal is to create a reed bed adjacent to the Pagham Rife towards the northern end of the site.

With the plan of discharging water into the surrounding ditches on site an assessment of water vole activity was commissioned, in order to establish their presence and assess any mitigation measures required in relation to the proposed development plans.

Methodology

A standard survey technique, as outlined in the Water Vole Conservation Handbook (Strachan, 1998) was employed to determine presence of water vole activity on selected water bodies within and surrounding Seftor Farm. In summary, the banks of the study area were intensively examined for the field signs of water voles (which includes latrines, burrows, footprints and feeding remains). Further details of these field signs are given in the appendix. The presence of other important riparian mammals would also be recorded.

Where practicable, the watercourse was examined from within the channel itself. In the event of dense vegetation or other obstruction disabling a thorough search, a series of spot checks would be employed at every available access point along the fringing banks.

Where present the number of water vole latrines found were tallied to give an indication of water vole activity, together with an estimate of water vole numbers (see note in Appendix II for calculating a water vole index).

The selected water bodies in the study area comprised of the western reservoir, its associating drainage ditch, parts of the Pagham Rife and a southern ditchline. Both of these ditches flow directly into the Pagham Rife (see Figure 1) and were examined for their full linear lengths. The Pagham Rife was examined at its closest point nearest the large reservoir and between the two adjoining ditches (see Figure 1). At the northern end of the site a small section of the Rife and a small ditch line was also examined in relation to a proposed reed bed construction (see Figure 2).

Only spot checks were employed along the Rife in order to reduce the disturbance to breeding birds (warblers in particular). All other water bodies selected for survey were examined for their full linear lengths.

The reservoir has an approximate circumference of 430 metres; its associating ditch is approximately 300 metres in length. The southern ditch is approximately 650 metres in length. Thus a total linear length of 1380 metres was surveyed fully for water vole activity in the southern part of the site. In addition, although approximately 370 metres of the Rife were targeted in the southern part of the site, just under a half of that length was physically surveyed (see Figure 1). Similarly, the Rife in the northern section of the site had a target length of approximately 530 metres (270m upstream, 260m downstream from the footbridge) but only 150 metres were physically surveyed. Therefore, a grand total of approximately 1700 metres linear length of water body was surveyed for the presence of water vole at Seftor Farm, over the course of two site visits.

Results

This survey of the reservoir, Pagham Rife and associating ditches in the southern part of the site were conducted on 30th June 2016. The Northern part of the site was surveyed on 7th July 2016; both visits were carried out during favourable weather conditions.

In the southern part of the site, Water vole activity was found only on the southern ditch system (see Figure 1). Fifteen field signs were found altogether, comprising of several dropping sites, five latrine sites, one burrow (Fig.1 - TN9), food caches and feeding remains.

The index equation was used to calculate the numbers of water voles utilising this system. This only resulted in a relatively low population score of almost 5 (4.90) water voles. Despite this however, they are present on site and occupy just over half of the linear length of this ditch.

