A38 Derby Junctions

TR010022

Volume 6

6.3 Environmental Statement Appendices

Appendix 8.12b: White-clawed Crayfish Survey in 2017

Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

April 2019

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

A38 Derby Junctions Development Consent Order 202[ ]

6.3 Environmental Statement Appendices
Appendix 8.12b: White-clawed Crayfish Survey in 2017

Regulation Number	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010022
Application Document Reference	6.3
Author	A38 Derby Junctions Project Team, Highways England

Version	Date	Status of Version
1	April 2019	DCO Application

A38 Derby Junctions

White-clawed Crayfish Survey Report 2017

Report Number: HE514503-ACM-EBD-A38_SW_PR_ZZ-RP-EG-0011 P02 S4
August 2018

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1 INTRODUCTION

1.1 Background and Scope

1.1.1 AECOM Infrastructure & Environment UK Limited (AECOM) has been commissioned by Highways England to provide design services with regards to the A38 Derby Junctions scheme (referred to herein as the proposed scheme).

1.1.2 The proposed scheme concerns the grade separation of three junctions on the A38 in Derby, namely:

- A38/ A61 Little Eaton junction;
- A38/ A52 Markeaton junction; and
- A38/ A5111 Kingsway junction.

1.1.3 These three junctions are located along an approximate 5.5km length of the A38 national trunk road, to the west and north of Derby.

1.1.4 In order to assist with the assessment of the proposed scheme's potential environmental effects, a range of environmental surveys have been undertaken to define prevailing baseline conditions.

1.1.5 The surveys conducted by AECOM in July 2015 noted the presence of white-clawed crayfish *Austropotamobius pallipes* on the Dam Brook (AECOM(a), 47071319-URS-RP-EN-017, 2016) with signal crayfish *Pacifastacus leniusculus* being recorded within Markeaton Lake.

1.1.6 The proposed scheme boundary was updated in 2017 to include potential additional areas for flood storage, construction compounds, and ecological compensation. A desk study review was therefore carried out in 2017 to identify any watercourses within 500m of the updated proposed scheme boundary. One additional watercourse, the Bottle Brook, was identified and surveyed for white-clawed crayfish in 2017 and updating surveys were carried out on watercourses surveyed in 2015 in order to ensure up to date baseline survey information was available for white-clawed crayfish to support the environmental impact assessment (EIA) and potential draft licence applications where applicable.

1.1.7 This report presents the results of the desk study and survey for white-clawed crayfish in 2017.

1.2 Study Site

1.2.1 The proposed scheme encompasses Kingsway and Markeaton junctions, west of the City of Derby (SK 32801 36103) and Little Eaton junction north of Derby (SK 36402 39990). A plan showing the locations of the Kingsway, Markeaton and Little Eaton junctions is presented in Figure 1 (Appendix A). The ecological survey area for the crayfish survey extends up to 500m beyond the 2017 proposed scheme boundary.

1.2.2 The A38 is an existing and busy arterial 'A' road carrying traffic around the west and north of the City of Derby. South of Kingsway junction, the road enters a cutting and is bordered by semi-improved grassland and scrub covered verges. The central reservation south of Kingsway junction and the junction island in this location support a mosaic of habitat types, including semi-improved neutral grassland and native broadleaved woodland. Bramble Brook a small tributary of the Markeaton Brook, see

Figures 2 and 3 (Appendix A) flows from the west of the proposed scheme in this location, through culverts located under the north-bound carriageway and the central reservation before connecting with further culverts located between the junction islands. North of Kingsway junction there is an area of mixed plantation represented by semi-mature trees on the embankment.

1.2.3 Markeaton junction is bordered to the east by residential properties and to the west by parkland with veteran trees. The outfall from Markeaton Lake and Markeaton Brook flows through culverts beneath the existing A38 at the northern extent of the Markeaton junction section of the proposed scheme towards the River Derwent, see Figures 2 and 3 (Appendix A).

