

Kilkenny Central Access Scheme

Aquatic Plant, Aquatic Macroinvertebrate and Otter Assessment



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1. INTRODUCTION

In advance of construction of the Kilkenny Central Access scheme, ECOFACT was commissioned by John Craddock Ltd. to undertake a survey of aquatic plants, aquatic macroinvertebrates and otters in the River Nore in the environs of the proposed development. The survey was undertaken during late June 2014 under ideal low water survey conditions.

The River Nore within the study area is part of the River Barrow and River Nore candidate Special Area of Conservation (site code 002162). This site is selected for the habitat floating river vegetation (Water courses of plain to montane levels with the *Ranunculus fluitans* and *Callitriche-Batrachion* vegetation) as well as presence of invertebrate, fish and mammal species which are listed under Annex II of the EU Habitats Directive, including freshwater pearl mussel (*Margaritifera margaritifera* and its hardwater form *M. durrovensis*), freshwater crayfish (*Austropotamobius pallipes*), and Eurasian otter (*Lutra lutra*).

The River Nore within the study area is a highly modified depositing lowland river. It has flood walls and gabions present and is artificially ponded by Ormond weir. These features were installed in the river during the Kilkenny Flood Relief scheme, during which time the river was extensively dredged.

2. METHODOLOGY

2.1 Desk study

The websites of the National Biodiversity Data Centre (NBDC) and National Parks and Wildlife Service (NPWS) were accessed to collate information on flora and fauna in the study area. Bailey and Rochford (2006) was reviewed to collate data on otters in the study area.

2.2 Field survey

A daytime field survey / ecological site walkover was undertaken during June 2014 under conditions ideal for the survey. The fluvial habitat of the River Nore at the proposed development site was surveyed for aquatic plants, macroinvertebrates and signs of otter activity.

Plant species were surveyed visually both from the bank and also by wading with a staff. The proposed crossing point was snorkelled. The survey included a transect at the proposed bridge crossing to 100m downstream. General surveys were also completed to 350m upstream and downstream of the proposed bridge crossing. Plant species nomenclature followed Stace 'New Flora of the British Isles' (1997).

The River Nore corridor was walked and examined in detail for the presence of otter to 350m upstream and 350m downstream of the proposed development site. Otter survey methodology followed Chanin (2003) and NRA (2008) where signs of footprints, spraints, slides or couches were recorded. The fisheries value of the River Nore in the environs of the proposed development site was evaluated in respect of its potential to be used by foraging otter.

Qualitative sampling of benthic (or bottom dwelling) aquatic macroinvertebrates was undertaken within the River Nore using kick-sampling (Toner *et al.*, 2005). Stone washings and vegetation sweeps were also undertaken to ensure a representative sample of the fauna within the river was collected. Qualitative sampling was undertaken at two sites: in ponded habitat within the footprint of the proposed development (Site 1) and at a riffled location upstream of Greens Bridge (Site 2). The

site locations can be seen in Figure 1. Presence/absence hand searching from white-clawed crayfish was also undertaken.

3. RESULTS

3.1 Aquatic plants

The study area occurs within National Ordnance Survey (NOS) 2km grid square S55D. NBDC does not indicate the presence of any protected aquatic flora in this 2km grid square or in the wider 10km grid square S55.

Aquatic plant communities at the proposed bridge crossing site are poorly developed and reflect the modified nature of the river channel. Species present at the crossing point were floating sweet grass *Glyceria fluitans*, pondweed *Potamogeton* sp, Canadian pondweed *Elodea canadensis*, water starwort *Callitriche* sp., aquatic moss *Fontinalis antipyretica* and filamentous algae *Cladophora* sp. A small stand of water crowfoot *Ranunculus* sp. (a type of floating river vegetation) was recorded in the Breagagh River immediately upstream of the River Nore. Figure 1 gives the location of aquatic plant assessment results where stands of water crowfoot were found. In riffled parts of the River Nore such as upstream of Green's Bridge, habitat is more suitable for water crowfoot / floating river vegetation and occurs frequently in riffles.