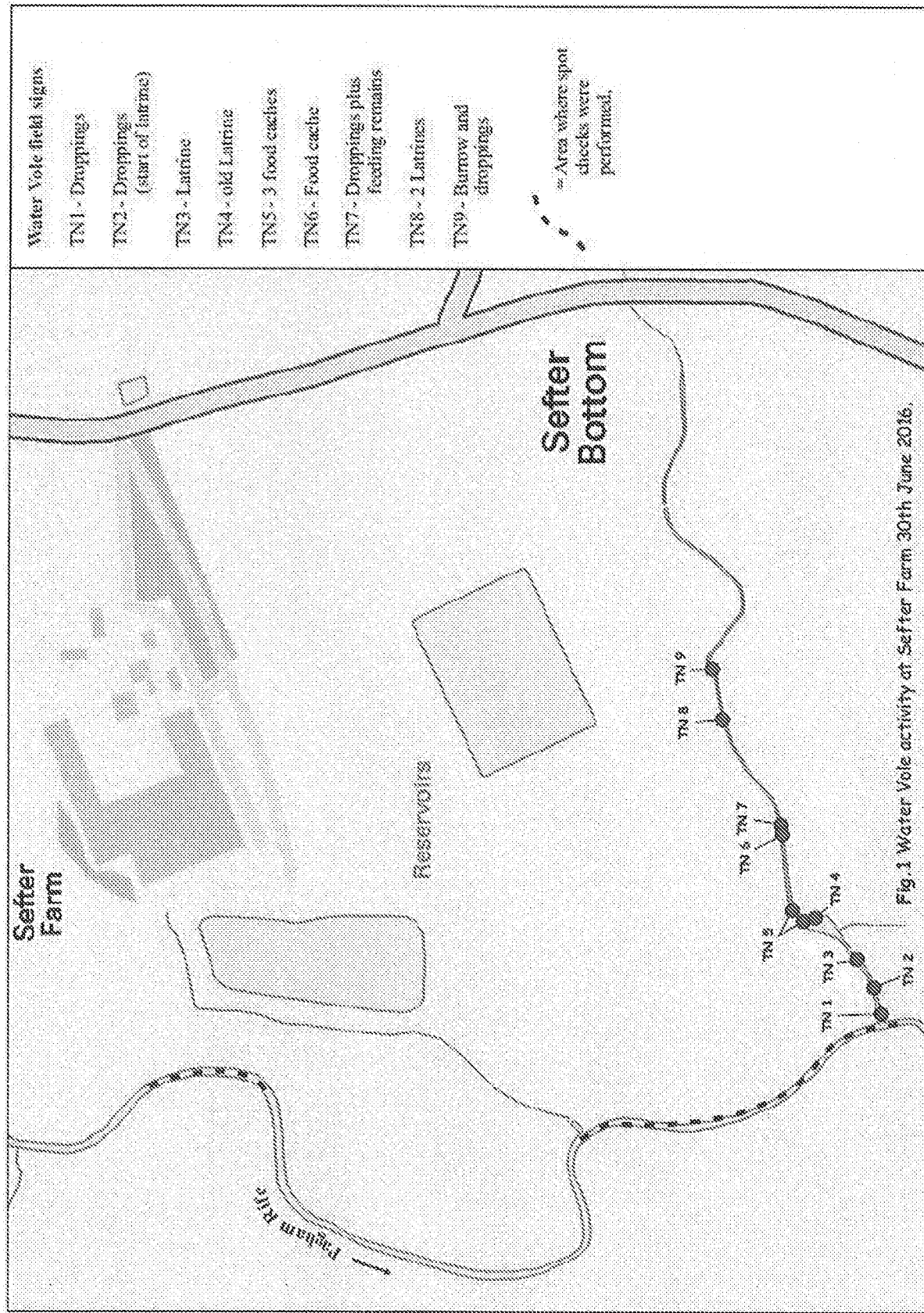
It stands to reason that water voles are also on the adjoining Pagham Rife, but due to the nature of the survey methods employed, no immediate evidence of water vole activity was found on the Rife in this area.

Both the western reservoir and its associating drainage ditch were deemed in its current state, of low potential for water vole occurrence. The drainage ditch was predominantly dry with a few isolated puddles of static water; whereas the reservoir (lined) consisted of predominately shallow banks with a relatively sparse understorey from the dense willow tree margins.

In contrast the southern ditch had predominantly steep banks, fast/slow flowing water at an average depth of 0.5 metres, with dense vegetation coverage from phragmites and bramble scrub. The Rife consisted of steep banks with wide dense margins of phragmites with some patches of bur-reed and sedges. The water depth on the Rife was 1 to 2 metres, with a strong fast/rapid flow.

Only three field signs of water vole were found on the Pagham Rife in the northern section of the site (see Figure 2). The combination of steep banks, dense vegetation and spot check operations reduced the chances of finding further evidence.

The northern most ditch line associated with the Rife was completely dry and engulfed by hedge line vegetation. Although there is potential (albeit low) for water voles to forage along this ditch. However no evidence was found to support this notion.



