

Appendix 7.1 European/National sites

Protected Sites for Nature Conservation in the Vicinity of the Proposed Development

European sites in the vicinity of the proposed development are listed below in **Table 1**, along with their qualifying/special conservation interests, reference to the most recent conservation objectives document, and their location relative to the proposed development site.

Other nationally protected sites for nature conservation in the vicinity of the proposed development are listed below in **Table 2**, along with the nature conservation interests for which they are designated, and their location relative to the proposed development site

Table 1 European sites in the vicinity of the proposed development

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
Special Area of Conservation (SAC)	
<p>Lower River Shannon SAC [002165]</p> <p>1110 Sandbanks which are slightly covered by sea water all the time</p> <p>1130 Estuaries</p> <p>1140 Mudflats and sandflats not covered by seawater at low tide</p> <p>1150 Coastal lagoons</p> <p>1160 Large shallow inlets and bays</p> <p>1170 Reefs</p> <p>1220 Perennial vegetation of stony banks</p> <p>1230 Vegetated sea cliffs of the Atlantic and Baltic coasts</p> <p>1310 Salicornia and other annuals colonising mud and sand</p> <p>1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>)</p> <p>1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>)</p> <p>3260 Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation</p> <p>6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caerulea</i>)</p> <p>91E0 Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)</p> <p>1029 <i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel)</p> <p>1095 <i>Petromyzon marinus</i> (Sea Lamprey)</p> <p>1096 <i>Lampetra planeri</i> (Brook Lamprey)</p> <p>1099 <i>Lampetra fluviatilis</i> (River Lamprey)</p> <p>1106 <i>Salmo salar</i> (Salmon)</p> <p>1349 <i>Tursiops truncatus</i> (Common Bottlenose Dolphin)</p> <p>1355 <i>Lutra lutra</i> (Otter)</p>	<p>c. 1.4km south west of the proposed development.</p>

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
NPWS (2012) <i>Conservation objectives for Lower River Shannon SAC [002165].</i> Version 1.0. Department of Culture, Heritage and the Gaeltacht. ¹	
<p>Ballyallia Lake SAC [000014] 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation</p> <p>S.I. No. 71/2018 - European Union Habitats (Ballyallia Lake Special Area of Conservation 000014) Regulations 2018</p> <p>NPWS (2017) <i>Conservation Objectives: Ballyallia Lake SAC 000014.</i> Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>	c. 2.1km west of the proposed development.
<p>Old Domestic Building (Keevagh) SAC [002010] 1303 Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>)</p> <p>S.I. No. 91/2016 - European Union Habitats (Old Domestic Building (Keevagh) Special Area of Conservation 002010) Regulations 2016.</p> <p>NPWS (2018) <i>Conservation Objectives: Old Domestic Building (Keevagh) SAC 002010.</i> Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>	c. 4.3km south east of the proposed development.
<p>Dromore Woods and Loughs SAC [000032] 1355 Otter (<i>Lutra lutra</i>) 1303 Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) Habitats 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels 8240 Limestone pavements*</p> <p>S.I. No. 114/2020 - European Union Habitats (Dromore Woods and Loughs Special Area of Conservation 000032) Regulations 2020</p> <p>NPWS (2018) <i>Conservation Objectives: Dromore Woods and Loughs SAC 000032.</i> Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht</p>	c. 4.4km north of the proposed development.
<p>Old Domestic Buildings, Rylane SAC [002314] 1303 Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>)</p> <p>S.I. No. 175/2016 - European Union Habitats (Old Domestic Buildings, Rylane Special Area of Conservation 002314) Regulations 2016.</p>	c. 5.9km north east of the proposed development.

¹ The versions of the conservation objectives documents referenced in this table are the most recent published versions at the time of writing

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
NPWS (2018) <i>Conservation Objectives</i> : Old Domestic Buildings, Rylane SAC 002314. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.	
<p>Newhall and Edenvale Complex SAC [002091] 1303 Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) 8310 Caves not open to the public</p> <p>S.I. No. 284/2017 - European Union Habitats (Newhall and Edenvale Complex Special Area of Conservation 002091) Regulations 2017.</p> <p>NPWS (2018) <i>Conservation Objectives</i>: Newhall and Edenvale Complex SAC 002091. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.</p>	c. 6.5km south west of the proposed development.
<p>Toonagh Estate SAC [002247] 1303 Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>)</p> <p>S.I. No. 520/2016 - European Union Habitats (Toonagh Estate Special Area of Conservation 002247) Regulations 2016.</p> <p>NPWS (2018) <i>Conservation Objectives</i>: Toonagh Estate SAC 002247. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.</p>	c. 6.6km north west of the proposed development.
<p>Newgrove House SAC [002157] 1303 Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>)</p> <p>S.I. No. 173/2016 - European Union Habitats (Newgrove House Special Area of Conservation 002157) Regulations 2016.</p> <p>NPWS (2018) <i>Conservation Objectives</i>: Newgrove House SAC 002157. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.</p>	c. 6.3km east of the proposed development.
<p>Poulnagordon Cave (Quin) SAC [000064] 1303 Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>)</p> <p>S.I. No. 90/2016 - European Union Habitats (Poulnagordon Cave (Quin) Special Area of Conservation 000064) Regulations 2016.</p> <p>NPWS (2018) <i>Conservation objectives</i>: Poulnagordon Cave (Quin) SAC [000064]. Version 1. Department of Culture, Heritage and the Gaeltacht.</p>	c. 7km south east of the proposed development.
<p>Poulnadatig Cave SAC [000037] 1303 Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) 8310 Caves not open to the public</p> <p>S.I. No. 89/2016 - European Union Habitats (Poulnadatig Cave Special Area of Conservation 000037) Regulations 2016</p>	c. 7.2km south west of the proposed development.

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
<p>NPWS (2018) <i>Conservation Objectives: Poulnadatig Cave SAC 000037</i>. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.</p>	
<p>Old Farm Buildings, Ballymacrogan SAC [002245] 1303 Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>)</p> <p>S.I. No. 92/2016 - European Union Habitats (Old Farm Buildings, Ballymacrogan Special Area of Conservation 002245) Regulations 2016</p> <p>NPWS (2018) <i>Conservation Objectives: Old Farm Buildings, Ballymacrogan SAC 002245</i>. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.</p>	<p>c. 8.1km north west of the proposed development.</p>
<p>Moyree River System SAC [000057] 1303 Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) 1355 Otter (<i>Lutra lutra</i>) 3260 Water courses of plain to montane levels with the <i>Ranunculon fluitantis</i> and Callitricho-Batrachion vegetation 7230 Alkaline fens 8240 Limestone pavements* 8310 Caves not open to the public</p> <p>S.I. No. 651/2019 - European Union Habitats (Moyree River System Special Area of Conservation 000057) Regulations 2019</p> <p>NPWS (2018) <i>Conservation objectives for Moyree River System SAC 000057</i>. Version 1. Department of Culture, Heritage and the Gaeltacht.</p>	<p>c. 8.2km north of the proposed development.</p>
<p>Ballycullinan, Old Domestic Building SAC [002246] 1303 Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>)</p> <p>S.I. No. 174/2016 - European Union Habitats (Ballycullinan, Old Domestic Building Special Area of Conservation 002246) Regulations 2016</p> <p>NPWS (2018) <i>Conservation Objectives: Ballycullinan, Old Domestic Building SAC 002246</i>. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>	<p>c. 9.2km north west of the proposed development.</p>
<p>East Burren Complex SAC [001926] 1355 Otter (<i>Lutra lutra</i>) 1065 Marsh Fritillary (<i>Euphydryas aurinia</i>) 1303 Lesser Horseshoe Bat 7.9(<i>Rhinolophus hipposideros</i>) 3140 Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. 3180 Turloughs* 3260 Water courses of plain to montane levels with the <i>Ranunculon fluitantis</i> and Callitricho-Batrachion vegetation 4060 Alpine and Boreal heaths 5130 <i>Juniperus communis</i> formations on heaths or calcareous grasslands</p>	<p>c. 9.3km north of the proposed development.</p>

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
<p>6130 Calaminarian grasslands of the <i>Violetalia calaminariae</i></p> <p>6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)</p> <p>6510 Lowland hay meadows (<i>Alopecurus pratensis</i>, <i>Sanguisorba officinalis</i>)</p> <p>7210 Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davalliana</i>*</p> <p>7220 Petrifying springs with tufa formation (Cratoneurion)*</p> <p>7230 Alkaline fens</p> <p>8240 Limestone pavements*</p> <p>8310 Caves not open to the public</p> <p>91E0 Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, <i>Alnion incanae</i>, <i>Salicion albae</i>)*</p> <p>NPWS (2022) Conservation Objectives: East Burren Complex SAC 001926. Generic Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.</p>	
<p>Ballycullinan Lake SAC [000016]</p> <p>7210 Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davalliana</i>*</p> <p>S.I. No. 518/2016 - European Union Habitats (Ballycullinan Lake Special Area of Conservation 000016) Regulations 2016</p> <p>NPWS (2018) Conservation Objectives: Ballycullinan Lake SAC 000016. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.</p>	c. 9.4km north west of the proposed development.
<p>Ballyogan Lough SAC [000019]</p> <p>7210 Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davalliana</i>*</p> <p>8240 Limestone pavements</p> <p>S.I. No. 547/2021 European Union Habitats (Ballyogan Lough Special Area Of Conservation 000019) Regulations 2021</p> <p>NPWS (2018) Conservation Objectives: Ballyogan Lough SAC 000019. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.</p>	c. 9.7km north of the proposed development.
<p>Lough Gash Turlough SAC [000051]</p> <p>3180 Turloughs*</p> <p>3270 Rivers with muddy banks with <i>Chenopodium rubri</i> p.p. and <i>Bidention</i> p.p. vegetation</p> <p>S.I. No. 72/2018 - European Union Habitats (Lough Gash Turlough Special Area of Conservation 000051) Regulations 2018</p> <p>NPWS (2017) Conservation Objectives: Lough Gash Turlough SAC 000051. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.</p>	c. 11.1km south of the proposed development

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
<p>Knockanira House SAC [002318] 1303 Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>)</p> <p>S.I. No. 521/2016 - European Union Habitats (Knockanira House Special Area of Conservation 002318) Regulations 2016</p> <p>NPWS (2018) <i>Conservation Objectives: Knockanira House SAC 002318</i>. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.</p>	c. 11.8km south west of the proposed development.
<p>Kilkishen House SAC [002319] 1303 Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>)</p> <p>S.I. No. 177/2016 - European Union Habitats (Kilkishen House Special Area of Conservation 002319) Regulations 2016.</p> <p>NPWS (2018) <i>Conservation Objectives: Kilkishen House SAC 002319</i>. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.</p>	c. 12.7km south east of the proposed development site.
Special Protection Area (SPA)	
<p>Balliallia Lough SPA [004041] A052 Teal(<i>Anas crecca</i>) A125 Coot(<i>Fulica atra</i>) A053 Mallard(<i>Anas platyrhynchos</i>) A050 Wigeon(<i>Anas penelope</i>) A156 Black-tailed Godwit(<i>Limosa limosa</i>) A056 Shoveler(<i>Anas clypeata</i>) A051 Gadwall(<i>Anas strepera</i>) A999 Wetland and Waterbirds</p> <p>S.I. No. 58/2010 - European Communities (Conservation of Wild Birds (Ballyallia Lough Special Protection Area 004041)) Regulations 2010</p> <p>NPWS (2022) <i>Conservation objectives for Ballyallia Lough SPA [004041]</i>. Generic Version 9.0. Department of Housing, Local Government and Heritage.</p>	c. 2.6km north west of the proposed development site.
<p>Slieve Aughty Mountains SPA [004168] A098 Merlin(<i>Falco columbarius</i>) A082 Hen Harrier(<i>Circus cyaneus</i>)</p> <p>S.I. No. 83/2012 - European Communities (Conservation of Wild Birds (Slieve Aughty Mountains Special Protection Area 004168)) Regulations 2012.</p> <p>NPWS (2022) <i>Conservation objectives for Slieve Aughty Mountains SPA [004168]</i>. Generic Version 9.0. Department of Housing, Local Government and Heritage</p>	c. 4.4km north east of the proposed development site.
<p>River Shannon and River Fergus Estuaries SPA [004077] A179 Black-headed Gull(<i>Chroicocephalus ridibundus</i>) A141 Grey Plover(<i>Pluvialis squatarola</i>) A038 Whooper Swan(<i>Cygnus cygnus</i>) A140 Golden Plover(<i>Pluvialis apricaria</i>)</p>	c. 5.1km south west of the proposed development.

European Site Name [Code] and its Qualifying interest(s) / Special Conservation Interest(s) (*Priority Annex I Habitats)	Location Relative to the Proposed Development Site
<p>A048 Shelduck(<i>Tadorna tadorna</i>) A157 Bar-tailed Godwit(<i>Limosa lapponica</i>) A046 Light-bellied Brent Goose(<i>Branta bernicla hrota</i>) A137 Ringed Plover(<i>Charadrius hiaticula</i>) A156 Black-tailed Godwit(<i>Limosa limosa</i>) A160 Curlew(<i>Numenius arquata</i>) A164 Greenshank(<i>Tringa nebularia</i>) A050 Wigeon(<i>Anas penelope</i>) A162 Redshank(<i>Tringa totanus</i>) A142 Lapwing(<i>Vanellus vanellus</i>) A017 Cormorant(<i>Phalacrocorax carbo</i>) A056 Shoveler(<i>Anas clypeata</i>) A052 Teal(<i>Anas crecca</i>) A143 Knot(<i>Calidris canutus</i>) A062 Scaup(<i>Aythya marila</i>) A054 Pintail(<i>Anas acuta</i>) A149 Dunlin(<i>Calidris alpina</i>) A999 Wetland and Waterbirds</p> <p>S.I. No. 329/2019 - European Union Conservation Of Wild Birds (River Shannon And River Fergus Estuaries Special Protection Area 004077) Regulations 2019</p> <p>NPWS (2012) Conservation Objectives: River Shannon and River Fergus Estuaries SPA 004077. Version 1.0.</p>	
<p>Corofin Wetlands SPA [004220] A156 Black-tailed Godwit(<i>Limosa limosa</i>) A052 Teal(<i>Anas crecca</i>) A038 Whooper Swan(<i>Cygnus cygnus</i>) A050 Wigeon(<i>Anas penelope</i>) A004 Little Grebe(<i>Tachybaptus ruficollis</i>) A999 Wetland and Waterbirds</p> <p>S.I. No. 117/2012 - European Communities (Conservation of Wild Birds (Corofin Wetlands Special Protection Area 004220)) Regulations 2012.</p> <p>NPWS (2022) Conservation objectives for Corofin Wetlands SPA [004220]. Generic Version 9.0. Department of Housing, Local Government and Heritage..</p>	c. 10.7km north west of the proposed development.

