



Norfolk County Council

NORWICH WESTERN LINK ROAD

River Wensum Crayfish Report





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CONTENTS

1	INTRODUCTION	6
1.1	PROJECT BACKGROUND	6
1.2	ECOLOGICAL BACKGROUND	6
1.3	BRIEF AND OBJECTIVES	7
2	RELEVANT LEGISLATION	8
2.1	LEGAL COMPLIANCE	8
3	METHODS	9
3.1	DESK STUDY	9
3.2	CRAYFISH FIELD SURVEYS	9
3.3	LIMITATIONS	10
4	RESULTS	11
4.1	DESK STUDY	11
4.2	ENVIRONMENT AGENCY CRAYFISH FIELD SURVEY RECORDS	11
4.3	CRAYFISH FIELD SURVEY	12
5	RECOMMENDATIONS FOR FURTHER SURVEY	14
6	REFERENCES	15

TABLES

Table 4-1 – Environment Agency records of white-clawed crayfish <i>Austropotamobius pallipes</i> sampled within the Survey Area.	12
Table 4-2 - Crayfish sampled during two crayfish surveys of the River Wensum near Attlebridge	12

FIGURES

Figure 1-1 - Crayfish Survey Area and Environment Agency sampling location	7
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APPENDICES

APPENDIX A

CRAYFISH TRAP LOCATIONS

APPENDIX B

PHOTOGRAPHS

1 INTRODUCTION

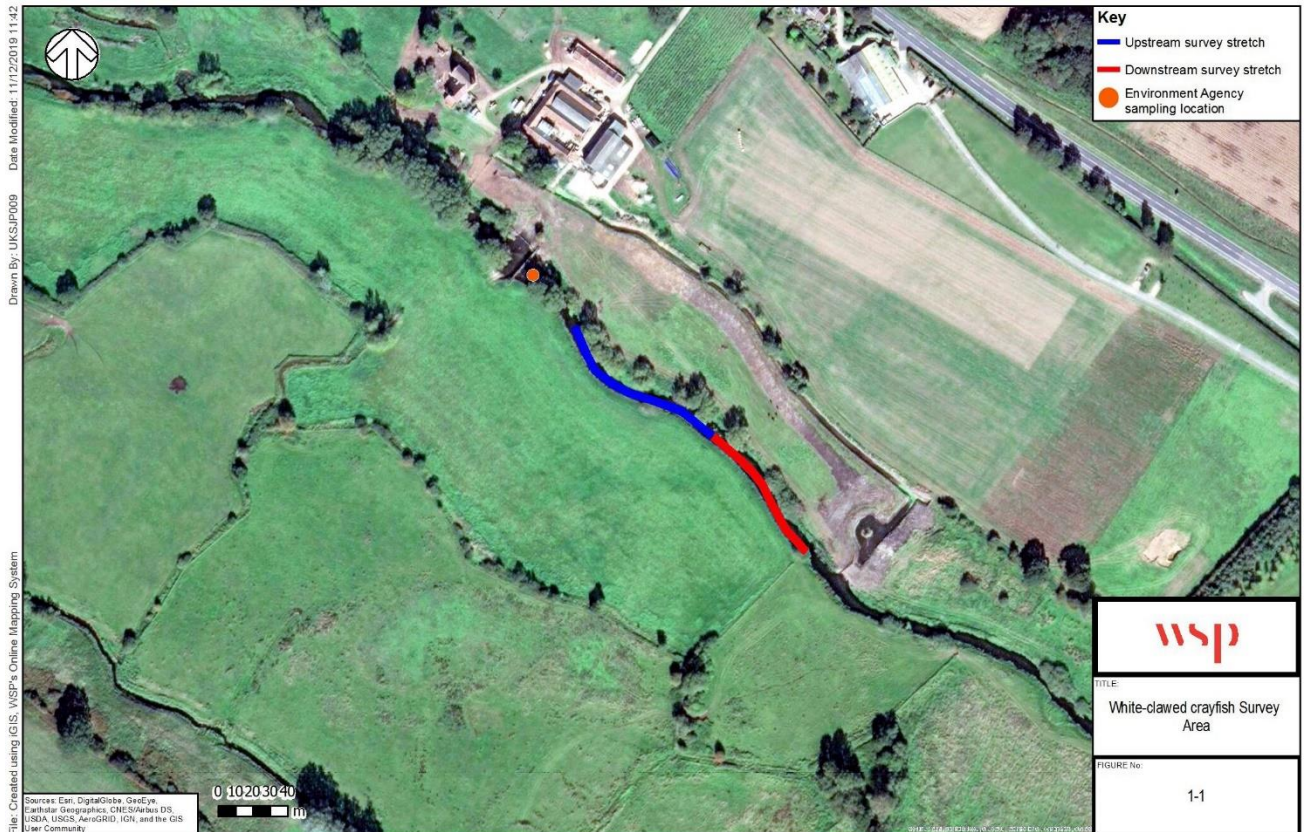
1.1 PROJECT BACKGROUND

- 1.1.1. The Norwich Western Link Road (NWL) is a highway scheme linking the A1270 Broadland Northway from its junction with the A1067 Fakenham Road to the A47 trunk road near Honingham.
- 1.1.2. The NWL, hereafter referred to as the Scheme, will comprise:
- Dualling the A1067 Fakenham Road westwards from its existing junction with the A1270 to a new roundabout located approximately 400m to the north west;
 - Construction of a new roundabout; and,
 - Constructing a dual carriageway link from the new roundabout to a new junction with the A47 near Honingham.
- 1.1.3. As part of a separate planned scheme, Highways England proposes to realign and dual the A47 from the existing roundabout at Easton to join the existing dual carriageway section at North Tuddenham. If that scheme proceeds, it is expected that Highways England will construct the Honingham junction and the Norwich Western Link will connect to the north-eastern side of that junction.
- 1.1.4. The Scheme will cross the River Wensum and its flood plain by means of a viaduct.. The Scheme will include ancillary works such as provision for non-motorised users, necessary realignment of the local road network and the provision of environmental mitigation measures.
- 1.1.5. Following feasibility studies, six route options were presented at public consultations in 2018 and 2019. The preferred route option was announced in June 2019.

1.2 ECOLOGICAL BACKGROUND

- 1.2.1. A desk study (WSP UK Ltd., 2018) was commissioned in 2018, to inform route options for the Scheme. An updated white-clawed crayfish *Austropotamobius pallipes* desk study for the preferred route option is included in this report.
