

# CURRAGHINALT GOLD PROJECT, COUNTY TYRONE, NORTHERN IRELAND

**Terrestrial and Freshwater (Lotic)  
Invertebrate Appraisal**

Prepared for: Dalradian Gold Limited

**DALRADIAN**  
**GOLD**

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**SLR** 

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## EXECUTIVE SUMMARY

This report has been prepared by SLR Consulting Ireland on behalf of Dalradian Gold Limited. It presents the results of the invertebrate appraisal to inform the baseline ecological conditions at the site of the proposed gold mine development as part of the Curraghinalt Project, County Tyrone.

The main groups were targeted for sampling based on their affinity for the range of habitats identified for sampling comprising Diptera (true flies), terrestrial and aquatic Coleoptera (beetles) and terrestrial and aquatic/semi-aquatic Hemiptera (true bugs).

A total of 172 taxa were recorded from sampling with the largest groups within the samples comprised of both terrestrial and aquatic Coleoptera and Hemiptera with 82 and 49 with the other target group Diptera accounting for a total of 20 species.

The taxa recorded in the sampling are considered to be characteristic of disturbed upland peat habitats and of typical upland valley mires on peat supporting a range of typical plants such as rushes and purple moor-grass and largely of widespread distribution if not common in Northern Ireland with a small number of localised occurrence.

No Northern Ireland Priority species were recorded as present in the invertebrate assemblage within the study area.

It is likely that the invertebrate assemblage found within the application site is typical of the habitats found throughout the local area and therefore it is considered that the invertebrate assemblage is evaluated to be at Local (lower) value.

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## 1.0 INTRODUCTION

### 1.1 Background

This report presents the findings of an invertebrate appraisal undertaken in 2015 to inform the baseline ecological conditions at the site of the proposed gold mine development as part of the Curraghinalt Project, County Tyrone.

It has been prepared by SLR Consulting Ireland (SLR) on behalf of Dalradian Gold Limited (DGL) to inform the Environmental Impact Assessment (EIA) process as part of the planning application for the development of a gold mine as part of the Curraghinalt Project.

### 1.2 Legislative and Planning Context

Under the Wildlife (Northern Ireland) Order 1985, it is an offence to kill, injure or take any animal listed in Schedule 5 as amended by the Wildlife and Natural Environment Act (Northern Ireland) 2011. It is also an offence to intentionally or recklessly:

- damage, destroy or obstruct access to any structure or place that a Schedule 5 listed species uses for shelter or protection;
- damage or destroy anything which conceals or protect any structure or place that a Schedule 5 listed species uses; and
- disturb a Schedule 5 listed species whilst it is occupying a structure or place which it uses for shelter or protection.

A number of invertebrate species are listed in Schedule 5 of the Wildlife (Northern Ireland) Order 1985 (as amended) that includes:

- brimstone butterfly (*Gonepteryx rhamni*);
- dingy skipper butterfly (*Erynnis tages*);
- holly blue butterfly (*Celastrina argiolus*);
- large heath butterfly (*Coenonympha tullia*);
- small blue butterfly (*Cupido minimus*);
- marsh fritillary butterfly (*Euphydryas aurinia*);
- Real's wood white butterfly (*Leptidea reali*);
- purple hairstreak butterfly (*Quercusia quercus*);
- Irish Damselfly (*Coenagrion lunulatum*);
- white-clawed crayfish (*Austropotamobius pallipes*); and
- freshwater pearl mussel (*Margaritifera margaritifera*).

In addition to the above, a number of species are also afforded protection under the Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora (Habitats Directive which places a duty on Northern Ireland Environment Agency (NIEA) on behalf of the Northern Ireland Assembly to maintain these species at a favourable conservation status. These species include, amongst others: marsh fritillary butterfly; white-clawed crayfish; and freshwater pearl mussel.

Policy Statement 2 (PPS2): Natural Heritage, published in July 2013 states that planning permission will only be granted for a development proposal that is not likely to harm a statutorily protected species and which can be adequately mitigated or compensated against.

A total of 142 species of insect and 40 species of mollusc from various groups are listed as Northern Ireland Priority Species (NIPS). Two species and two groups of invertebrates are also identified in the Draft Fermanagh & Omagh Local Biodiversity Action Plan 2016-2020 as priority species for conservation action including: white-clawed crayfish; freshwater pearl mussel; dragonflies and damselflies; and bumblebees.

### 1.3 Study Aims and Objectives

The primary aim of the study was to provide an appraisal of the invertebrate interest at the site of the proposed above ground mine infrastructure. The appraisal was not intended to obtain a complete invertebrate inventory of the site, but rather randomly sample, as far as practically possible, groups likely to contain species that may be used as habitat quality indicators upon which an evaluation could be made in respect of the habitats present for individual and groups of invertebrate species.

Please note that freshwater pearl mussel and marsh fritillary butterfly were not included within the invertebrate appraisal as these species were subject to separate individual specialist baseline surveys as part of EIA process and which are reported in their own stand-alone reports.

## 2.0 METHODOLOGY

### 2.1 Study Area

The Curraghinalt gold deposit is located in the South Sperrin Mountains approximately 7.5 km east of the village of Gortin, County Tyrone.

The application site has five component project areas that include:

- i. **Proposed Infrastructure Site (Area A).** The site where the process plant and dry stack facility (DSF) will be located and includes the proposed access road of from the Crockanboy Road.
- ii. **Proposed Mineral Extraction Area (Area B).** The area where the mineral deposit is known to occur and the maximum extent of the underground mine workings.
- iii. **The Existing Surface Infrastructure Site (Area C).** The existing surface infrastructure that was developed for the underground exploration programme that will be retained for use as an early works base and for underground development and future training.
- iv. **Passing Bays on Camcosy Road (Area D).** The existing passing bays developed for the Curraghinalt Underground Exploration Programme and proposed turning point for heavy goods vehicles during the construction phase of the development.
- v. **Proposed Mineral Exploration Area (Area E).** The target area for future exploration of the Curraghinalt deposit by means of underground drifts (essentially exploration tunnels). All tunnels will be more than 100 m below the surface.