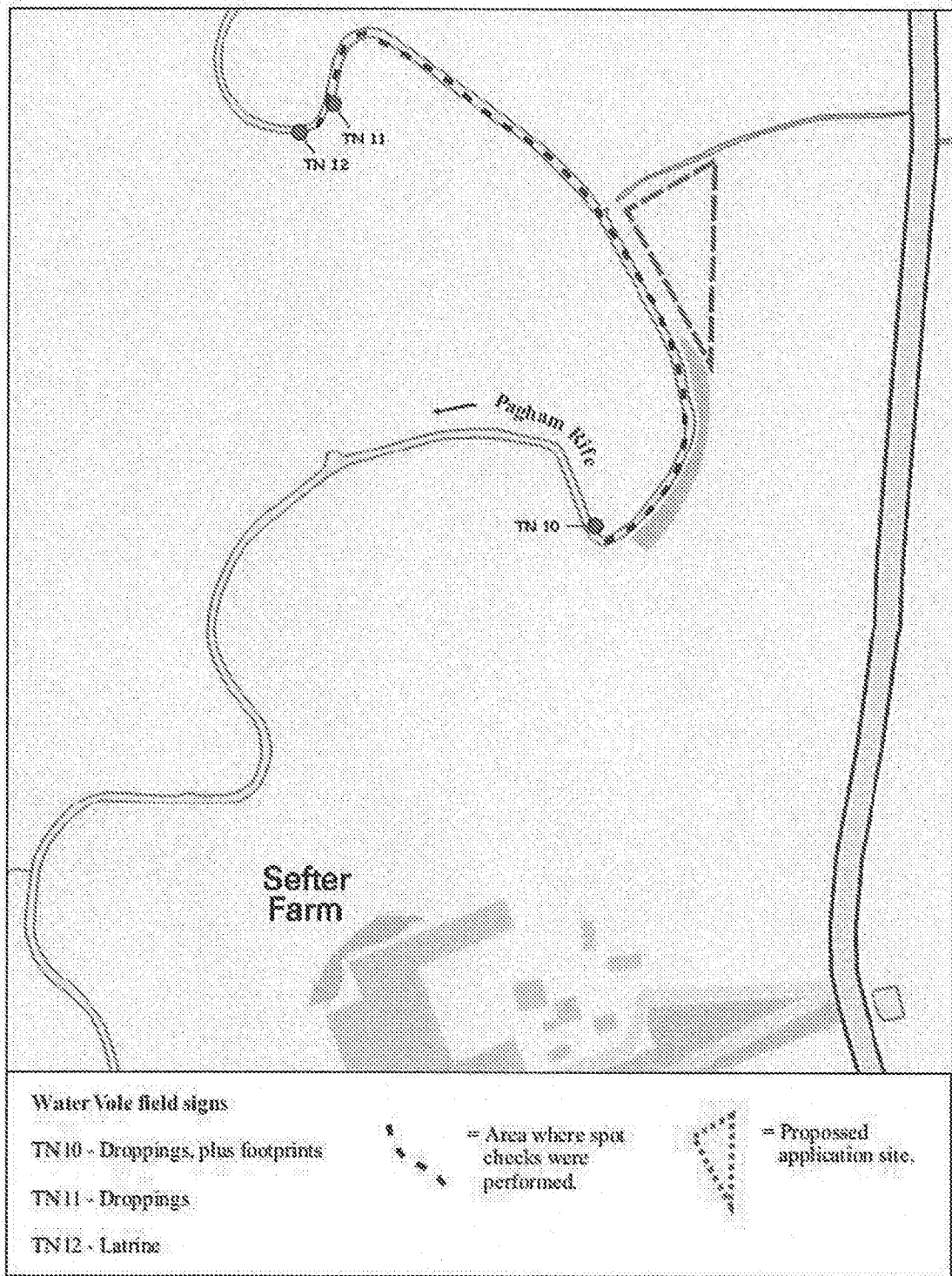


Fig.2 Water Vole activity at Seftor Farm 7th July 2016.

Survey implications

At the time of year of the survey, water voles are showing a peak in weaned animals, with second litters being produced. Juveniles are dispersing and immigration complements the population status (Strachan, 1997). However, this can fluctuate, depending on many biotic and abiotic factors.

The survey effort can be significantly hampered during the summer months, due to dense vegetation and sensitive methods for breeding riparian birds. Despite this, Water voles were found to be present on the southern ditch at Sefton Farm and on the Pagham Rife in the northern part of the site (Figures 1 and 2). Although the number of field signs found would be indicative of a low water vole population. It should be assumed that this in reality is likely to be higher at a low/medium level.

Any farm practices currently in place at Sefton Farm do not seem to have any undesirable affect /displacement of water voles. As such the planned surface water disposal, creation of a reed bed in the north and secondary reservoir in the south, is unlikely to have any further effect on this species. However, during the proposed developments, if any extra pipe-work or earthworks at the banksides of the Rife and associated ditches is required, then mitigation measures may need to be sort and put in practice; depending on their location this might also require a licence! Only one water vole burrow was found on the upper reaches of the southern ditch during this survey (see Figure 1 TN9). This is approximately 200 metres downstream from the proposed new reservoir footprint, at the southern end of the site. Therefore should be well out of harms way and not in any impact zone. Further advice may need to be taken depending on the finalised development structural plans.

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APPENDIX I: CURRENT STATUS OF THE WATERVOLE

Brief History

The water vole [*Arvicola amphibius* (formerly *A. terrestris*)] is the largest of the British voles. They are adapted to living in burrows and were once seen to inhabit the majority of the river banks throughout Britain, favouring sites with lush waterside vegetation for food and shelter (Strachan, 1997).

