# A303 Amesbury to Berwick Down

## TR010025

## 6.3 Environmental Statement Appendices

Appendix 8.6B River Habitat Survey River Till

Volume 6

APFP Regulation 5(2)(a)

Planning Act 2008

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

October 2018

| | | | |
|---|---|---|---|
| **Subject:** | River Habitat Surveys of the River Till | | |
| **Date:** | 08 June 2017 | **Date amended:** | 10 June 2017 |
| **Reference:** | HE551506-AA-EWE-SWI-SU-YE-000008 | | P01 |
| **Prepared by:** | Bonnie Boulton | | |

# 1 Introduction

## 1.1 Overview

1.1.1 River Habitat Surveys (RHS) were undertaken at six sites on the River Till, two in August 2016 and four in May 2017, to provide a baseline of the physical structure of the watercourses and vegetation types present.

1.1.2 Figure 1-1 provides an overview of the RHS reach locations on the River Till. The upstream and downstream NGRs for each survey reach are recorded in Table 1-1.

**Figure 1-1 River Till RHS locations**

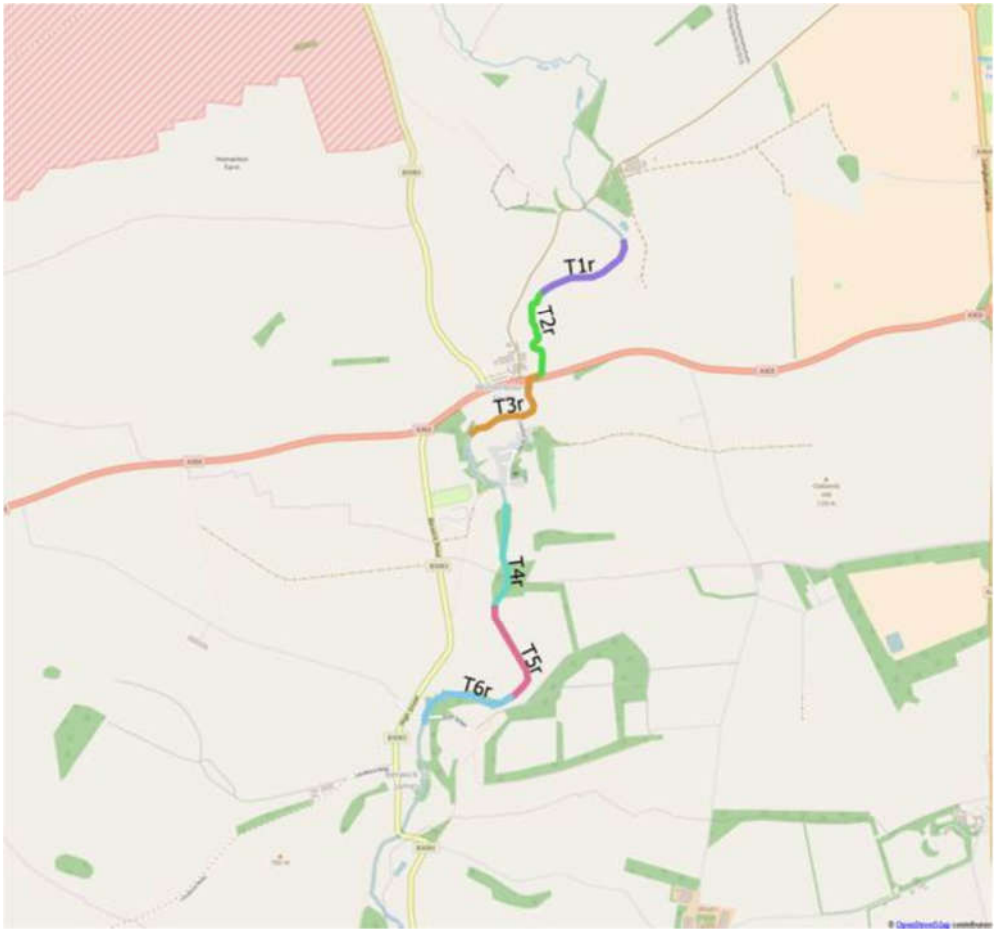

**Table 1-1 RHS reach NGRs**

| RHS Reach | Upstream NGR (start) | Downstream NGR (end) | Description |
|---|---|---|---|
| T1r | SU 08202 41752 | SU 07827 41506 | Northern bypass – 500m upstream and 1km downstream |
| T2r | SU 07827 41506 | SU 07807 41109 | |
| T3r | SU 07807 41109 | SU 07518 40865 | |
| T4r | SU 07649 40501 | SU 07642 40031 | Southern bypass – 500m upstream and 1km downstream |
| T5r | SU 07642 40031 | SU 07726 39588 | |
| T6r | SU 07726 39588 | SU 07272 39518 | |

# 2 Methods

## 2.1 Field survey

2.1.1 Field surveys were undertaken following published standards for RHS[1]. The surveys of T1r and T2r were undertaken on the 18th August 2016 in predominantly fair weather conditions, the surveys of T3r – T6r were undertaken on the 25th and 26th May 2017 in sunny weather conditions. All surveys were led by Atkins surveyor Bonnie Boulton (Environment Agency RHS Accreditation Number FA008).

## 2.2 Habitat modification assessment

2.2.1 On completion of the RHS, Habitat Modification Scores (HMS) were calculated. Some bankside features were obscured due to abundant vegetation growth; however this has been acknowledged in the characterisation of the watercourses and has not impacted the overall Habitat Modification Class (HMC).