The area of study for the invertebrate appraisal was based on key habitats within the proposed infrastructure site (Area A) and in adjacent blanket bog habitat, access permitting (Figure 1).

### 2.2 Target Groups

Three main groups were targeted for sampling based on their affinity for the range of habitats identified for sampling. These comprised Diptera (true flies), terrestrial and aquatic Coleoptera (beetles) and terrestrial and aquatic/semi-aquatic Hemiptera (true bugs). Other groups collected as part of the sampling but treated as of secondary importance included Araneae (spiders), Opiliones (harvestmen), Lepidoptera (butterflies and moths), Hymenoptera (bees, wasps and ants) and Myriapoda (centipedes and millipedes).

The key areas identified for the sampling of these target groups comprised a range of upland habitats including marsh, valley mire, blanket bog and wet and dry heath.

### 2.3 Desk-based Study

A preliminary desk-based study was undertaken and involved collating data from a number of organisations and examining published data relating to the target groups at and within a 2km radius of the study area. Data sources included any records held by the Centre for Environmental Data and Recording (CEDaR) and by the National Biodiversity Data Centre (NBDC) ([www.biodiversityireland.ie](http://www.biodiversityireland.ie)).

### 2.4 Field Survey

The appraisal of invertebrate interest was undertaken over two survey visits. The first visit took place between 8<sup>th</sup> and 10<sup>th</sup> July 2015 and the second between 17<sup>th</sup> and 22<sup>nd</sup> August 2015, comprising of 2 days and 3.5 days sampling respectively. The sampling comprised of both the key terrestrial and freshwater (lotic) habitats with a total of 31 areas sampled at and in the immediate vicinity of the proposed infrastructure site. In addition two reference sites were surveyed on 20<sup>th</sup> August 2015 at Boorin Nature Reserve and one at Gortin Lakes.

### 2.4.1 Terrestrial Sampling

During the July visit the following sampling techniques were employed:

- sweep-netting, both targeted and general, were employed in areas of wet heath and bog/mire, acidic and semi-improved rough grassland; and
- beating of mature dwarf shrub heath and other tall vegetation.

During the August visit the above sampling methods were supplemented with suction sampling using a petrol-powered leaf blower. A small number of additional observations of terrestrial invertebrates were also recorded from the study area on other visits and are included here for completeness of the appraisal process.

### 2.4.2 Aquatic/Semi-aquatic Sampling

During the July visit ponds and streams were sampled with an Environment Agency specification pond sampling net and surrounding emergent and marginal marshy vegetation was sampled by hand.

## 2.5 Laboratory Work - Identification

Wherever possible all terrestrial invertebrate and aquatic macro-invertebrate specimens have been identified to species level. Immature specimens are identified to the lowest possible level (genus/family) and for some groups, where the identification of females can be problematic, these are also treated in the same manner.

Terrestrial beetles were identified by Eric J. Smith, Coelopterist of the Sorby Natural History Society with nearly 30 years of recording experience. All other determinations were made by the author.

## 2.6 Uncertainty of Data and Limitations

The weather conditions during Summer 2015 were uncharacteristically wet, cool and windy which followed on from a similar Spring. This may have been attributable to the poor catches from the samples taken during the survey visits. Although it is considered that Coleoptera and Hemiptera have been adequately covered, other groups for example Diptera (including Dolichopodidae) may have been under recorded. However, it is not anticipated that any group under recorded would contain species of significance.

The field work was limited to two visits. This gives rise to the possibility that single generation species having an early or late flight period may not have been recorded. However, again it is considered not to have materially altered the results and that it would be unlikely that any species of significance would be found.

It is considered highly unlikely that the overall baseline conditions would significantly alter year on year within the study area and where any further survey or monitoring would result in a change in the evaluation and in any assessment of the implications of the proposed gold mine development on invertebrates. It is therefore considered that the information provided and contained within this report allows all public bodies to have due regard to their statutory obligations in the exercise of their functions under Section 1 of the Wildlife and Natural Environment (Northern Ireland) Act 2011 (as amended).

## 3.0 RESULTS

### 3.1 Contextual Information and Historical Records

CEDaR returned records for a total of 99 invertebrate species from within the 2km search area. With the exception of freshwater pearl mussel none of the records returned are for any protected species as listed in Schedule 5 of the Wildlife (Northern Ireland) Order 1985 (as amended).

The desk study showed no previous invertebrate records held for the study area.

### 3.2 General Habitat Description

The study area for the invertebrate appraisal was good quality invertebrate habitat within the site of the proposed above ground mine infrastructure and in other areas of blanket bog in adjacent areas.

Much of the study area comprises of a variety of open habitats characteristic of upland/hill country with extensive areas of disturbed/damaged or recovering blanket bog from former and active hand cutting as well as some small valley mires and flushes and streams. A small number of ponds are present in the southern part of the study area.

### 3.3 Summary Description of Sampling Sites

A total of 15 samples, comprising of 11 terrestrial and four aquatic samples, were collected during the visit in July 2015.

In August 2015 a total of 16 terrestrial and semi-terrestrial samples were collected. In addition a sample was taken from Boorin Nature Reserve and Gortin Lakes to the south of the village of Gortin as a reference collection from good quality mire and freshwater habitats in the local area in August.

Table 1 below provides basic details of the sampling locations and these are shown in Figure 2.