- 1.2.2. The requirement for white-clawed crayfish surveys followed the identification of suitable habitats within the River Wensum that may be impacted by the Scheme. The River Wensum is a calcareous lowland river designated as a Special Area of Conservation (SAC) and as a Site of Special Scientific Interest (SSSI). As part of the Scheme a viaduct structure is required to carry the NWL across the River Wensum at NGR TG 13979 15483. It was therefore recommended that white-clawed crayfish surveys be undertaken to establish a sufficient baseline to inform impact assessment.
- 1.2.3. The 'Survey Area', as it is referred to hereafter, includes the location of the proposed viaduct where it crosses the River Wensum (Figure 1-1).

Figure 1-1 - Crayfish Survey Area and Environment Agency sampling location



1.3 BRIEF AND OBJECTIVES

1.3.1. WSP UK Ltd was commissioned by Norfolk County Council to complete a desk study and white-clawed crayfish surveys to fulfil the following objectives:

- To determine the presence/likely absence of protected species; and
- To provide recommendations to enable compliance with relevant legislation and planning policy.

1.3.2. The findings of the desk study and surveys will be used to inform the impact assessment and proposed mitigation for white-clawed crayfish, which are to be presented within the Nature Conservation Chapter of the Environmental Statement for the Scheme.

2 RELEVANT LEGISLATION

2.1 LEGAL COMPLIANCE

- 2.1.1. White-clawed crayfish receive partial protection under Schedule 5 of the Wildlife and Countryside Act (HMSO, 1981). This prohibits the taking of any native crayfish for any purpose except under licence. They are listed on Annex II and V of the European Communities Habitats Directive (EU Commission, 1992), which allows sites to be designated based on the species being present.
- 2.1.2. White-clawed crayfish are an Annex II species that are a primary reason for the designation of the River Wensum as a SAC under The Conservation of Habitats and Species Regulations 2017 (HMSO, 2017). Annex II species are animal and plant species of community interest whose conservation requires the designation of Special Areas of Conservation.
- 2.1.3. This means that core areas of white-clawed crayfish habitat are designated as Sites of Community importance (SCIs) and included in the Natura 2000 network. These sites must be managed in accordance with the ecological needs of the species that characterise them.
- 2.1.4. White-clawed crayfish are a reportable feature of the River Wensum SSSI, as specified under the Wildlife and Countryside Act (HMSO, 1981). The purpose of SSSI designation is to safeguard the diversity and geographic range of habitats, species and geological and physiographic features.
- 2.1.5. Public bodies have a statutory duty to take reasonable steps, consistent with the proper exercise of its functions, to further the conservation and enhancement of the sites special scientific interest.