2.2.2 HMS is calculated from the RHS data based on the presence and distribution of habitat modifications such as channel and bank re-sectioning within the survey reach, as well as artificial features such as bridges, culverts and outfalls. The HMS translates into HMC which classifies each RHS site into one of five categories as outlined in Table 2-1.

**Table 2-1 – Habitat modification categories**

| Habitat modification class (HMC) | HMC description | Habitat modification score (HMS) |
|---|---|---|
| 1 | Pristine/semi-natural | 0 – 16 |
| 2 | Predominantly unmodified | 17 – 199 |
| 3 | Obviously modified | 200 – 499 |
| 4 | Significantly modified | 500 – 1399 |
| 5 | Severely modified | 1400 + |

[1] Environment Agency (2003). River Habitat Survey in Britain and Ireland. Field Survey Guidance Manual: 2003. Bristol.

# 3 Summary results

## 3.1 Habitat modification

3.1.1 Table 3-1 summarises the HMS and HMC of each 500m RHS undertaken within the study area. All sites have been historically modified, reflected by high HMS, and a HMC of 'Severely' modified.

3.1.2 Individual site summaries are provided in section 4, with HMS calculation and representative photos included in Appendix A.

**Table 3-1 – Habitat modification results**

| RHS reach | Date | Central NGR | HMS | HMC |
|---|---|---|---|---|
| T1r | 18th August 2016 | SU 08059 41588 | 2255 | 5 |
| T2r | 18th August 2016 | SU 07814 41312 | 1520 | 5 |
| T3r | 26th May 2017 | SU 07716 40924 | 3390 | 5 |
| T4r | 26th May 2017 | SU 07634 40259 | 3000 | 5 |
| T5r | 25th May 2017 | SU 07719 39779 | 3100 | 5 |
| T6r | 25th May 2017 | SU 07445 39590 | 3405 | 5 |

# 4 Site summaries

## 4.1 River Till T1r

4.1.1 Representative channel dimensions: water depth: 0m; water width: 0m; bankfull width: 8m.

4.1.2 HMS: 2255; HMC:5

4.1.3 The watercourse was accessed via a gate into an area of rough pasture and surveyed from upstream to downstream. The watercourse was ephemeral within RHS reach T1r, and was not flowing at the time of survey. 'Dry' was recorded for the flow type at all spot-checks.