1.2.4 The western boundary of the proposed scheme at Little Eaton junction borders the road bridge over the River Derwent. The existing A38 is on embankment in this location, with the embankments themselves represented by areas of scrub and immature broadleaved plantation habitats. A variety of grassland habitats exist at the base of the embankments in this location. A number of watercourses, and small tributaries of the River Derwent, are present within this junction and include Boosemoor Brook, Bottle Brook, Dam Brook and the Watermeadows ditch (see Figure 4 (Appendix A)).

1.3 Relevant Legislation

1.3.1 The white-clawed (or Atlantic stream) crayfish is afforded protection under the Wildlife and Countryside Act (WCA) 1981. This species is listed on Schedule 5 of the Act and is afforded part protection under Section 9(1) making it an offence to intentionally kill, injure or take any of these species. There are additional offences in relation to buying, selling or exchanging any live or dead animal of this species or anything derived from a white-clawed crayfish, under Section 9(5).

1.3.2 White-clawed crayfish are listed on Annex II(a) of the EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora, also known as the ‘Habitats Directive’. This means that the UK is required to establish Special Areas of Conservation (SACs) to protect the habitat of this species. These sites form part of the Natura 2000 network across Europe. In addition, its inclusion on Annex V of this Directive also restricts the taking, capture or killing of this species in the wild.

1.3.3 The white-clawed crayfish is listed in Section 74 of the Countryside Rights of Way (CRoW) 2000 and Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 as a species of principle importance for nature conservation in England. The Section 41 list is used to guide decision-makers such as public bodies, including Highways England, in implementing their duty under Section 40 of the NERC Act to have regard to the conservation of biodiversity in England, when carrying out their normal functions. The species covered by the Section 41 list were originally identified as requiring nature conservation action under the (now withdrawn) UK Biodiversity Action Plan (BAP) and continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework. In the National Planning Policy Framework (NPPF), local authorities in England are required to take measures to protect the habitats of these species from further decline, protect the species from the adverse effect of development and refuse planning permission for development that harms these species unless the need for, or benefit of, the development clearly outweighs that harm.

1.3.4 White-clawed crayfish is designated as “Endangered” on the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species (2010). It is under threat in most of its range in Europe, including in England and Wales, due to reduction of habitat quality and from competition and disease from species of crayfish introduced from North America.

1.3.5 Prior to the UK Post-2010 Biodiversity Framework, local partnerships were formed to produce Local Biodiversity Action Plans (LBAP). These identified species and habitat which are important at a local level e.g. by County or Local Authority Administrative Area, for the purpose of conserving and enhancing biodiversity. The Lowland Derbyshire Biodiversity Action Plan lists white-clawed crayfish as an LBAP species (Lowland Derbyshire Biodiversity Partnership 2011).

1.3.6 Highways England, through the national Road Investment Strategy, has set an aspiration that the operation, maintenance, and enhancement of the Strategic Road Network (SRN) should move to a position that delivers no net loss of biodiversity; and, in the long term, Highways England should deliver a net gain in biodiversity across its broader range of works. Highways England published a Biodiversity Action Plan in 2015 (Highways England, 2015) to show how it will work with service providers to halt overall biodiversity loss, and maintain and enhance habitats and ecological networks. The Government requires Highways England to demonstrate progress against the Biodiversity Plan, to secure an ongoing annual reduction in the loss of net biodiversity due to its activities. The 2015 Biodiversity Plan supersedes the 2002 Highways Agency (now Highways England) Biodiversity Action Plan (BAP) 2002, which still carries some relevance as it lists specific species of conservation concern including white-clawed crayfish. The main aim of the 2002 Highways BAP for the white-clawed crayfish was to ensure that new road developments avoid or adequately mitigate any potential impacts on the species.

