Sandleford Park, Newbury

Appendix F13: Aquatic Invertebrate Survey Report

Bloor Homes & The Sandleford Farm Partnership

February 2019

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4	December 2018	Ben Cooke	Tamsin Clark	Updated to reflect current proposals and include new survey information
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Executive Summary

Contents	Summary
Site Location	The site is located at Sandleford Park in Newbury, West Berkshire, centred on OS Grid Reference SU 46847 64550. The site comprises agricultural fields with areas of grassland and several copses of ancient woodland. A central valley runs from the north-western corner of the site towards the River Enborne at the site's southern boundary.
Existing Site Information	WYG completed an initial ecological appraisal in 2008 with update surveys completed in 2011, 2013, 2015, 2016 and 2017. In addition, a number of protected species surveys and aquatic invertebrate surveys have been completed at the site. Aquatic invertebrate surveys were completed in 2011 and 2014.
Scope of this Survey(s)	Update aquatic invertebrate surveys were completed in 2018, and the report updated to reflect the current proposals. Water quality was established using Biological Monitoring Working Party (BMWP) and Average Score per Taxon (ASPT) scores.
Results	Water quality on the site was found to range from poor to good, and a locally important dragonfly was identified (in 2011 and 2014). During 2018, water quality in all the areas sampled was poor and had declined at S1, S2 and S4. Rather than a pollution event occurring, this likely to be due to water levels and low flow conditions leading to poorly oxygenated shallow water that is unsuitable for a diverse range of aquatic invertebrates A number of bullhead fish (*Cottus gobio*) were noted, but they do not form part of the BMWP and ASPT scores. Bullheads are listed on Schedule II of the Conservation of Habitats and Species Regulations 2017, and a UK Priority Species under Section 41 of the NERC Act. A single signal crayfish (*Pacifastacus leniusculus*) was observed in the stream at Sample Point 2. The signal crayfish is listed under Schedule 9 of the Wildlife and Countryside Act 1981 as an invasive species as such it is an offence to release or allow the escape of the species into the wild.
Recommendations	Ecological input to the final design has been ongoing. Water bodies are retained within the final proposals, together with appropriate buffers. . Where crossing points are required it is recommended that 5m buffer zones on both banks of stream should be established, Pollution Prevention Guidelines (PPGs) adhered to, and any siltation kept to a minimum. After construction, banks should be returned to their original height and shape, and be allowed to re-vegetate naturally. These measures are outlined in the EMMP (Appendix F18). It is recommended that some understory is carefully removed, which will allow light penetration to the stream and benefit aquatic invertebrates and growth of aquatic vegetation. Careful removal of silt from stream bed will also provide refuge habitats for aquatic invertebrates. Management by periodic grazing would also benefit invertebrates by creating unique microclimates.

Glossary

CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology & Environmental Management
EMMP	Ecological Mitigation and Management Plan
LERC	Local Ecological Record Centre
LBAP	Local Biodiversity Action Plan
LNR	Local Nature Reserve
LWS	Local Wildlife Site
MCIEEM	Member of Chartered Institute of Ecology & Environmental Management
NERC Act	Natural Environment and Rural Communities Act 2006
NNR	National Nature Reserve
NPPF	Revised National Planning Policy Framework
PPG	Pollution Prevention Guidelines
SAC	Special Area of Conservation
SPA	Special Protection Area
SSSI	Site(s) of Special Scientific Interest
W&CA	Wildlife & Countryside Act 1981

1.0   Introduction

1.1   Background

WYG was commissioned by Bloor Homes and the Sandleford Farm Partnership in December 2018 to review the findings of the aquatic invertebrate surveys with reference to the most recent proposals.

This revision of the report has been prepared by WYG Associate Ecologist Tamsin Clark MCIEEM.

1.2   Site Location

The site is located at Sandleford Park in Newbury, West Berkshire and is centred at Ordnance Survey National Grid Reference SU 46847 64550. The survey area, hereafter referred to as the 'site' comprises of agricultural fields with areas of grassland and several copses of ancient woodland dispersed throughout. A central valley runs from the north-western corner of the site towards the River Enborne at the site's southern boundary.

For details of the development description, please see the main ES chapter.