4.1.4 At the upstream extent of the survey reach the channel and banks were relatively natural, with a gentle gradient. The dry channel was overgrown with emergent broad-leaved herbs (dominated by water cress *Rorippa nasturtium-aquaticum* with water forget-me-not *Myosotis scorpioides* and brooklime *Veronica beccabunga* also recorded), indicating that the watercourse had only recently dried. No channel or bank resectioning was recorded in the upper 150m.

4.1.5 Moving downstream, resectioning was recorded for both the channel and banks. The channel cross-section became increasingly uniform and is likely to have been subject to historical realignment for agriculture. A number of structures were also recorded which would have acted to form the observed scour pools immediately downstream, at times of flow (see photo ATT-65). The channel falls into HMC 5, 'severely modified', as a result of the historical resectioning described above.

4.1.6 The channel substrate was almost consistently recorded as earth, however the bed was almost entirely covered by macrophytes, making the substrate difficult to observe. There were no livestock present at the time of survey but the banks were extensively poached (more than 33% of reach) which had caused the banks to slump in places which will accelerate sediment delivery into the channel during times of flow.

4.1.7 Trees were recorded as isolated/scattered with associated shading of the channel and overhanging boughs both recorded as present. However large woody debris was not recorded. Large woody debris acts to increase flow complexity and initiate a more natural sediment regime; an overall lack of woody debris has prevented any meaningful channel recovery from taking place.

## 4.2 River Till T2r

4.2.1 Representative channel dimensions: water depth: 0.1m; water width: 8m; bankfull width: 11m.

4.2.2 HMS: 1520; HMC:5

4.2.3 This section of watercourse was sited immediately downstream of T1r. The surrounding land use was rough pasture and there was evidence of historical modification through the survey reach. The channel planform comprised a relic meander through the middle sections with greater connectivity to the surrounding floodplain. In addition, clumps of trees lining the banks are likely to have helped the channel to naturalise.

4.2.4 Despite a degree of naturalisation, bank and channel resectioning was recorded at the spot-checks in the upper and lower sections of the survey extent, where the channel planform was straight and the cross-section relatively uniform. At the lower extent the planform takes a 90 degree turn to the west to flow parallel to the A303 before it is crossed by it. Here the left bank is reinforced with concrete, which contributes to the overall HMS.

4.2.5 The channel was no longer dry and macrophytes choked the channel for much of its length, with ‘non-perceptible’ flow type recorded at the majority of spot-checks. Due to the abundant vegetation growth the channel substrate was not always visible, but where it could be observed, was recorded as gravel, silt and cobble, suggesting a greater range of habitat availability.

4.2.6 As at T1r emergent broad-leaved herbs were extensive throughout the reach (water cress *Rorippa nasturtium-aquaticum* with water forget-me-not *Myosotis scorpioides* and brooklime *Veronica beccabunga*) with the addition of free-floating duckweed *Lemna minor* and filamentous algae *Cladophora* in the lower section. Water crowfoot *Ranunculus sp.* was also found in the lower section which is typically found in the downstream sections of chalk streams.

4.2.7 Reach T2r falls into category of 5, ‘severely modified’, due to the resectioning, but showed a greater degree of naturalisation than T1r.

## 4.3 River Till T3r

4.3.1 Representative channel dimensions: water depth: 0.2m; water width: 6.0m; bankfull width: 6.5m.

4.3.2 HMS: 3390; HMC:5

4.3.3 Surrounding land use was dominated by rough pasture in the lower half of the reach and the private gardens of Winterbourne Stoke in the upper section. Broadleaved trees almost continuously lined both banks resulting in extensive shading of the channel. Three bridges were recorded, associated with the A303 and surrounding settlement, as well as a ford to the lower extent of the reach where cattle can access the channel causing fine sediment input. In addition to these structures, the HMS is driven by widespread historical bank and channel resectioning, and isolated bank reinforcement along the right bank. However, in the lower section the bank profile had re-naturalised in places through localised deposition.