Table 2 Nationally protected sites in the vicinity of the proposed development

Designated Site Name [Code] and its nature conservation features	Location Relative to the Proposed Development Site
Natural Heritage Area (NHA)	
<p>Oysterman's Marsh NHA [002439] This site contains a significant area of lowland blanket bog, a globally scarce resource.</p>	c. 5.2km north east of the proposed development

Designated Site Name [Code] and its nature conservation features	Location Relative to the Proposed Development Site
<p>Maghera Mountain Bogs NHA [002442] Consists of a diversity of habitats such as, heath, flush, scrub and upland blanket bog which is the dominant habitat.</p>	c. 11.1km north east of the proposed development
proposed Natural Heritage Area (pNHA)	
<p>Newpark House (Ennis) pNHA [000061] Diversity and naturalness with a range of old native tree species such as <i>Quercus</i> sp. and <i>Tilia</i> sp.</p>	c. 1.5km south west of the proposed development.
<p>Ballyallia Lake pNHA [000014] Wintering bird species and wetland habitats, see also Ballyallia Lake SAC and Ballyallia Lough SPA.</p>	c. 2.1km north west of the proposed development.
<p>Durra Castle pNHA [000033] Its significance lies in the fact that it is one of the few nursery sites at the eastern edge of the distribution of the Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) in Ireland. There is also a suitable foraging habitat in close proximity to the site</p>	c. 3.4km north east of the proposed development
<p>Inchicronan Lough pNHA [000038] A wide range of habitats can be found around the lake and include an area of cut-over bog to the north, Ash (<i>Fraxinus excelsior</i>) and Hazel (<i>Corylus avellana</i>) woodland along the eastern shore, a complex mosaic of wet grassland, dense scrub and marsh at the southern end and a habitat of significant interest on the western side of the lake due to the presence of the Limerick-Sligo railway line.</p>	c. 4.1km north east of the proposed development
<p>Old Domestic Building (Keevagh) [002010] See description of Old Domestic Building (Keevagh) SAC.</p>	c. 4.2km south east of the proposed development
<p>Dromore Woods and Loughs pNHA [000032] See description of Dromore Woods and Loughs SAC</p>	c. 4.3km north west of the proposed development
<p>Lough Cleggan pNHA [001331] This site has a diverse range of habitats and plant species which include the Common Reed (<i>Phragmites australis</i>), Bottle Sedge (<i>Carex rostrata</i>), Yellow Irish (<i>Iris pseudacorus</i>), Hazel (<i>Corylus avellana</i>), Willow (<i>Salix</i> spp.), Ash (<i>Fraxinus excelsior</i>), Rushes (<i>Juncus</i> spp.), Marshmarigold (<i>Caltha palustris</i>), and Meadowsweet (<i>Filipendula ulmaria</i>). The lake is of local importance for wintering waterfowl. Breeding bird species include the Tufted Duck (<i>Aythya fuligula</i>) and Coot (<i>Fulica atra</i>).</p>	c. 4.9km north west of the proposed development
<p>Fergus Estuary And Inner Shannon, North Shore pNHA [002048] See description of River Shannon and River Fergus Estuaries SPA</p>	c. 5.1km south west of the proposed development
<p>Cahircalla Wood pNHA [001001] It is a great example of relatively intact mostly native woodland. The presence of scrub, wet woodland and limestone pavement provides for habitat diversity at this location.</p>	c. 6.1km south west of the proposed development
<p>Newhall and Edenvale Complex pNHA [002091] See description of Newhall and Edenvale Complex SAC</p>	c. 6.6km south west of the proposed development

Designated Site Name [Code] and its nature conservation features	Location Relative to the Proposed Development Site
<p>Pouladatig Cave pNHA [000037] See description of Pouladatig Cave SAC</p>	c. 7.2km south west of the proposed development
<p>Poulnagordon Cave (Quin) pNHA [000064] See description of Poulnagordon Cave (Quin) SAC</p>	c. 7.0km south east of the proposed development
<p>Ballycullinan Lake pNHA [000016] See description of Ballycullinan Lake SAC</p>	c. 9.4km north west of the proposed development
<p>Dromoland Lough pNHA [001008] Designated for the presence of a diverse range of marsh species which include Bottle Sedge (<i>Carex rostrata</i>), Slender Sedge (<i>C. lasiocarpa</i>), Tufted-sedge (<i>C. elata</i>), Lesser Tussock-sedge (<i>C. diandra</i>), Greater Pond-sedge (<i>C. riparia</i>), Fibrous Tussock-sedge (<i>C. appropinquata</i>), Long-stalked Yellow-sedge (<i>C. lepidocarpa</i>), Reed Canary grass (<i>Phalaris arundinacea</i>), Grass-of-parnassus (<i>Parnassia palustris</i>) and Eyebright (<i>Euphrasia scottica</i>).</p>	c. 8.3km south east of the proposed development
<p>Moyree River System pNHA [000057] See description of Moyree System SAC</p>	c. 8.3km north of the proposed development
<p>East Burren Complex pNHA [001926] See description of East Burren Complex SAC</p>	c. 9.2km north west of the proposed development
<p>Ballyogan Lough pNHA [000019] See description of Ballyogan Lough SAC</p>	c. 9.7km north of the proposed development
<p>Ballycar Lough pNHA [000015] This is a small calcareous lake. It has a considerable ecological value which stems from the transitory state of the fen vegetation on the northern limb. At this site, bog vegetation such as the Bog-myrtle (<i>Myrica gale</i>) and the Purple Moor-grass (<i>Molinia caerulea</i>) has invaded a fen community so that conditions are finely balanced between the two.</p>	c. 9.9km south east of the proposed development
<p>Fin Lough (Clare) pNHA [001010] The beetle, <i>Panagaeus cruxmajor</i> has been recorded twice at this location. This is one of a small number of stations for this insect in Ireland.</p>	c. 10.4km south east of the proposed development
<p>Lough Cullaunyeeda pNHA [001017] This site contains nationally important numbers of Tufted Duck (<i>Aythya fuligula</i>) and Coot (<i>Fulica atra</i>)</p>	c. 10.5km south east of the proposed development
<p>Rosroe Lough pNHA [002054] Designated for the presence of Holly (<i>Ilex aquifolium</i>) -dominated scrub and associated grassland. This location contains a finely struck balance between the requirements of moisture and acid-loving species and those requiring a more demanding dry, alkaline regime.</p>	c. 11.1km south east of the proposed development
<p>Lough Gash Turlough pNHA [000051] See description of Lough Gash Turlough SAC</p>	c. 11.2km south of the proposed development

Appendix 7.2

NBDC records/BCI records

Desktop records of protected, rare, or other notable fauna species are listed below in **Table 1**. In relation to amphibian, reptile and mammal species those which are protected under the Wildlife Acts, the Habitats Directive and/or are listed as threatened (Vulnerable to Critically Endangered) on the relevant national Red Lists are included. In the case of bird species, only those species listed in Annex I of the Birds Directive or on the Birds of Conservation Concern in Ireland (BoCCI) Red List are included in the table below. For invertebrate species, those which are listed as threatened (Vulnerable to Critically Endangered) on the relevant national Red List are included.

Table 1 Records of protected, red-listed or notable fauna from the desktop study in the vicinity of the study area

Common Name/ Scientific Name	Legal Status ²	Red List Status ³	Source
Amphibians			
Common frog <i>Rana temporaria</i>	HD_V, WA	Least concern	NBDC online database record
Mammals (Terrestrial)			
Badger <i>Meles meles</i>	WA	Least concern	NBDC online database record
Otter <i>Lutra lutra</i>	HD_II & IV, WA	Least concern	NBDC online database record
Hedgehog <i>Erinaceus europaeus</i>	WA	Least concern	NBDC online database record
Irish hare <i>Lepus timidus subsp. hibernicus</i>	HD_V, WA	Least concern	NBDC online database record

² HD_II/IV/V = Habitats Directive Annexes II/IV/V; WA = Wildlife Acts; BD_I/II/III = Birds Directive Annex I/II/III; OSPAR = Convention for the protection of the marine environment of the North-east Atlantic 1992

³ Mammal Red-list from Marnell, F., Kingston, N. & Looney, D. (2009) *Ireland Red List No. 3: Terrestrial Mammals* and Marnell, F., Looney, D. & Lawton, C. (2019) *Ireland Red List No. 12: Terrestrial Mammals*.

Birds from Colhoun, K. & Cummins, S. (2013) Birds of Conservation Concern in Ireland 2014-2019. *Irish Birds* 9:523-544.

Amphibians, reptiles and fish from King, J.L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J.M., Fitzpatrick, Ú., Gargan, P.G., Kelly, F.L., O'Grady, M.F., Poole, R., Roche, W.K. & Cassidy, D. (2011) *Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish*.

Non-Marine Molluscs from Byrne, A., Moorkens, E.A., Anderson, R., Killeen, I.J. & Regan, E.C. (2009) *Ireland Red List No. 2 – Non-Marine Molluscs*.

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Damselflies and dragonflies from Nelson, B., Ronayne, C. & Thompson, R. (2011) *Ireland Red List No.6: Damselflies & Dragonflies (Odonata)*.

Water beetles from Foster, G. N., Nelson, B. H. & O Connor, Á. (2009) *Ireland Red List No. 1 – Water beetles*.

Common Name/ Scientific Name	Legal Status ²	Red List Status ³	Source
Pine marten <i>Martes martes</i>	HD_V, WA	Least concern	NBDC online database record
Red squirrel <i>Sciurus vulgaris</i>	WA	Least concern	NBDC online database record
Stoat <i>Mustela erminea</i>	WA	Least concern	NBDC online database record
Pygmy shrew <i>Sorex minutus</i>	WA	Least concern	NBDC online database record
Lesser horseshoe bat <i>Rhinolophus hipposideros</i>	HD_II & IV, WA	Least concern	BCI database record ⁴ NBDC online database record
Natterer's bat <i>Myotis nattereri</i>	HD_IV, WA	Least concern	BCI database record
Brown long-eared bat <i>Plecotus auritus</i>	HD_IV, WA	Least concern	BCI database record NBDC online database record
Daubenton's bat <i>Myotis daubentonii</i>	HD_IV, WA	Least concern	BCI database record
Leisler's bat <i>Nyctalus leisleri</i>	HD_IV, WA	Least concern	BCI database record NBDC online database record
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	HD_IV, WA	Least concern	BCI database record NBDC online database record
Common pipistrelle <i>Pipistrellus pipistrellus</i>	HD_IV, WA	Least concern	BCI database record NBDC online database record
Birds			
Barn owl <i>Tyto alba</i>	WA	Red	NBDC online database record
Black-headed gull <i>Larus ridibundus</i>	WA	Red	NBDC online database record
Blackcap <i>Sylvia atricapilla</i>	WA	Amber	NBDC online database record
Black-tailed godwit <i>Limosa limosa</i>	BD_I, WA	Red	NBDC online database record
Brambling <i>Fringilla montifringilla</i>	WA	Amber	NBDC online database record
Coot <i>Fulica atra</i>	BD_II (I), BD_III (II), WA	Amber	NBDC online database record

⁴ Bat Conservation Ireland (BCI) database record accessed in October 2014

Common Name/ Scientific Name	Legal Status ²	Red List Status ³	Source
Goldeneye <i>Bucephala clangula</i>	BD_II (II), WA	Red	NBDC online database record
Kestrel <i>Falco tinnunculus</i>	BD_I, WA	Red	NBDC online database record
Kingfisher <i>Alcedo atthis</i>	BD_I, WA	Amber	NBDC online database record
Linnet <i>Carduelis cannabina</i>	WA	Amber	NBDC online database record
Moorhen <i>Gallinula chloropus</i>	WA	Green	NBDC online database record
Pochard <i>Aythya ferina</i>	BD_II (I), III (II), WA	Red	NBDC online database record
Redshank <i>Tringa totanus</i>	WA	Red	NBDC online database record
Common sandpiper <i>Actitis hypoleucos</i>	WA	Amber	NBDC online database record
Shelduck <i>Tadorna tadorna</i>	WA	Red	NBDC online database record
Common snipe <i>Gallinago gallinago</i>	BD_II (I), BD_III (III), WA	Red	NBDC online database record
Starling <i>Sturnus vulgaris</i>	WA	Amber	NBDC online database record
Swift <i>Apus apus</i>	WA	Red	NBDC online database record
Corn crane <i>Crex crex</i>	BD_I, WA	Red	NBDC online database record
Dunlin <i>Calidris alpina</i>	BD_I	Red	NBDC online database record
Curlew <i>Numenius arquata</i>	BD_II (II), WA	Red	NBDC online database record
Sparrowhawk <i>Accipiter nisus</i>	WA	Green	NBDC online database record
Teal <i>Anas crecca</i>	BD_II (I), BD_III (II), WA	Amber	NBDC online database record
Tree sparrow <i>Passer montanus</i>	WA	Amber	NBDC online database record
Wigeon <i>Anas penelope</i>	BD_II (I), III (II), WA	Amber	NBDC online database record