1.3   Purpose of the Report

The objectives of this is assessment are to:

- Review the findings of the aquatic invertebrate surveys;
- Assist the client to operate within the law; and
- Provide advice on mitigation strategies against any adverse effects on the protected and / or notable aquatic invertebrate populations which may arise with reference to the current development masterplan.

Note that Latin names are provided at the first mention of each species and common names (where appropriate) are then used throughout the rest of the report for ease of reading.

2.0 Methodology

2.1 Desk Study

2.1.1 Previous Reports

The first aquatic invertebrate survey was undertaken during 2011 as a consequence of a recommendation made as part of the extended Phase 1 habitat survey report for this site (WYG, 2011) and subsequent liaison with the County Ecologist. Update aquatic invertebrate surveys were completed in 2014 and 2018.

2.1.2 Local Ecological Records Centre

Up to date information was requested from the Thames Valley Environmental Record Centre (TVERC) and Hampshire Biodiversity Information Centre (HBIC) in December 2017 for information on any nature conservation designations and protected or notable species records within 2 km of the site.

The data search covers:

- Statutory designated sites for nature conservation, namely SACs, SPAs, Ramsar sites, SSSIs, NNRs and LNRs;
- Non-statutory designated sites for nature conservation, namely LWS;
- Legally protected species, such as great crested newts, bats and badger;
- Notable habitats and species, such as those listed as Habitats or Species of Principal Importance; and,
- Priority habitats or species within the Berkshire LBAP.

The data search did not cover:

- Tree Preservation Orders (TPOs); or
- Conservation Areas designated for their special architectural and historic interest.

2.2 Field Surveys

2.2.1 Habitat

The stream bed substrate along the survey length is a mosaic of silt, bedrock and pebbles with some cobbles. At the time of survey, the stream had pools and riffles along its length and varied in width from approximately 1m to 3m and in depth from approximately 25mm to 1.5m.

A section of the stream has been dammed with steel pilling and this has created a pool which is approximately 20m x 30m.

The stream bank sides range in steepness from 60° to 90° and also in height ranging from 1m to shallow sides which where poached by cattle. The banks are heavily wooded with dense scrub in places which meets over the stream and interspersed with few open sunny glades.

The drain which flows into the stream flows through an open marshy field with stands of rush. The width of the drain varies from approximately 1m to 15m and in depth from 30mm to 200mm; the drain has been heavily poached by the cattle and contains a considerable amount of silt.

The stream and drain both peter out into wet flushes in their upper reaches.

2.2.2 Sample Dates and Locations

Aquatic sampling was carried out at five locations (Figure 1, Table 1). Sample points were between OS Grid Reference SU 472 639 to SU 467 645 for the main stream and OS Grid Reference SU 469 649 to SU 468 645 for the drain running into the main stream.

Table 1. Sample Point Locations

Sample	Grid Reference	Description (2014)	Photograph
S1	SU 47182 64062	Sample taken from shallow edge of pond, approximately 0.5 metres deep but centre of pond likely to be very deep. The water was quite murky / silty. Ducks present on pond. 30% shade around pond. Very little aquatic vegetation present. Set within woodland, with arable fields and set aside beyond the woodland habitat.	
S2	SU 47180 64157	Flowing stream within woodland, upstream from pond. Quite clear water with a stony bed. 95% shade, approximately 20cm deep and 1m wide with quite shallow banks. No aquatic vegetation present.	
S3	SU 47035 64427	Very slow flowing stream, quite clear with gravel bed. Overhanging trees and bramble so almost completely shaded. Approximately 20cm deep and 60cm wide with very steep banks. No aquatic vegetation present.	

Sample	Grid Reference	Description (2014)	Photograph
S4	SU 46844 64542	Slow flowing stream with clear water, a stony bed and shallow banks. Almost completely shaded by overhanging trees and bramble with no aquatic vegetation present. Approximately 30cm wide and less than 10cm deep.	
S5	SU 46883 64807	Very slow flowing stream within marshy grassland, with woodland blocks on both sides. Extremely shallow, with a few deeper points which were possible to survey, but no deeper than 10 cm.	

