



West Winch Housing Access Road

Environmental Statement Chapter 8: Annex 8.4 Aquatic Ecology Scoping Report

Author: WSP

Document Reference: NCC/3.08.08

Version Number: 01

Date: November 2023



Contents

1	Aquatic Ecology Scoping Report.....	3
1.1	Methodology.....	3
1.2	Results	9
1.3	References	18

Tables

Table 1-1	– Statutory designated sites within 2km of the study area	10
Table 1-2	– Environment Agency fish data from a single catch survey conducted in March 2017 on the River Nar (NGR TF 67090 13498)	12
Table 1-3	– Biological metrics derived from Environment Agency macroinvertebrate surveys undertaken on the River Nar (NGR TF 63588 13456).....	13
Table 1-4	- Environment Agency – Environment Agency macrophyte data from a macrophyte survey undertaken on 19/07/2019 on the River Nar (NGR TF 67716 14049)	13
Table 1-5	– Summary of scoping survey sites with watercourse section details habitat descriptions and further survey scope	15

Figures

Figure 1-1	– Scoping area with extents of receptors assessed and scheme boundary - south.....	5
Figure 1-2	– Scoping area with extents of receptors assessed and scheme boundary - central.....	6
Figure 1-3	– Scoping area with extents of receptors assessed and scheme boundary - North.....	7



1 Aquatic Ecology Scoping Report

1.1 Methodology

Desk Study

Designated Nature Conservation Sites

- 1.1.1 A desk study of statutory sites within 2km of the Proposed Scheme was undertaken. Information was obtained from Multi Agency Geographical Information for the Countryside (MAGIC) website (Natural England, 2022).

Water Framework Directive

- 1.1.2 The current Water Framework Directive (WFD) status for the catchments within 2km of the Study Area was obtained from the Environment Agency's Catchment Data Explorer website (Environment Agency, 2022a).

Environment Agency Records

- 1.1.3 Fish, aquatic macroinvertebrates (hereafter referred to as 'macroinvertebrates') and macrophyte survey data for relevant watercourses was obtained from the Environment Agency's Ecology and Fish Data Explorer (Environment Agency, 2022b).

Scoping Survey

- 1.1.4 An aquatic ecology scoping survey was conducted on all watercourses and waterbodies within or adjacent to the Scheme Boundary. These surveys were carried out in conjunction with a River Condition Assessment (RCA), the results of which will be presented in a separate technical note.
- 1.1.5 The Scheme Boundary and scoped aquatic receptors are shown in Figures 1-1 - 1-3. The Scheme Boundary used in these figures is a previous version of the Scheme Boundary that was relevant at the time of the scoping assessment. The version provided for the planning application has been revised to increase the area of landscaping within the Proposed Scheme or the boundary reduced where required. This does not affect the accuracy of this assessment.



- 1.1.6 The 'Survey Area', as it is referred to hereafter, includes 10 identified sections of ditch, Pierpoint Drain and a single pond, located within or in close proximity to the Scheme Boundary.



Figure 1-1 – Scoping area with extents of receptors assessed and scheme boundary - south