**Table 1: Sampling Locations**

Sampling Reference	Site	Date	Grid Reference	Description
July 2015 Fieldwork				
Stop 1.1		08/07/2015	H 59155 84418	Pool in area of wet heath
Stop 1.2		08/07/2015	H 59269 84537	Wet heath with <i>Sphagnum</i> and rushes
Stop 1.3		08/07/2015	H 59138 84593	Degraded blanket bog
Stop 1.4		08/07/2015	H 59034 84271	Mire with stands of heather
Stop 1.5		08/07/2015	H 58971 84233	Pollanroe Burn
Stop 1.6		08/07/2015	H 59025 84156	Rush/mire/wet heath
Stop 1.7		08/07/2015	H 58932 84097	Heath/mire
Stop 1.8		08/07/2015	H 58681 84396	Pond
Stop 1.9		08/07/2015	H 58730 84361	Pond
Stop 2.1		09/07/2015	H 57786 84540	Small stream valley side and stream margins

Sampling Reference	Site	Date	Grid Reference	Description
Stop 2.2		09/07/2015	H 57744 84526	Wet heath
Stop 2.3		09/07/2015	H 57311 84892	Wet heath/mire
Stop 2.4		09/07/2015	H 57122 85062	Wet heath/mire
Stop 2.5		09/07/2015	H 57147 85112	On edge of cut-over bog and heather
Stop 2.6		09/07/2015	H 56880 85272	A mix of cut-over bog, wet heath/mire
August 2015 Fieldwork				
Stop 3.1		17/08/2015	H 59164 94435	Marsh/wet heath with <i>Sphagnum</i>
Stop 3.2		17/08/2015	H 59237 84587	Degraded wet heath/bog
Stop 4.1		18/08/2015	H 58584 84637	Disturbed/damaged blanket bog
Stop 4.2		18/08/2015	H 58679 84878	Disturbed/damaged blanket bog
Stop 4.3		18/08/2015	H 59111 84667	Slightly disturbed/disturbed blanket bog
Stop 4.4		18/08/2015	H 59174 84634	Slightly disturbed/disturbed blanket bog
Stop 4.5		18/08/2015	H 59109 84585	Heath
Stop 4.6		18/08/2015	H 58526 84433	Tussocky purple moor-grass area with some sedge and rush along stream/ditch
Stop 5.1		20/08/2015	H 58948 84094	Mosaic of rush/mire and acidic grassland
Stop 5.2		20/08/2015	H 59073 84309	Recovering blanket bog with <i>Drosera</i> sp.
Stop 5.3		20/08/2015	H 59017 84251	Mosaic of mire/flush with bogbean
Stop 5.4		20/08/2015	H 58981 84217	Rush dominated flush/mire
Stop 5.5		20/08/2015	H58493 84444	Marshy grassland along stream/ditch
Gortin Lakes		20/08/2015	H 49976 84156	Vegetation around freshwater small lakes
Nature Reserve		20/08/2015	H 49474 84356	Wet heath
Stop 6.1		22/08/2015	H 58161 84353	Valley mire with rush and wet grassland
Stop 6.2		22/08/2015	H 58981 84217	Rush dominated valley mire
Stop 6.3		22/08/2015	H 59099 84337	Valley mire (including <i>Eriophorum</i> sp. and <i>Drosera</i> sp.)

### 3.4 Weather Data

Table 2 presents details of the survey dates and weather conditions.

**Table 2: Survey Dates and Weather Conditions**

Survey Dates	Weather Conditions
Visit 1	
8th July 2015	Wet, windy with some sunny spells
9th July 2015	Dull, mostly 100% cloud cover with high humidity and lower than average temperatures
Visit 2	
17 <sup>th</sup> August 2015	Cloudy, mild and windy
18 <sup>th</sup> August 2015	Warm, sunny but with some strong winds
20 <sup>th</sup> August 2015	Cloudy (mostly 100% cover), high humidity, moderate winds with a deterioration in the early evening to rain
22 <sup>nd</sup> August 2015	A mixture of cloud with some sunny spells and moderate wind and high humidity, ground and field layer vegetation damp for most of the morning

### 3.5 Species and Assemblages

A total of 172 taxa were recorded from sampling undertaken in July (71 species) and in August (101 species). The full survey results for each of the sampling locations for each survey visit is provided at Appendix 01.

The largest groups within the samples comprised of both terrestrial and aquatic Coleoptera and Hemiptera with 82 and 49 with the other target group Diptera accounting for a total of 20 species.

Within the Coleoptera the two largest groups were rove beetles (Staphylinidae) with 16 species and ground beetles (Carabidae) with 14 species.

Freshwater samples included six species of Odonata and a range of common and widespread species of water beetles.

Many of the species sampled are characteristic of rush pasture, upland moorland habitats, and upland wetlands including acidic pools and seepages.

One Irish Red Listed (IUCN Near Threatened) butterfly – small heath (*Coenonympha pamphilus*) - was recorded as an additional species from a location in the southern part of the study area (Kingston, 2012).

There was found no real significant variation in the terrestrial invertebrate assemblage sampled from Boorin Nature Reserve from those recorded in the study area. Gortin Lakes were found to be rather species-poor and showed variation in the species recorded compared to the samples taken from the ponds study area.

## 4.0 DISCUSSION AND EVALUATION

### 4.1 Discussion of Results

The invertebrate sampling in July and August 2015 recorded a total of 172 taxa in the study area with the target groups accounting for the majority of the species captured.

The taxa recorded in the sampling are considered to be characteristic of disturbed upland peat habitats and of typical upland valley mires on peat supporting a range of typical plants such as rushes and purple moor-grass and largely of widespread distribution if not common in Northern Ireland with a small number of localised occurrence.

The nature of the blanket bog within the study area, and indeed in the wider area, which has been worked for peat for a long period has created modified habitat which has created opportunities for a wider range of non-blanket bog specialists (i.e. species with a wider habitat tolerance) to occur and establish populations. The modification has resulted in the establishment of a more complex topography and hydrology introducing localised areas of drier peat (from the cutting of drains) that has led to some drier heathy areas and acidic grassland to establish, this often occurring as a mosaic with wetter habitats including rush, cotton-grass and purple moor-grass dominated stands. In this case species of drier habitats were recorded such as the ground beetles *Calathus melanocephalus*, *Nebria salina*, *Clivina fossor* and *Bradycellus harpalinus*. In contrast species characteristic of wetter habitats such as the wet heath and mire were also recorded including *Pterostichus diligens* and *Notiophilus aquaticus*. Upland moorland areas species were also recorded and included *Bradycellus ruficollis* and *Patrobis assimilis*. Some modified areas are also recovering their former vegetation with Sphagnum re-establishing locally in many areas and is evidence of a re-starting of the laying down of peat and reinforcing the mosaic of habitats occurring in the study area. This is largely due to the continuing high levels of rainfall the region continues to experience.