2.2.3   Aquatic Sampling

Invertebrate samples were collected using a standard pond net with a mesh diameter of 0.5 mm by sweeping the net through the various different habitats within the water body. The sample collected was then sorted within a white plastic tray to extract the invertebrates. Kick sampling was also used within flowing water, where the surveyor stands up-stream of the net and kicked the stream substrate to dislodge the invertebrates to be swept into the net. Again samples were sorted in a white plastic tray to extract the invertebrates (Eyre, 1996; Hill et al., 2005, Sutherland, 2004).

2.3   Water Quality Assessment

Mason (1991), and Jeffries and Mills (1990) outline a system to assess water quality based on aquatic invertebrate assemblages found in water samples. Biological Monitoring Workshop Party (BMWP) has been derived along with the Average Score Per Taxon (ASPT) and thus what these scores are actually measuring. Presence of particular aquatic invertebrates is assigned a value based on their tolerance to pollution. Species that can tolerate high pollution levels are assigned low values while species that cannot tolerate pollution are assigned high values. The water quality is based on the cumulatively score of aquatic invertebrates found in the water body. BMWP represents the cumulative number of scores of invertebrates found and ASPT represents BWMP score divided by the number of taxon found. Polluted water body will therefore have a low BMWP and ASPT value while clear water body will have high BMWP and ASPT value. The water quality is derived from Table 2 below.

Table 2. Water Quality Scoring (BMWP and ASTP)

BMWP Score	Water Quality Assessment	ASPT Score	Water Quality Assessment
0-10	Very poor	<= 3.9	Very poor
11-40	Poor	4.0 – 4.9	Poor
41-70	Moderate	5.0 – 5.9	Fair
71-100	Good	6.0 – 6.9	Good
>100	Very good	>7.0	Very good

The samples collected during the surveys were identified to enable the BMWP and ASPT scores to be calculated.

2.4   Limitations

The spring and summer of 2018 experienced an unusually low amount of rainfall, the result of which was that many water courses were flowing exceptionally low and many smaller streams ran completely dry. Within the survey area the stream at Sample Point 5 remained dry throughout the period, whilst other sample points were periodically dry. This is however not considered to be limitation overall as surveys were also undertaken in 2011 and 2014 and the surveys undertaken in 2018 give an accurate representation of the conditions at the time.

All areas of the site were accessible and there were no limitations to the surveys carried out. Surveys were completed between May and August which is within the optimum survey window for this type of survey.

3.0   Baseline Conditions

3.1   Data search results

A single record of small red damselfly (*Ceriagrion tenellum*) was returned from the HBIC data search dating from 2009, Hampshire is listed as a national stronghold for the species. The British Dragonfly Society recognises the small red damselfly as being rare (BDS, 2014b). A single record of a cranefly (*Tipularia tenellum)* Thames Valley Environmental Records Centre (TVERC) was returned, this species is listed as being 'notable' due to its scarcity in the UK.

Table 3. Invertebrate species returned from the TVERC / HBIC.

Scientific name	Common Name	Date	Grid Ref	Distance from site ref (km) / Direction
Ceriagrion tenellum	Small red damselfly	2009	SU477630	1.70 / SSE
Tipula helvola	A cranefly	27/06/1998	SU490646	2.10 / E

3.2   Survey results

3.2.1   Survey Weather Conditions

The most recent (2018) survey weather conditions are shown in Table 4 below.

Table 4. Survey Weather Conditions

Date	Temperature (°C)	Cloud cover	Wind speed
22/06/2018	21.6	10%	Light breeze
13/07/2018	25.5	5%	Still
26/09/2018	20.0	20%	Light breeze
28/09/2018	18.0	50%	Still

3.2.2   Water Quality Assessment

BMWP and ASPT scores are shown in Tables 5 – 7 below.

Table 5. BMWP and ASPT scores for each sample point/survey occasion.