Conditions for submerged aquatic plant growth in the River Nore at the proposed bridge crossing point are deemed suboptimal with respect to the modified habitats present, and evidence of siltation. The river is also ponded back by a number of weirs which reduces the habitat for floating river vegetation.

Other aquatic / emergent plants recorded along the study stretch included unbranched bur-reed *Sparganium emersum*, branched bur-reed *Sparganium erectum* and reed canary grass *Phalaris arundinacea* and watercress *Rorippa nasturtium*. The non-native invasive species Himalayan balsam *Impatiens glandulifera* and Japanese knotweed *Fallopia japonica* are also present, but not at the proposed bridge crossing point.

Evaluation: The annex I habitat 'Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation [3260]' does not occur at the bridge crossing site on the River Nore. The stretch of the River Nore at the proposed bridge is highly modified and a limited aquatic plant community.

3.2 Otter

The study area is located in NOS 10km grid square S55. There are records of otter from this area (NPWS, NBDC).

No evidence of otter was recorded however on either bank or riparian areas of the River Nore within the current study area i.e. to 350m upstream and downstream of the proposed bridge crossing. Some trails did occur but these tracks were created and continue to be used by pedestrians together with dogs. Much of the left bank of the river within the study area is unsuitable for otter as vertical gabion baskets line the bank. The right bank of the river near the proposed bridge crossing is used by canoeists to access the river and the river itself in this area is used as recreational area for water sport enthusiasts. Such activities increase disturbance to wildlife reduce the likelihood of otter foraging in this part of the river. No holts or couches were recorded within the study area. The River

Nore within the study area supports brown trout and Atlantic salmon, prey items of the otter. Habitat for salmonids is suboptimal/poor for these species in the vicinity of the proposed bridge as the river is sluggish and back up by weirs. The River Nore outside of the current study area is considered to provide much better habitat for otter in terms of foraging and dwelling, as the river and river corridor within the environs of Kilkenny are largely modified and artificial surfaces occurring to the verge of the river in many areas.

Scats considered to be those of a mink were recorded on a rock alongside the confluence of the Breagagh River and the River Nore. Mink are a non-native species.

Evaluation: There are no dwellings or other important 'Otter (*Lutra lutra*) [1355]' features in the study area. The stretch of the river affected by the proposed development is likely to be used occasionally by otter but is of no particular importance with regard to otter foraging and the riparian areas in the vicinity of the proposed development do not appear to be used by otter. The riparian areas outside of the cSAC are evaluated as being of Local Importance (higher value) in light of these areas providing some connectivity of habitats along the river corridor.

3.3 Aquatic macroinvertebrates

Freshwater White-clawed Crayfish *Austropotamobius pallipes* has been previously recorded from the 10km grid square S55. This macroinvertebrate is protected under the Wildlife Acts and is an Annex II listed species under the EU Habitats Directive. NBDC does not indicate the occurrence of this species in the 2km grid square containing the proposed development.

The macroinvertebrates recorded during the current survey are listed in Table 1. A total of 17 macroinvertebrate families were recorded at Site 1 in the environs of the proposed bridge crossing in sluggish habitat. The benthic faunal community at Site 1 comprised mostly pollution tolerant macroinvertebrates such as snails (*Planorbis carinatus*, *Ancylus fluviatilis*, *Bithynia tentaculata*, *Potamopyrgus jenkinsi*), Freshwater shrimp *Gammarus deubeni*, and beetles (*Potamonectes depressus elegans*, *Halipus* sp. and Gyrinidae). Less pollution sensitive taxa were limited to the cased Trichopterans *Sericostoma personatum* and *Lepidostoma hirtum*. Site 1 was not suitable for rating biological water quality using in the EPA freshwater biological monitoring system as the site was too sluggish.