3 METHODS

3.1 DESK STUDY

DESIGNATED SITES

- 3.1.1. An online desk study of aquatic ecological information relating to statutory sites within 2km of the Survey Area was undertaken. Information was obtained from Multi Agency Geographical Information for the Countryside (MAGIC) website (Natural England, 2019).

ENVIRONMENT CRAYFISH SURVEY RECORDS

- 3.1.2. Crayfish survey records, relating to the River Wensum between NGRs TG 13749 15640 and TG 14185 15336, were requested from the Environment Agency on 28th October 2019.

3.2 CRAYFISH FIELD SURVEYS

- 3.2.1. Two crayfish surveys were conducted along separate stretches of the River Wensum. The first survey took place on 24th to the 25th September 2019 along a 100m stretch, upstream of the proposed river crossing location, between TG 13905 15538 and TG 13990 15482 (Figure 1-1). A second survey was carried out on 25th to the 26th September 2019 along an 80m stretch (shortened by 20m due to excessively deep water), downstream of the proposed river crossing location, between TG 13988 15475 and TG 14044 15417 (Figure 1-1).
- 3.2.2. Field surveys were conducted by following guidance specified in the 'Monitoring the White-clawed Crayfish', Conserving Natura 200 Rivers' monitoring series of guidance (Peay, 2003). Surveyors operated under the NE Class Licence [CL11] for white-clawed crayfish 2016-21996-CLS-CLS.
- 3.2.3. The optimum period for carrying out surveys of native crayfish is from July to September, after the crayfish have released their young.
- 3.2.4. Crayfish surveys should not be carried out during increasing or high river flow conditions. In addition to the issue of personal safety, crayfish tend to stay in their refuges and are harder to sample. Surveys also tend to produce poorer results when the water temperature is less than 8°C, as crayfish are less active.
- 3.2.5. Standard protocol uses a 100m section for the sample site within which five habitat patches are selected. Within these patches ten refuge areas, if possible, are selected and manually searched for the presence of white-clawed crayfish.
- 3.2.6. Due to the depth of water present (>60cm) manual searching of the refuge areas was not possible so traps baited with cat food were deployed.
- 3.2.7. Trapping using baited traps is a low efficiency method which only captures active adult crayfish. However, the one major advantage of trapping is that it can be done in deep water, where no other methods can be used.
- 3.2.8. Traps were baited and deployed at approximately 11:00 on the first day of each survey and left for a period of seven hours. At 18:00 on the first day the traps were emptied of crayfish, rebaited and deployed overnight before once again being emptied of crayfish at approximately 11:00 of the second day. Totals of 50 and 40 traps were set along the



upstream and downstream survey stretches respectively. Ten traps were set along every 20m of watercourse surveyed.

- 3.2.9. All crayfish caught were identified to species level, measured (carapace length) and sexed. Additional notes were taken relating to any damage to the crayfish (such as missing claws), whether they are breeding or berried females, moult status and the presence of any crayfish disease.
- 3.2.10. The physical characteristics of each survey stretch were recorded at the time of survey. The features noted included the length, width and depth of the river; substrate type; extent of siltation; shading; and possible crayfish refuges.

3.3 LIMITATIONS

- 3.3.1. Ecological survey data is typically valid for up 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).

4 RESULTS

4.1 DESK STUDY

DESIGNATED NATURE CONSERVATION SITES

- 4.1.1. Two statutory designated nature conservation sites of interest were identified within 2km of the Study Area:
- River Wensum SAC; and,
 - River Wensum SSSI.
- 4.1.2. There are no additional designated sites with aquatic species as a primary reason for selection or as a qualifying feature within 2km of the Study Area.