Common Name/ Scientific Name	Legal Status ²	Red List Status ³	Source
Woodcock <i>Scolopax rusticola</i>	BD_II (I), III (III), WA	Red	NBDC online database record
Golden plover <i>Pluvialis apricaria</i>	BD_I, II (II), III (III), WA	Red	NBDC online database record
Greenfinch <i>Carduelis chloris</i>	BD_II (I), WA	Amber	NBDC online database record
Gadwall <i>Anas strepera</i>	WA	Amber	NBDC online database record
Garganey <i>Anas querquedula</i>	BD_II (I), WA	Amber	NBDC online database record
Goldcrest <i>Regulus regulus</i>	WA	Amber	NBDC online database record
Great black-backed gull <i>Larus marinus</i>	WA	Green	NBDC online database record
Cormorant <i>Phalacrocorax carbo</i>	WA	Amber	NBDC online database record
Great crested grebe <i>Podiceps cristatus</i>	WA	Amber	NBDC online database record
Greater scaup <i>Aythya marila</i>	BD_II (II), BD_III (III), WA	Red	NBDC online database record
Greenland white-fronted goose <i>Anser albifrons flavirostris</i>	BD_I, II (II), III (III), WA	Amber	NBDC online database record
Heron <i>Ardea cinerea</i>	WA	Green	NBDC online database record
Grey wagtail <i>Motacilla cinerea</i>	WA	Red	NBDC online database record
Hen harrier <i>Circus cyaneus</i>	BD_I, WA	Amber	NBDC online database record
Herring gull <i>Larus argentatus</i>	WA	Amber	NBDC online database record
House martin <i>Delichon urbicum</i>	WA	Amber	NBDC online database record
House sparrow <i>Passer domesticus</i>	WA	Amber	NBDC online database record
Jack snipe <i>Lymnocyptes minimus</i>	BDII_(I), BDIII_III, WA	Green	NBDC online database record
Lesser black-backed gull <i>Larus fuscus</i>	WA	Amber	NBDC online database record

Common Name/ Scientific Name	Legal Status ²	Red List Status ³	Source
Little egret <i>Egretta garzetta</i>	BD_I, WA	Green	NBDC online database record
Little grebe <i>Tachybaptus ruficollis</i>	WA	Green	NBDC online database record
Long-eared owl <i>Asio otus</i>	WA	Green	NBDC online database record
Mallard <i>Anas platyrhynchos</i>	BD_II (I), BD_III (I), WA	Amber	NBDC online database record
Meadow pipit <i>Anthus pratensis</i>	WA	Red	NBDC online database record
Merlin <i>Falco columbarius</i>	BD_I, WA	Amber	NBDC online database record
Common gull <i>Larus canus</i>	WA	Amber	NBDC online database record
Mistle thrush <i>Turdus viscivorus</i>	WA	Green	NBDC online database record
Mute swan <i>Cygnus olor</i>	WA	Amber	NBDC online database record
Lapwing <i>Vanellus vanellus</i>	BD_II (II), WA	Red	NBDC online database record
Pintail <i>Anas acuta</i>	BD_II (I), III (II), WA	Amber	NBDC online database record
Shoveler <i>Anas clypeata</i>	BD_II (I), III (III), WA	Red	NBDC online database record
Wheatear <i>Oenanthe oenanthe</i>	WA	Amber	NBDC online database record
Peregrine <i>Falco peregrinus</i>	BD_I, WA	Green	NBDC online database record
Redwing <i>Turdus iliacus</i>	WA	Red	NBDC online database record
Ringed plover <i>Charadrius hiaticula</i>	WA	Amber	NBDC online database record
Sand martin <i>Riparia riparia</i>	WA	Amber	NBDC online database record
Sky lark <i>Alauda arvensis</i>	WA	Amber	NBDC online database record
Spotted flycatcher <i>Muscicapa striata</i>	WA	Amber	NBDC online database record

Common Name/ Scientific Name	Legal Status ²	Red List Status ³	Source
Tufted duck <i>Aythya fuligula</i>	BD_II (I), III (II), WA	Amber	NBDC online database record
Bewick's swan <i>Cygnus columbianus</i>	WA	Red	NBDC online database record
Twite <i>Carduelis flavirostris</i>	WA	Red	NBDC online database record
Whinchat <i>Saxicola rubetra</i>	WA	Red	NBDC online database record
Whooper swan <i>Cygnus cygnus</i>	BD_I, WA	Amber	NBDC online database record
Willow warber <i>Phylloscopus trochilus</i>	WA	Amber	NBDC online database record
Yellowhammer <i>Emberiza citrinella</i>	WA	Red	NBDC online database record
Invertebrates			
Marsh fritillary butterfly <i>Euphydryas aurinia</i>	HD_II	Vulnerable	NBDC online database record
Willughby's Leaf-Cutter Bee <i>Megachile (Delomegachile) willughbiella</i>	none	Endangered	NBDC online database record
Long-toed water beetles <i>Dryops (Dryops) similaris</i>	none	Near threatened	NBDC online database record
Small heath <i>Coenonympha pamphilus</i>	none	Near threatened	NBDC online database record
Wall <i>Lasiommata megera</i>	none	Endangered	NBDC online database record
Wood white <i>Leptidea sinapis</i>	none	Near threatened	NBDC online database record

Appendix 7.3

Flora Species List By Habitat (Habitats of Local Importance (Higher value) or more)

Dry calcareous and neutral grassland (GS1)		Reed and large sedge swamps (FS1)	
Scientific Name	Common Name	Scientific Name	Common Name
<i>Agrostis stolonifera</i>	Creeping Bent	<i>Phragmites australis</i>	Common reed
<i>Alopecurus pratensis</i>	Meadow foxtail	<i>Cladium mariscus</i> *	Great fen-sedge
<i>Anthoxanthum odoratum</i>	Sweet vernal grass	<i>Carex paniculate</i> *	Greater tussock-sedge

Dry calcareous and neutral grassland (GS1)		Reed and large sedge swamps (FS1)	
<i>Bellis perennis</i>	Daisy	<i>Menyanthes trifoliata</i>	Bog bean
<i>Briza media</i> *	Quaking grass	<i>Equisetum fluviatile</i> *	Water Horsetail
<i>Cirsium arvense</i>	Creeping thistle	<i>Calliergonella cuspidata</i>	Pointed Spear-moss
<i>Cynosurus cristatus</i>	crested dog's-tail	<i>Carex rostrata</i> *	Bottle Sedge
<i>Dactylis glomerata</i>	Cock's foot	<i>Juncus articulatus</i> *	Jointed Rush
<i>Daucus carota</i> *	Wild carrot	<i>Agrostis stolonifera</i>	Creeping bent
<i>Festuca rubra</i>	Red fescue	<i>Typha latifolia</i>	Bulrush
<i>Galium verum</i> *	Lady's Bedstraw	<i>Epilobium palustre</i>	Marsh Willowherb
<i>Heracleum sphondylium</i>	Common hogweed	<i>Calliergon cordifolium</i>	Heart-leaved Spear-moss
<i>Holcus lanatus</i>	Yorkshire fog	<i>Mentha aquatica</i>	Water Mint
<i>Hypochaeris radicata</i>	Cat's-ear	<i>Lemna minor</i>	Common duckweed
<i>Jacobaea vulgaris</i>	Ragwort	<i>Apium nodiflorum</i>	Fool's-water-cress
<i>Leontodon saxatilis</i> *		<i>Nuphar lutea</i>	Yellow water-lily
<i>Leucanthemum vulgare</i>	Oxeye daisy	<i>Lythrum salicaria</i> *	Purple-loosestrife
<i>Linum catharticum</i> *	Fairy flax	<i>Galium palustre</i> *	Common Marsh-bedstraw
<i>Ranunculus repens</i>	Creeping buttercup	<i>Berula erecta</i>	Lesser Water-parsnip
<i>Taraxacum officinale</i> agg.	Dandelion	<i>Nasturtium officinale</i> agg.	Watercress
<i>Trifolium pratense</i>	Red clover	<i>Myosotis scorpioides</i>	Water Forget-me-not
<i>Trifolium repens</i>	White clover	<i>Eupatorium cannabinum</i>	Hemp-agrimony
<i>Veronica chamaedrys</i>	Germander speedwell	<i>Rumex obtusifolius</i>	broad-leaved dock
<i>Vicia sativa</i>	Common vetch	<i>Persicaria amphibia</i>	Longroot smartweed
		<i>Salix cinerea</i>	Grey willow
		<i>Myrica gale</i>	Bog-myrtle

* high quality indicator species of 'semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometea*) (*important orchid sites) (6210)' or 'Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* (*7210)'

* positive indicator species of 'semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometea*) (*important orchid sites) (6210)' or 'Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* (*7210)'

Wet grassland (GS4)		Rich fen and flush (PF1)	
Scientific Name	Common Name	Scientific Name	Common Name
<i>Juncus effusus</i> *	Soft rush	<i>Typha latifolia</i>	Bulrush
<i>Juncus bulbosus</i>	Bulbous Rush	<i>Sparganium erectum</i>	branched bur-reed
<i>Mentha aquatica</i>	Watermint	<i>Schoenus nigricans</i>	black bog-rush
<i>Potentilla anserina</i>	Silverweed	<i>Carex flacca</i>	Blue sedge
<i>Ranunculus acris</i>	Meadow buttercup	<i>Carex paniculata</i>	Greater tussock-sedge
<i>Ranunculus repens</i>	Creeping buttercup	<i>Carex nigra</i>	Black sedge
<i>Cardamine pratensis</i>	Cuckoo flower	<i>Calliergonella cuspidata</i>	Pointed Spear-moss
<i>Galium palustre</i>	Common march bedstraw	<i>Galium uliginosum</i>	Fen bedstraw
<i>Calliergonella cuspidata</i>	Pointed Spear-moss	<i>Mentha aquatica</i>	Water mint
<i>Trifolium repens</i>	White Clover	<i>Lychnis flox-cuculi</i>	Ragged robin
<i>Cirsium palustre</i>	Marsh Thistle		
<i>Filipendula ulmaria</i>	Meadowsweet		
<i>Holcus lanatus</i>	Yorkshire Fog		
<i>Epilobium palustre</i>	Marsh Willowherb		

Wet grassland (GS4)		Rich fen and flush (PF1)	
<i>Cerastium fontanum</i>	mouse-ear chickweed		
<i>Alopecurus geniculatus</i>	Marsh Foxtail		
<i>Ranunculus flammula</i>	Lesser Spearwort		
<i>Lolium perenne</i>	perennial ryegrass		
<i>Calliargon cordifolium</i>	Heart-leaved Spear-Moss		
<i>Agrostis stolonifera</i>	Creeping Bent		
<i>Carex ovalis</i>	Oval Sedge		
<i>Molinia caerulea*</i>	Purple moor grass		
<i>Lotus pedunculatus*</i>	Birdsfoot Trefoil		
<i>Lythrum salicaria*</i>	Purple loosestrife		
<i>Iris pseudacorus</i>	Yellow iris		
<i>Cardamine flexuosa</i>	Wavy Bitter-cress		
<i>Hypericum tetrapterum</i>	St John's-wort		
<i>Anthoxanthum odoratum</i>	sweet vernal grass		
<i>Cynosurus cristatus</i>	crested dog's-tail		
<i>Juncus articulatus*</i>	Jointed Rush		
<i>Plantago lanceolata</i>	Ribwort plantain		
<i>Dactylorhiza fuchsia*</i>	Common spotted orchid		

* high quality indicator species of 'Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) (6410)' or 'Alkaline fens (7230)'

*positive indicator species of 'Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) (6410)' or 'Alkaline fens (7230)'

Riparian Woodland (WN5)		Willow-alder-ash woodland (WN6)	
Scientific Name	Common Name	Scientific Name	Common Name
<i>Salix cinerea</i> subsp. <i>oleifolia</i>	rusty willow	<i>Salix cinerea</i>	Grey willow
<i>Salix x multinervis</i>	Hybrid willow	<i>Salix caprea</i>	Goat willow
<i>Juncus effusus</i>	Soft rush	<i>Salix aurita</i>	Eared willow
<i>Carex paniculata</i>	Greater tussock-sedge	<i>Alnus glutinosa*</i>	Alder
<i>Filipendula ulmaria*</i>	Meadowsweet	<i>Corylus avellana</i>	Hazel
<i>Epilobium parviflorum</i>	Hoary Willowherb	<i>Phalaris arundinacea</i>	canary reed-grass
<i>Angelica sylvestris*</i>	Wild Angelica	<i>Filipendula ulmaria</i>	Meadowsweet
<i>Equisetum fluviatile</i>	Water horsetail	<i>Circaea lutetiana</i>	enchanter's-nightshade
<i>Comarum palustre</i>	Marsh cinquefoil	<i>Angelica sylvestris</i>	wild Angelica
<i>Rhytidadelphus squarrosus</i>	Springy Turf-moss	<i>Iris pseudacorus</i>	Yellow iris
<i>Galium palustre</i>	Common Marsh-bedstraw	<i>Carex paniculata</i>	greater tussock-sedge
<i>Menyanthes trifoliata</i>	Bog bean	<i>Acer pseudoplatanus</i>	sycamore
<i>Myrica gale</i>	Bog-myrtle	<i>Fraxinus excelsior*</i>	Ash
<i>Rubus fruticosus</i> agg.	Bramble		
<i>Vicia sativa</i>	Common vetch		
<i>Potentilla erecta</i>	Tormentil		
<i>Hedera helix</i>	Ivy		
<i>Lonicera periclymenum</i>	Honeysuckle		
<i>Stellaria palustris*</i>	Marsh stitchwort		

* high quality indicator species of 'Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Pandion, Alnion incanae, Salicion albae*) (*91E0)'

*positive indicator species of "Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Pandion, Alnion incanae, Salicion albae*) (*91E0)'

Depositing/Lowland rivers (FW2)		Marsh (GM1)	
Scientific Name	Common Name	Scientific Name	Common Name
<i>Filipendula ulmaria</i>	Meadowsweet	<i>Filipendula ulmaria</i>	Meadowsweet
<i>Typha latifolia</i>	Bulrush	<i>Lythrum salicaria</i>	Purple loosestrife
<i>Mentha aquatica</i>	Watermint	<i>Mentha aquatica</i>	Watermint