4.3.4 Given the low energy of the system and localised bank reinforcement, widespread recovery of a natural bank profile is unlikely. Where the channel was unshaded by trees the river had recovered to a more natural wetted width, predominantly through emergent marginal vegetation encroachment rather than through fluvial processes of erosion and deposition. The most widespread emergent species noted were hemlock water dropwort *Oenanthe crocata* and water mint *Mentha aquatic.*

4.3.5 Semi-continuous tree cover provided extensive shading of the channel, which suppressed the growth of marginal vegetation. The tree-line did provide a source of woody channel features, with overhanging boughs, exposed bankside roots and large woody debris all recorded by the survey. These features served to locally affect substrate and flow character, and increase river habitat variability.

## 4.4 River Till T4r

4.4.1 Representative channel dimensions: water depth: 0.25m; water width: 11.5m; bankfull width: 12m.

4.4.2 HMS: 3000; HMC:5

4.4.3 Surrounding land use was dominated by rough pasture with a buffer of broadleaved trees continuously lining both banks. One minor footbridge and a minor ford were recorded, these were in addition to wooden deflectors or possible historic bank reinforcement (likely decades old and in a state of disrepair). The HMS is driven by widespread historical bank and channel resectioning, the aforementioned structures and poaching at one spot-check.

4.4.4 The channel had been historically over-widened which had led to predominantly slow laminar flows. However, the surrounding trees provided a significant source of woody debris to the channel, which caused faster flows and added habitat complexity where present. Overall, given the low energy of the system widespread recovery of a natural bank profile is unlikely, and the historical modification of the channel cross-section is likely to be decades if not centuries old.

4.4.5 Where the channel was unshaded marginal vegetation encroached into the channel and acted to narrow the main flow path. *Oenanthe crocata*, *Mentha aquatic* and *Myosotis scorpioides* were the predominant species noted.

## 4.5 River Till T5r

4.5.1 Representative channel dimensions: water depth: 0.25m; water width: 5.5m; bankfull width: 6.5m.

4.5.2 HMS: 3100; HMC: 5

4.5.3 Surrounding land use was dominated by rough pasture with broadleaved trees semi-continuously lining the banks. Artificial structures recorded were limited to two minor footbridges. In addition to these structures, the HMS is driven by widespread historical bank and channel resectioning, localised reinforcement and poaching at one spot check. The upper section of the reach is over-wide and heavily shaded, similar to Tr4 upstream. At spot check 7 the channel narrows but remains heavily modified, with any bank recovery almost entirely absent.

4.5.4 Downstream of spot check 7 the river recovered a more natural width through fringing reeds on banks narrowing the flow, rather than through fluvial processes of erosion and deposition. In the lower section the left bank is confined by the valley side, which is wooded and acts to shade the channel. Despite some shading, marginal vegetation encroaches, primarily *Oenanthe crocata* on the right bank. Downstream of the reach (start of T6r) a historic sluice structure forces the channel to take a right-angle bend to the north west. Despite this, flows were faster though the lower section than upstream with clean gravel substrate dominant.

## 4.6 River Till T6r

4.6.1 Representative channel dimensions: water depth: 0.3m; water width: 6.0m; bankfull width: 7.5m.

4.6.2 HMS: 3405; HMC:5

4.6.3 Surrounding land use was dominated by broadleaved woodland on both banks. The woodland was bordered by the village of Berwick St James on the right bank and rough pasture on the left bank. A major sluice was recorded in the upper half of the reach and an intermediate bridge at the road crossing marked the end of the reach. In addition to these structures, the HMS is driven by widespread historical bank and channel resectioning, localised reinforcement (largely associated with the sluice structure), a minor outfall at the bridge and defunct wooden deflectors/historic reinforcement.

4.6.4 Upstream of the sluice the channel maintained the same character as T5r upstream; shaded on the right bank confined by the valley side with marginal vegetation encroaching from the left bank. Downstream of the sluice the channel was overwide and extensively shaded by trees (predominantly willow). Through this lower section the water was deeper, flows were slower and the margins were covered in silt. Due to the extensive shading, in channel vegetation growth was minimal. Despite an absence of marginal habitat from in-channel vegetation, the tree-lined banks provided a source of woody debris, bankside routes and over-hanging boughs. These features served to locally affect substrate and increase river habitat complexity.