RIVER WENSUM SAC

- 4.1.3. One of the primary reasons for the selection of this site as a SAC is the presence of white-clawed crayfish, an EC Habitats Directive Annex II species. Annex II lists species whose conservation requires the designation of SACs.
- 4.1.4. The SAC description of the River Wensum states that that:
- 'The Wensum is a chalk-fed river in eastern England and is an eastern example of riverine white-clawed crayfish populations. As with most of the remaining crayfish populations in the south and east of England, the threats from non-native crayfish species and crayfish plague are severe. Designation of the river as a SAC provides as much protection as can be afforded to such vulnerable populations'* (JNCC, 2019a).

RIVER WENSUM SSSI

- 4.1.5. The River Wensum has also been selected as a SSSI as an example of an enriched, calcareous lowland river. White-clawed crayfish are a reportable feature of the River Wensum SSSI.
- 4.1.6. Whilst the river is of rich ecological and cultural value in its present state, the condition of the River Wensum SSSI aquatic units is currently regarded as being "Unfavourable – Recovering".

4.2 ENVIRONMENT AGENCY CRAYFISH FIELD SURVEY RECORDS

- 4.2.1. A request to the Environment Agency for white-clawed crayfish data, collected between NGRs TG 13749 15640 and TG 14185 15336, since January 2009, returned one record. This record consisted of a single white-clawed crayfish that was sampled incidentally as part of an electric fishing survey in 2009 (
- 4.2.2.
- 4.2.3.
- 4.2.4. Table 4-1). The location to which this recording relates is approximately 30m upstream of the upstream survey stretch (Figure 1-1).

Table 4-1 – Environment Agency records of white-clawed crayfish *Austropotamobius pallipes* sampled within the Survey Area.

Date	Number of white-clawed crayfish	NGR	Locality name	Watercourse	Survey method
23/09/2009	1	TG 13875 15572	Attlebridge – Hall Farm	River Wensum	Electric fishing survey

4.3 CRAYFISH FIELD SURVEY

- 4.3.1. Both survey stretches were on average 8m wide and more than 1m deep. The flow type of both stretches consisted of a deep glide, with the substrate consisting of pebble, gravel and silt. The degree of siltation throughout both stretches was noted as ‘moderate’.
- 4.3.2. Crayfish refuge areas recorded along both stretches included tree roots, undercut banks and crayfish burrows.
- 4.3.3. No white-clawed crayfish and seven American signal crayfish *Pacifastacus leniusculus* were caught during the crayfish surveys.
- 4.3.4. Four American signal crayfish were caught from the upstream survey section whilst three were sampled from the downstream section. The locations of all traps and the numbers of crayfish caught in each are detailed in Appendix A.
- 4.3.5. Six of the seven American signal crayfish caught were male with carapace lengths measuring between 38.6mm and 58.6mm. The carapace length of the single female, collected from the downstream section, measured 49.8mm.
- 4.3.6. All American signal crayfish collected were mature adults that displayed clinical symptoms of disease, these being small melanised spots in their soft cuticle.

Table 4-2 - Crayfish sampled during two crayfish surveys of the River Wensum near Attlebridge

Site	Trap no.	Common name	Latin name	Sex	Carapace length (mm)	Damage	Disease	NGR
Upstream	5	American signal crayfish	<i>Pacifastacus leniusculus</i>	Male	57.2	Missing claw	Yes	No
Upstream	16	American signal crayfish	<i>Pacifastacus leniusculus</i>	Male	53.5	None	Yes	No
Upstream	27	American signal crayfish	<i>Pacifastacus leniusculus</i>	Male	50.3	None	Yes	No

Site	Trap no.	Common name	Latin name	Sex	Carapace length (mm)	Damage	Disease	NGR
Upstream	44	American signal crayfish	<i>Pacifastacus leniusculus</i>	Male	58.6	None	Yes	No
Downstream	2	American signal crayfish	<i>Pacifastacus leniusculus</i>	Female	49.8	Missing claw	Yes	No
Downstream	13	American signal crayfish	<i>Pacifastacus leniusculus</i>	Male	46.5	None	Yes	No
Downstream	40	American signal crayfish	<i>Pacifastacus leniusculus</i>	Male	38.6	None	Yes	No

5 RECOMMENDATIONS FOR FURTHER SURVEY

- 5.1.1. The River Wensum SAC experienced a large-scale infection of crayfish plague in late 2015 (JNCC, 2019b). It is therefore likely that American signal crayfish within the survey area is infected with this pathogen.
- 5.1.2. Once a mixed population of American signal crayfish and white-clawed crayfish occurs, the white-clawed crayfish population is progressively lost due to crayfish plague and/or competition (Peay, 2003). Once this happens, there is no known action that can be taken to allow future recovery of the native crayfish population (Peay, 2003). Therefore, no further white-clawed crayfish surveys are recommended.