2 METHODOLOGY

2.1 Desk-Based Study

2.1.1 A desk-based study was undertaken to identify internationally, nationally and locally designated statutory sites, local designated non-statutory sites and records of crayfish species within 2km of the proposed scheme. The OS grid references representing the central points of the desk-based studies undertaken were SK 32801 36103 and SK 36402 39990 and relate to the Kingsway and Markeaton junctions and Little Eaton junction respectively.

2.1.2 Online resources reviewed included the Multi-Agency Geographic Information Centre (MAGIC), and the National Biodiversity Network (NBN) Gateway. A data search to identify any further crayfish records within 2km of the central OS grid locations detailed above was also requested from the Derbyshire Wildlife Trust (DWT).

2.1.3 Further to the desk based assessment presented in the previous AECOM report (AECOM(a), 2016), a more detailed desk based assessment was undertaken utilising online sources and biological records provided by DWT for crayfish up to November 2016. The Environment Agency was also approached for more detailed data on potential signal crayfish locations in the River Derwent catchment at this location and AECOM records from the 2015 survey were also used to help inform this study (see Figures 2 and 3 (Appendix A)).

2.2 Field Survey Methodology

2.2.1 The survey methodology was adapted from Joint Nature Conservation Committee's (2015) Common Standards Monitoring (CSM) – Protocol for Population Monitoring of White-clawed Crayfish. This protocol favours manual searching for crayfish where there is sufficient habitat for this method with 100 refugia searched (cobbles and boulders turned) initially over a 200m length of channel. If less than five crayfish are found then the search is extended to 250 refugia.

2.2.2 Manual searches (i.e. hand-searching) were undertaken within suitable habitat, however, most waterbodies were considered unsuitable for this standard methodology (i.e. they were deep/ turbid watercourses). Therefore, a trapping methodology was employed in such areas with consent from the Environment Agency (see below).

2.2.3 A well-established signal crayfish population was noted at the inlet of the Markeaton Lake and is likely to be present, at least at low abundance, in areas beyond this location. The previous AECOM report (AECOM(a), 2016) noted that it was highly likely that there is a strong correlation between the increasing numbers of signal crayfish (carriers of the well documented crayfish plague Aphanomyces astaci) and the absence of white-clawed crayfish downstream of Markeaton Park. This included: the rest of Markeaton Lake, Mill Pond, Mill Dam and the connecting Middle Brook that flows into the lower Markeaton Brook.

2.2.4 Crayfish plague is readily carried by signal crayfish populations and is responsible for losses of white-clawed crayfish populations in many catchments in England and Wales.

2.2.5 Bramble Brook is located within Kingsway junction, and within the proposed scheme boundary. The brook is heavily engineered with both man-made and natural

materials with a mix of substrates including bedrock, concrete and silt. There is a lack of rocky substrate (i.e. refuges for white-clawed crayfish) and thus this watercourse is considered unsuitable habitat to support white-clawed crayfish. Bramble Brook was therefore omitted from the white-clawed crayfish surveys in 2015 and 2017.

2.2.6 As a result of the AECOM 2015 survey findings and the close proximity of signal crayfish, further white-clawed crayfish surveys in at Markeaton and Kingsway junctions were not considered necessary and were discounted from further survey in 2017.

2.2.7 Four stretches of watercourse were identified as potentially having the suitability to support white-clawed crayfish populations, within the vicinity of Little Eaton junction, namely: Site b1 – River Derwent, Site b2 – Watermeadows ditch, Site b3 – Dam Brook, Site b4 – Boosemoor Brook and Site b5 - Bottle Brook; refer to Figure 4, Appendix A and Table 1).

2.2.8 Six survey locations were identified across these five watercourse stretches: two locations were surveyed using only the standard in-channel refuge searches (i.e. standardised manual search at Site b1 and b5) and locations were trapped where standard in-channel searches could not be undertaken (i.e. at Site b2 and b3). Two locations used a combination of both standardised manual searches and trapping (i.e. at Site b1 – River Derwent and Site b5 – Bottle Brook). Refer to Table 1 for details.