# Appendix A HMS Calculations and Representative Photos

## River Till – T1r: RHS Habitat Modification Scoring and Key Photos

**Survey: Till (T1r) 18/08/16**
**RHS Habitat Modification Score & Habitat Modification Class Scoring System**

| | | |
|---|---|---|
| A | Spot check channel modification - Culverts | 0 |
| B | Sweep-up artificial features - Culverts | 0 |
| | **HMS: Culverts sub-score** | **0** |
| C | Spot check bank material | 100 |
| D | Spot check bank modification - RI | 0 |
| E | Sweep-up bank profiles - RI | 0 |
| F | Sweep-up artificial features - revetments | 0 |
| G | Spot check channel substrate | 200 |
| H | Spot check channel modification - RI | 0 |
| | **HMS: Bank & bed reinforcement sub-score** | **300** |
| I | Spot check bank modification - RS | 440 |
| J | Sweep-up bank profiles - RS | 0 |
| K | Spot check channel modification - RS | 1200 |
| L | Sweep-up channel modification - over deepened | 0 |
| | **HMS: Bank & bed resectioning sub-score** | **1640** |
| M | Spot check bank modification - Berms (BM) | 0 |
| N | Spot check bank modification - EM | 0 |
| O | Sweep-up bank profiles - Artificial two-stage | 0 |
| P | Sweep-up bank profiles - Embanked | 0 |
| Q | Sweep-up bank profiles - set back embankment | 0 |
| | **HMS: Berms & embankments sub-score** | **0** |
| R | Sweep-up artificial features - weirs/dams/sluices | 75 |
| | **HMS: Weirs/dams/sluices sub-score** | **75** |
| S | Sweep-up artificial features - bridges | 100 |
| | **HMS: Bridges sub-score** | **100** |
| T | Spot check bank modification - poaching (PC or PC(B)) | 140 |
| U | Sweep-up bank profiles - poached | 0 |
| | **HMS: Poaching sub-score** | **140** |
| V | Sweep-up artificial features - fords | 0 |
| | **HMS: Fords sub-score** | **0** |
| W | Sweep-up artificial features - outfall | |
| X | Sweep-up artificial features - deflectors | 0 |
| | **HMS: Outfall/deflectors sub-score** | **0** |
| | **Total HMS** | **2255** |

**Photo ATT-54 –** Upper section

**Photo ATT-60 –** Bank poaching

**Photo ATT-65 –** Scour downstream of structure

**Photo ATT-74 –** Modified cross-section in lower half of survey

## River Till – T2r: RHS Habitat Modification Scoring and Key Photos

| | Survey: Till (T2r) 18/08/16<br>RHS Habitat Modification Score & Habitat Modification Class Scoring System | |
|---|---|---|
| A | Spot check channel modification - Culverts | 0 |
| B | Sweep-up artificial features - Culverts | 0 |
| | **HMS: Culverts sub-score** | **0** |
| C | Spot check bank material | 0 |
| D | Spot check bank modification - RI | 0 |
| E | Sweep-up bank profiles - RI | 40 |
| F | Sweep-up artificial features - revetments | 0 |
| G | Spot check channel substrate | 0 |
| H | Spot check channel modification - RI | 0 |
| | **HMS: Bank & bed reinforcement sub-score** | **40** |
| I | Spot check bank modification - RS | 600 |
| J | Sweep-up bank profiles - RS | 0 |
| K | Spot check channel modification - RS | 600 |
| L | Sweep-up channel modification - over deepened | 0 |
| | **HMS: Bank & bed resectioning sub-score** | **1200** |
| M | Spot check bank modification - Berms (BM) | 0 |
| N | Spot check bank modification - EM | 0 |
| O | Sweep-up bank profiles - Artificial two-stage | 0 |
| P | Sweep-up bank profiles - Embanked | 0 |
| Q | Sweep-up bank profiles - set back embankment | 0 |
| | **HMS: Berms & embankments sub-score** | **0** |
| R | Sweep-up artificial features - weirs/dams/sluices | 0 |
| | **HMS: Weirs/dams/sluices sub-score** | **0** |
| S | Sweep-up artificial features - bridges | 0 |
| | **HMS: Bridges sub-score** | **0** |
| T | Spot check bank modification - poaching (PC or PC(B)) | 200 |
| U | Sweep-up bank profiles - poached | 0 |
| | **HMS: Poaching sub-score** | **200** |
| V | Sweep-up artificial features - fords | 80 |
| | **HMS: Fords sub-score** | **80** |
| W | Sweep-up artificial features - outfall | |
| X | Sweep-up artificial features - deflectors | 0 |
| | **HMS: Outfall/deflectors sub-score** | **0** |
| | **Total HMS** | **1520** |