The Staphylinid or rove beetles in the samples exhibit a similar range of habitat fidelity. Many of the *Stenus* species recorded appear to be a mixed bag of species with wide habitat tolerance such as *Stenus impressus* (ranging from lowland to the summits of high fells) and *Stenus clavicornis* along with species more specifically associated with a variety of wetland types such as *Stenus nitidiusculus* and *Stenus flavipes*. The samples of Coleoptera also featured prominently the species of invertebrate assemblages characteristic of heather moorland. These included species dependent or largely dependent on heather such as the weevil *Micrelus ericae* and the Chrysomelid *Lochmaea suturalis*. Other species also characteristic of moorland but also found in other habitats include the pill beetle *Byrrhus piulula* which is common in mainland Britain but is so far confined Ireland to the north based on a small number of records.

Both the rove beetles (Staphylinidae) and ground beetles (Carabidae) are two groups which show considerable sensitivity to habitat changes with ground beetles rich in habitats subject to disturbance and rove beetles showing high habitat specificity as well as being sensitive to changes in hydrology (Lott, 2003). Lott lists wetland ground and rove beetles according to habitat fidelity (to wetlands as a whole) according to 3 categories with species having the highest fidelity in Category A comprising species routinely recorded from or largely dependent on wetlands but also found in other habitats, with Category B for species also routinely found in wetlands but also in other habitats in their entire range and Category C which covers species recorded in numbers from wetlands but predominantly terrestrial across their distribution. From the sampling undertaken within the study area we have two Category A rove beetles (*Stenus nitidiusculus* – fen/bog species and *S. flavipes* – carr litter), six Category B (*Stenus impressus* – from moss in mire *Stenus brunripes* – mainly riparian/marsh and *S. providus* – mainly from fen sites; the ground beetle *Pterostichus diligens* – wet heath and mire, *Mocyta fungii* – marsh litter, tussocks & *Loricera pilicornis* – a springtail feeding ground beetle eurytopic recorded from many wet habitats) and two Category C (*Nebria brevicollis* and *Drusilla canaliculata*).

Among the Hemiptera there is a similar mix of characteristic upland/hill country species and species found more widely in a range of lowland and upland habitats. Among the true bugs *Teratocoris saundersi* is a

plantbug with a widespread but localised distribution and is to be found in flushes and mires containing extensive stands of rushes. The aquatic species included a small range of species characteristic of upland waterbodies including *Heseprocoryxa castanea* and *Gerris costai*. Many of the plathoppers and leafhoppers recorded are characteristic of wetland situations and, to an extent, moor/heath habitats. In the latter case *Anoscopus albifrons* was the typical hopper of these habitats but *Ulopa reticulata*, a hopper that is strongly associated with heather and very common in heath and moor in Britain, was recorded in only one sample. In the wetter valley mire habitats *Kelisia vitipennis* (a cotton-grass feeding species) and *Megamelus notula* (a sedge feeder) were locally frequent and in rush areas the rush-feeding species *Conomelus anceps* and *Cicadella viridis* were very common. In addition to a single sighting of small heath there was also a single sighting of green hairstreak (*Callophrys rubi*) near to the 'horseshoe' sampling sites. This is a widespread species in Northern Ireland but very localised and the Sperrins are perhaps its main stronghold (Thompson & Nelson, 2003/website at [www.habitas.org.uk/moths](http://www.habitas.org.uk/moths)).

The Diptera (20 species) also include a few typical of upland moorland habitats including the hoverflies *Sericomyia silentis* and *Sphaerophoria fatarum* along with the parasitic fly *Tachina grossa*. Indicative of upland wetland habitats were the craneflies *Phylidorea fulvonervosa* and *Molophilus occultus*.

The freshwater samples, collected from a bog pool and three well-vegetated ponds located in the southern part of the study area, included six species of Odonata including emperor dragonfly (*Anax imperator*). A range of common and widespread species of water beetles were recorded from the samples. Many species characteristic of acidic pools and seepages in upland sites were also recorded.

The invertebrate conservation charity Buglife has published a list of notable invertebrates associated with blanket bog and this includes habitat indicator species, including four rove beetles. None of these species were recorded in the sampling undertaken which perhaps indicates the extent to which the study area has been impacted on by previous and current peat-cutting.

## 4.2 Evaluation

No protected invertebrate species as listed in Schedule 5 of the Wildlife (Northern Ireland) Order 1985 (as amended) was recorded as present within the study area.

No Northern Ireland Priority species were recorded as present in the invertebrate assemblage within the study area and only one species is red listed as Near Threatened.

The sample taken from Boorin Nature Reserve, as a reference sample from good quality blanket bog habitat, would seem to indicate that there is little variation in the invertebrate assemblage from that found in the study area. Therefore it is likely that the invertebrate assemblage found within the application site is typical of the habitats found throughout the local area.