Depositing/Lowland rivers (FW2)		Marsh (GM1)	
<i>Apium nodiflorum</i>	Fool's-water-cress	<i>Epilobium hirsutum</i>	Hairy willowherb
<i>Phragmites australis</i>	common reed	<i>Apium nodiflorum</i>	Fool's-water-cress
		<i>Phragmites australis</i>	Common reed
		<i>Salix sp.</i>	Willow species

Mesotrophic Lake (FL4)		Oak-ash-hazel woodland (WN2)	
Scientific Name	Common Name	Scientific Name	Common Name
<i>Nuphar alba</i>	white water lily	<i>Fraxinus excelsior</i>	Ash
<i>Nasturtium officinale</i>	Watercress	<i>Salix cinerea</i>	Grey willow
<i>Apium nodiflorum</i>	Fool's-water-cress	<i>Acer pseudoplatanus</i>	Sycamore
<i>Potamogeton natans</i>	broad-leaved pondweed	<i>Hedera helix</i>	Ivy
<i>Lemna minor</i>	Common duckweed	<i>Rubus fruticosus</i> agg.	Bramble
<i>Ranunculus flammula</i>	Lesser Spearwort	<i>Fagus sylvatica</i>	Beech
<i>Nuphar lutea</i>	Yellow water lily	<i>Crataegus monogyna</i>	Hawthorn
<i>Callitriche</i> spp	water-starwort	<i>Dryopteris dilatata</i>	broad buckler-fern
<i>Typha latifolia</i>	bulrush	<i>Dryopteris affinis</i>	Male Fern
<i>Equisetum</i> spp.	Horsetail	<i>Juncus effusus</i>	Soft rush
<i>Mentha aquatica</i>	Water mint	<i>Polytrichum commune</i>	Common Haircup
<i>Menyanthes trifoliata</i>	Bog-bean	<i>Oxalis acetosa</i>	Wood sorrel
<i>Bidens cernua</i>	Nodding beggars-ticks	<i>Kindbergia praelonga</i>	Common Feather-moss
<i>Myosotis scorpioides</i>	Water Forget-me-not	<i>Corylus avellana</i>	Hazel
		<i>Thamnobryum alopecurum</i>	Fox-tail Feather-moss
		<i>Neckera complanata</i>	flat Neckera
		<i>Geranium robertianum</i>	Hert robert
		<i>Arum maculatum</i>	Cuckoo pint
		<i>Eurhynchium striatum</i>	Common striated feather-moss
		<i>Polypodium sp.</i>	Wall fern
		<i>Asplenium scolopendrium</i>	Hart's Tongue Fern
		<i>Ilex aquifolium</i>	Holly
		<i>Alnus glutinosa</i>	Common Alder
		<i>Lonicera periclymenum</i>	Honeysuckle
		<i>Prunus spinosa</i>	Blackthorn
		<i>Hypnum sp.</i>	Hypnum sp. moss
		<i>Frullania dilatata</i>	Dilated Scalewort
		<i>Rhamnus cathartica</i>	buckthorn
		<i>Salix cinerea</i> subsp. <i>oleifolia</i>	Grey willow sp.
		<i>Urtica dioica</i>	Nettle
		<i>Circaea lutetiana</i>	Enchanter's-nightshade
		<i>Polystichum setiferum</i>	Soft Shield Fern
		<i>Glechoma hederacea</i>	Ground ivy


Immature woodland (WS2)		Other artificial lakes and ponds (FL8)	
Scientific Name	Common Name	Scientific Name	Common Name
<i>Alnus glutinosa</i>	Alder	<i>Lemna minor</i>	Common duckweed
<i>Salix cinerea</i>	Grey willow	<i>Potamogon natans</i>	Broad-leaved pondweed


<i>Viburnum opulus</i>	Guelder rose	<i>Typha latifolia</i>	Bulrush
<i>Quercus sp.</i>	Oak	<i>Alisma plantago-aquatica</i>	common water-plantain
<i>Betula pubescens</i>	Downy birch	<i>Sparganium erectum</i>	Branched Bur-reed
<i>Fagus sylvatica</i>	Beech	<i>Phragmites australis</i>	common reed
<i>Sorbus aucuparia</i>	Rowan	<i>Achillea millefolium</i>	Yarrow
<i>Corylus avellana</i>	Hazel	<i>Equisetum arvense</i>	Horsetail
<i>Rubus fruticosus</i>	Bramble	<i>Salix sp.</i>	Willow
<i>Ulex europeus</i>	Gorse	<i>Charales spp.</i>	Stonewort species
<i>Pteridium aquilinum</i>	Bracken	<i>Juncus inflexus</i>	Hard rush
		<i>Lotus corniculatus</i>	Bird's-foot-trefoil


Hedgerows (WL1)		Treelines (WL2)	
Scientific Name	Common Name	Scientific Name	Common Name
<i>Crataegus monogyna</i>	Hawthorn	<i>Ulmus procera</i>	Elm
<i>Fraxinus excelsior</i>	Ash	<i>Aesculus hippocastanum</i>	Horse chesnut
<i>Ilex aquifolium</i>	Holly	<i>Acer pseudoplatanus</i>	Sycamore
<i>Acer pseudoplatanus.</i>	Sycamore	<i>Fraxinus excelsior</i>	Ash
<i>Sambucus nigra</i>	Elder	<i>Quercus robur</i>	Oak
<i>Rosa canina</i>	Dog rose	<i>Hesperocyparis macrocarpa</i>	Monterey cypress
<i>Hedera helix</i>	Ivy	<i>Chamaecyparis lawsoniana</i>	Lawson cypress
<i>Corylus avellana</i>	Hazel	<i>Betula pendula</i>	Silver birch
<i>Rubus fruticosus</i>	Bramble	<i>Acer platanoides</i>	Norway maple
<i>Galium aparine</i>	Cleaver		
<i>Geranium robertianum</i>	Herb Robert		
<i>Arum maculatum</i>	Cuckoo pint		
<i>Asplenium scolopendrium</i>	Hart's Tongue Fern		
<i>Anthriscus sylvestris</i>	Cow Parsley		


Appendix 7.4
Building inspection results


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Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
BB 1A	R 37583 79425	Low	Cattle shed with concrete block and corrugated metal walls and corrugated metal roof. Open on side of shed. Surrounding landscape - pasture fields to the north, east and west, and treelines to the south.	<p data-bbox="920 304 1756 408">1 – Gaps between blocks where mortar has come away on all sides of shed. Unable to be endoscoped due to height of features and wall in front.</p> 


Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				<p data-bbox="920 293 1796 363">2 – Gaps under corrugated metal on sides on building where metal meets concrete blocks, crevices under this metal sheeting.</p> 


Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
BB 1B	R 37573 79421	Low	Adjacent to 1A. Concrete external walls with corrugated roof. Not accessible inside due to safety concerns. Creamery machinery within. Same surrounding habitat as 1A.	1 – Gaps at corners where roof meets external walls, on all corners of building.  2 – Open windows into barn providing entry inside where more features may be present

Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				
BB 2	R 37515 79417	Moderate	<p>Large residential house, brick walls with rendering, slate roof, two stories. Surrounded by treelines and hedgerows, and Torreen Lough closeby. Most likely more features present near roof but due to height of house difficult to assess fully.</p>	<p>1 – Gaps under slates in various areas of roof, potential crevices under here with room for small number of bats, and under lead flashing by chimney</p>

Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				 <p data-bbox="920 826 1688 863">2 – Possible gaps where roof joins wall on western side of house</p>


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Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				
BB 3	R 37480 79432	High	Residential house, bungalow, slate roof with stone walls.	1 – Potential gap under slate on edge of roof near apex where mortar has come away, droppings evident underneath feature.

Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				 <p data-bbox="913 815 1783 922">2 – Gap under roof mortar and lead flashing where roof meets chimney, droppings underneath. Similar feature on other side of house (but no droppings present on other side)</p>

Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				

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Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				<p data-bbox="913 304 1688 368">3 – Gaps under roof slates across whole roof, especially by velux windows</p> 

BB 4A	R 37437 79475	Low	Corrugated cow shed with part concrete walls, and wooden beams within. Pasture fields bordered by hedgerows/treelines. Adjacent to meadow with Tooreen Lough	<p>1 – Crevices along both ends of building where corrugated iron meets wall.</p>  <p>2 – Potential gaps crevices along roof where wooden beams joins corrugated sheeting. Potentially only suitable for temporary night roosts.</p>
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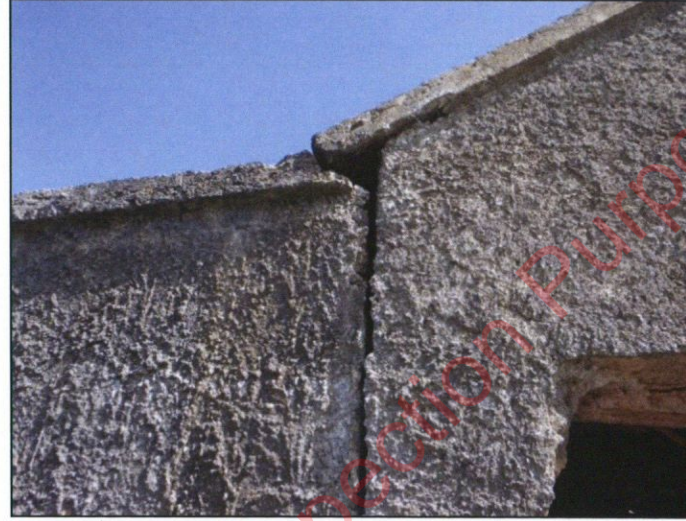
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BB 4B	R 37453 79480	Low	Stone/Stipling walls with corrugated roof, cow shed. Adjacent to 4A	<p>1 – Small gap to right of rear door into barn which goes into stonework between walls, goes quite far back.</p>  <p>2 – Gap in wall where it has split on external wall adjacent to rear door</p>
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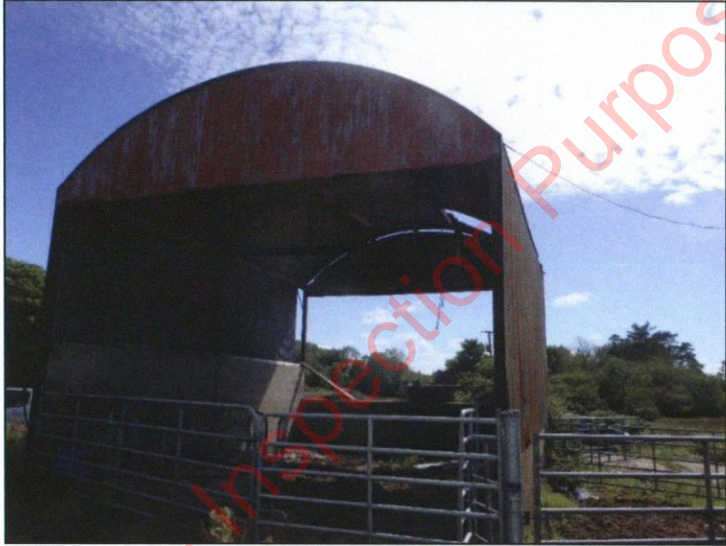
Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				<p>3 – gaps along lead flashing at top of roof</p>  <p>4 – Thick, dense ivy on NE facing wall</p>

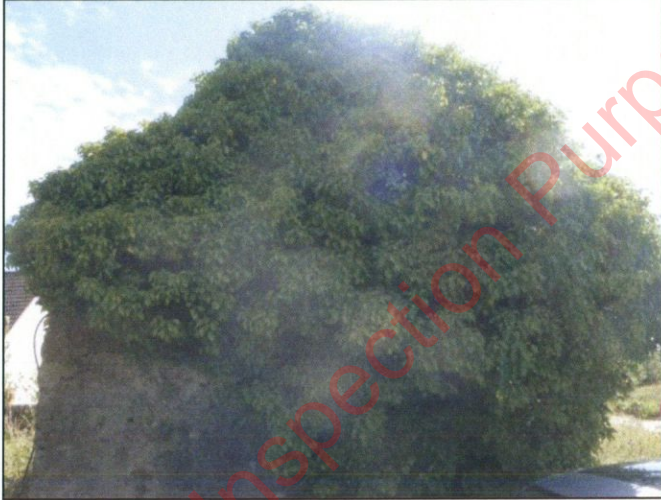
Clare Planning Authority Inspection Purposes Only!


Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				 <p data-bbox="920 850 1796 922">5 – Window going into extra part of shed with fabric roof material inside, not fully accessible</p>



Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				
BB 4C	R 37461 79471	Negligible	Tall barn building, very open with wooden beams, no walls on two	No features visible, suitable for foraging only

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Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
			sides, very exposed. Corrugated roof and sides	
BB 4D	R 37469 79460	Low	Small building with stone walls, partly collapsed roof on one side and very open, small room at end with some potential	1 – Dense ivy on each gable end of building

Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				 <p data-bbox="922 826 1787 938">2 – Open doorway into small end room, ceiling inside partially collapsed, turf roof and wooden beams. Not fully accessible due to health and safety. No evidence noted</p>


Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				
BB 5A	R 37628 79863	Moderate	Brick house with flat slated roof. Wooden sheds in garden, treelines and hedgerows adjacent to house, surrounding habitat pasture field	1 – Gaps where soffit board meets roof, potentially going quite far back on NW corner, NE and southern corner of house


Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				 <p data-bbox="913 810 1653 842">2 – Gaps along flashing of roof, some parts replaced recently.</p> 

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Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				<p>3 – Gaps on edge of roof where slates have come up slightly leaving gap exposed on W side of house, also gaps present along flashing of chimney</p>  <p>4 – Gaps into soffit on West of house</p>

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Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				
BB 5B	R 37572 79903	Low	Wood shed close to BB 5A, exposed on two sides, concrete block walls and corrugated metal roof. Wooden beams inside. Thick ivy on western end of shed. Surrounded by pasture fields, very exposed. Swallows nesting in here	1 – Thick ivy on western end, has started to grow within shed

Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				 <p data-bbox="922 847 1464 879">2 - gaps where beams meet roof within shed</p>

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Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				
BB 6A, 6B, 6C	R 37422 79737	Low	Three cattle barn sheds, all with corrugated steel roofs and concrete block walls. Very exposed buildings, mostly open with very little features. Suitable for foraging but little roosting features, any present would only house 1-2 bats. Hedgerows and treelines nearby, with	6A – Very open shed with no doors, potential for foraging within barn, and possibly some small crevices along roof where beams join the roof.