2.2.9 Fladen folding crayfish traps (appropriately modified to prevent entry by otter and water vole) were used in this study, with traps baited with sardines in vegetable oil and set for one night (per visit) in favourable habitat for crayfish in areas of slow flow. Fifteen traps were set out on all stretches of watercourse except on the Site b5 – Bottle Brook where ten traps were used and the Watermeadows Ditch where 25 traps were used, with 10 traps used upstream of the railway line and 15 traps used downstream of the railway line. Flow conditions were found to be normal (or low) during both survey visits, with water levels and flow rates remaining constant throughout the study.

2.2.10 The traps were set as unobtrusively as practicable, to minimise the risk of interference or theft. No traps were lost or damaged during the survey.

2.2.11 Environment Agency consents were obtained for all trapping locations prior to the surveys commencing in July 2017.

2.2.12 Where appropriate a follow-up crayfish survey (Visit 2) was undertaken on watercourses that failed to identify a crayfish presence on Visit 1.

2.2.13 All surveys were undertaken by fully licensed AECOM ecologists.

Table 1: White-Clawed Crayfish Survey Locations and Methods

Survey Locations			**Methodologies**	
Site Name	**Location**	**Location(s) / (Grid Ref.)**	**Standardised Manual Search**	**Trapping**
Little Eaton Junction				
River Derwent (A38 Bridge)	Within the scheme boundary.	b1 – At SK3585039940	Yes	Yes

Survey Locations			Methodologies	
Site Name	**Location**	**Location(s) / (Grid Ref.)**	**Standardised Manual Search**	**Trapping**
Little Eaton Junction				
Watermeadows Ditch	Within 50 m of the scheme boundary to the south-west.	b2 - Section 1: SK 36231 39644 to SK 36365 39688 Section 2: SK3618039492 to SK3588839111	No	Yes
Dam Brook	Within the scheme boundary	b3 - From SK 36502 40035 to SK 36406 39706	No	Yes
Boosemoor Brook	Within 250 m of the scheme boundary to the east.	b4 - From SK 36600 39966 to SK 36861 39972	<100m of channel available for refugia search and limited habitat suitability for white-clawed crayfish. Trapping not suitable due to water depth.	<100m of channel available for refugia search and limited habitat suitability for white-clawed crayfish. Trapping not suitable due to water depth.
Bottle Brook	Within the site boundary at the confluence to the River Derwent and within 50m of the scheme boundary to the north-east.	b5 – Section 1: SK3594740696 to SK3599640730 Section 2: SK3601640762 to SK3608141088	Yes	Section 1: Yes Section 2: No

2.3 Survey Limitations

2.3.1 There was restricted access to several sections of watercourse channel, especially on the Dam Brook upstream of the weir, located at SK 36499 40033, and the entire section of the Boosemoor Brook, where dense scrub was present and the channel obscured. Additionally, several steep sections of the River Derwent either side of the A38 Bridge were heavily choked by dense bankside stands of hawthorn, tall herbs and bramble restricting access. Where access allowed, sections of the Dam Brook downstream of the weir and the River Derwent were surveyed, gaining a good representation of the presence/ likely absence of white-clawed crayfish in these watercourses. Consequently, not accessing these areas is unlikely to affect the findings of this survey. Additionally, increased survey effort (i.e. both standardised manual searches and trapping) was undertaken on Dam Brook downstream of the weir and the River Derwent providing confidence in the survey results for the areas surveyed.

3 RESULTS

3.1 Desk-Based Study

3.1.1 No further records of white-clawed crayfish were identified beyond those reported in the previous report (AECOM(a), 2016), with a single white-clawed crayfish recorded on the Dam Brook adjacent to the A38/A61 roundabout.

3.1.2 A desk study search identified two American signal crayfish records on the Bottle Brook immediately upstream of the survey area in the vicinity of SK 36300 41400.

3.2 Field Results

3.2.1 The results of the field surveys carried out in 2017 are shown in Table 2 and Figure 4 Appendix A. Site photos are also provided in Appendix B and referenced in Table 2.