From the first nationwide survey 1989 - 1990 it was seen that the water vole had suffered a long-term decline since 1990, with 94% of the sites no longer supporting water voles (Strachan, 1998). Furthermore, from the most recent national survey (1996 - 1998) this decline has developed into a serious population crash with a further loss of 67.5% of the survey sites occupied by water voles, (or an overall 88% loss of the British population) since the first national survey (Strachan *et al.* 2000).

The main cause of this decline was changes in agricultural practices and river habitat management (Strachan, 1997). Consequentially habitat degradation and loss resulted in isolation and fragmented populations of water voles in Britain. This increased the predation risk, especially from the introduced American mink (*Mustela vison*), which has been well documented as an important predator of the water vole (Strachan, 1997; Strachan, 1998; Strachan and Jefferies, 1998; Macdonald and Strachan, 1999).

Legal Status

On the 6th April 2008 water voles received an increased level of protection, becoming fully covered by the provisions of section 9 of the Wildlife and Countryside Act 1981 (as amended). Prior to this the water vole was only covered by section 9(4) and had limited legal protection.

The new amendment to this piece of legislation now makes it an offence to intentionally kill, injure, take from the wild, possess or trade in a water vole. Furthermore, it is also an offence to intentionally or recklessly damage, destroy or obstruct access to any structure or place that water voles use for shelter or protection, and to disturb water voles while they are using such a place. The water vole is also a UKBAP and Local Area BAP species.

APPENDIX H: FIELD SIGNS OF WATER VOLE

* Droppings and Latrine Sites

The presence of the water vole can be determined from its droppings, which provide the most distinctive field sign. They are roughly 8-12mm long and 4-5mm wide, cylindrical with blunt ends. Their colour ranges from black, brown and green, depending on age, diet and water content.

Most droppings are deposited on latrine sites (distinct area of droppings), which can be found at favoured areas where the voles leave and enter the water, at discrete sites near to their burrows and are used to mark territorial boundaries. Breeding voles use regular latrine sites along water margins, and often consist of a flattened mass of old droppings with fresh ones on top.

* Burrows

Water vole burrows have an approximate hole size of 4-8cm. The burrows can appear as a series of holes along the waters edge, some may open below the water line, whilst others can occur amongst the vegetation up to three metres from the water. Land holes may also show evidence of a closely cropped grazed lawn, where a female water vole has nibbled the vegetation short within easy reach of the burrow.

* Grazing Remains

Water voles often bring food items to favoured feeding stations along the waters edge and at burrow entrances. Feeding remains consist of neat piles of chewed off lengths of vegetation. These grazing remains typically measure 8-10cm, showing two large incisor marks. Grazing remains also double as food caches and are often accompanied by droppings.

* Footprints

Imprints from water voles show four digits from the fore foot and five digits in the hind foot. The imprinted digits form a star shape of splayed-out toes. Water vole tracks are very difficult to distinguish between tracks made from the brown rat, particularly young animals. Generally, water vole prints tend to be much smaller than rat prints and cannot always be used as reliable indicators in the absence of other water vole field signs.

* Latrine Densities and Water Vole numbers

Latrine counts not only provide a useful index of water vole activity they can also give an indication of the strength of the water vole colony. A predictive equation has been established to estimate the numbers of water voles from the number of latrines found in a given area (Morris *et al.* in Strachan, 1998):

$$y = 1.48 + 0.683x$$

[where y = number of water voles inhabiting a stated length of waterway, and x = number of latrines counted in that same length].

Note: The original research leading to the equation was not aimed at producing a formula for estimating population density from latrine density. As a result it may not be applicable to all habitats and situations where water voles occur; nevertheless it gives a useful index of water vole densities.

WATER VOLE SURVEY FORM

BACKGROUND INFORMATION

Site name/river **Ditch line tributary of the Pagham Rife**

Site number **n/a** 10km square **SZ 89** Grid ref **SZ 889 992**

County **Hampshire** Water Authority

Recorder **Andy Rothwell** Date **30-June-16**

HABITAT INFORMATION (mark features on map)

Survey distance **690** m

Habitat

☒ Ditch
☐ Dyle
☐ Gravel pit
☐ Pond
☐ Lowland lake
☐ Upland loch
☐ Reservoir
☒ Running water
☐ Marsh/bog
☐ Canal

Shore/bank

☐ Boulder
☒ Stone
☐ Gravel
☐ Sand
☐ Silt
☒ Earth
☐ Rock cliffs
☐ Earth cliffs
☐ Concreted
☐ Poached
☐ Reinforced (man-made)