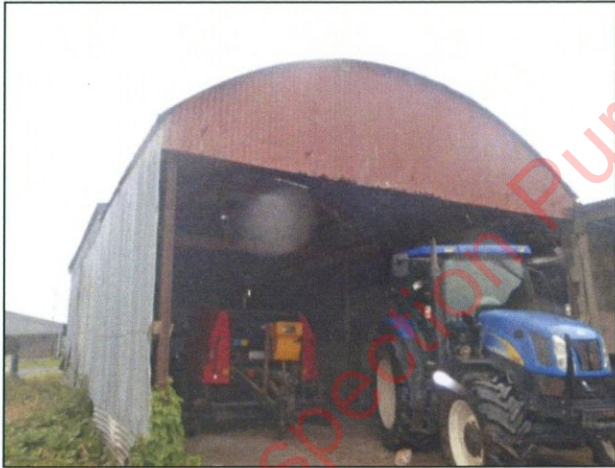

Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
			pasture fields surrounding.	

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Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				<p data-bbox="920 293 1787 400">6B – Collection of small sheds with limited suitability, very exposed and open. Cattle within part of shed when surveying so could not enter all of shed. Suitable for foraging and small single roosts potentially</p>  


Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				6C – Roof fallen down in places, similar to other barns, very exposed and open. Wooden beams inside with some fabric hanging from these, slightly more potential than other sheds

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Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				 


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Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
BB 7	R 37489 79848	Moderate	Residential unoccupied house. Very run down, concrete walls with slate roof. Dense ivy at northern gable end where stone shed used to be. Well connected to hedgerows and treelines nearby.	<p>1 – Gable end of house where shed/outhouse collapsed, lots of gaps along wall, not fully accessible to inspect. Dense ivy on top half of wall, with gaps along the roof edge that potentially go into further crevices in house.</p>  <p>2 – Gap between lead flashing and chimney, also other gaps around chimney present</p>


Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				 <p data-bbox="920 858 1771 933">3 – Gaps along edged of roof where missing tiles, potentially going into attic space. Gaps below times along soffit edge also</p>

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Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				
BB 8	R 37579 79375	Moderate	Modern residential building, stone walls with flat slated roof. Garage building behind house. Hedgerow surrounding building (Leylandii spp.), and main road along southern boundary.	1 – Gap where roof flashing meets chimney wall

Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				 <p data-bbox="916 826 1753 938">2 – Crevices above window in conservatory like building, where stone wall meets soffit board, gap going upwards into it all along above window, droppings on window below.</p>

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Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				 <p data-bbox="920 836 1420 868">3 – Gap going upwards into porch feature</p>

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Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				
BB 9	R 37544 79359	Moderate	Modern residential building, with stone walls and flat roof slates. Large slated shed/building (Edward Casey kitchens workshop) beside house. Hedgerows and treelines along boundary, road along southern boundary.	1 – Gap on above porch feature where stone facing meets wall, potential droppings spotted but not possible to reach.

Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				 <p data-bbox="922 1268 1727 1337">2 – Slated shed building with potential crevices at corners between guttering and soffit boards.</p>

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Building ID no.	Location	Rating	Details of building and surrounding habitat	Features present
				

Clare Planning Authority - Inspection Purposes Only!

Appendix 7.5

Details of roost emergence/re-entry surveys at buildings and structures

Building ID	Roost Potential	Building description	No. and type of surveys	Roost(s) identified	No. of roosts	Comments
BB 1A	Low	Partially open cattle shed with concrete block walls and corrugated iron roofing.	<ul style="list-style-type: none"> • 2x internal and external inspection • 1x dusk emergence • 1x dawn re-entry 	Yes	One – Soprano pipistrelle	Optimal conditions experienced for both activity surveys. One soprano pipistrelle re-entered side of barn on western aspect. Moderate levels of activity recorded on both surveys, with soprano pipistrelle, common pipistrelle, Leisler's bat and brown long-eared bat recorded during surveys foraging and commuting in the area. Foraging within barns and along nearby hedgerows and treelines was also noted.
BB 1B	Low	Adjacent to 1A, creamery barn with concrete walls and corrugated roofing.	<ul style="list-style-type: none"> • 2x external inspection • 1x dusk emergence • 1x dawn re-entry 	No	N/a	Surveyed at same time as 1A. No roosts identified in this building. Similar species identified as 1A foraging and commuting in the area.
BB 2	Moderate	Two-story residential house with rendered brick walls,	<ul style="list-style-type: none"> • 2x external inspection • 1x dusk emergence 	Yes	Four – Soprano pipistrelle	Two roosts recorded during dawn survey (one individual soprano pipistrelle from both). Two additional roosts during second survey, all <i>P. pyg</i> and 1-2 individuals. Significant activity along treelines and hedgerows around house including; soprano pipistrelle, common pipistrelle, brown long-eared, <i>Myotis</i> spp., and leisler's bat.

Building ID	Roost Potential	Building description	No. and type of surveys	Roost(s) identified	No. of roosts	Comments
		and slated roof.	<ul style="list-style-type: none"> • 1x dawn re-entry 			
BB 3	High	Residential house with slate roof and stone walls.	<ul style="list-style-type: none"> • 2x external inspection • 2x dusk emergence • 1x dawn re-entry 	Yes	Five – Soprano pipistrelle	Droppings identified on building during external survey. Five soprano pipistrelle roost points identified across building. 30 soprano pipistrelle bats emerged and re-entered from one roost on first and second survey. Four other roosts small roosts with low numbers observed. Soprano pipistrelle, common pipistrelle, leisler's bat, brown long-eared identified foraging and commuting during surveys, particularly along hedgerows and treelines leading to Lough Tooreen, and hedgerows adjacent to house.
BB 4A	Low	Partially open cow shed with corrugated roof and sides, and concrete block walls.	<ul style="list-style-type: none"> • 2x internal inspection • 2x external inspection • 1x dusk emergence 	No	N/A	No roosts identified during surveys, or evidence noted during building inspections. High level of activity from soprano pipistrelle, common pipistrelle, <i>Myotis</i> spp., and Leislars bat. Bat species were noted to be foraging within the barn, and commuting along hedgerows leading to Tooreen Lough.
BB 4B	Low	Adjacent to BB 4B, stone walled cattle barn with corrugated roof.	<ul style="list-style-type: none"> • 2x internal inspection • 2x external inspection • 1x dusk emergence 	No	N/A	Similar results as BB 4A as survey was undertaken at the same time as these. No roosts identified or evidence of bats noted during building inspections.

Building ID	Roost Potential	Building description	No. and type of surveys	Roost(s) identified	No. of roosts	Comments
BB 4C	Negligible	Adjacent to BB 4A and 4B. Large, open, two-sided corrugated cattle shed.	<ul style="list-style-type: none"> • 2x internal inspection • 2x external inspection • 1x dusk emergence 	No	N/A	Similar results as BB 4A and 4B as survey was undertaken at the same time as these. No roosts identified or evidence of bats noted during building inspections. Bats identified foraging within barn during survey.
BB 4D	Low	Small disused building, stone walls with partially collapsed roof.	<ul style="list-style-type: none"> • 2x internal inspection • 2x external inspection • 1x dusk emergence 	No	N/A	Similar results as BB 4A, 4B, and 4C as survey was undertaken at the same time as these. No roosts identified or evidence of bats noted during building inspections.
BB 5A	Moderate	Residential house, brick walls with flat slated roof.	<ul style="list-style-type: none"> • 1x external inspection • 2x dawn re-entry • 1x dusk emergence 	Yes	Four – Soprano pipistrelle and common pipistrelle	Three roosts identified on house, two were small soprano pipistrelle roosts (one and two individuals), and the third being a common pipistrelle roost of one individual. Moderate foraging activity along the treelined laneway adjacent to house, and commuting observed along nearby hedgerows. Common pipistrelle, soprano pipistrelle, Leisler's bat and brown long-eared bat were observed during activity surveys.
BB 5B	Moderate	Woodshed with concrete block walls	<ul style="list-style-type: none"> • 2x external inspection 	Yes	One – Brown long-eared bat	Two brown long-eared bats identified roosting in this shed, observed flying inside barn, and landing on wooden beams and walls. Emerged from ivy that has overgrown within shed. Droppings identified on

Building ID	Roost Potential	Building description	No. and type of surveys	Roost(s) identified	No. of roosts	Comments
		and corrugated roof. Partially open.	<ul style="list-style-type: none"> • 2x internal inspection • 2x dawn re-entry • 1x dusk emergence 			wood piles, no other roosts or evidence noted. Soprano pipistrelle also observed foraging within shed but did not emerge from here.
BB 6A	Low	Large partially open cattle shed, mainly comprised of corrugated iron material.	<ul style="list-style-type: none"> • 2x internal inspection • 2x external inspection • 1x dawn re-entry 	No	N/A	No roosts were identified during the activity survey or evidence of bats was noted during building inspections. Common pipistrelle, soprano pipistrelle, and Leisler's bat were observed during the survey, with pipistrelles foraging within the barn.
BB 6B	Low	Collection of small cattle sheds with corrugated sides and roof, and concrete walls.	<ul style="list-style-type: none"> • 2x external inspection • 1x dawn re-entry 	No	N/A	No roosts were identified during the activity survey or evidence of bats noted during external inspection. Similar species as identified at BB 6A, low activity observed here.

Building ID	Roost Potential	Building description	No. and type of surveys	Roost(s) identified	No. of roosts	Comments
		Adjacent to BB 6A.				
BB 6C	Low	Corrugated iron barn, partially open at one end. Adjacent to BB 6A and 6B.	<ul style="list-style-type: none"> • 2x internal inspection • 2x external inspection • 1x dawn re-entry 	Yes	One – Leisler's bat	No roosts were identified during the activity survey. During building inspections in 2022, a single Leisler's bat roost was identified in a small section of this shed, between a crack in the exterior wall. Similar species foraging during activity surveys as identified at BB 6A and 6B.
BB 7	Moderate	Residential unoccupied house with stone walls and slate roof. Partially collapsed stone shed that adjoins property.	<ul style="list-style-type: none"> • 2x external inspection • 1x internal inspection • 1x dawn re-entry • 2x dusk emergence 	No	N/A	No roosts identified during activity surveys, however was sub-optimal weather conditions during one of the dusk surveys. Very little bat activity recorded during surveys, with soprano pipistrelle, common pipistrelle and Leisler's bat identified commuting through the area.
BB 8	Moderate	Modern residential house, stone walls	<ul style="list-style-type: none"> • 2x external inspection • 1x dawn 	Yes	Three – Soprano pipistrelle	Three roosts identified, two on the house, and one on the garage. Roost on the house with 13 soprano pipistrelles, second roost with a single soprano pipistrelle roost. Roost within garage with single P. pyg. Droppings were identified under the roost with 13 bats. Moderate activity level with soprano pipistrelle, common pipistrelle, Leisler's

Building ID	Roost Potential	Building description	No. and type of surveys	Roost(s) identified	No. of roosts	Comments
		and flat slated roof.	<ul style="list-style-type: none"> • 1x dusk 			bat, and brown long-eared bat observed foraging and commuting along hedgerows and treeline surrounding the house.
BB 9	Moderate	Modern residential building with stone walls and flat slate roof. Large shed adjacent to building (workshop) with stone slated walls and roof.	<ul style="list-style-type: none"> • 2x external inspection • 1x dawn • 1x dusk 	Yes	One – Soprano pipistrelle	One roost identified during last survey within porch of house. 7 – 8 individuals emerged from one roost location.

APPENDIX 7.6
Transect Survey Results

Date	Survey Type	Bat species recorded	Comments
Visit 1 – Undertaken on the 8th July 2020			
July	Dusk (Transect)	Soprano pipistrelle bat Common pipistrelle bat Leisler' s bat Myotis species	<p>The most commonly recorded species during this walked transect was the soprano pipistrelle bat, followed by the common pipistrelle bat. Both species were found in the majority of the areas walked within the site, with high levels of activity recorded within the vicinity of Toureen Lough, Toureen Laneway and the woodland located within the north-western section of the proposed development site. Mature hedgerows perpendicular to Toureen Laneway also had relatively high levels of activity of both these species.</p> <p>Leisler's bat was identified mainly near Toureen Lough, and along the hedgerows off Toureen Laneway. It was also recorded in lower numbers in areas within the northern section of the proposed development and near to the woodland in the north eastern section of the proposed development site.</p> <p>A single <i>Myotis</i> species bat call was identified along Toureen Laneway close to BB 6A, 6B and 6C in the northern section of the proposed development site).</p>
Visit 2 – Undertaken on the 28th – 29th July 2020			
July	Dusk - Dawn (Transect)	Soprano pipistrelle bat Common pipistrelle bat Leisler' s bat	<p>The most commonly recorded species during this full night walked transect of the entire site was the soprano pipistrelle bat, followed by the common pipistrelle. Areas of high activity of both species included; Toureen Lough, woodland in north-eastern section of the proposed development, Toureen Laneway, and hedgerows/treelines bordering fields in the eastern section of the proposed</p>

Date	Survey Type	Bat species recorded	Comments
		Unidentified Pipistrellus species Myotis species Lesser horseshoe bat Brown long-eared bat	<p>development site. Activity levels of common pipistrelles was also high in the north-eastern area adjacent to the woodshed and residential house.</p> <p>Leisler's bat species were recorded mainly around Toureen Lough, with high levels of activity identified there. Activity was also identified in the south-western and north-eastern sections of the proposed development site, in lower numbers in areas near the woodland in the western section of the proposed development site, and along Toureen Laneway.</p> <p><i>Myotis</i> species was recorded in localised areas in the north of the proposed development site, and along Toureen Laneway.</p> <p>A single lesser horseshoe bat call was identified in the southern section of the proposed development site, adjacent to cattle sheds in a pasture field. This was the only lesser horseshoe bat call identified during transect surveys.</p> <p>High levels of activity of brown long-eared bat was recorded along Toureen Laneway, very close to the woodshed in the north (where a roost was confirmed, <i>i.e.</i> in BB 5B, and in lower numbers adjacent to the woodland in the north-west section of the proposed development site.</p>
Visit 3 – Undertaken on the 18th August 2020			
August	Dusk (Transect)	Soprano pipistrelle bat Common pipistrelle bat Unidentified Pipistrellus species Leisler's bat Myotis species	<p>The most commonly recorded species during this walked transect was the soprano pipistrelle. High levels of activity were recorded along Toureen Laneway, Toureen Lough and the hedgerow located parallel to the R125 along the southern boundary of the proposed development site. Soprano pipistrelle was also recorded in the woodland in the north-western of the proposed development site, and around BB 6a, 6B and 6C in the north.</p> <p>Common pipistrelle was the second most commonly recorded species and was identified in similar areas to that of soprano pipistrelle.</p>

Date	Survey Type	Bat species recorded	Comments
		Brown long-eared bat	<p>Leisler's bat was recorded in pockets across the site, mainly along Toureen Laneway, and briefly in the north adjacent to the barns, and within the woodland in the north-western section of the proposed development site.</p> <p>Myotis species and brown long-eared were mostly recorded along Toureen Laneway, the latter of which had a higher number of associated calls.</p>

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Appendix 7.7

Examples of Valuing Important Ecological Features

International Importance:

- 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.
- Proposed Special Protection Area (pSPA).
- Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended).
- Features essential to maintaining the coherence of the Natura 2000 Network.⁵
- Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.
- Resident or regularly occurring populations (assessed to be important at the national level)⁶ of the following:
 - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or
 - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.
- Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).
- World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).
- Biosphere Reserve (UNESCO Man & The Biosphere Programme).
- Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).
- Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).
- Biogenetic Reserve under the Council of Europe.
- European Diploma Site under the Council of Europe.
- Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 1988).⁷

National Importance:

- Site designated or proposed as a Natural Heritage Area (NHA).