Table 2: White-Clawed Crayfish 2017 Survey Results

	Little Eaton Junction					
Site Name	**Method**	**Visit 1 / Dates**	**Habitat Description**	**Survey 1 Findings**	**Visit 2 Date(s)**	**Survey 2 Findings**
River Derwent (b1) From – SK 35894 40001 To – SK 35930 39830	Trapping (x15) and Standard Methodologies (hand-searching)	25 - 26 July	A short section of the River Derwent that lies beneath the A38 Abbey Hill Road Bridge	No crayfish recorded	No survey undertaken, site now negative on 3 occasions two in 2015 and one in 2017.	Not applicable
R Watermeadows Ditch (b2) From – SK 36365 39688 To – SK 36231 39644	Trapping (x25)	24 – 25 July	Two sections of trapezoidal ditch channel located upstream and downstream of railway line. Limited refugia on bed of watercourse (fine sediments) but in-channel vegetation and burrowing opportunities present.	A single female **signal crayfish** was recorded from a trap upstream of an agricultural concrete access culvert located at SK 35898 39122. The animal was mature, carapace length 53mm (Plate 1). There was no sign of damage and the animal appeared healthy.	No further surveys undertaken due to signal presence. White-clawed crayfish are likely to be absent from this stretch.	Not applicable
Dam Brook (b3) From – SK 36805 39837 To – SK 36232 39645	Trapping (x15) and standard methodologies (hand searching)	24 – 25 July	Two sections of straightened brook located upstream of the A61 Road Bridge divided by a weir located at SK 36499 40033. Banks trapezoidal with bankside reinforcement present in places in sections of channel adjacent to the A61. Fine bed sediments with deep silt and overhanging bankside vegetation also present.	Four male **signal crayfish** were recorded upstream and downstream of the A61 culvert (see Plate 2). All animals were mature with carapace lengths being 48mm, 52mm, 55mm and 59mm respectively. There was no sign of damage and all animals appeared healthy.	No further surveys were undertaken downstream of the A38 road culvert and weir.	Landowner permission was not granted to significant sections of channel upstream of the A38 road culvert therefore a second survey could not be undertaken to determine white-clawed crayfish presence/ absence.
Boosemoor Brook (b4) From – SK 36861 39972	No access permitted for survey due to	24 – 25 July	Straightened heavily shaded and vegetated	Not available	Not Available	Not Available

	Little Eaton Junction					
Site Name	**Method**	**Visit 1 / Dates**	**Habitat Description**	**Survey 1 Findings**	**Visit 2 Date(s)**	**Survey 2 Findings**
To – SK 36600 39966	dense stands of Hawthorn. Habitat is unsuitable for white-clawed crayfish and they were not found in 2015.		brook channel located upstream of the Dam Brook confluence			
Bottle Brook (b5) From - SK 35946 40697 To - SK 36148 41194	Trapping (x10) and standard methodologies (hand searching and torching) downstream of railway line. Standard methodologies (hand searching) used upstream of railway line.	24 – 25 July	Two sections of straightened reinforced channel located upstream and downstream of the railway line. Large boulders cobbles and building materials such as pipes bricks offering a range of in channel and bank toe refugia	No crayfish recorded	Sept. 12	No crayfish recorded.

4 DISCUSSION

4.1.1 American signal crayfish were recorded during the survey, with four adults captured on the Dam Brook adjacent to the A61 and one adult captured on the Watermeadows Ditch downstream of the railway line. These sections of watercourse are hydraulically linked, with no known barriers to crayfish movement. Signal crayfish are therefore likely to be established throughout both the Watermeadows Ditch and the Dam Brook downstream of the A38 culvert located at SK 36464 39984.