**Photo ATT-80**

**Photo ATT-89 –** Channel lined by trees on right bank

**Photo ATT-93 –** Start of meander

**Photo ATT-98 –** Straightened section immediately before the channel bends 90º to flow parallel to A303

## River Till – T3r: RHS Habitat Modification Scoring and Key Photos

| Survey: Till (TR3) 26/05/17<br>RHS Habitat Modification Score & Habitat Modification Class Scoring System | | |
|---|---|---|
| A | Spot check channel modification - Culverts | 0 |
| B | Sweep-up artificial features - Culverts | 0 |
| | **HMS: Culverts sub-score** | **0** |
| C | Spot check bank material | 100 |
| D | Spot check bank modification - RI | 0 |
| E | Sweep-up bank profiles - RI | 0 |
| F | Sweep-up artificial features - revetments | 0 |
| G | Spot check channel substrate | 0 |
| H | Spot check channel modification - RI | 0 |
| | **HMS: Bank & bed reinforcement sub-score** | **100** |
| I | Spot check bank modification - RS | 680 |
| J | Sweep-up bank profiles - RS | 0 |
| K | Spot check channel modification - RS | 2000 |
| L | Sweep-up channel modification - over deepened | 0 |
| | **HMS: Bank & bed resectioning sub-score** | **2680** |
| M | Spot check bank modification - Berms (BM) | 0 |
| N | Spot check bank modification - EM | 0 |
| O | Sweep-up bank profiles - Artificial two-stage | 0 |
| P | Sweep-up bank profiles - Embanked | 0 |
| Q | Sweep-up bank profiles - set back embankment | 0 |
| | **HMS: Berms & embankments sub-score** | **0** |
| R | Sweep-up artificial features - weirs/dams/sluices | 0 |
| | **HMS: Weirs/dams/sluices sub-score** | **0** |
| S | Sweep-up artificial features - bridges | 550 |
| | **HMS: Bridges sub-score** | **550** |
| T | Spot check bank modification - poaching (PC or PC(B)) | 0 |
| U | Sweep-up bank profiles - poached | 20 |
| | **HMS: Poaching sub-score** | **20** |
| V | Sweep-up artificial features - fords | 40 |
| | **HMS: Fords sub-score** | **40** |
| W | Sweep-up artificial features - outfall | |
| X | Sweep-up artificial features - deflectors | 0 |
| | **HMS: Outfall/deflectors sub-score** | **0** |
| | **Total HMS** | **3390** |