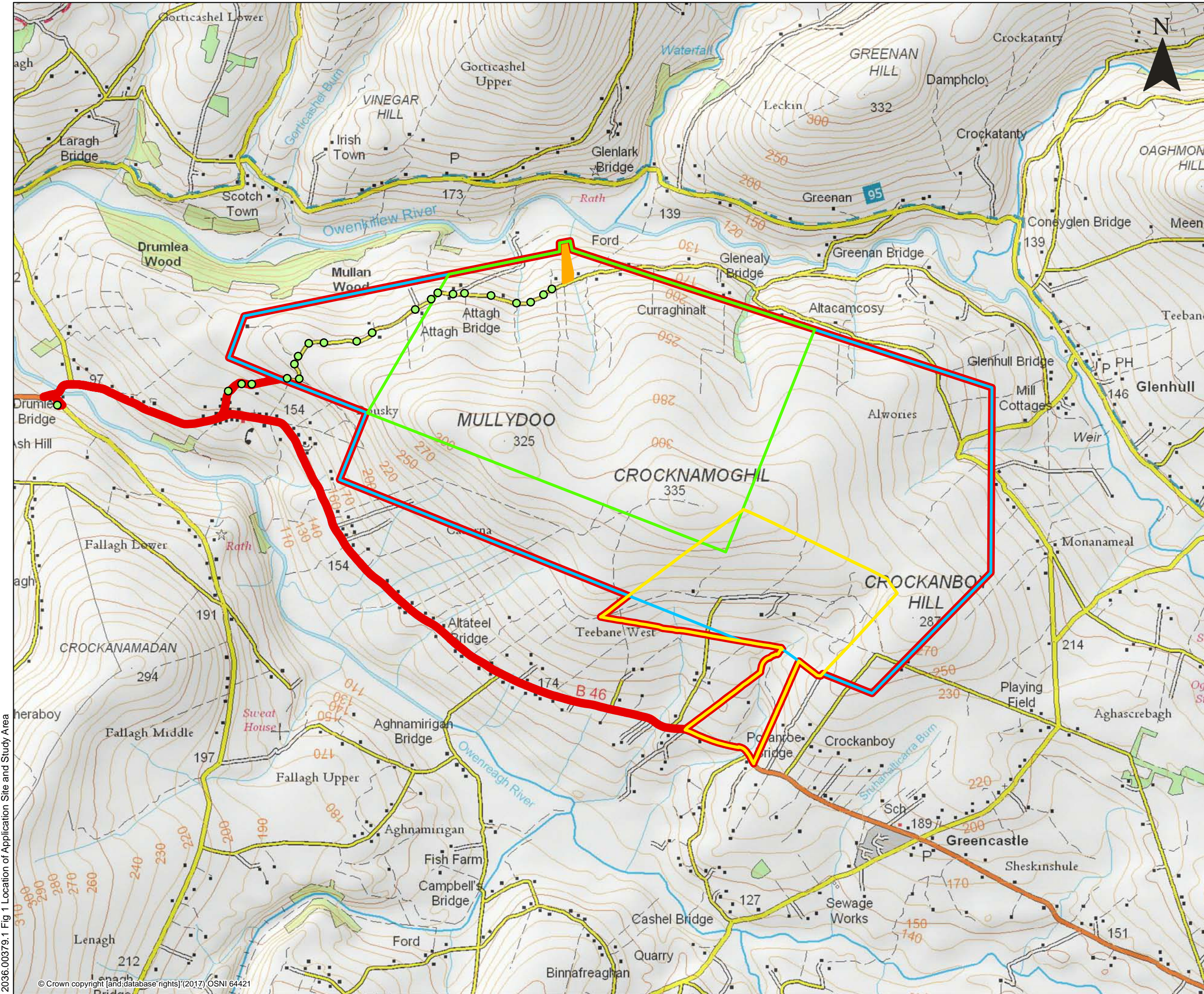
Based on the above it is considered that the invertebrate assemblage is evaluated to be at Local (lower) value.

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## FIGURES



**LEGEND**

- APPLICATION BOUNDARY
- PROPOSED INFRASTRUCTURE SITE (AREA A)
- PROPOSED MINERAL EXTRACTION AREA (AREA B)
- EXISTING SURFACE INFRASTRUCTURE SITE (AREA C)
- PASSING BAYS ON CAMCOSY ROAD AND TURNING POINT ON LENAGH ROAD (AREA D)
- PROPOSED MINERAL EXPLORATION AREA (AREA E)

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CURRAGHINALT GOLD PROJECT,  
COUNTY TYRONE,  
NORTHERN IRELAND

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TERRESTRIAL AND FRESHWATER  
INVERTEBRATE APPRAISAL

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**LOCATION OF APPLICATION SITE  
& STUDY AREA**

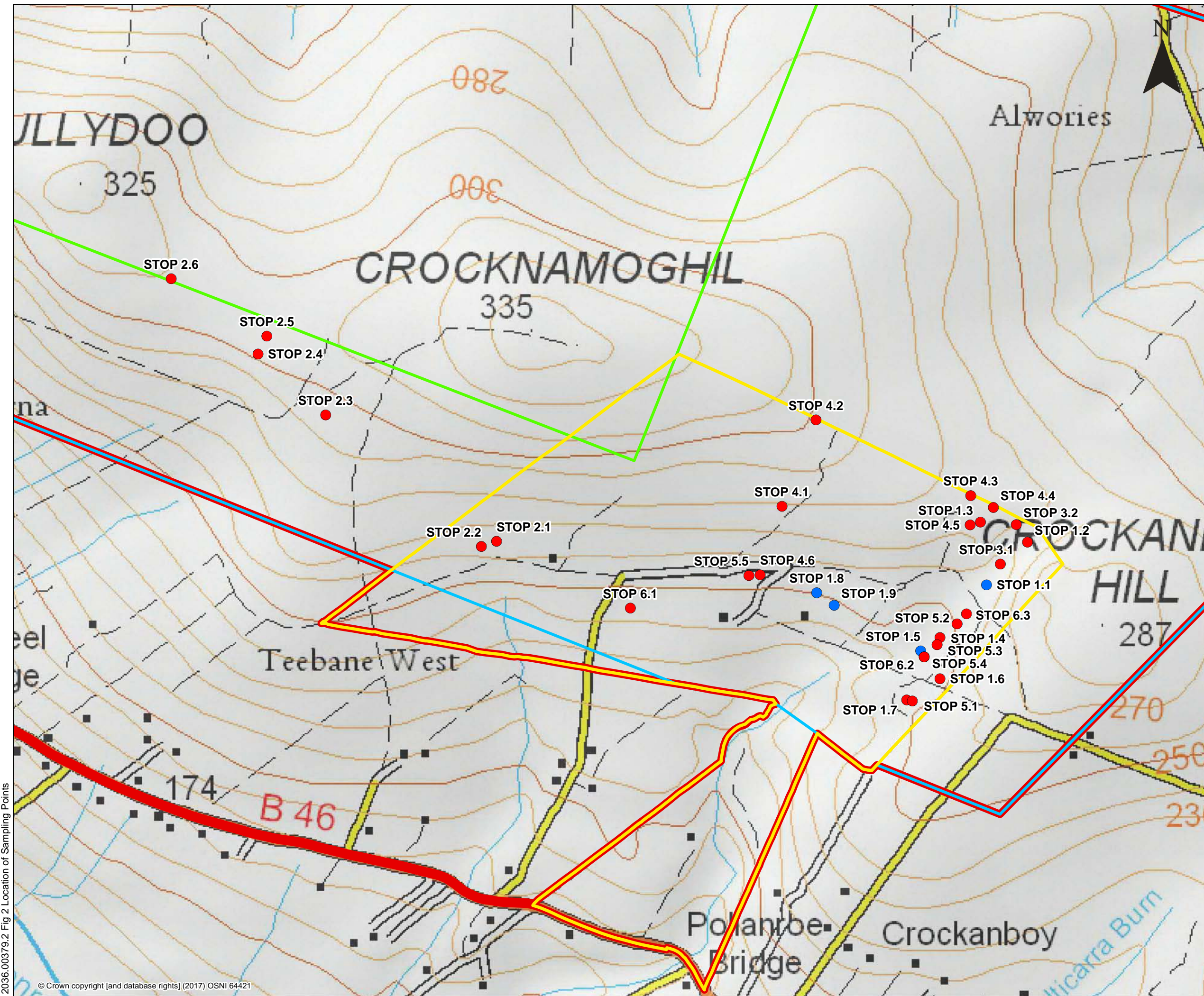
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**FIGURE 1**

