

IRZ categories concern the section of the river located in England. As such, further consultation with the local planning authority are required, with the possibility of a Habitat Regulations Assessment being required. The remaining statutory designated sites within the search area were more than 3km from the site and as such are too far afield to be significantly impacted due to the level of development.

There was one Local Wildlife Site recorded within the search area, comprising Bangor-on-Dee Meadows, which is located 57m from the site. Due to the close proximity, pollution control as well as dust suppression techniques should be followed to minimise pollution of the site. As the site is an infrastructure development, the LWS will not be negatively impacted by an influx of people to the area.

Habitats

The River Dee, located adjacent to the site, qualifies as a Habitat of Principal Importance due to being a river. As such, pollution prevention methods as provided earlier, should be utilised during any works.

The Himalayan balsam located within the woodland is a Schedule 9 invasive species. As such, efforts should be made to not impact the plant, with a suitable buffer surrounding the area where no works can take place, as interference may result in the spreading of seeds. If possible, management methods should be considered to remove the Himalayan balsam safely and minimise future risk.

Further Survey Requirements for Protected and Notable Species

Bats

If the woodland on site is to be impacted, further ground level tree assessments are required in order to determine the bat roost suitability of any trees. Any trees assessed as low suitability are to be soft felled, with any trees assessed as moderate or high suitability are to be subject to further aerial or nocturnal assessments.

The site offers limited suitability for foraging bats; however the river may act as a dark corridor for commuting bats and as such, lighting of the watercourse during and after the works should be avoided. A bat sensitive lighting scheme should also be followed with regards to the woodland, as this is particularly notes for its provision of foraging habitat.

Badger

No further surveys are recommended for badgers, however, a precautionary method of works is required during the works. In order to minimise the risk of harm to animals using the Site it is recommended that preventative measures are in place during construction. These precautions are:

- Mammal ladders (such as a plank) or earth ramps to be placed in any open excavations at the end of each day;
- Cap off any open pipes at the end of each day;
- Cover any open holes, or install mammal ladders or earth ramps in any open excavations at the end of each day to prevent animals from becoming trapped;
- Keep all fuel and other harmful substances in a locked area;
- Ensure any spillages are treated with spill kits;
- Night work should be avoided where possible, and any flood lighting should face away from the Site boundaries; and
- If any fresh sett digging is observed notify an ecologist immediately and leave a 20m buffer around the area until an assessment can be made.

Otters and Water Vole

The River Dee presents suitable habitat for otter, with potential resting places on the banks and local records returned. No evidence of otter was identified during the survey, however due to the time of year dense vegetation may obscure features. It is recommended that otter surveys are undertaken by boat,

between April and September, in order to determine presence/likely absence of otter within 200m of the works location.

The potential for water vole to be present within the river is limited due to the fast flow, however scoping for burrows or evidence should be carried out during the otter survey, to further consolidate this.

Nesting Birds

All vegetation clearance and tree felling should be undertaken outside of the nesting bird season (March to October). Should this not be possible a nesting bird check should be undertaken by a qualified ecologist up to 24hr prior to works commencing. Should an active nest be found no works can proceed until the chick has fledged.

Reptiles and Amphibians

Vegetation clearance should be undertaken following a precautionary method of works. Where vegetation clearance on the site is required, works should be conducted in temperatures above 11 °C ideally in the late morning to afternoon when reptiles and amphibians are most active. The habitats should first be cut to a height of 15-20cm by a hand tool such as brush cutter, progressing at walking pace only. The area should be left for 24-48hrs and then cut to 5cm using the same method, working in the same direction as the previous cut. This will allow any reptiles present to disperse into the wider environment unharmed. In the event that a reptile or amphibian is seen during the works they should be allowed to escape unharmed at their own pace. Only a trained ecologist should attempt to move them by hand. If multiple reptiles or protected amphibian species are encountered, works should cease, and the methodology be re-evaluated.

Other Fauna

In order to minimise risk to small mammals that may traverse the site during the works period, all works should be undertaken following a precautionary method of works as mentioned above for badger.