**Photo IMG_0062:** The channel has a more natural width where marginal vegetation encroaches

**Photo IMG_0067:** Extensive shading suppressed the growth of vegetation

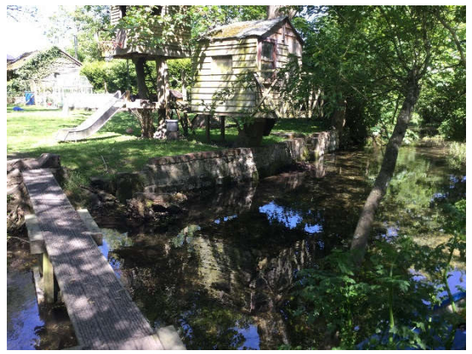

**Photo IMG_0081:** Minor wooden footbridge and bank reinforcement on the right bank

**Photo IMG_0086:** A303 road bridge

## River Till – T4r: RHS Habitat Modification Scoring and Key Photos

| Survey: Till (TR4) 26/05/17<br>RHS Habitat Modification Score & Habitat Modification Class Scoring System | | |
|---|---|---|
| A | Spot check channel modification - Culverts | 0 |
| B | Sweep-up artificial features - Culverts | 0 |
| | **HMS: Culverts sub-score** | **0** |
| C | Spot check bank material | 0 |
| D | Spot check bank modification - RI | 0 |
| E | Sweep-up bank profiles - RI | 0 |
| F | Sweep-up artificial features - revetments | 0 |
| G | Spot check channel substrate | 0 |
| H | Spot check channel modification - RI | 0 |
| | **HMS: Bank & bed reinforcement sub-score** | **0** |
| I | Spot check bank modification - RS | 800 |
| J | Sweep-up bank profiles - RS | 0 |
| K | Spot check channel modification - RS | 2000 |
| L | Sweep-up channel modification - over deepened | 0 |
| | **HMS: Bank & bed resectioning sub-score** | **2800** |
| M | Spot check bank modification - Berms (BM) | 0 |
| N | Spot check bank modification - EM | 0 |
| O | Sweep-up bank profiles - Artificial two-stage | 0 |
| P | Sweep-up bank profiles - Embanked | 0 |
| Q | Sweep-up bank profiles - set back embankment | 0 |
| | **HMS: Berms & embankments sub-score** | **0** |
| R | Sweep-up artificial features - weirs/dams/sluices | 0 |
| | **HMS: Weirs/dams/sluices sub-score** | **0** |
| S | Sweep-up artificial features - bridges | 100 |
| | **HMS: Bridges sub-score** | **100** |
| T | Spot check bank modification - poaching (PC or PC(B)) | 10 |
| U | Sweep-up bank profiles - poached | 0 |
| | **HMS: Poaching sub-score** | **10** |
| V | Sweep-up artificial features - fords | 40 |
| | **HMS: Fords sub-score** | **40** |
| W | Sweep-up artificial features - outfall | |
| X | Sweep-up artificial features - deflectors | 50 |
| | **HMS: Outfall/deflectors sub-score** | **50** |
| | **Total HMS** | **3000** |

**Photo IMG_0040:** Defunct deflectors/historic reinforcement

**Photo IMG_0047:** Significant woody debris adds habitat complexity

**Photo IMG_0053:** Ford/cattle access point

**Photo IMG_0059:** Marginal vegetation encroaches where channel is unshaded

## River Till – T5r: RHS Habitat Modification Scoring and Key Photos

| Survey: Till (TR5) 25/05/17<br>RHS Habitat Modification Score & Habitat Modification Class Scoring System | | |
|---|---|---|
| A | Spot check channel modification - Culverts | 0 |
| B | Sweep-up artificial features - Culverts | 0 |
| | **HMS: Culverts sub-score** | **0** |
| C | Spot check bank material | 0 |
| D | Spot check bank modification - RI | 0 |
| E | Sweep-up bank profiles - RI | 80 |
| F | Sweep-up artificial features - revetments | 0 |
| G | Spot check channel substrate | 0 |
| H | Spot check channel modification - RI | 0 |
| | **HMS: Bank & bed reinforcement sub-score** | **80** |
| I | Spot check bank modification - RS | 800 |
| J | Sweep-up bank profiles - RS | 0 |
| K | Spot check channel modification - RS | 2000 |
| L | Sweep-up channel modification - over deepened | 0 |
| | **HMS: Bank & bed resectioning sub-score** | **2800** |
| M | Spot check bank modification - Berms (BM) | 0 |
| N | Spot check bank modification - EM | 0 |
| O | Sweep-up bank profiles - Artificial two-stage | 0 |
| P | Sweep-up bank profiles - Embanked | 0 |
| Q | Sweep-up bank profiles - set back embankment | 0 |
| | **HMS: Berms & embankments sub-score** | **0** |
| R | Sweep-up artificial features - weirs/dams/sluices | 0 |
| | **HMS: Weirs/dams/sluices sub-score** | **0** |
| S | Sweep-up artificial features - bridges | 200 |
| | **HMS: Bridges sub-score** | **200** |
| T | Spot check bank modification - poaching (PC or PC(B)) | 20 |
| U | Sweep-up bank profiles - poached | 0 |
| | **HMS: Poaching sub-score** | **20** |
| V | Sweep-up artificial features - fords | 0 |
| | **HMS: Fords sub-score** | **0** |
| W | Sweep-up artificial features - outfall | |
| X | Sweep-up artificial features - deflectors | 0 |
| | **HMS: Outfall/deflectors sub-score** | **0** |
| | **Total HMS** | **3100** |