Scale  
1:25,000 @ A3

Date  
SEPTEMBER 2017

2036.00379.1 Fig 1 Location of Application Site and Study Area



**LEGEND**

- APPLICATION BOUNDARY
- PROPOSED INFRASTRUCTURE SITE (AREA A)
- PROPOSED MINERAL EXTRACTION AREA (AREA B)
- PROPOSED MINERAL EXPLORATION AREA (AREA E)

**TERRESTRIAL AND FRESHWATER INVERTEBRATE APPRAISAL**

- AQUATIC
- TERRESTRIAL



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**LOCATION OF  
SAMPLING POINTS**

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**FIGURE 2**

Scale  
1:10,000 @ A3

Date  
SEPTEMBER 2017

2036.00379.2 Fig 2 Location of Sampling Points

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## APPENDIX 01

### Field Sampling Results

## July 2015 Field Sampling Results

Species	Stop 1.1 08/07/15 (Aquatic)	Stop 1.2 08/07/15	Stop 1.3 08/07/15	Stop 1.4 08/07/15	Stop 1.5 08/07/15 (Aquatic)	Stop 1.6 08/07/15	Stop 1.7 08/07/15	Stop 1.8 08/07/15 (Aquatic)	Stop 1.9 08/07/15 (Aquatic)	Stop 2.1 09/07/15	Stop 2.2 09/07/15	Stop 2.3 09/07/15	Stop 2.4 09/07/15	Stop 2.5 09/07/15	Stop 2.6 09/07/15
<b>Amphipoda (crustaceans)</b>															
<i>Gammarus duebeni</i>					■										
<b>Target Order: Coleoptera (beetles)</b>															
<i>Acilius canaliculatus</i>								■							
<i>Adalia 10-punctata</i>														■	
<i>Agabus sturmii</i>	■							■							
<i>Anacaena globulus</i>					■										
<i>Anaspis regimbarti</i>												■			
<i>Anisotoma humeralis</i>		■													
<i>Anthonomus rubi</i>		■		■											
<i>Bembidion lampros</i>													■	■	
<i>Bradycellus harpalinus</i>		■										■		■	
<i>Brachypterus glaber</i>		■													
<i>Byrrhus pilula</i>													■	■	
<i>Calathus melanocephalus</i>														■	
<i>Cantharis fulva</i>							■								
<i>Cantharis nigra</i>		■								■	■				
<i>Cantharis rufa</i>			■								■				
<i>Cyphon coarctatus</i>															■
<i>Cyphon padi</i>		■													
<i>Cyphon hilaris</i>												■			
<i>Drusilla canaliculatus</i>		■												■	
<i>Enochrus coarctatus</i>								■	■						
<i>Helophorus flavipes</i>									■			■			
<i>Helophorus grandis</i>									■						
<i>Cf. Helophorus obscurus</i>									■						
<i>Helophorus sp.</i>				■											
<i>Hydrobius fuscipes</i>					■										
<i>Hydroporus nigrita</i>									■						
<i>Hydroporus sp.</i>	■			■											