4.1.2 The only potential barrier to signal crayfish movement is a weir located at SK 36499 40033, on the Dam Brook adjacent to the A38/A61 roundabout, see Figure 4 (Appendix A). The slope of the weir is approximately 50° - 60° and the height of the weir crest above bed level is approximately 1m with plant material present on the weir face. The condition of the weir suggests it may, at best, be a temporary barrier to signal crayfish movement upstream given that signal crayfish would be capable of climbing such a structure. It should also be noted that signal crayfish may have already passed this weir (noting that they have, at least, been present in the watercourse downstream since 2015/ 2016).

4.1.3 Due to access constraints, appropriate survey upstream of the weir could not be undertaken to confirm white-clawed or signal crayfish presence. Whilst the weir is potentially passable, confirmation of either white-clawed or signal crayfish presence is advised especially as the proposed scheme could impact the weir structure and/ or the Dam Brook channel.

4.1.4 No crayfish species were noted on the River Derwent despite extensive areas of suitable in-channel habitat and refugia.

4.1.5 The banks and bank toe of the Bottle Brook were reinforced with rip rap stone which provided extensive areas of in-channel habitat for crayfish species; however, despite significant survey effort including traditional methods, hand searching and torching, no crayfish were recorded.

5 SUMMARY AND RECOMMENDATIONS

5.1.1 Signal crayfish were identified on both the Watermeadows Ditch and the Dam Brook downstream of the A38/ A61 roundabout. White-clawed crayfish are therefore likely to be absent from these stretches and further survey is not required.

5.1.2 Access to the Dam Brook upstream of the A38/ A61 roundabout was not available and the status of any white-clawed crayfish upstream of this area in unknown.

5.1.3 Further presence/ absence survey upstream of the A38/ A61 roundabout is advised to determine the likely impact of the proposed scheme on any remnant white-clawed crayfish populations which may be located upstream of the weir at this location.

5.1.4 No crayfish were noted on the River Derwent or Bottle Brook and further survey is not required.

5.1.5 Recommendations for mitigation and/ or enhancement of the proposed scheme with regard to white-clawed crayfish together with any Natural England Licence requirements will be considered and reported in the Environmental Statement.

6 REFERENCES

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Lowland Derbyshire Biodiversity Partnership (2011). Lowland Derbyshire Biodiversity Action Plan 2011-2020.

Appendix A Figures

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M1 JUNCTION 28

A38/A61 LITTLE EATON JUNCTION

A38/A6 PALM COURT JUNCTION

A38/A52 MARKEATON JUNCTION

A38/A5111 KINGSWAY JUNCTION

A50/A38 JUNCTION

2 0 2 4 6 8 Kilometres

Project Title/Drawing Title

A38 DERBY JUNCTIONS SCHEME LOCATION PLAN

AECOM Internal Project Number
47071319

Drawn	Checked	Approved
GB	SW	SW
Date	**Scale @ A3**	**Purpose of issue**
04/02/2016	1:100,000	FINAL
Drawing Number		**Rev**
Figure 1		2F

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A38 Derby Junctions Project
Highways England, Floor 5
2 Colmore Square
38 Colmore Circus
Birmingham
B4 6BN

AECOM
Royal Court
Basil Close, Chesterfield
Derbyshire. S41 7SL
+44 (0) 1246 209221
+44 (0) 1246 209229
www.aecom.com

File Name:\\ch-wip-001\CH_Roads\A38 Derby Jcns - PO1339\12 CAD\12.1 WIP\FIGURE 1.1 - LOCATION PLAN F1.mxd

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N

Markeaton Park Survey Site (2012)

Markeaton Park (2008)

2002 A

1996 B

Markeaton Brook

2012 A

1986 A

2008 A

1986 B

Markeaton Lake

2012 B

2000

1996 A

Middle Brook

1993 C

1993 A

1993 B

Mill Pond 1

Sturgess Field Survey Site (2012)

2002 B

Mill Pond 2

1992 C

1998

1997

2008 B

St Johns Terrace (2008)

1992 B

Bramble Brook

200 0 200 400 600 800 1000 Metres

Legend

- Scheme boundary - indicative
- 50m buffer
- 250m buffer
- 500m buffer
- Watercourse
- Direction of flow