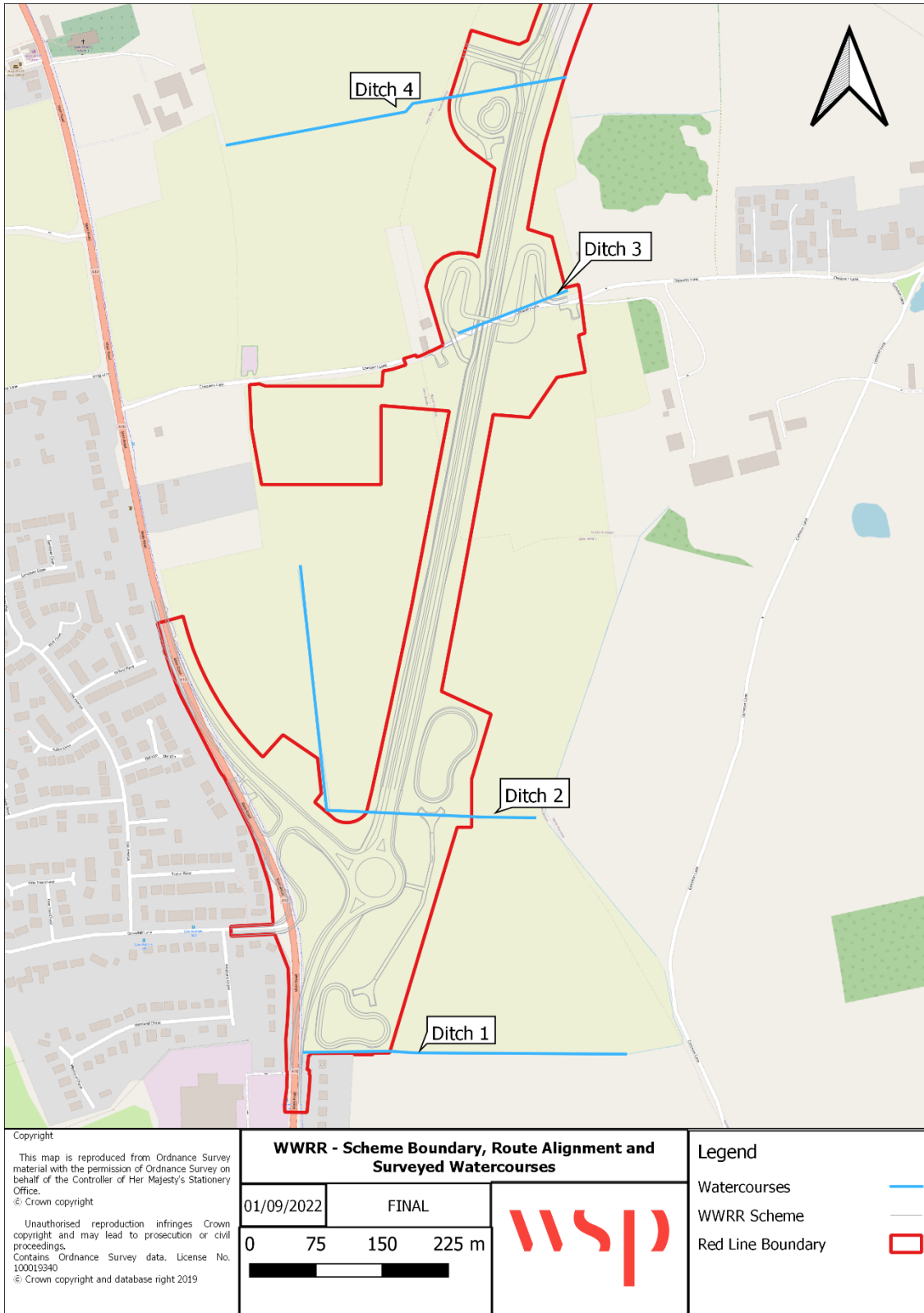




Figure 1-2 – Scoping area with extents of receptors assessed and scheme boundary - central