Bordering land use

☐ Upland grass
☒ Permanent/temporary grass
☒ Mixed broadleaf woodland
☐ Conifer wood
☐ Peat bog
☒ Arable crop
☐ Salt marsh
☒ Urban/industrial
☐ Polygarden
☐ Heath
☐ Fen
☐ Cattle/grazing
☐ Bank fenced

Vegetation (DAFORM)

☒ F Fenside trees
☐ O Bushes
☐ O Herbs
☒ R Submerged weed
☒ A Reeds/sedges
☐ O Tall grass
☒ R Short grass

Disturbance:

Name:

Bank profile

☐ Flat < 10°
☒ Shallow < 45°
☒ Steep > 45°
☐ Vertical/undercut

Depth

☒ < 0.5m
☐ 0.5-1m
☐ 1-2m
☐ > 2m

Width

☒ 1m
☐ 1-2m
☐ 3-5m
☐ 5-10m
☐ 10-20m
☐ 20-40m
☐ > 40m

Current

☒ Slow
☐ Rapid
☐ Stagnant
☒ Fast
☐ Static

WILDLIFE INFORMATION

Water voles

0 Sightings (count)
5 Latrines (count)
1 Burrows (count)
☒ Footprints
☐ Pathway in vegetation
☒ Feeding remains
☐ Cropped grass around tunnel entrance

Other (none)

☐ Sightings
☐ Droppings
☐ Footprints/urine

Other (none)

☐ Sightings
☐ Droppings
☐ Footprints/urine

Other (none)

☐ Sightings
☐ Droppings
☐ Footprints/urine

Other wildlife

☐ Kingfisher
☐ Heron
☒ Coot
☒ Wadswort
☐ Moorhen
☐ Dipper

Identified plants from feeding remains:

Phragmites

ADDITIONAL INFORMATION

Burrow on the left-hand bank, on the upper reaches at SZ 89209 99351

WATER VOLE SURVEY FORM

BACKGROUND INFORMATION

Site name/river **Pagham Rife**

Site number **n/a** 10km square **SU 80** Grid ref **SU 890 000**

County **Hampshire** Water Authority

Recorder **Andy Rothwell** Date **7-July-16**

HABITAT INFORMATION (mark features on map)

Survey distance

150 m

Habitat

- ☒ Ditch
☐ Dyke
☐ Gravel pit
☐ Pond
☐ Lowland lake
☐ Upland loch
☐ Reservoir
☒ Running water
☐ Marsh/bog
☐ Canal

Shore/bank

- ☐ Boulder
☒ Stones
☐ Gravel
☐ Sand
☐ Silt
☒ Earth
☐ Rock cliffs
☐ Earth cliffs
☐ Condensed
☐ Poached
☐ Reinforced (man-made)

Bordering land use

- ☐ Upland grass
☒ Permanent/temporary grass
☒ Mixed broadleaf woodland
☐ Conifer wood
☐ Peat bog
☒ Arable crop
☐ Salt marsh
☐ Urban/industrial
☐ Park/garden
☐ Heath
☐ Fen
☐ Cattle/grazing
☐ Bank fenced

Vegetation (DAFORN)

- ☒ Bankside trees
☐ Bushes
☐ Herbs
☒ Submerged weed
☐ Reeds/sedges
☐ Tall grass
☒ Short grass

Disturbance:

None

Bank profile

- ☐ Flat < 10°
☐ Shallow < 45°
☒ Steep > 45°
☐ Vertical/undercut

Depth

- ☐ < 0.5m
☐ 0.5-1m
☒ 1-2m
☐ > 2m

Width

- ☐ 1m ☐ 1-2m ☒ 2-5m
☐ 5-10m ☐ 10-20m ☐ 20-40m ☐ > 40m

Current

- ☐ Rapid ☒ Fast
☐ Slow ☐ Stagnant ☐ Static

WILDLIFE INFORMATION

Water voles

- 0** Sightings (count)
1 Latrines (count)
0 Burrows (count)
☒ Footprints
☐ Pathway in vegetation
☐ Feeding remains
☐ Cropped grass around tunnel entrance

Rat (none)

- ☐ Sightings
☐ Droppings
☐ Footprints/runs

Otter (none)

- ☐ Sightings
☐ Droppings
☐ Footprints/runs

Mink (none)

- ☐ Sightings
☐ Droppings
☐ Footprints/runs

Other wildlife

- ☐ Kingfisher ☐ Heron ☒ Coot ☒ Moorhen
☐ Wader ☐ Waterfowl ☐ Dipper

Identified plants from feeding remains:

ADDITIONAL INFORMATION

Latrine on the right-hand bank at SU 89029 00318