Crayfish survey results provided by DCC. Peter Cowley, 2012

- White-clawed crayfish
- White-clawed crayfish + Signal crayfish
- No crayfish

Records provided by Derbyshire Wildlife Trust

- White-clawed crayfish (with date and reference)

Records from David Rogers Associates, 2008

- White-clawed crayfish

AECOM 2015 survey

- Americal Signal crayfish

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Project Title/Drawing Title

A38 DERBY JUNCTIONS KINGSWAY MARKEATON WHITE-CLAWED CRAYFISH DESK STUDY

Project Number
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Figure 2

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Highways England, Floor 5
2 Colmore Square
38 Colmore Circus
Birmingham
B4 6BN

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Royal Court
Basil Close, Chesterfield
Derbyshire. S41 7SL
+44 (0) 1246 209221
+44 (0) 1246 209229
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N

Bottle Brook

1991 B

1991 A

1992

River Derwent

Boosemoor Brook

2014

Dam Brook

Watermeadows Ditch

1983

1989

200 0 200 400 600 800 1000 Metres

Legend

- Scheme boundary - indicative
- 50m buffer
- 250m buffer
- 500m buffer
- Water body
- Direction of flow

Derbyshire Wildlife Trust

- White-clawed crayfish record (with date and reference)

NBN search -

- 2 American Signal

AECOM survey

- 1 ♂ White-clawed crayfish

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A38 DERBY JUNCTIONS
LITTLE EATON
WHITE-CLAWED CRAYFISH
DESK STUDY

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Highways England, Floor 5
2 Colmore Square
38 Colmore Circus
Birmingham
B4 6BN

AECOM
Royal Court
Basil Close, Chesterfield
Derbyshire. S41 7SL
+44 (0) 1246 209221
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N

Bottle Brook

River Derwent

Boosemoor Brook

Dam Brook

Watermeadows Ditch

Legend

- Scheme boundary - indicative
- 50m buffer
- 250m buffer
- 500m buffer
- Watercourse
- Direction of flow
- White-clawed crayfish survey area

Survey results (2017)

- Male Signal Crayfish
- Female Signal Crayfish
- No White-clawed crayfish recorded
- Weir - Potential Signal Crayfish barrier

200 0 200 400 600 800 1000 Metres

File Name:X:\Highways Agency\47071390 A38 Derby Jcns - Environment\Technical\Ecology\GIS_A38_2017\project_files\WCC\A38_WCC_LE_20171101.mxd

Project Title/Drawing Title

A38 DERBY JUNCTIONS
LITTLE EATON
WHITE-CLAWED CRAYFISH SURVEY RESULTS

Project Number 60533462		
Drawn GSB	Checked DW	Approved SP
Date 19/12/2017	Scale @ A3 1:10,000	Purpose of issue FINAL
Drawing Number Figure 4		Rev .

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A38 Derby Junctions Project
Highways England, Floor 5
2 Colmore Square
38 Colmore Circus
Birmingham
B4 6BN

AECOM
Royal Court
Basil Close, Chesterfield
Derbyshire. S41 7SL
+44 (0) 1246 209221
+44 (0) 1246 209229
www.aecom.com