Sample Point	Date	BMWP Score	Water Quality Assessment	ASPT Score	Water Quality Assessment
S1	22.06.2018	16	Poor	3.2	Very poor
S2	22.06.2018	7	Very poor	3.5	Very poor
S3	22.06.2018	13	Poor	6.5	Fair

Sample Point	Date	BMWP Score	Water Quality Assessment	ASPT Score	Water Quality Assessment
S4	22.06.2018	Dry	Dry	Dry	Dry
S5	22.06.2018	Dry	Dry	Dry	Dry
S1	13.07.2018	16	Poor	3.2	Very Poor
S2	13.07.2018	12	Poor	5.6	Fair
S3	13.07.2018	Dry	Dry	Dry	Dry
S4	13.07.2018	Dry	Dry	Dry	Dry
S5	13.07.2018	Dry	Dry	Dry	Dry
S1	26.09.2018	16	Poor	3.2	Very poor
S2	26.09.2018	12	Poor	4.0	Poor
S3	26.09.2018	7	Very poor	3.5	Very poor
S4	26.09.2018	17	Poor	4.2	Poor
S5	26.09.2018	Dry	Dry	Dry	Dry
S1	28.09.2018	16	Poor	3.2	Very poor
S2	28.09.2018	19	Poor	4.7	Poor
S3	28.09.2018	14	Poor	4.6	Poor
S4	28.09.2018	29	Poor	4.8	Poor
S5	28.09.2018	Dry	Dry	Dry	Dry

The combined survey results for each sample point are presented in Table 6 below.

Table 6. Combined BMWP and ASPT scores 2018.

Sample Point	BMWP Score	Water Quality Assessment	ASPT Score	Water Quality Assessment
S1	24	Poor	3.4	Very poor
S2	27	Poor	4.5	Poor
S3	24	Poor	4.6	Poor
S4	29	Poor	4.1	Poor
S5	Dry	Dry	Dry	Dry

The full surveys results for each sample point on each survey date are provided in Appendix A.

Table 7. Combined BMWP and ASPT scores 2014.

Sample Point	BMWP Score	Water Quality Assessment	ASPT Score	Water Quality Assessment
S1	32	Poor	4.0	Poor
S2	78	Good	5.2	Fair
S3	67	Moderate	4.8	Poor
S4	76	Good	5.1	Fair
S5	78	Good	4.6	Poor

3.3   Protected & Notable Species

In 2011 and 2014 the larvae of a golden-ringed dragonfly (*Cordulegaster boltonii*) was recorded (local importance - BDS 2014). None were recorded in 2018 due to low water levels. Sample Point 5 remained dry throughout the survey period and could not be surveyed. Anecdotal evidence suggests that the stream very rarely dries out completely.

A low number of bullheads (*Cottus gobio*) were caught within the stream during the aquatic invertebrate sampling but they do not form part of the BMWP and ASPT scores. Bullheads are listed on Schedule II of the Conservation of Habitats and Species Regulations 2017, and are a UK Priority Species under Section 41 of the NERC Act.

A single signal crayfish (*Pacifastacus leniusculus*) was observed in the stream at Sample Point 2, when water levels are higher they may be widespread within the stream and may impact upon the aquatic invertebrate assemblage present. The signal crayfish is listed under Schedule 9 of the Wildlife and Countryside Act 1981 as an invasive species as such it is an offence to release or allow the escape of the species into the wild. If any trapping of signal crayfish is planned, an application should be made to Natural England.

4.0   Relevant Legislation

A number of invertebrate species are protected by European and UK legislation, such as those listed on Schedule 5 of the *Wildlife and Countryside Act 1981 (as amended)* and in the *Conservation of Species and Habitats (Amended) Regulations 2017*. As a result, some species are protected from some or all of the following (amongst others):

- killing, injuring or taking;
- possession or control;
- damage to, destruction of or obstruction of access to any places used for shelter or protection; and
- disturbance while using such a structure.

There are currently 411 UK invertebrate Priority Species listed under Section 41 of the Natural Resources and Environment and Rural Communities Act 2006 (NERC).

5.0   Discussion

5.1   Water Quality Assessment

Despite the individual sample scores giving rise to water quality assessments (BMWP) ranging from poor to moderate, the combined scores for all the samples at each sample point gives water quality assessment (BMWP) of poor to good. The ASPT score is calculated from the BMWP score being divided by the number of taxa recorded to produce the BMWP score. The higher ASPT scores indicate that there are higher scoring families recorded within that sample and thus the sample point has aquatic invertebrates that are less tolerant to any pollution. The water quality assessments from the APST indicates water quality ranging from very poor to good with the combined scores indicating water quality ranging from poor to fair.