Species	Stop 1.1 08/07/15 (Aquatic)	Stop 1.2 08/07/15	Stop 1.3 08/07/15	Stop 1.4 08/07/15	Stop 1.5 08/07/15 (Aquatic)	Stop 1.6 08/07/15	Stop 1.7 08/07/15	Stop 1.8 08/07/15 (Aquatic)	Stop 1.9 08/07/15 (Aquatic)	Stop 2.1 09/07/15	Stop 2.2 09/07/15	Stop 2.3 09/07/15	Stop 2.4 09/07/15	Stop 2.5 09/07/15	Stop 2.6 09/07/15
<i>Ilybius ater</i>	■								■						
<i>Limnobaris t-album</i>							■								
<i>Lochmaea suturalis</i>		■		■											
<i>Loricera pilicornis</i>															■
<i>Micrelus ericae</i>		■										■	■	■	■
<i>Nebria brevicollis</i>			■												
<i>Nebria salina</i>		■	■												■
<i>Neocrepidodera transversa</i>							■			■					
<i>Notiphilus aquaticus</i>													■		
<i>Notiphilus biguttatus</i>										■			■	■	■
<i>Olophrum piceum</i>															■
<i>Patrobis assimilis</i>															■
<i>Phyllodecta laticollis</i>							■								
<i>Pterostichus diligens</i>		■		■			■					■			
<i>Quedius aridulus</i>														■	
<i>Quedius curtipennis</i>														■	
<i>Quedius molochinus</i>														■	
<i>Rhagonycha lignosa</i>		■													
<b>Target Order: Diptera (true flies)</b>															
<i>Dolichopus atratus</i>				■											
<i>Phylidorea fulvonervosus</i>							■								
<i>Rhagio scolopacea</i>										■					
<b>Target Order: Hemiptera – Auchenorrhyncha (leafhoppers &amp; planthoppers)</b>															
<i>Cicadella viridis</i>							■								
<i>Macrostelus laevis</i>							■								
<i>Macrostelus sexnotatus</i>												■			
<i>Macustus grisescens</i>							■								■
<i>Philaenus spumarius</i>				■											
<b>Target Order: Hemiptera – Heteroptera (true bugs)</b>															
<i>Gerris lateralis</i>								■							
<i>Hesperocorixa castanea</i>	■								■						
<i>Leptopterna ferrugata</i>		■													
<i>Mecomma ambulans</i>				■			■								

Species	Stop 1.1 08/07/15 (Aquatic)	Stop 1.2 08/07/15	Stop 1.3 08/07/15	Stop 1.4 08/07/15	Stop 1.5 08/07/15 (Aquatic)	Stop 1.6 08/07/15	Stop 1.7 08/07/15	Stop 1.8 08/07/15 (Aquatic)	Stop 1.9 08/07/15 (Aquatic)	Stop 2.1 09/07/15	Stop 2.2 09/07/15	Stop 2.3 09/07/15	Stop 2.4 09/07/15	Stop 2.5 09/07/15	Stop 2.6 09/07/15
<i>Notonecta sp.</i> (nymphs)									■						
<i>Pithanus maerkelii</i>							■								■
<i>Velia caprai</i>				■											
<b>Isopoda (crustaceans)</b>															
<i>Asellus aquaticus</i>								■							
<b>Mollusca</b>															
Sphaeriidae					■										
<b>Odonata (dragonflies and damselflies)</b>															
<i>Aeschna juncea</i>								■							
<i>Anax imperator</i>									■						
<i>Lestes sponsa</i>									■						
<i>Libellula quadrimaculata</i>									■						
<i>Pyrrhosoma nymphula</i>								■	■						
<i>Sympetrum striolatum</i>								■	■						
<b>Plecoptera (stoneflies)</b>															
<i>Leuctra sp.</i>					■										
<b>Trichoptera (caddis flies)</b>															
<i>Plectrocnemia geniculata</i>					■										

## August 2015 Field Sampling Results

Species	Stop 3.1 17/08/15	Stop 3.2 17/08/15	Stop 4.1 18-08-15	Stop 4.2 18-08-15	Stop 4.3 18-08-15	Stop 4.4 18-08-15	Stop 4.5 18-08-15	Stop 4.6 18-08-15	Stop 5.1 20-08-15	Stop 5.2 20-08-15	Stop 5.3 20-08-15	Stop 5.4 20-08-15	Stop 5.5 20-08-15	Gortin Lakes 20-08-15 (Aquatic)	Nature Reserve 20-08-15!	Stop 6.1 22-08-15	Stop 6.2 22-08-15	Stop 6.3 22-08-15
<b>Arachnidae – Araneae (spiders)</b>																		
<i>Ero furcata</i>							■											
<i>Xysticus cristatus</i>							■											
<b>Chilopoda (centipedes)</b>																		
<i>Lithobius forficatus</i>															■			
<i>Lithobius variegatus</i>															■			
<b>Target Order: Coleoptera (beetles)</b>																		
<i>Adalia10-punctata</i>										■								
<i>Altica lythri</i>											■							
<i>Anacaena globulus</i>					■								■			■		
<i>Anthonomus rubi</i>								■				■						
<i>Aphidecta oblitterata</i>																	■	
<i>Aphodius fimetarius</i>				■														
<i>Bradycellus harpalinus</i>				■														
<i>Bradycellus ruficollis</i>			■															
<i>Clivina fossor</i>								■										
<i>Coccidula rufa</i>													■					
<i>Coccinella hieroglyphica</i>	■																	
<i>Cyphon padi</i>		■										■	■					
<i>Cyphon variabilis</i>				■											■			
<i>Dalopius marginatus</i>																		■
<i>Lochmaea suturalis</i>																		
<i>Micrelus ericae</i>	■	■			■		■			■								
<i>Mocyta fungi</i>												■						
<i>Nebria salina</i>			■															
<i>Neocrepidodera transversa</i>			■					■										

Species	Stop 3.1 17/08/15	Stop 3.2 17/08/15	Stop 4.1 18-08-15	Stop 4.2 18-08-15	Stop 4.3 18-08-15	Stop 4.4 18-08-15	Stop 4.5 18-08-15	Stop 4.6 18-08-15	Stop 5.1 20-08-15	Stop 5.2 20-08-15	Stop 5.3 20-08-15	Stop 5.4 20-08-15	Stop 5.5 20-08-15	Gortin Lakes 20-08-15 (Aquatic)	Nature Reserve 20-08-15	Stop 6.1 22-08-15	Stop 6.2 22-08-15	Stop 6.3 22-08-15
<i>Phalacrus substriatus</i>								■										
<i>Philonthis fimetarius</i>																■		
<i>Phyllotreta tetrastigma</i>											■	■						
<i>Pterostichus diligens</i>		■													■			
<i>Pterostichus niger</i>							■											
<i>Rhagonycha fulva</i>	■								■		■							
<i>Stenus brunnipes</i>						■												
<i>Stenus clavicornis</i>												■						
<i>Stenus flavipes</i>								■								■		
<i>Stenus fulvicornis</i>												■				■		
<i>Stenus impressus</i>	■	■	■	■	■			■			■							
<i>Stenus nitidiusculus</i>															■	■		
<i>Stenus picipes</i>										■		■				■		
<i>Stenus providus</i>								■										
<i>Tachyporus nitidulus</i>															■	■		
<b>Target Order: Diptera (true flies)</b>																		
<i>Brachylimnophila separata</i>																		■
<i>Dicranomyia autumnalis</i>																■		
<i>Dolichopus atratus</i>		■																
<i>Haematopota pluvialis</i>											■	■				■		
<i>Hybos culiciformis</i>		■																
<i>Melanostoma mellinum</i>									■									■
<i>Molophilus occultus</i>		■													■			
<i>Opomyza petrei</i>			■															
<i>Phylidorea ferruginea</i>																	■	
<i>Phylidorea fulvonervosa</i>			■	■														
<i>Platycheirus clypeatus</i>									■									