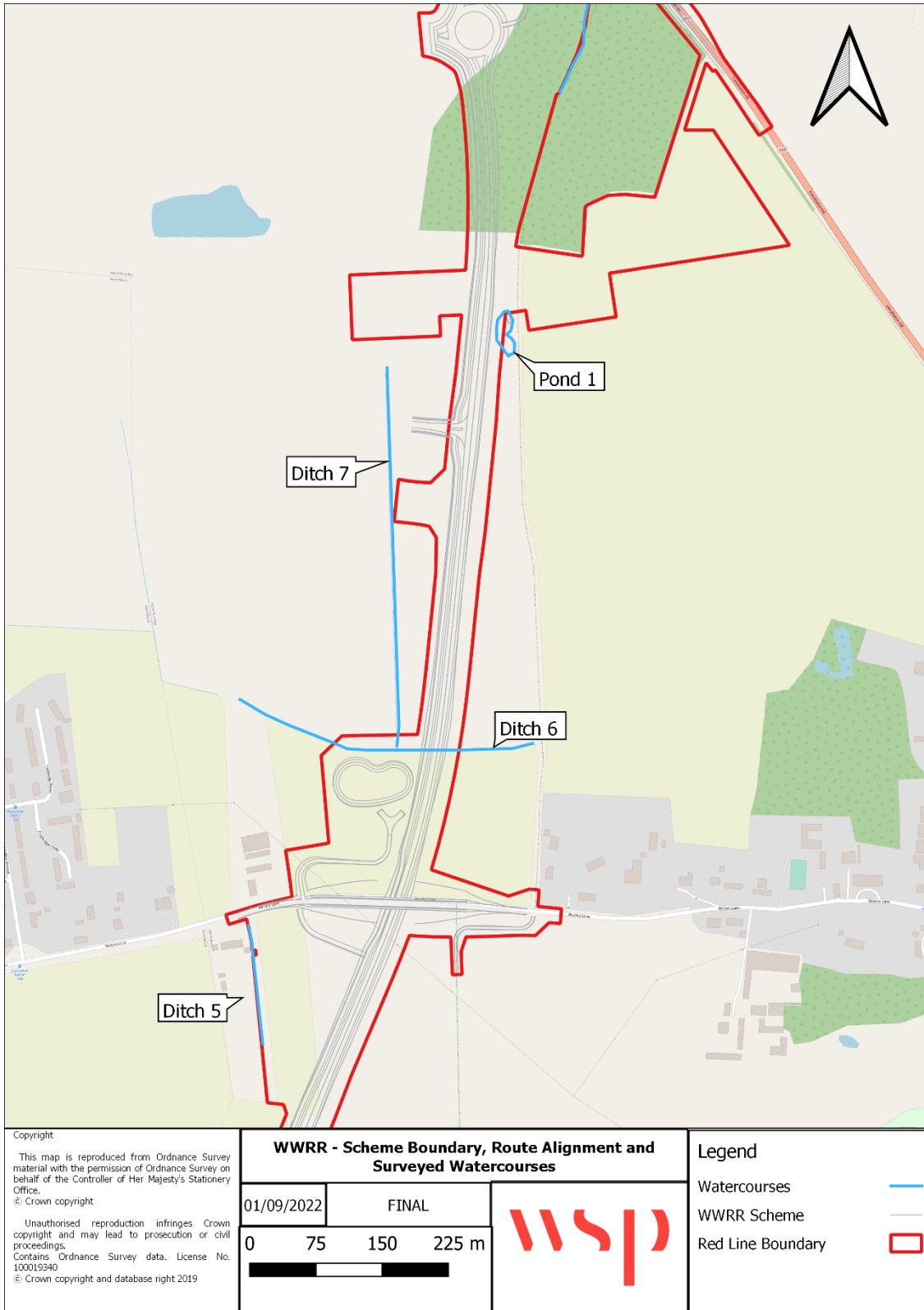




Figure 1-3 – Scoping area with extents of receptors assessed and scheme boundary - North





1.1.7 During the scoping survey the potential for aquatic habitats to support legally protected and/or notable aquatic species and suitability for further survey was assessed through field observations of various channel and bank characteristics. The characteristics assessed included substrate type, water depth and approximate flow type and velocity, riparian vegetation, presence of any artificial modifications, notable features (such as woody debris, stepped weirs, etc.), and potential sources of anthropogenic stress (i.e., rubbish, outfalls, signs of pollution). Observations were made on habitat suitability, connectivity, and the presence of invasive non-native species (INNS). Proximity to the route, potential impacts, and considerations for further assessments (e.g., WFD assessment, Biodiversity Net Gain (BNG), and CEMP) were also recorded during the survey. Photographs were taken to record both general channel characteristics and to further detail specific features.

1.1.8 Surveyors also noted any pertinent watercourse access details for the suitability of further in-channel surveys, including health and safety considerations.

Dates of Survey and Personnel

1.1.9 The aquatic ecology scoping assessment was led by a suitably experienced and qualified Aquatic Ecologist who is 'capable-accomplished' in habitat/species survey design, planning and fieldwork; and species identification as per the CIEEM Competency Framework (CIEEM, 2022). The aquatic scoping assessment was completed on 5th July 2022.

Notes and Limitations

1.1.10 Every effort has been made to provide a comprehensive description of the Study Area; however, the following specific limitations apply to this assessment:

- Ecological survey data is typically valid for 12 to 18 months unless otherwise specified. The likelihood of surveys needing to be updated increases with time and is greater for mobile species or in



circumstances where the habitat or its management has changed significantly since the surveys were undertaken. Factors to be considered include (but are not limited to): whether a site supports, or may support, a mobile species which could have moved on to site, or changed its distribution within a site (CIEEM, 2019).