The 2018 scores within Table 6 indicate that water quality in all the areas sampled is poor and it has declined in at S1, S2 and S4 (see table 7). Rather than a pollution event occurring, this likely to be due to water levels and low flow conditions leading to poorly oxygenated shallow water that is unsuitable for a diverse range of aquatic invertebrates. In addition to this most of the sample points are heavily shaded with very little or no aquatic vegetation being present – further restricting the potential for aquatic invertebrates.

The BMWP and ASPT scores for sample points S2 – S5 did not change significantly between the 2011 results and the 2014 results. The exception is sample point S1 which has reduced BMWP and ASPT scores from the 2011 survey results, thus indicating that the water quality had reduced and thus affected the number and diversity of aquatic invertebrates recorded during the 2014 surveys. However, during the 2011 and 2014 surveys **_Aeshnidae_ dragonfly larvae** were recorded indicating that the water quality is actually higher that the BMWP and ASPT score indicate.

Mayflies of the family **_Leptophlebiidae_** and **Stoneflies** of the family **_Leuctridae_** have been recorded and these have an individual BMWP score of 10 which means that they are particularly sensitive to pollution and thus suggest that was no significant pollution problem in 2014.

The low BMWP scores could be a result of the stream being heavily shaded by the surrounding woodland thus precluding aquatic vegetation from growing to include either submerged, floating or emergent types.

5.2   Recommendations

Some locally important dragonflies, and species indicative of good water quality, were found during the surveys in 2011 and 2014. The UK BAP fish species Bullhead have been found within the ditches and streams on the site.

Streams are proposed to be retained and buffered within the final proposals.

Where works will are required in proximity to the stream, such as the construction of crossing points, the following measures are recommended , and have been included within the EMMP (Appendix F18):

- Avoid or reduce any siltation or runoff to a minimum. This can be partly achieved by ensuring that any excavated material is not stored adjacent to the stream or drain. Implementation of approximately 5m buffer zone of either side of the stream will also help

to significantly reduce the amount of siltation. Best management practices such as temporary sediment traps, silt fences and diversion trenches are all means to reduce runoff pollution and sedimentation. Pollution Prevention Guidelines (PPGs) should be adhered to. Spill kits should be available and used immediately in the case of pollution incident.

- Any material removed from the stream as part of construction of crossing point, should be stored outside of the buffer zone thus minimising the potential for any material to re-enter the water body. Any potential pollutant should be contained and dealt with quickly and appropriately for the pollutant type.

- Both during the construction phase and the operational phase, water levels within the waterbodies on site and within the wider area should be maintained and not impacted upon by the proposed development.

- Following the construction of these crossing points over the drain or stream, it is recommended that the banks be reinstated to the same height and profile as prior to works, and allowed to vegetate naturally from the surrounding area. This will help to maintain the stream and drain in as natural a condition as possible.

5.3   Enhancements

It is requirement of the NPPF to provide enhancements for biodiversity as part of development. Ongoing ecological involvement in the design evolution for this development has ensured that enhancements have been incorporated into the design, construction and operation of the site. The following measures are of particular relevance to aquatic invertebrate populations:

- The careful removal of some of the understory trees along the stream banks will be beneficial as it would allow light onto the stream and therefore aquatic vegetation to establish and grow. The removal of understory trees will also benefit water voles as they favour tussocky and herbaceous vegetation. A check for otters and water voles should be made prior to vegetation removal works commencing.

- Some careful removal of silt from the stream bed will help to provide areas that are deeper and thus provide refuge habitats in times of low water level for the aquatic invertebrates.

- Management by grazing is recommended to be implemented (if possible) in areas adjacent to the drain and stream e.g. twice a year by cattle or an appropriate breed of sheep. This is because cattle create areas of poaching that are a particular microhabitat which is favourable to aquatic invertebrates.