⁵ See Articles 3 and 10 of the Habitats Directive

⁶ It is suggested that, in general, 1% of the national population of such species qualifies as an internationally important population. However, a smaller population may qualify as internationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

⁷ Note that such waters are designated based on these waters' capabilities of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*)

- Statutory Nature Reserve.
- Refuge for Fauna and Flora protected under the Wildlife Acts.
- National Park.
- Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.
- Resident or regularly occurring populations (assessed to be important at the national level)⁸ of the following:
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Site containing 'viable areas'⁹ of the habitat types listed in Annex I of the Habitats Directive

County Importance:

- Area of Special Amenity.¹⁰
- Area subject to a Tree Preservation Order.
- Area of High Amenity, or equivalent, designated under the County Development Plan.
- Resident or regularly occurring populations (assessed to be important at the County level)¹¹ of the following:
 - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
 - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
- County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local Biodiversity Action Plan, if this has been prepared.
- Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.

⁸ It is suggested that, in general, 1% of the national population of such species qualifies as a nationally important population. However, a smaller population may qualify as nationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

⁹ A 'viable area' is defined as an area of a habitat that, given the particular characteristics of that habitat, was of a sufficient size and shape, such that its integrity (in terms of species composition, and ecological processes and function) would be maintained in the face of stochastic change (for example, as a result of climatic variation).

¹⁰ It should be noted that whilst areas such as Areas of Special Amenity, areas subject to a Tree Preservation Order and Areas of High Amenity are often designated on the basis of their ecological value, they may also be designated for other reasons, such as their amenity or recreational value. Therefore, it should not be automatically assumed that such sites are of County importance from an ecological perspective.

¹¹ It is suggested that, in general, 1% of the County population of such species qualifies as a County important population. However, a smaller population may qualify as County important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

- Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Local Importance (higher value):

- Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;
- Resident or regularly occurring populations (assessed to be important at the Local level)¹² of the following:
 - Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
 - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
 - Species protected under the Wildlife Acts; and/or
 - Species listed on the relevant Red Data list.
- Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
- Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

Local Importance (lower value):

- Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;
- Sites or features containing non-native species that are of some importance in maintaining habitat links.

¹² It is suggested that, in general, 1% of the local population of such species qualifies as a locally important population. However, a smaller population may qualify as locally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

Appendix 7.8

Bat survey results and analysis from 2018

1. METHODOLOGY

1.1 BAT BUILDING INSPECTIONS

External and/or internal inspections of buildings located within the proposed development site were undertaken on the 7th June 2018 to determine whether or not roosting bats were present. In addition to the actual presence of bats, bat activity may also be detected by the following signs:

- Bat droppings (these will accumulate under an established roost or under access points);
- Insect remains (under feeding perches);
- Oil (from fur) and urine stains;
- Scratch marks; or,
- Bat corpses.

1.2 TREE INSPECTIONS

A preliminary inspection of trees on site was carried out during an initial multidisciplinary site visit on 7th June 2018, with the aim of assessing their suitability to support roosting bats. The trees were assessed based on the presence of features commonly used by bats. Examples of such features include:

- Natural holes;
- Woodpecker holes;
- Cracks/splits in major limbs;
- Loose bark; and,
- Hollows/cavities.

1.3 WALKED BAT ACTIVITY TRANSECT

Post-dusk bat activity surveys comprising walked transects were undertaken within the subject lands on the 7th August 2018 and 16th August 2018. These transect routes are illustrated on Figure 1 of this report.

The transect carried out on the 7th August 2018 (*i.e.* visit 1) covered as much of the subject lands as possible with an emphasis on surveying linear vegetation features and field boundaries.

The second transect visit carried out on the 16th August 2018 aimed to replicate a similar route, however as two surveyors were on-site at this time, areas not previously accessed were covered more thoroughly. Dates, locations, timings, weather and other details of these manual bat activity surveys are outlined within Table 1 below.

Overall, the weather conditions were considered to be optimal for bat activity surveys. These surveys were undertaken at the appropriate time of year for recording bat activity.

Dusk surveys commenced 15 minutes before sunset and lasted for approximately two hours afterwards. The activity surveys were completed using both direct observation and handheld ultrasound detectors (*i.e.* Elekon BatLogger M and Pettersson D240X). The aims of these surveys were:

- to determine the level of bat activity within or directly adjacent to the survey area;
- to identify what bat species may be present and what landscape features they may be utilising; and,
- to determine the potential use of built structures on-site by roosting bat species.

The second visit also included a post-dusk emergence survey at an existing private dwelling and four farm structures (located in close proximity to ITM grid reference 537405 679488) within the subject lands. No bats were observed exiting any of these buildings.

Data generated from the bat activity surveys was analysed using both Elekon BatExplorer software and BatSound analysis software, which differentiate bat species by their ultrasonic echolocation calls. Calls were manually identified against species descriptions provided within *British Bat Calls: A Guide to Species Identification* (Russ, 2012).

Table 1 Manual bat activity survey information

DATE	SURVEY TYPE	DETECTOR USED	SUNSET TIME	SURVEY TIMES	WEATHER AND TEMPERATURE
Visit 1					
07/08/2018	Dusk (Transect)	Elekon BatLogger M	21:18	21:00-22:50	Mostly dry except for heavy rain for approximately 30 minutes of survey, light winds, temperature 14°C
Visit 2					
16/08/2018	Dusk (Transect)	Elekon BatLogger M	21:00	20:45-23:00	Dry and calm, with temperatures ranging from 16-13°C
		Pettersson D240X			

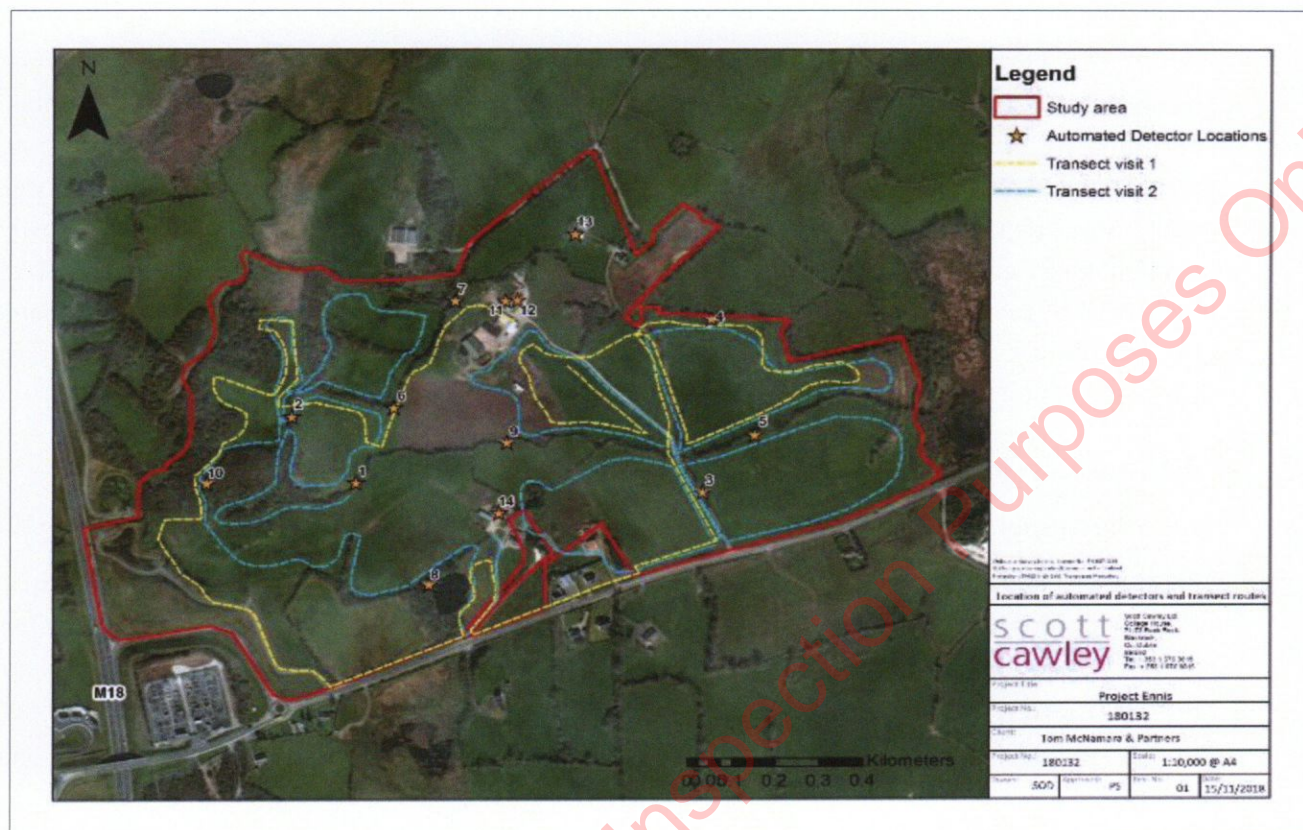
1.4 AUTOMATED STATIC BAT DETECTOR SURVEY

The manual walked transects were supplemented by automated static bat detector surveys, which were deployed from the 6th July 2018 to 31st October at 14 different locations within the subject lands.

Weather conditions during September and October 2018 were unseasonably mild and as such, it was considered that all these deployments were undertaken in suitable conditions for recording bat activity. These locations were chosen with an emphasis on areas identified as being potentially suitable for roosting, commuting and/or foraging bats. Whilst efforts were made to standardise survey periods, the total number of nights of deployment and dates of deployment varied per location.

The locations of these statics are presented in Figure 1 overleaf. Details on the locations and associated habitats, dates of deployment and number of nights recorded are presented within Table 4 of this report.

Figure 1 Locations of automated static bat detectors deployed within the subject lands (see Table 2 for details on each of these locations) and walked transect routes



1.5 LIMITATIONS

A preliminary tree roost inspection survey was carried out as part of the initial multidisciplinary site visit. As a consequence of this, not all potential bat roost trees located within the subject lands and that may be impacted by the proposed development have been assessed to the level that will inform the impact assessment. This limitation will be addressed as part of further surveys of the trees within the subject lands, which will be undertaken at a more advanced stage of the project design and during the appropriate survey season. The number of nights which the automated detectors recorded at each location varied, often due to performance issues with some of the detector units. This survey limitation has been overcome by applying a precautionary approach to the judgements made in this report and providing an average figure per detector unit per night, allowing a more realistic comparison to be made between locations.

Calls of certain bat species, *e.g.* brown long-eared bat and lesser horseshoe bat, may be easily missed on handheld detectors and thus the presence of this species is likely to be understated by the recording data. A precautionary approach has been taken towards the interpretations of the results in order to address this potential limitation.

2. RESULTS

2.1 DESK STUDY RESULTS

Records of six bat species were returned from the National Biodiversity Data Centre data search on the 13th November 2018. These included Daubenton's bat *Myotis daubentonii*, Lesser horseshoe bat

Rhinolophus hipposideros, common pipistrelle bat *Pipistrellus pipistrellus*, soprano pipistrelle bat *P. pygmaeus*, brown long-eared bat *Plecotus auratus* and Leisler's bat *Nyctalus leisleri*. The former five species are listed as being of "Least concern" in the Ireland Red List No. 3: Terrestrial Mammals (Marnell *et al.*, 2009), while the latter species, Leisler's bat, is listed as being "Near threatened".

The review of records held by Bat Conservation Ireland returned 116 records of bat roosts from within approximately 10km of the subject lands. The closest three roosts were all lesser horseshoe bat, located approximately 400m, 700m and 830m south of the subject lands respectively. Six additional lesser horseshoe bat roosts lie within approximately 2km of the subject lands as well as one known common pipistrelle roost located approximately 1.6km south west of the subject lands. The distribution of Lesser horseshoe bat in Ireland is restricted to six counties on the western seaboard (*i.e.* Clare, Cork, Galway, Kerry, Limerick and Mayo) and it has the smallest predicted core area of any other species (Roche *et al.*, 2014).