Site 2 was located on a riffled part of the river upstream of Green's Bridge. A macroinvertebrate family richness of 24 was recorded at this location. The macroinvertebrate community at this location included pollution sensitive larvae of the mayfly *Ecdyonurus* sp. and the stonefly *Perla bipunctata*. Using criteria in Toner *et al*, (2005), this stretch of the river was rated Q3-4.

Evaluation: The 'Freshwater pearl mussel (*Margaritifera margaritifera*) [1029]' does not occur at the proposed bridge site. The 'White-clawed crayfish (*Austropotamobius pallipes*) [1092]' was not recorded during the current survey, but may be present along this stretch of river at very low densities. Habitat quality for crayfish is reduced due to the highly modified nature of the River Nore channel in the study area. The macroinvertebrate community in the study area is relatively diverse however and indicative of good water quality.

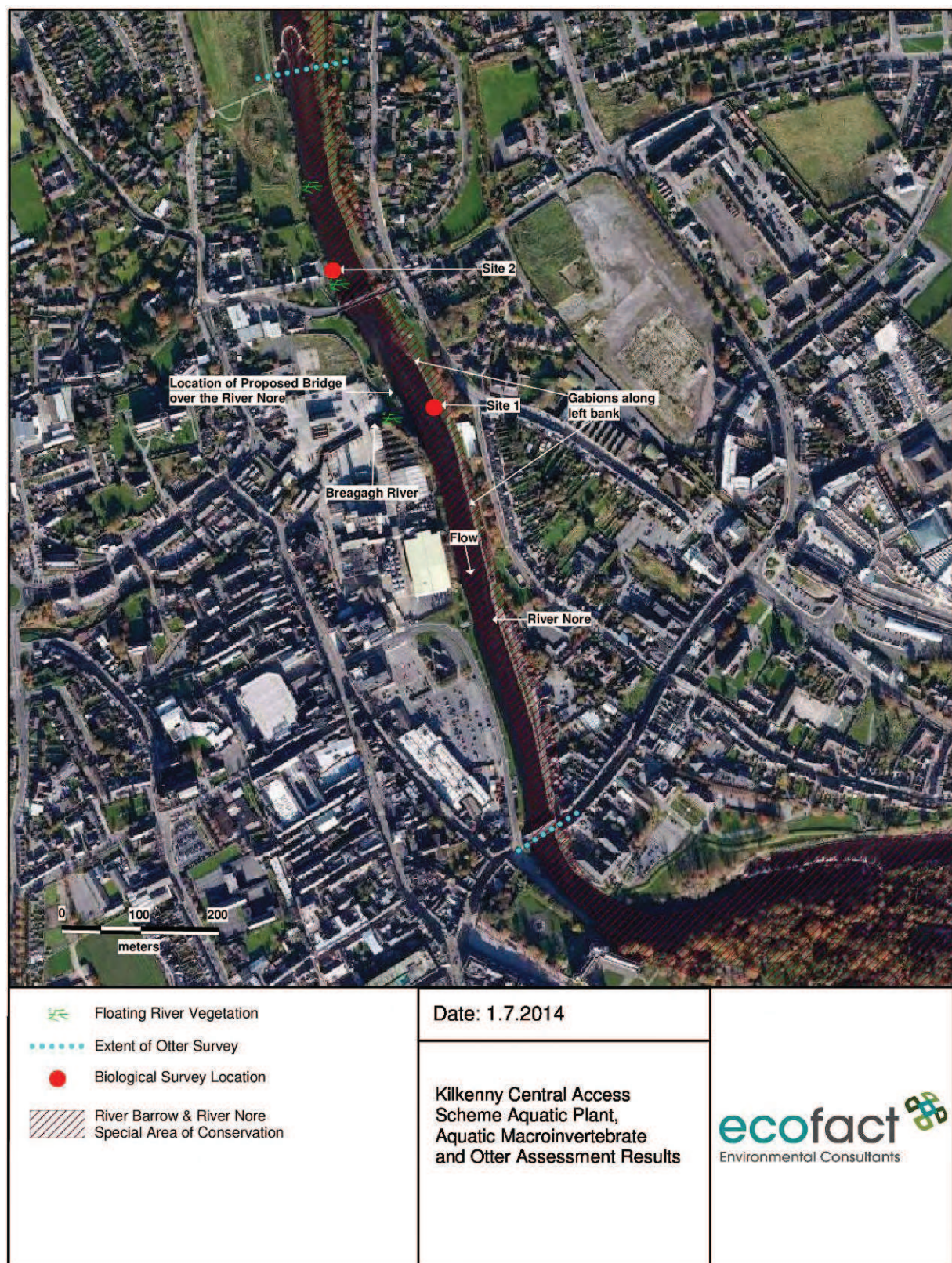


Figure 1 Kilkenny central access scheme aquatic plant, aquatic macroinvertebrate and otter assessment results.

Table 1 Results of the macroinvertebrate sampling on the River Nore in Kilkenny during June 2014.

Taxa	Pollution sensitivity group	Functional group	Site 1	Site 2
LEECHES (Hirudinea)				
Family Glossiphonia				
<i>Glossiphonia complanata</i>	D	Predator		*
Family Erpobdellidae				
<i>Erpobdella octoculata</i>	D	Predator	**	
Family Piscicolidae				
<i>Piscicola geometra</i>	C	Predator		*
SNAILS (Mollusca, Gastropoda)				
Family Planorbidae				
Keeled ramshorn snail <i>Planorbis carinatus</i>	C	Scraper	*	