6.0   References

- BDS (2014) Key sites. [Internet], Available from: <http://www.british-dragonflies.org.uk/content/conservation> [accessed 04.10.2018].
- Eyre, M.D. (ed.) (1996) Environmental monitoring, surveillance and conservation using invertebrates. EMS publications, Newcastle upon Tyne.
- Hill, D., Fasham, M., Tuicker, G., Shewry, M. and Shaw, P. (2005) Handbook of biodiversity methods survey, evaluation and monitoring. Cambridge university press, Cambridge.
- Jeffries, M. and Mills, D. (1990) Freshwater ecology principles and applications. Belhaven press, London.
- Mason, C.F. (1991) Biology of freshwater pollution (2nd edition). Longman scientific & technical, Harlow, Essex.
- WYG (2011). Sandleford Park, Newbury. Aquatic Invertebrate Report.
- WYG (2016). Sandleford Park, Newbury. Aquatic Invertebrate Report.
- WYG (2018). Sandleford Park, Newbury. Appendix F1 Ecological Appraisal.
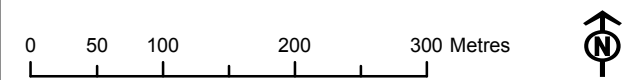- WYG (2018). Sandleford Park, Newbury. Appendix F18 Ecological Mitigation and Management Plan.

FIGURES

Figure 1 – Aquatic Sample Locations

Legend

▲ Sample point

▬ Watercourses

☐ Site boundary

S5

S4

S3

S2

S1

0 50 100 200 300 Metres

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Aquatic Sample Locations

Sandleford Park, Newbury
Bloor Homes & Sandleford Farm Partnership

Appendix A – Full Survey Results

Survey results for 22st June 2018

Group	Families	Sample Points				
		S1	**S2**	**S3**	**S4**	**S5**
Caddis or Sedge flies	Polycentropidae			7		
Shrimps	Gammaridae		6	6		
Bugs	Notonectidae	5				
	Corixidae	5				
Cockles	Sphaeriidae	3				
Midges	Chironomidae	2				
Worms	Oligochaeta (whole class)	1	1			
BMWP Score		16	7	13		
ASPT Score		3.2	3.5	6.5		
Interpretation (Water Quality BMWP)		Poor	Very poor	Poor		
Interpretation (Water Quality ASPT)		Very poor	Very poor	Good		

Survey results for 13th July 2018

Group	Families	Sample Points				
		S1	**S2**	**S3**	**S4**	**S5**
Shrimps	Gammaridae		6			
Bugs	Notonectidae	5	5			
	Corixidae	5				
Cockles	Sphaeriidae	3				
Midges	Chironomidae	2				
Worms	Oligochaeta (whole class)	1	1			
BMWP Score		16	12			
ASPT Score		3.2	4			
Interpretation (Water Quality BMWP)		Poor	Poor			
Interpretation (Water Quality ASPT)		Very Poor	Poor			

Survey results for 26th Sept 2018

Group	Families	Sample Points				
		S1	**S2**	**S3**	**S4**	**S5**
Damselflies	Zygoptera				6	
Shrimps	Gammaridae		6	6	6	
Bugs	Notonectidae	5	5			
Beetles	Dytiscidae	5				
Cockles	Sphaeriidae	3				
Leeches	Glossiphoniidae				4	
Midges	Chironomidae	2				
Worms	Oligochaeta (whole class)	1	1	1	1	
BMWP Score		16	12	7	17	
ASPT Score		3.2	4.0	3.5	4.2	
Interpretation (Water Quality BMWP)		Poor	Poor	Very poor	Poor	
Interpretation (Water Quality ASPT)		Very poor	Fair	Very poor	Poor	

Survey results for 28th Sept 2018

Group	Families	Sample Points				
		S1	S2	S3	S4	S5
Dragonflies	Libellulidae				8	
Damselflies	Zygoptera				6	
Caddis or Sedge flies	Polycentropidae		7	7		
Shrimps	Gammaridae		6	6	6	
Bugs	Notonectidae	5	5			
	Corixidae	5				
Beetles	Dytiscidae				5	
Cockles	Sphaeriidae	3				
Leeches	Glossiphoniidae				4	
Midges	Chironomidae	2				
Worms	Oligochaeta (whole class)	1	1	1	1	
BMWP Score		16	19	14	29	
ASPT Score		3.2	4.7	4.6	4.8	
Interpretation (Water Quality BMWP)		Poor	Poor	Poor	Poor	
Interpretation (Water Quality ASPT)		Very Poor	Poor	Poor	Poor	