Appendix B Site Photos

Little Eaton Junction Plates

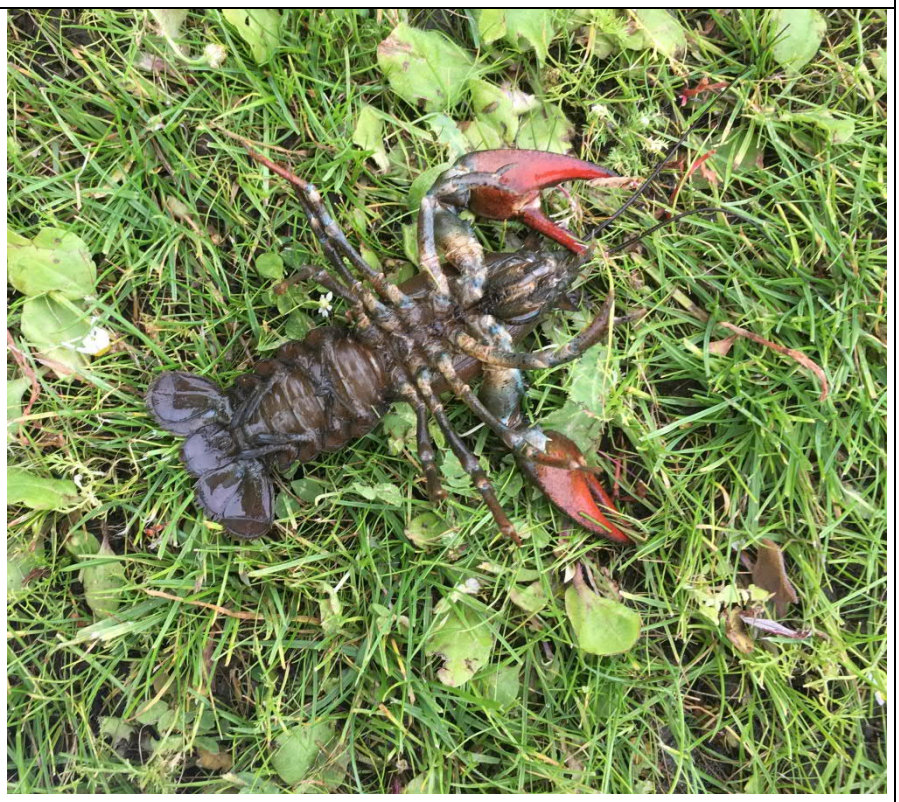
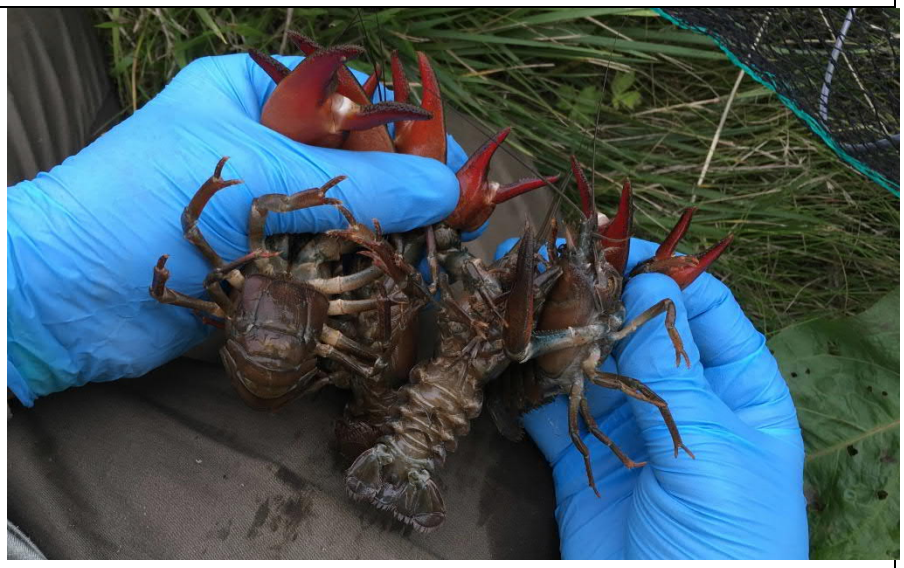
Plate number	Notes	Plate
1	Watermeadows Ditch (b2): Single Female	
2	Dam Brook (b3): Four Male Signal Crayfish	

Plate number	Notes	Plate
3	Dam Brook (b3): Accessible area upstream of weir – shallow water depth with silty substrate and limited crayfish refugia	
4	Bottle Brook (b5) near confluence with R. Derwent: In-channel habitat and rip-rap bank reinforcement providing suitable refugia for crayfish