Species	Stop 3.1 17/08/15	Stop 3.2 17/08/15	Stop 4.1 18-08-15	Stop 4.2 18-08-15	Stop 4.3 18-08-15	Stop 4.4 18-08-15	Stop 4.5 18-08-15	Stop 4.6 18-08-15	Stop 5.1 20-08-15	Stop 5.2 20-08-15	Stop 5.3 20-08-15	Stop 5.4 20-08-15	Stop 5.5 20-08-15	Gortin Lakes 20-08-15 (Aquatic)	Nature Reserve 20-08-15	Stop 6.1 22-08-15	Stop 6.2 22-08-15	Stop 6.3 22-08-15
<i>Platycheirus granditarsus</i>									■									
<i>Sericomyia silentis</i>																		■
<i>Sicus ferrugineus</i>																		■
<i>Sphaerophoria fatarum</i>		■																
<i>Tachina grossa</i>						■												
<i>Tephritis conura</i>																	■	
<i>Tetanocera ferruginea</i>																■		
<i>Tipula paludosa</i>												■						
<b>Target Order: Hemiptera – Auchenorrhyncha (planthoppers and leafhoppers)</b>																		
<i>Anoscopus albifrons</i>	■		■	■			■				■							■
<i>Aphrodes albicinctus</i>			■															
<i>Aphrodes makarovi</i>																■		
<i>Arthaldeus pascuellus</i>									■							■		■
<i>Cicadella viridis</i>											■	■				■		
<i>Cicadula quadrinotata</i>	■										■	■						■
<i>Conomelus anceps</i>	■		■	■							■					■	■	
<i>Conosanus obsoletus</i>			■	■							■					■	■	■
<i>Elymana sulphurella</i>												■						
<i>Forcipata citrinella</i>									■						■			■
<i>Jassargus pseudocellaris</i>												■						■
<i>Kelisia vittipennis</i>												■						■
<i>Megamelus notula</i>											■	■						■
<i>Megophthalmus scabripennis</i>																■	■	
<i>Muellerianella extrusa</i>			■	■								■				■		
<i>Neophilaenus lineatus</i>			■															
<i>Paradelphacodes paludosa</i>	■																	

Species	Stop 3.1 17/08/15	Stop 3.2 17/08/15	Stop 4.1 18-08-15	Stop 4.2 18-08-15	Stop 4.3 18-08-15	Stop 4.4 18-08-15	Stop 4.5 18-08-15	Stop 4.6 18-08-15	Stop 5.1 20-08-15	Stop 5.2 20-08-15	Stop 5.3 20-08-15	Stop 5.4 20-08-15	Stop 5.5 20-08-15	Gortin Lakes 20-08-15 (Aquatic)	Nature Reserve 20-08-15	Stop 6.1 22-08-15	Stop 6.2 22-08-15	Stop 6.3 22-08-15
<i>Philaenus spumarius</i>	■					■					■				■			
<i>Populicerus confusus</i>														■				
<i>Streptanus sordidus</i>				■													■	■
<i>Ulopa reticulata</i>					■													
<b>Hemiptera: Heteroptera (true bugs)</b>																		
<i>Asciadema obsoleta</i>	■																	
<i>Capsus ater</i>								■	■		■							
<i>Gerris odontogaster</i>									■									
<i>Leptopterna ferrugata</i>									■									
<i>Mecomma ambulans</i>	■		■	■				■	■		■					■	■	
<i>Nabis limbatus</i>	■								■		■							
<i>Orthops sp.</i>														■				
<i>Orthotylus ericetorum</i>							■		■									
<i>Picromerus bidens</i>						■							■					
<i>Pithanus maerkelii</i>						■			■									
<i>Plagiognathus arbustorum</i>														■				
<i>Saldula saltatoria</i>																		■
<i>Scolopostethus decoratus</i>			■	■	■										■			
<i>Stenodema holsata</i>									■									
<i>Stygnocoris sabulosus</i>							■								■			
<i>Teratocoris saundersi</i>											■					■		
<i>Trigonotylus ruficornis</i>											■							
<b>Hymenoptera (bees, wasps and ants)</b>																		
<i>Myrmica ruginodis</i>															■			
<b>Lepidoptera (butterflies &amp; moths)</b>																		
<i>Ceramica pisi</i>															■			■
<i>Macrothylacia rubi</i>														■				

Species	Stop 3.1 17/08/15	Stop 3.2 17/08/15	Stop 4.1 18-08-15	Stop 4.2 18-08-15	Stop 4.3 18-08-15	Stop 4.4 18-08-15	Stop 4.5 18-08-15	Stop 4.6 18-08-15	Stop 5.1 20-08-15	Stop 5.2 20-08-15	Stop 5.3 20-08-15	Stop 5.4 20-08-15	Stop 5.5 20-08-15	Gortin Lakes 20-08-15 (Aquatic)	Nature Reserve 20-08-15	Stop 6.1 22-08-15	Stop 6.2 22-08-15	Stop 6.3 22-08-15	
<i>Pieris napi</i>																			■
<b>Opiliones (harvestmen)</b>																			
<i>Leiobunum rotundatum</i>	■																		
<i>Nemastoma bimaculatum</i>											■				■				

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