Family Ancyliidae				
River limpet <i>Ancylus fluviatilis</i>	C	Scraper	***	****
Family Hydrobiidae				
Common Bithynia <i>Bithynia tentaculata</i>	C	Shredder	*****	****
<i>Potamopyrgus jenkinsi</i>	C	Shredder	*****	****
Family Lymnaeidae				
<i>Lymnea peregra</i>	C	Shredder		**
MUSSELS (Mollusca, Lamellibranchiata)				
Family Sphaeriidae				
Orb/ Pea Mussels <i>Pisidium</i> sp.	D	Filtering collector	***	*
CRUSTACEANS (Crustacea)				
Family Gammaridae				
Freshwater shrimp <i>Gammarus deubeni</i>	C	Shredder	*****	*****
Family Asellidae				
Hog louse <i>Asellus aquaticus</i>	D	Shredder	**	
MAYFLIES (Uniramia, (Ephemeroptera)				
Family Heptageniidae				
<i>Ecdyonurus</i> sp.	A	Scraper & gathering collector		**
Family Baetidae				
<i>Baetis rhodani</i>	C	Gathering collector		*****
Family Ephemerellidae				
<i>Ephemerella</i> sp.	C	Gathering collector	*	****
STONEFLIES (Order Plecoptera)				
(Perlidae)				
Large pale stonefly <i>Perla bispunctata</i>	A	Shredder		*
CASELESS CADDIS FLIES (Trichoptera)				
Family Hydropsychidae				
<i>Hydropsyche</i> sp.	C	Filtering collector		***
Family Polycentropodidae				
<i>Polycentropus kingi</i>	C	Filtering collector		*
Family Rhyacophilidae				
<i>Rhyacophila dorsalis</i>	C	Predator		**
CASED CADDIS FLIES (Trichoptera)				
Family Sericostomatidae				
Black caper <i>Sericostoma personatum</i>	B	Shredder	**	****
Family Lepidostomatidae				
<i>Lepidostoma hirtum</i>	B	Shredder	*	**
Glossosomatidae				
Little black caddisfly <i>Agapetus fuscipes</i>	B	Scraper		**
TRUE FLIES (Diptera)				