1.2 Results

Desk Study

Designated Nature Conservation Sites

1.2.1 There is one statutory designated site with aquatic species as a primary reason for selection or as a qualifying feature, within 2km of the Study Area:

- River Nar SSSI.

1.2.2 Designation details relating to the River Nar SSSI are summarised in Table 1-1.

Table 1-1 – Statutory designated sites within 2km of the study area

Site	Designation	Size (ha)	Approximate Distance and Orientation from Site	Description
River Nar	SSSI	233.43	1.30km West	<p>The River Nar originates as a spring-fed stream, west of Mileham in Norfolk and flows for 42km before joining the River Great Ouse at Kings Lynn, where a sluice prevents the penetration of seawater at high tide. The River combines the characteristics of a southern chalk stream and an East Anglian fen river. Together with the adjacent terrestrial habitats, the Nar is an outstanding river system of its type.</p> <p>The upper Nar has a wide range of natural physical features incorporating riffles, pools, gravel beds and meanders, whilst the lower reaches below Narborough are embanked and steep sided with water flowing sluggishly through a predominantly arable flood plain. The variation in physical features and the influence of the underlying chalk give rise to a rich and diverse flora. Amongst the 78 species of riverine and bankside plants are many eutrophic and mesotrophic species, including 5 pondweeds and 8 bryophytes. The flora of the first 10 km of the river, to West Lexham, is typical of a calcareous, lowland ditch community with an abundance of Starwort <i>Callitriche spp.</i> and Reed Sweetgrass, <i>Glyceria maxima</i>. The next 12 km of the River, to Narborough Mill, is fast flowing over stoney substrates and is rich in chalk stream plants including Narrow-leaved Waterparsnip, <i>Berula erecta</i>; Mare's-tail, <i>Hippuris vulgaris</i>; Greater Tussock-sedge, <i>Carex paniculata</i>; water crowfoot, <i>Ranunculus pseudofluitans var. vertumnus</i> and Opposite-leaved Pondweed, <i>Groenlandia densa</i>. The wet margins, with a constantly high-water table typical of chalk streams, support a wide range of emergent plants. The final 18.5 km is embanked and although less physically diverse than the upper reaches, it possesses a contrasting flora with several species not found in the upper river. These plants are characteristic of sluggish flows and include 3 pondweeds, <i>Potamogeton spp.</i>; 2 water Crowfoots, <i>Ranunculus spp.</i>; Hornwort, <i>Ceratophyllum demersum</i>; Water-milfoil, <i>Myriophyllum spicatum</i>; and river Water-dropwort, <i>Oenanthe aquatica</i>. The Nar is well-known locally for its Brown Trout, <i>Salmo trutta</i>. Since 1985, trout numbers have increased steadily; Pike, <i>Esox lucius</i>, numbers have remained fairly stable whilst Roach, <i>Rutilus rutilus</i>, and Eel, <i>Anguilla anguilla</i>, have continued to be the dominant species in the river. A further 11 species have been recorded in the Nar although they contribute only a small amount to the total fish biomass e.g.: Chub, <i>Squalius cephalus</i>; Tench, <i>Tinca tinca</i>; Gudgeon, <i>Gobio gobio</i>; Rudd, <i>Scardinius erythrophthalmus</i>; Bullhead, <i>Cottus gobio</i>; Rainbow Trout, <i>Oncorhynchus mykiss</i>; Spined Loach, <i>Cobitis taenia</i>; and Roach x Bream, <i>Abramis brama</i> hybrids.</p>