**Photo IMG_0018:** The channel highly modified and shaded on the left bank

**Photo IMG_0022:** Fringing reed banks

**Photo IMG_0031:** Cattle access point

**Photo IMG_0036:** Heavily shaded channel through tree-lined section in the upper half of the reach

## River Till – T6r: RHS Habitat Modification Scoring and Key Photos

| | Survey: Till (TR6) 25/05/17<br>RHS Habitat Modification Score & Habitat Modification Class Scoring System | |
|---|---|---|
| A | Spot check channel modification - Culverts | 0 |
| B | Sweep-up artificial features - Culverts | 0 |
| | **HMS: Culverts sub-score** | **0** |
| C | Spot check bank material | 150 |
| D | Spot check bank modification - RI | 0 |
| E | Sweep-up bank profiles - RI | 0 |
| F | Sweep-up artificial features - revetments | 0 |
| G | Spot check channel substrate | 200 |
| H | Spot check channel modification - RI | 0 |
| | **HMS: Bank & bed reinforcement sub-score** | **350** |
| I | Spot check bank modification - RS | 680 |
| J | Sweep-up bank profiles - RS | 0 |
| K | Spot check channel modification - RS | 1800 |
| L | Sweep-up channel modification - over deepened | 0 |
| | **HMS: Bank & bed resectioning sub-score** | **2480** |
| M | Spot check bank modification - Berms (BM) | 0 |
| N | Spot check bank modification - EM | 0 |
| O | Sweep-up bank profiles - Artificial two-stage | 0 |
| P | Sweep-up bank profiles - Embanked | 0 |
| Q | Sweep-up bank profiles - set back embankment | 0 |
| | **HMS: Berms & embankments sub-score** | **0** |
| R | Sweep-up artificial features - weirs/dams/sluices | 300 |
| | **HMS: Weirs/dams/sluices sub-score** | **300** |
| S | Sweep-up artificial features - bridges | 200 |
| | **HMS: Bridges sub-score** | **200** |
| T | Spot check bank modification - poaching (PC or PC(B)) | 0 |
| U | Sweep-up bank profiles - poached | 0 |
| | **HMS: Poaching sub-score** | **0** |
| V | Sweep-up artificial features - fords | 0 |
| | **HMS: Fords sub-score** | **0** |
| W | Sweep-up artificial features - outfall | 25 |
| X | Sweep-up artificial features - deflectors | 50 |
| | **HMS: Outfall/deflectors sub-score** | **75** |
| | **Total HMS** | **3405** |

**Photo IMG_0089:** A view upstream of the road crossing at Berwick St James

**Photo IMG_0095:** A over-wide heavily shaded channel for majority of reach

**Photo IMG_007:** Historic sluice structure

**Photo IMG_0012:** Upstream of the sluice the channel is shaded on the left bank

## Arup Atkins Joint Venture Approvals

| Version | Role | Name | Signature | Date |
|---|---|---|---|---|
| P01 | Author | Bonnie Boulton | [redacted] | 08 June 2017 |
| | Checker | Ellie Derbyshire | [redacted] | 10 June 2017 |
| | Checker | Liz Brown | [redacted] | 10 June 2017 |
| | Approver | Andy Keen | [redacted] | 10 June 2017 |

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