Taxa	Pollution sensitivity group	Functional group	Site 1	Site 2
Family Chironomidae				
Green chironomid	C	Filtering collector	***	****
<i>Chironomus</i> sp.	E	Filtering collector	***	
Family Tipulidae	C	Shredder		
<i>Dicranota</i> sp.	C	Shredder		*
BEETLES (Coleoptera)				
Family Elmidae				
<i>Elmis</i> sp.	C	Predator		***
Family Gyrinidae	C	Predator	*	
Family Dytiscidae (Sub-family Hydroporinae)				
<i>Potamonectes depressus elegans</i>	C	Predator	***	*
Sub-family Colymbetinae	C	Predator	*	
Family Haliplidae				
<i>Haliplus</i> sp.	C	Predator	*	
BUGS (Hemiptera)				
Family Corixidae	C	Predator	***	*
WATERMITES Hydracarina sp.			****	*

*Present (1 or 2 individuals), **Scarce/Few (<1%), ***Small Numbers (<5%), ****Fair Numbers (5-10%), *****Common (10-20%), *****Numerous (25-50%), *****Dominant (50-75%), *****Excessive (>75%).

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PLATES



Plate 1 The River Nore in the environs of Kilkenny is highly modified with river walls and weirs reducing the value of the watercourse to aquatic ecology and otters.



Plate 2 Kilkenny castle; the river here is again highly modified with no natural riparian area and water is ponded by weirs.



Plate 3 The River Nore at the proposed development site corresponds to a depositing lowland river habitat.



Plate 4 Gabions occur along left bank of the River Nore within the study area.



Plate 5 Aquatic plant life within the footprint of the proposed development was very limited and influenced by the modified nature of the channel.

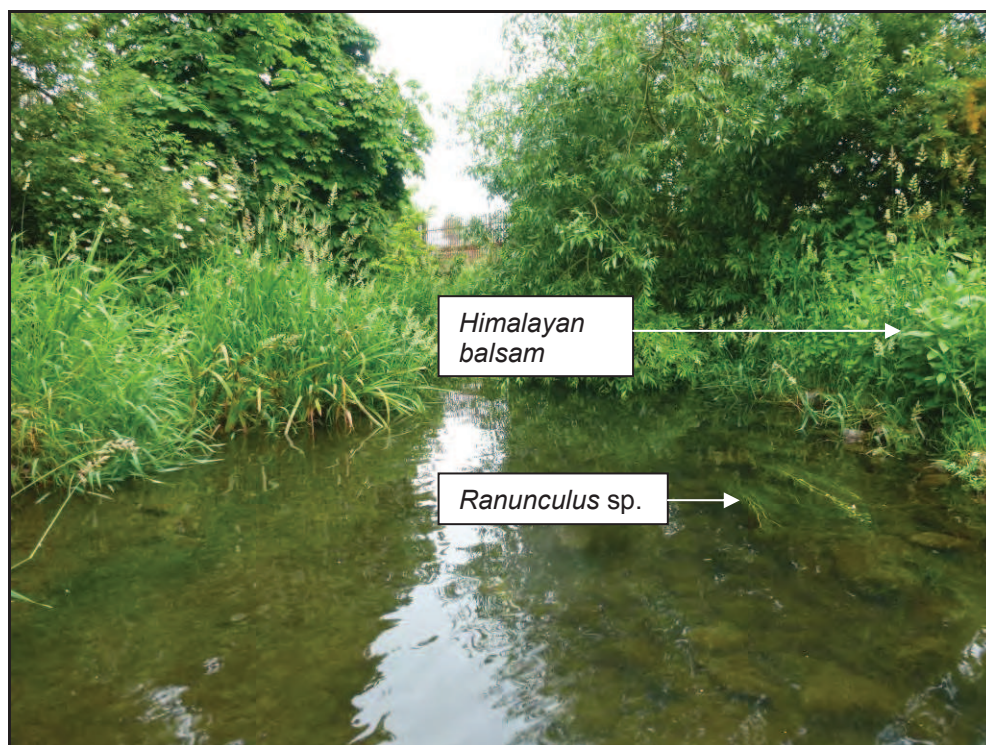


Plate 6 Breaghagh River immediately upstream of the River Nore.



Plate 7 Underwater view of the typical pondweed growths, with siltation evident, in the River Nore at the proposed crossing point.