Water Framework Directive

- 1.2.3 There are three WFD-designated waterbodies located within 2km of the Study Area, the Nar downstream of Abbey Farm waterbody (GB105033047792), Middleton Stop Drain Water Body (GB105033047670) and County Drain Water Body (GB105033047770) (Environment Agency, 2022a).
- 1.2.4 The 2019 WFD ecological status of the Nar was Moderate overall. Fish and invertebrates were classified as High and High, respectively. Ecological status of the Nar did not reach a good status overall due to a Moderate status for dissolved oxygen. The 2019 WFD ecological status of the Middleton Stop Drain waterbody was also Moderate overall. Invertebrates and macrophytes and phytobenthos combined were classified as High and Moderate. The 2019 WFD ecological status of the County Drain waterbody was Poor overall. Invertebrates and macrophytes and phytobenthos combined were classified as High and Poor, respectively.
- 1.2.5 The 2019 WFD physico-chemical status of the Nar was classified as Moderate overall. Ammonia, phosphate and pH were classified as High. Temperature was classified as Good, and dissolved oxygen as Moderate. The 2019 WFD physico-chemical status of Middleton Stop Drain waterbody was classified as Good. Acid neutralising capacity, phosphate, temperature and pH were classified as High. Ammonia and dissolved oxygen were classified as Good. The 2019 WFD physico-chemical status of the County Drain waterbody was classified as Moderate. Ammonia, temperature and pH were classified as High. Phosphate was classified as Good and dissolved oxygen as Moderate.

Fish Records

- 1.2.6 A search of the Environment Agency's Ecology and Fish Data Explorer returned data from a single catch survey conducted in 2017 on the River Nar at NGR TF 67090 13498, approximately 3.7km south east of the Scheme Boundary.



1.2.7 A total of 67 fish, across nine species, were caught during the survey. The data are detailed in Table 1-2.

Table 1-2 – Environment Agency fish data from a single catch survey conducted in March 2017 on the River Nar (NGR TF 67090 13498)

Common Name	Latin Name	No. of Individuals
Brown/sea Trout*	<i>Salmo trutta</i>	10
Perch	<i>Perca fluviatilis</i>	2
Stone Loach	<i>Barbatula barbatula</i>	4
Bullhead*	<i>Cottus gobio</i>	2
Gudgeon	<i>Gobio gobio</i>	27
European Eels > elvers*	<i>Anguilla anguilla</i>	10
Pike	<i>Esox lucius</i>	2
3-spined Stickleback	<i>Gasterosteus aculeatus</i>	9
River Lamprey*	<i>Lampetra fluviatilis</i>	1
TOTAL	NULL	67

*Denotes protected/notable species.

Aquatic Macroinvertebrate Records

1.2.8 A search of the Environment Agency’s Ecology and Fish Data Explorer returned results from macroinvertebrate surveys carried out in 2021 on the River Nar, at NGR TF 63588 13456, approximately 1.2km south of the Scheme Boundary. No protected macroinvertebrate species were noted in the sample. Two species of INNS, the New Zealand Mud Snail *Potamopyrgus antipodarum* and the amphipod *Crangonyx pseudogracilis/floridanus* were identified in the sample.

1.2.9 The biological metrics derived from these surveys are detailed in Table 1-3.



Table 1-3 – Biological metrics derived from Environment Agency macroinvertebrate surveys undertaken on the River Nar (NGR TF 63588 13456)

Date	WHPT-ASPT	WHPT-NTAXA	LIFE (TL5)	PSI (TL5)	CCI
12/03/2021	4.73	27	6.65	22.45	7

1.2.10 The WHPT-ASPT scores indicate that neither pollution tolerant nor intolerant taxa dominated the assemblage.

1.2.11 The LIFE scores indicate the predominant presence of taxa primarily associated with slow to moderate flows.

1.2.12 The PSI scores classifies the River Nar as “Sedimented”.

1.2.13 The CCI scores identify the site as having a “Moderate” conservation value.

Macrophyte Records

1.2.14 A search of Environment Agency’s Ecology and Fish Data Explorer returned data from a survey conducted in 2019 from a location on Country Drain at NGR TF 67716 14049, approximately 4.2km east of the Scheme Boundary.