2.2 FIELD STUDY RESULTS

Tree Roost Inspections

There were a few mature trees within hedgerows throughout the subject lands have some potential to host individual opportunistic roosting bats. No trees were identified as having High suitability for roosting bats, on the basis that trees contained relatively few obvious potential roost features, and no potential roosting features observed were considered likely to host anything other than a small numbers of bats. As illustrated within section 1.6 of this report a designated tree roost inspection survey will be required.

Walked Bat Activity Transect

Common pipistrelle bat, soprano pipistrelle bat, Leisler's bat and unidentified *Pipistrellus* species were recorded during each of the walked transect surveys. Calls of unidentified *Myotis* bat species were also recorded during the transect surveys undertaken on the 16th August 2018. All of these species are known to have a widespread distribution across the region, and in Ireland (Roche *et al.*, 2014).

Bats recorded during the walked transect surveys were either foraging and/or commuting along field boundaries, such as hedgerows, within the subject lands. Relatively high levels of bat activity were noted at the following locations:

- At Tooreen Lough lake adjacent to the R352;
- Along the hedgerows surrounding the woodland in the western section of the subject lands and,
- The double hedgerow lining Tooreen laneway, within the south-eastern section of the subject lands.

These areas are considered to be important for foraging and/or commuting bats.

Based on the total number of calls recorded during the walked transect and whether or not a species was recorded during both visits, the most common species recorded were soprano pipistrelle bat, followed by common pipistrelle bat and then Leisler's bat. Full details for each survey, including the results, are presented in Table 3 below. Locations of the various bat species recorded are shown on Figures 2- 8 of this report.

Table 3 Details on walked transects

Date	Survey Type	Bat species recorded	Comments
Visit 1 – Undertaken on the 7th August 2018			
07/08/2018	Dusk (Transect)	<ul style="list-style-type: none"> • Soprano pipistrelle bat, • Common pipistrelle bat, • Leisler's bat, • <i>Pipistrellus</i> species 	<p>The most commonly recorded species during the walked transect was the soprano pipistrelle bat. The majority of soprano pipistrelle bat activity was located around the pond within the property adjacent to the R352 and along the hedgerows lining Tooreen laneway which runs perpendicular to the R352.</p> <p>The next most commonly recorded species was common pipistrelle bat which was mostly noted within similar areas to soprano pipistrelle bat activity.</p> <p>Leisler's bats were also recorded but in small quantities along hedgerows within the south east of the subject lands.</p>
Visit 2 – Undertaken on the 16th August 2018			
16/08/2018	Dusk (Transect)	<ul style="list-style-type: none"> • Soprano pipistrelle bat, • Common pipistrelle bat, • Leisler's bat, • <i>Pipistrellus</i> species, • <i>Myotis</i> species 	<p>The most commonly recorded species during the walked transect was common pipistrelle bat, followed by common pipistrelle bat and Leisler's bat. The majority of bats calls were recorded: nearby to, and over Tooreen Lough; along a hedgerow stretching across the centre of the subject lands from woodland in the western section of the subject lands to a smaller block of woodland within the eastern, and within the woodland located within the western section of the subject lands.</p>

Automated Static Bat Detector Survey

In total seven bat species were recorded on automated static bat detectors deployed within the survey area including; Leisler's bat, common pipistrelle bat, soprano pipistrelle bat, brown long-eared bat, lesser horseshoe bat, unidentified *Myotis* bats¹³ and unidentified Pipistrelle bats¹⁴.

At Location 1, located within the hedgerow running from east to west across the site and directly east of the woodland area, six of the aforementioned species were recorded with lesser horseshoe bat, *Myotis sp.* and *Pipistrelle sp.* making up the majority of the calls.

At Location 2 all seven species were recorded. At this location soprano pipistrelle bat was the most common species with approximately 1,529 calls recorded, followed by Pipistrelle bat sp. and then common pipistrelle bat. Location 2 was positioned within a hedgerow running from north to south, approximately 50m north-east of the woodland area. Slightly east of this was location 6. At this location lesser horseshoe bat species was the most common species recorded, compared to all other locations, with 92 calls recorded. After this, the next most common species noted at this location were soprano pipistrelle bat (75 calls) and *Myotis* bat species. (71 calls).

Locations 3 and 5 are both located along field boundaries adjacent to Tooreen laneway. A large number of bats were recorded commuting and foraging along the hedgerows in this area with soprano pipistrelle being the most commonly detected species at both locations *i.e.* 3,983 calls and 3,292 calls for location 3 and 5 respectively. Additionally, common pipistrelle bat was the second most common species at both of these locations.

Location 4 was located within a hedgerow further along Tooreen laneway in the north-east of the subject lands, approximately 200m north of detector location 5. Similar to the other automated detectors within the east of the subject lands (*i.e.* 3 and 5), pipistrelle bats, *i.e.* common pipistrelle bat, soprano pipistrelle bat and unidentified pipistrelle bats, were most commonly recorded.

At Location 7, located within a hedgerow behind the property in the north of the site, all seven species were recorded commuting and foraging in the vicinity. Soprano pipistrelle bat was the most common species recorded with 734 calls, followed by common pipistrelle bat with 98 calls.

The most southerly deployed detector within the subject lands was location 8, which was set up within a treeline adjacent to Tooreen Lough. Soprano pipistrelle bat was the most common species recorded with 1,174 calls, followed by common pipistrelle bat with 160 calls. Other bat species recorded at this location include Leisler's bat, *Myotis* bat *sp.* and lesser horseshoe bat. Only 1 call from lesser horseshoe bats was noted.

The automated detector deployed at location 9 recorded calls from the following six species; soprano pipistrelle bat, common pipistrelle bat, Leisler's bat, lesser horseshoe bat, brown long-eared bat and *Myotis* bat *sp.* Approximately 2,115 soprano pipistrelle calls were recorded at this location, making it

¹³ Calls identified as belonging to species of the genus *Myotis* were recorded on automated detectors. Species of the genus *Myotis* which have been recorded in Ireland comprise Daubenton's bat *Myotis daubentonii*, whiskered bat *Myotis mystacinus*, Brandt's bat *Myotis brandtii* (vagrant), and Natterer's bat *Myotis nattereri*. These species tend to exhibit similar call sonograms, which are often very difficult to differentiate with any accuracy. For this reason, these species have been assigned to genus level only.

¹⁴ In some instances, it can be difficult to differentiate between calls of both pipistrelle species, where their peak frequency approaches 50kHz, and in this instance we have assigned the generic category *Pipistrellus* species.

the most common species. Similar to location 1, location 9 was deployed within the hedgerow running from east to west across the centre of the site; however, location 9 was situated further east toward Tooreen laneway.

The automated detector at location 10 was deployed within the woodland area in the west of the subject lands. *Myotis* bat *sp.* and lesser horseshoe bats were the most commonly recorded calls in this area, accounting for 250 and 184 of the calls respectively. Soprano pipistrelle and common pipistrelle were also detected, but in lesser call numbers.

Automated detectors at locations 11 and 12 were both deployed within farm sheds located in the north of the subject lands, at the end of Tooreen laneway. Both of these were placed in stone-walled sheds with corrugated metal roofs. On both detector units, soprano pipistrelle bat was the most common species recorded with 247 calls at location 11 and 126 calls at location 12. At location 11 lesser horseshoe bat was the second most commonly recorded species with 57 calls. At location 12 however, the second most commonly-recorded species was brown long-eared bat with 94 calls, followed by common pipistrelle bat with 44 calls and then lesser horseshoe bat with 25 calls noted. It is likely that detectors placed within open sheds will record bats flying outside as well as inside the shed.

Similar to location 11 and 12 described above, location 13 was located within a farm shed in the north of the subject lands. Common pipistrelle bat was the most commonly recorded species with 626 calls, then soprano pipistrelle bat with 37 calls, brown long-eared bat with 30 calls, lesser horseshoe bat with 22 calls, *Myotis* bat *sp.* with 5 calls and *Pipistrellus* bat *sp.* with 2 calls.

The final automated detector deployed was at location 14 within a stone barn behind the property located within the south of the subject lands and adjacent to the R352. Five species were recorded at this location with soprano pipistrelle comprising the majority of the calls (*i.e.* 119). Similar numbers of common pipistrelle, Leisler's bat and lesser horseshoe bat were recorded at this location, accounting for 37, 33 and 30 of the calls respectively. Only 1 call for *Myotis* *sp.* was noted.

Details on the locations, timings and species recorded at each static deployed is presented in Table 4 below.

Table 4 Results of bat activity surveys per location using automated detectors

Location	Habitat description	Deployment dates	Number of nights recorded	Species recorded ¹⁵
1	Automated detector placed within a hedgerow located directly east of woodland area.	6th July 2018 – 20th July 2018	1	<ul style="list-style-type: none"> • Pipistrelle sp. (14) • Soprano pipistrelle (10) • Common pipistrelle (8)
		7th August 2018 – 17th August 2018	6	<ul style="list-style-type: none"> • Lesser horseshoe bat (52) • Myotis sp. (51) • Leisler's bat (8) • Pipistrelle sp. (6) • Soprano pipistrelle (5) • Common pipistrelle (4)
2	Automated detector placed within a hedgerow north-east of woodland area, within the west of the subject lands.	6th July 2018 – 20th July 2018	1	<ul style="list-style-type: none"> • Pipistrelle sp. (204) • Soprano pipistrelle (79) • Common pipistrelle (15) • Lesser horseshoe bat (15)
		7th August 2018 – 17th August 2018	5	<ul style="list-style-type: none"> • Soprano pipistrelle (1,450) • Common pipistrelle (107) • Leisler's bat (34) • Myotis sp. (10) • Brown long-eared bat (1)
3	Automated detector was deployed within an ash tree along Tooreen laneway.	6th July 2018 – 20th July 2018	1	<ul style="list-style-type: none"> • Soprano pipistrelle (149) • Pipistrelle sp. (134) • Common pipistrelle (84) • Leisler's bat (39) • Myotis sp. (4)

¹⁵ The number of bat calls is provided beside each species in brackets. To note, this does not necessarily correspond to the exact number of bats using the lands; however, it does provide an indication of usage by a particular bat species at that location

Location	Habitat description	Deployment dates	Number of nights recorded	Species recorded ¹⁵
		7th August 2018 – 17th August 2018	8	<ul style="list-style-type: none"> • Soprano pipistrelle (3,834) • Common pipistrelle (341) • Myotis sp. (104) • Pipistrelle sp. (6) • Leisler's bat (6) • Lesser horseshoe bat (5)
4	Automated detector was deployed within a hedgerow, running from east to west within the north east of the subject lands.	6th July 2018 – 20th July 2018	1	<ul style="list-style-type: none"> • Common pipistrelle (81) • Pipistrelle sp. (74) • Soprano pipistrelle (60) • Leisler's bat (42) • Myotis sp. (4) • Lesser horseshoe bat (1)
		7th August 2018 – 17th August 2018	8	<ul style="list-style-type: none"> • Soprano pipistrelle (1,025) • Common pipistrelle (155) • Leisler's bat (9) • Lesser horseshoe bat (2) • Myotis sp. (1)
5	Automated detector deployed within a hedgerow, running from east to west in the north of the site.	17th August 2018 – 28th August 2018	6	<ul style="list-style-type: none"> • Soprano pipistrelle (3,292) • Common pipistrelle (423) • Lesser horseshoe bat (30) • Myotis sp. (27) • Pipistrelle sp. (4) • Leisler's bat (1)
6	Detector was deployed within a hedgerow.	20th July 2018 – 27th July 2018	1	<ul style="list-style-type: none"> • Soprano pipistrelle (71) • Common pipistrelle (18) • Lesser horseshoe bat (2) • Myotis sp. (1) • Leisler's bat (1)

Location	Habitat description	Deployment dates	Number of nights recorded	Species recorded ¹⁵
		27th July 2018 – 7th August 2018	6	<ul style="list-style-type: none"> • Lesser horseshoe bat (90) • Myotis sp. (70) • Soprano pipistrelle (4) • Leisler's bat (2) • Common pipistrelle (1)
7	Automated detector was deployed within a hedgerow towards the northern boundary of the subject lands, behind the farm sheds.	17th August 2018 – 28th August 2018	11	<ul style="list-style-type: none"> • Soprano pipistrelle (734) • Common pipistrelle (98) • Leisler's bat (55) • Myotis sp. (54) • Lesser horseshoe bat (30) • Pipistrelle sp. (4) • Brown long-eared bat (1)
8	Automated detector was placed within hedgerow/Treeline adjacent to Tooreen Lough	20th July 2018 – 27th July 2018	1	<ul style="list-style-type: none"> • Soprano pipistrelle (271) • Common pipistrelle (24)
		27th July 2018 – 7th August 2018	11	<ul style="list-style-type: none"> • Soprano pipistrelle (903) • Common pipistrelle (136) • Leisler's bat (4) • Myotis sp. (2) • Lesser horseshoe bat (1)
9	Automated detector was placed within hedgerow running from east to west across the centre of the site. It is located within the same hedgerow as location 1, except further east.	20th July 2018 – 27th July 2018	1	<ul style="list-style-type: none"> • Soprano pipistrelle (433) • Common pipistrelle (37) • Leisler's bat (10) • Lesser horseshoe bat (2) • Brown long-eared bat (1) • Myotis sp. (1)
		27th July 2018 – 7th August 2018	11	<ul style="list-style-type: none"> • Soprano pipistrelle (1,682) • Common pipistrelle (304)