Plate 8 The banks of the River Nore were examined for evidence of otter and otter holts but no evidence of same was recorded.



Plate 9 Substrate in the River Nore at the proposed development crossing point.



Plate 10 Floating river vegetation (water crowfoot) was recorded in riffled habitat upstream of the proposed development.



Plate 11 Mink scat on a rock alongside the confluence of the Breaghagh River and the River Nore.



Plate 12 River Nore within the study area is frequented by canoeists/kayakers and is also used for water sports. Such activities increase disturbance to wildlife reduce the likelihood of otter foraging in this part of the river.



Plate 13 The leech *Erpobdella octoculata* was recorded underneath stones within the study area.

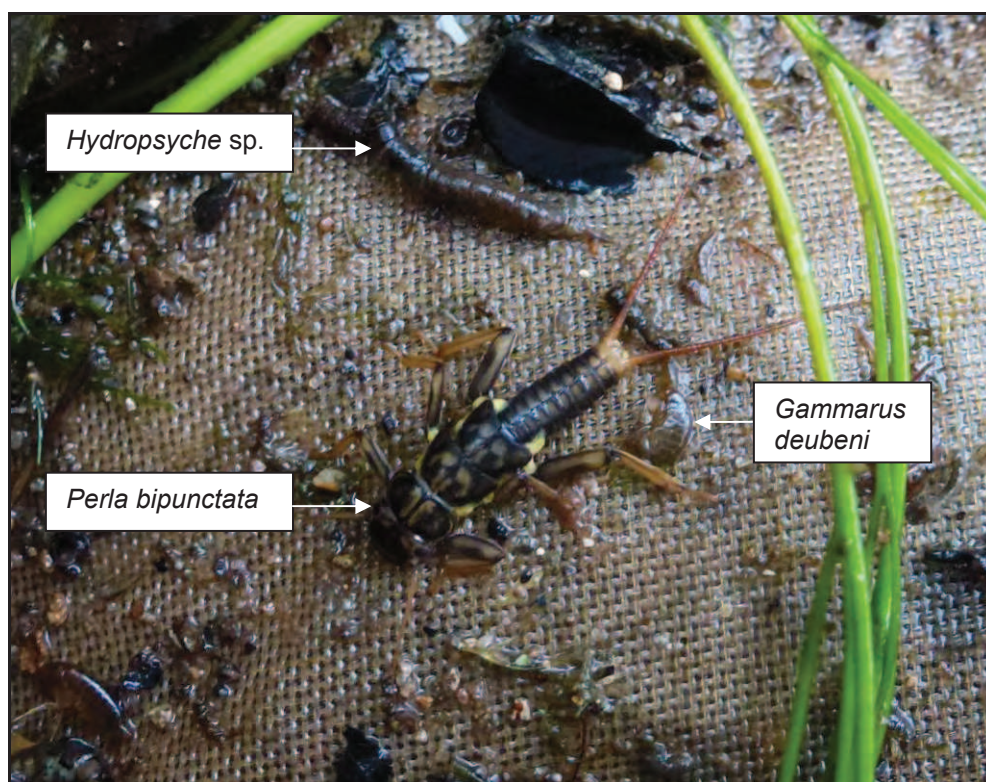


Plate 14 Larvae of the stonefly *Perla bipunctata*, the caseless caddisfly *Hydropsyche* sp. and *Gammarus deubeni* were recorded in riffled habitat upstream of the proposed development.



Plate 15 The River Nore supports a rich molluscan community. *Pisidium* sp. (above) and *Bithynia tentaculata* (below) were recorded in the river at the proposed crossing point.



Plate 16 underwater view of the left bank of the River Nore at the proposed crossing point. This bank comprises vertical rocks and gabion baskets. Some crevices occur between rocks and could potentially be used by White-clawed crayfish.



Plate 17 River Nore approximately 350m upstream of the proposed development. The highly modified nature of the river within Kilkenny reduces riparian habitat quality for otter holts.



Plate 18 River Nore at Lacken weir downstream of the study area.