1.2.15 A total of 67 fish, across nine species, were caught during the survey. The data are detailed in Table 1-2.

Table 1-4 - Environment Agency – Environment Agency macrophyte data from a macrophyte survey undertaken on 19/07/2019 on the River Nar (NGR TF 67716 14049)

Taxa	Common Name	Percentage Cover Bands
<i>Agrostis sp.</i>	Bentgrass	2
<i>Apium nodiflorum</i>	Fool’s Water-cress	1
<i>Berula erecta</i>	Lesser Water Parsnip	4
<i>Enteromorpha flexuosa</i>	Flexuous Gutweed	2
<i>Epilobium hirsutum</i>	Hairy Willowherb	2
<i>Equisetum arvense</i>	Common Horsetail	1



Taxa	Common Name	Percentage Cover Bands
<i>Glyceria maxima</i>	Reed Sweet Grass	6
<i>Lemna minor</i>	Common Duckweed	6
<i>Phalaris arundinacea</i>	Reed Canary Grass	4
<i>Potamogeton perfoliatus</i>	Claspingleaf Pondweed	3
<i>Sagittaria sagittifolia</i>	Arrowhead	6
<i>Sparganium emersum</i>	Unbranched Bur-reed	5
<i>Sparganium erectum</i>	Branched Bur-reed	7
<i>Veronica catenata</i>	Pink Water-speedwell	2
<i>Rorippa nasturtium-aquaticum</i> agg.	Watercress	5
<i>Cladophora glomerata/Rhizoclonium hieroglyphicum</i>	Green Algae	9

1.2.16 No protected or invasive non-native macrophyte species were noted in the sample.

Scoping Survey

1.2.17 Information regarding each watercourse section and whether the watercourses are crossed by the proposed route is outlined in Table 1-5.

Table 1-5 – Summary of scoping survey sites with watercourse section details habitat descriptions and further survey scope

Waterbody name	Site location	Habitat Description	Crossed by Proposed Route?
Ditch 1	Upstream extent: TF 63470 14726 Downstream extent: TF 63869 14731	Linear 2m deep field drain with uniform sloped banks. Dry and terrestrialised. No INNS (Invasive Non-Native Species)	No
Ditch 2	Upstream extent: TF 63464 15281 Downstream extent: TF 63731 14992	Linear 2m deep field drain with uniform sloped banks. Dry and terrestrialised in areas. Wetland species <i>Iris sp.</i> , <i>Carex sp.</i> , <i>Phragmites sp.</i> and <i>Phalaris sp.</i> present. No INNS.	Yes
Ditch 3	Upstream extent: TF 63642 15538 Downstream extent: TF 63782 15585	Linear 1.5m deep field drain next to road with uniform sloped banks. Dry and terrestrialised. Overgrown with dense vegetation. No INNS.	Yes
Ditch 4	Upstream extent: TF 63595 15801 Downstream extent: TF 63767 15830	Linear 0.5m shallow field drain on field boundary with uniform gently sloped banks. Dry and terrestrialised. Overgrown with dense vegetation. No INNS.	Yes
Ditch 5	Upstream extent: TF 63716 15999 Downstream extent: TF 63697 16140	Dry and terrestrialised. Likely filled in during construction of nearby fence. Overgrown with dense vegetation. No INNS.	No
Ditch 6	Upstream extent: TF 63800 16343 Downstream extent TF 63937 16336	Linear 1m deep field drain with uniform sloped banks. Dry and terrestrialised. Wetland plant species present with poor species diversity, e.g. <i>Iris sp.</i> , <i>Epilobium sp.</i> . No INNS.	Yes

Waterbody name	Site location	Habitat Description	Crossed by Proposed Route?
Ditch 7	Upstream extent: TF 63856 16776 Downstream extent TF 63869 16338	Linear 1m deep field drain with uniform sloped banks. Dry and terrestrialised.	No
Pond 1	TF 63990 16803	Extensive algal bloom possible sign of eutrophication (high nutrient input). Large wood, floating duckweed, trash and fine debris, shaded banks, no perceptible flows. No INNS.	No
Ditch 8	Upstream extent: TF 64060 17301 Downstream extent TF 64055 17078	Sinuuous woodland ditch with bare channel bed and bank face. Shallow in areas. Extensive organic woody material. Dry. No INNS.	Yes
Ditch 9	Upstream extent: TF64082 17319 Downstream extent TF 64523 17964	Linear 2m deep field drain with uniform sloped banks. Dry and terrestrialised in areas. Overgrown with vegetation. Macrophytes <i>Apium sp.</i> and <i>Phragmites sp.</i> in lower sections of the ditch towards confluence with Pierpoint Drain. No INNS.	No
Ditch 10	Upstream extent: TF 63590 17992 Downstream extent TF 63702 18186	Linear 1.5m deep field drain with uniform sloped banks. Dry in areas. Channel contained water in northern sections. Overgrown with vegetation. Macrophytes <i>Apium sp.</i> and <i>Phragmites sp.</i> in lower sections of the ditch towards confluence with Pierpoint Drain. No INNS.	Yes
Pierpoint Drain	Upstream extent: ST 02310 07251 Downstream extent ST 02344 07045	Dredged drain, 4 m in width. 0.75 m water depth with a silt bed. Steep banks with uniform vegetation cover. Water levels controlled by sluice gate system.	No