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Appendix A

CRAYFISH TRAP LOCATIONS





Table A-1 – Crayfish trap locations along the upstream survey stretch. Numbers of signal crayfish *Pacifastacus leniusculus* caught in each trap are also displayed.

Trap number	National grid reference	Number of signal crayfish
1	TG 13905 15538	-
2	TG 13906 15536	-
3	TG 13901 15535	-
4	TG 13903 15531	-
5	TG 13904 15528	1
6	TG 13905 15526	-
7	TG 13906 15524	-
8	TG 13908 15521	-
9	TG 13909 15517	-
10	TG 13912 15515	-
11	TG 13916 15519	-
12	TG 13919 15517	-
13	TG 13915 15512	-
14	TG 13921 15514	-
15	TG 13918 15510	-
16	TG 13922 15512	1
17	TG 13919 15509	-
18	TG 13922 15507	-
19	TG 13925 15505	-
20	TG 13928 15510	-
21	TG 13931 15508	-
22	TG 13929 15503	-
23	TG 13932 15502	-
24	TG 13935 15501	-
25	TG 13937 15506	-



Trap number	National grid reference	Number of signal crayfish
26	TG 13937 15500	-
27	TG 13940 15499	1
28	TG 13943 15498	-
29	TG 13945 15503	-
30	TG 13948 15503	-
31	TG 13952 15502	-
32	TG 13956 15502	-
33	TG 13960 15499	-
34	TG 13956 15494	-
37	TG 13963 15491	-
38	TG 13968 15495	-
39	TG 13970 15494	-
40	TG 13971 15493	-
41	TG 13967 15489	-
42	TG 13969 15487	-
43	TG 13972 15484	-
44	TG 13975 15482	1
45	TG 13979 15480	-
46	TG 13981 15478	-
47	TG 13982 15488	-
48	TG 13984 15487	-
49	TG 13988 15485	-
50	TG 13990 15482	-



Table A-2 - Crayfish trap locations along the upstream survey stretch. Numbers of signal crayfish *Pacifastacus leniusculus* caught in each trap are also displayed.

Trap number	National grid reference	Number of signal crayfish
1	TG 13988 15475	-
2	TG 13991 15472	1
3	TG 13994 15470	-
4	TG 13996 15472	-
5	TG 13999 15472	-
6	TG 13998 15467	-
7	TG 14000 15465	-
8	TG 14004 15471	-
9	TG 14005 15470	-
10	TG 14008 15468	-
11	TG 14009 15466	-
12	TG 14003 15462	-
13	TG 14004 15460	1
14	TG 14004 15459	-
15	TG 14011 15464	-
16	TG 14012 15463	-
17	TG 14014 15460	-
18	TG 14004 15460	-
19	TG 14004 15459	-
20	TG 14007 15457	-
21	TG 14010 15453	-
22	TG 14012 15451	-
23	TG 14014 15448	-
24	TG 14016 15446	-
25	TG 14021 15448	-



Trap number	National grid reference	Number of signal crayfish
26	TG 14018 15442	-
27	TG 14020 15438	-
28	TG 14023 15434	-
29	TG 14024 15433	-
30	TG 14026 15430	-
31	TG 14028 15428	-
32	TG 14030 15425	-
33	TG 14032 15423	-
34	TG 14032 15422	-
35	TG 14030 15434	-
36	TG 14033 15430	-
37	TG 14036 15427	-
38	TG 14039 15424	-
39	TG 14042 15421	-
40	TG 14044 15417	1

Appendix B

PHOTOGRAPHS



Figure B-1 – Signal crayfish *Pacifastacus leniusculus* caught during a white-clawed crayfish *Austropotamobius pallipes* survey of the upstream stretch of the River Wensum on 24-25/2019.





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