Location	Habitat description	Deployment dates	Number of nights recorded	Species recorded ¹⁵
				<ul style="list-style-type: none"> • Leisler's bat (62) • Lesser horseshoe bat (49) • Myotis sp. (20) • Brown long-eared bat (4)
10	Automated detector was placed within the centre of the woodland in the western side of the subject lands.	20th July 2018 – 27th July 2018	1	<ul style="list-style-type: none"> • Myotis sp. (9) • Soprano pipistrelle (5) • Common pipistrelle (2) • Pipistrelle sp. (1)
		27th July 2018 – 7th August 2018	11	<ul style="list-style-type: none"> • Myotis sp. (241) • Lesser horseshoe bat (184) • Soprano pipistrelle (116) • Common pipistrelle (6) • Pipistrelle sp. (1)
11	Automated detector was deployed within a vehicle storage shed with corrugated metal roof and stone walls in the northern section of the subject lands.	11th October 2018 – 31st October 2018	9	<ul style="list-style-type: none"> • Soprano pipistrelle (247) • Lesser horseshoe bat (57) • Myotis sp. (19) • Common pipistrelle (1)
12	Automated detector was deployed within a tool shed with corrugated metal roof and stone walls in the northern section of the subject lands.	11th October 2018 – 31st October 2018	19	<ul style="list-style-type: none"> • Soprano pipistrelle (126) • Brown long-eared bat (94) • Common pipistrelle (44) • Lesser horseshoe bat (25) • Myotis sp. (14) • Leisler's bat (4) • Pipistrelle sp. (2)
13	Automated detector was deployed within a storage shed with corrugated	11th October 2018 – 31st October 2018	7	<ul style="list-style-type: none"> • Common pipistrelle (626) • Soprano pipistrelle (37)

Location	Habitat description	Deployment dates	Number of nights recorded	Species recorded ¹⁵
	plastic roof and stone walls in the northern section of the subject lands.			<ul style="list-style-type: none"> • Brown long-eared bat (30) • Lesser horseshoe bat (22) • Myotis sp. (5) • Pipistrelle sp. (2)
14	Automated detector was deployed within a stone barn in the property adjacent to the R352, within the southern section of the subject lands.	7th August 2018 – 17th August 2018	9	<ul style="list-style-type: none"> • Soprano pipistrelle (119) • Common pipistrelle (37) • Leisler's bat (33) • Lesser horseshoe bat (30) • Myotis sp. (1)

Significance of results per species

Figures 2–8 below show the location of each bat species as recorded within the subject lands. Locations highlighted with a star indicate a species recorded on an automated static bat detector, while locations highlighted with a circle illustrate the location of that species noted during a walked transect. The numbers beside each of the automated static bat detector recordings indicate the average number of that species recorded per night. These numbers as well as observations made during the walked transects provide an indication of the level of usage of different features within the subject lands by the different bat species. Overall, the most common species recorded during both the walked transect and automated detectors were soprano pipistrelle followed by common pipistrelle, *myotis sp.*, lesser horseshoe bat, *pipistrelle sp.*, Leisler's bat and finally brown long-eared bat.

Soprano pipistrelle bat

Soprano pipistrelle bats were noted throughout the subject lands, with the majority of activity recorded:

- along the hedgerows and field boundaries adjacent to Tooreen laneway within the eastern section of the subject lands;
- followed by the hedgerow running from north to south adjacent to the woodland area; and,
- the area adjacent to the Tooreen Lough in close proximity to the southern boundary of the subject lands.

Figure 2 Location of soprano pipistrelle bats calls recorded during both the walked transects and automated static bat detector deployment, along with the average number of soprano pipistrelle calls recorded per night during the static deployment only



Common pipistrelle bat

Similar to soprano pipistrelle bats, the majority of activity recorded for common pipistrelle was located;

- within the east of the subject lands along the hedgerow running from north to south along Tooreen laneway; and,
- along the hedgerow running from east to west adjacent to this.

The hedgerow running from north to south adjacent to the woodland as well as the farm shed in the far north of the site (*i.e.* location 13), were also deemed important for common pipistrelle bats due to the relatively high level of calls recorded within a night (*i.e.* 20.33 and 89.43 respectively).

Figure 3 Location of common pipistrelle bat calls recorded during both the walked transects and automated static bat detector deployment, along with the average number of common pipistrelle bat calls recorded in a night during the static deployment only



Unidentified Myotis bat species

No *Myotis* bat species were recorded during the first walked transect on the 7th August and only three *Myotis* bat species were recorded during the second walked transect on the 16th August. Most of the *Myotis* bat species activity recorded during this walked transect was noted along the hedgerow running from north to south directly east of the woodland area, with only one bat observed foraging along the hedgerow adjacent to Tooreen laneway.

While, *Myotis* bat species were recorded across the entire site on all automated detectors, the woodland within the west of the site had the highest number of calls. This coupled with observations made during the walked transect highlight the importance of this area for *Myotis* bat species. As for

previously described species, the hedgerow along Tooreen laneway was also deemed important for foraging and commuting *Myotis* bat species.

Figure 4 Location of *Myotis* bat species calls recorded during both the walked transects and automated static bat detector deployment, along with the average number of *Myotis* bat species calls recorded in a night during the static deployment only



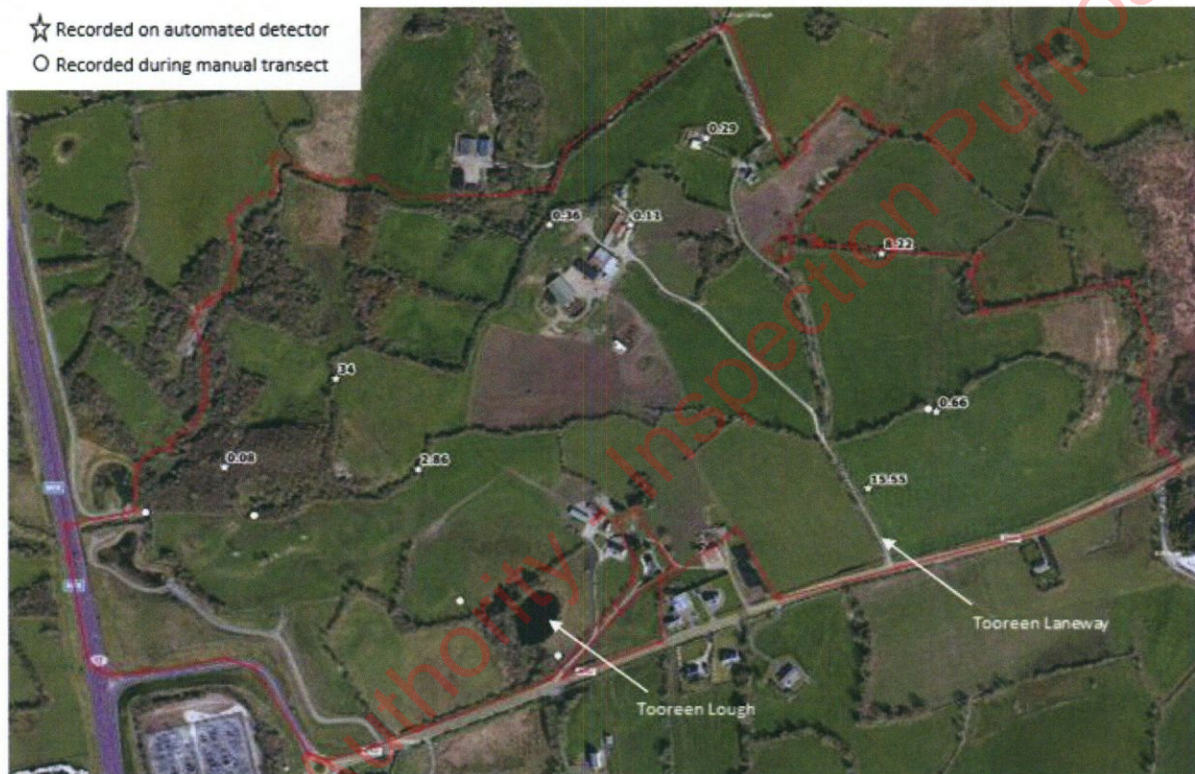
Figure 5 Location of lesser horseshoe bat calls recorded during both the walked transects and automated static bat detector deployment, along with the average number of lesser horseshoe bat calls recorded in a night during the static deployment only



Unidentified pipistrelle

The areas with the highest levels of unidentified pipistrelle bat activity were located along Tooreen laneway and the hedgerow running north to south, directly adjacent to the woodland. As illustrated in Figures 2-4, linear vegetation features within the east of the subject lands and the hedgerow located directly east of the woodland area were deemed the most important areas for commuting and foraging pipistrelle bats.

Figure 6 Location of unidentified pipistrelle bat calls recorded during both the walked transects and automated static bat detector deployment, along with the average number of unidentified pipistrelle calls recorded in a night during the static deployment only



Leisler's bat

Leisler's bat activity was confined to;

- the east and centre of the subject lands with no calls recorded around the woodland or hedgerows towards the western sections of the site.
- The highest level of activity was found along Tooreen laneway hedgerows and the adjacent field boundaries to the north east of the site.
- A higher level of activity was also noted at detector location 16, within a farm shed belonging to the property along the southern boundary.

Figure 7 Location of Leisler's bat calls recorded during both the walked transects and automated static bat detector deployment, along with the average number of Leisler's bat calls recorded in a night during the static deployment only



Brown long-eared bat

No brown long-eared bats were recorded during the walked transects. The species was recorded on automated detectors in locations 2, 8, 11, 14 and 15, with the majority of activity based around the farm buildings within the north of the subject lands (Figure 8).

Figure 8 Location of brown long-eared bat calls recorded during both the walked transects and automated static bat detector deployment, along with the average number of brown long-eared bat calls recorded in a night during the static deployment only



3. EVALUATION AND CONCLUSION

All bat species in Ireland are protected under the *Wildlife Acts 1976-2012* and are listed in Annex IV of the *EU Habitats Directive 92/43/EEC* (as amended). It is an offence under Section 23 of the *Wildlife Acts 1976-2012* and under Section 51 of the *European Communities (Birds and Natural Habitats) Regulations, 2011* to kill or to damage or destroy the breeding or resting place of any bat species. Under the *Birds and Natural Habitats Regulations* it is not necessary that the action should be deliberate for an offence to occur. This places an onus of due diligence on anyone proposing to carry out works that that might result in such damage or destruction.

Given the availability of commuting and foraging features and the suitability for buildings and vegetation within the subject lands to host a population of roosting bats, the subject lands as a whole are deemed to have a high level of suitability for bats. The specific value of each area/ feature within the lands differs depending on the species in question, however the main areas of importance include:

- the woodland along the western boundary;
- the hedgerow running from west to east through the site;
- the double hedgerow lining Tooreen laneway in the east; and,
- the hedgerow/ field boundaries surrounding the Tooreen Lough within the south of the site.

The loss of these habitats in particular may result in a direct significant impact on roosting bat species, if present, and/or indirect significant impact on commuting and/or foraging bats due to the loss of suitable foraging habitat and/or fragmentation of commuting routes.

The lowest classification given to these areas within the subject lands with regard bats is local importance (higher value), in accordance with NRA (2009) and CIEEM (2018) guidelines. This is on a precautionary basis given the protection afforded to bats and their roosts under the Wildlife Acts and under the Habitats Directive.

Although soprano pipistrelle, common pipistrelle and Leisler's bat were recorded in high numbers across the site, they are known to have a widespread distribution across the region, and in Ireland (Roche *et al.*, 2014), however common pipistrelle bats and Leisler's bats tend to show a southern bias in their distributions, with greater numbers occurring in the south west and east of the country than in the north. In contrast to this, soprano pipistrelle bats vary in abundance across the country (Aughney *et al.*, 2018). Additionally, all three species have shown an increase in their population trend. Taking this into account, as well as the availability of suitable roosting, commuting and foraging habitat in the immediate surrounding environment, the habitats within the study area are considered to be of *local importance (higher value)* for Leisler's bat and bats of the pipistrelle species. Similarly, brown long-eared bats are widely distributed across the country and have also shown an increasing population trend, thus habitats were assigned the same classification of local importance (higher value), despite the lower numbers of this species recorded through the subject lands.

Myotis bat species, including Daubenton's bat, whiskered bat and Natterer's bat *Myotis nattereri* have a relatively wide but thin distribution throughout Ireland. Bat species of the genus *Myotis* were associated most commonly with habitats within the west of the site, *i.e.* the woodland area. Outside of the subject lands the next closest area of significant woodland is c. 110m south. Similarly, certain species in the genus *Myotis* (*i.e.* Daubenton's bat) perform the majority of its foraging over water. Numerous smaller waterbodies are present outside of the subject lands, such as the larger lakes of Hoolan Lough, located approximately 500m south-east of the subject lands, Girroga Lough located approximately 2.3km west, and Ballyallia Lake located approximately 2.6km north-west. Given the widespread distribution of bats of the genus *Myotis* and the availability of similar habitat (woodland and waterbodies) within the immediate surrounding environment, the subject lands have been classified as *local importance (higher value)* for *Myotis* sp.

Although lesser horseshoe bats were found throughout the subject lands, the majority of activity was focused in the west of the site, *i.e.* within the woodland area and associated hedgerows. Unlike other species, lesser horseshoe bats do not have a wide distribution throughout the country with its core area restricted to six western counties (*i.e.* Clare, Cork, Galway, Kerry, Limerick and Mayo). Lesser horseshoe bats are known to forage a few kilometres from the roost, relying on linear landscape features to commute to and from these roosts, and avoiding flying out in the open (Roche *et al.*, 2014). As evident from the desk study, numerous small lesser horseshoe roosts exist in the vicinity of the subject lands and it is likely that they use the subject lands for foraging or the linear vegetation features for commuting to and from their roosts.

Given the small range of the species, the quantity and proximity of confirmed lesser horseshoe bat roosts around the site as well as the species' sensitivity to habitat change and removal of linear vegetation features, the subject land have been classified as national importance for lesser horseshoe bats.

Based on the information above, gathered during walked transects and automated detector deployments, the areas of highest ecological constraint within the subject lands, in the context of commuting and foraging bat species, are the woodland area in the west of the site as well as the hedgerows lining Tooreen laneway within the east. After this, the hedgerows branching off the

woodland, running from west to east, the area around the pond and associated hedgerow and the field boundary within the north east corner of the site are deemed to be of moderate ecological constraint for bat species within the lands. Finally, areas that are still considered important for local bat species, but the lowest ecological constraint in comparison, include the farm sheds within the properties to the south and north of the site.

This information is presented in Figure 9 of this report below. Areas highlighted in red indicate highest ecological constraint areas, orange indicates moderate and while indicates a lower ecological constraint area.

Figure 9 Areas of high, moderate and low ecological constraint for bats located within the subject lands



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