Ditches 1-8

1.2.18 The majority of the ditches within the Survey Area to the south of the A47 were dry field drains with low ecological value for aquatic species. The ephemeral nature of these ditches renders them unsuitable for supporting the majority of macroinvertebrate and fish species.

1.2.19 Refer to Appendix A, Figures A1-A19 for photographs.

Ditch 9-10

1.2.20 Ditch 9 flows north of the A47 before joining Pierpoint drain. Much of the surveyed section was dry and exhibited similar characteristics to Ditches 1-8. However, suitable habitat to support aquatic species was present towards the confluence with Pierpoint Drain, and it was observed that any runoff flow from the A47 would likely discharge into this ditch before entering Pierpoint Drain. The upper section of Ditch 9 is likely ephemeral in nature, therefore rendering it unsuitable for supporting the majority of macroinvertebrate and fish species.

1.2.21 Ditch 10 also flows north of the A47, splitting into two sections before joining Pierpoint Drain. Much of the surveyed section was wet and macrophyte species were present, however areas of dry channel were also present. It was not clear from observation whether the drain passes under the A47, or if there are any surface water run-off outfalls along it, due to overgrown vegetation and impassable paths.

1.2.22 Refer to Appendix A, Figures A20-A22 for photographs.

Pierpoint Drain

1.2.23 Pierpoint Drain flows from east to west and joins the River Nar SSSI at NGR TF 62201 18772. The flow is impounded by a series of culverts and a sluice gate at the A149 road bridge crossing. Land use surrounding the drain is dominated by arable farmland. The banks are steep and uniform.

1.2.24 Submerged and emergent macrophytes were observed in high abundance, including *Sagittaria sagittifolia*, *Potamogeton sp.*, *Sparganium erectum*,



Phragmites sp., suggesting a diverse plant community which has the potential to support notable and protected macroinvertebrate and fish species.

1.2.25 Refer to Appendix A, Figures A23-A27 for photographs.

1.3 References

- CIEEM, (2019). Advice note on the lifespan of ecological reports and surveys. Available at: [hyperlink to website https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf](https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf). [Accessed July 2022].
- CIEEM, (2022). CIEEM Competency Framework. Available at: [hyperlink to website https://cieem.net/resource/competency-framework/](https://cieem.net/resource/competency-framework/) [Accessed July 2022].
- Environment Agency, (2022a). Catchment Data Explorer. [Online]. Available at: [hyperlink to website https://environment.data.gov.uk/catchment-planning/WaterBody/GB105033042690](https://environment.data.gov.uk/catchment-planning/WaterBody/GB105033042690) [Accessed July 2022].
- Environment Agency, (2022b). Ecology and Fish Data Explorer. Available at: [hyperlink to website https://environment.data.gov.uk/ecology/explorer/](https://environment.data.gov.uk/ecology/explorer/) [Accessed July 2022].
- HMSO, (1981). The Wildlife and Countryside Act. JNCC and Defra. Available at: [hyperlink to website http://jncc.defra.gov.uk/page-1377](http://jncc.defra.gov.uk/page-1377) [Accessed July 2022].
- HMSO, (2006). Natural Environment and Rural Communities (NERC) Act (2006). HMSO, London.
- HMSO, (2019). The Conservation of Habitats and Species Regulations (Amendment) (EU Exit). HMSO, London.

The UK Post-2010 Biodiversity Framework 2011-2020. Available at: [hyperlink to website https://jncc.gov.uk/our-work/uk-post-2010-biodiversity-framework/](https://jncc.gov.uk/our-work/uk-post-2010-biodiversity-framework/) [Accessed July 2022].