The river dee supports populations of protected or important fish such as lampreys, eels and Atlantic salmon. As such, further aquatic surveys by specialists are recommended, in order to reliably assess the impacts upon the watercourse together with the terrestrial ecology.

Advice

Biodiversity Net Gain

A Biodiversity Enhancement Plan is to be separately issued, with visualisations of the proposed enhancements.

Project Implementations

Native Planting

The grassland verges surrounding the building on site comprised poor semi-improved grassland and as such, could be enhanced through the sowing of wildflower grassland. It is recommended that a wildflower mix is used such as the N5 value long season meadow mix from Naturescape that will produce flowers from May to September. Once the wildflower meadow is established this will be easy to manage and will only require cutting once a year (recommended in June or late September).

The understorey of the woodland can also be enhanced through native planting using a ground flora seed mix such as the N10 Value Woodland Meadow Mixture, which includes heavy shade tolerant species., such as garlic mustard *Allaria petiolate*, hedge bedstraw *Gallium mollugo* and English bluebell *Hyacinthoides non scripta*.

Enhancing both of these habitats will increase the suitability for invertebrates, including lepidoptera and pollinators. This will, in turn provide an ample food source for insectivores such as bats and hedgehogs. Plant species that will encourage these species to site include field scabius *Knautia arvensis*, oxeye

daisy *Leucanthemum vulgare*, meadows cranesbill *Geranium pratense* and birds-foot-trefoil *Lotus corniculatus*. All these species can be found within the N5 value long season meadow mix and are important foodplants for invertebrates.

Hedgerow Planting

There were no hedgerows present on site. In order to achieve a net gain in linear habitats, a hedgerow could be constructed around the boundary of the site. In order to achieve a species rich hedgerow a minimum of six species should be planted, which may include blackthorn (*Prunus spinosa*), field maple (*Acer campestre*), alder (*Alnus glutinosa*), common dogwood (*Cornus sanguinea*), hazel (*Corylus avellana*) and guelder rose (*Viburnum opulus*), Standard trees such as English oak (*Quercus robur*) and wild cherry (*Prunus avium*) can also be planted at 50m intervals.

Planting should be undertaken during early winter, providing the ground is not frozen. Planting up gaps can be done in conjunction with coppicing existing plants, to give new plants minimum competition. To further reduce competition and aid establishment of the planted-up sections, the bases of the plants would be kept weed free through spot treatment of herbicide for the first three years.

Native Tree Planting

It is recommended that any trees that are removed will be replaced on a like for like basis, to limit the loss of biodiversity for the development. This will help the development to continue to support species such as roosting and foraging bats and nesting birds.

Species such as silver birch (*Betula pendula*), rowan (*Sorbus aucuparia*) and whitebeam (*Sorbus aria*) would make attractive additions to the Site. In particular rowan will provide a valuable source of berries late into the winter months and provide an important food source for native and migratory bird species. Ash and elm should currently be avoided due to the prevalence of 'Ash die-back' and 'Dutch elm disease', as stocks of these species cannot be guaranteed to be free from these afflictions. The planting of fruit trees, such as crab apple (*Malus sylvestris*) and wild cherry (*Prunus avium*) would also provide a valuable foraging resource for terrestrial mammals, such as badgers. The use of native species in tree planting is also encouraged as these can harbour a high diversity of invertebrates. For example, English oak trees have over 400 associated invertebrate species (Kennedy & Southwood, 1984). Other suggested planting of benefit to invertebrates includes:

- Willow (*Salix sp.*);
- Hawthorn (*Crataegus monogyna*);
- Blackthorn (*Prunus spinosa*);
- Hazel (*Corylus avellana*); and
- Birch (*Betula sp.*).

Habitat Boxes

In order to enhance the site for birds and increase the availability of nesting opportunities, it is recommended that nest boxes are incorporated within the completed development. Boxes should be placed on retained trees, facing south for additional warmth and with a clear flight path. Recommended boxes include the Apex bird box, as this is available in 25mm, 28mm and 32mm entrance hole sizes and as such can cater to a range of bird species.

Bat boxes could also be incorporated into the site on retained trees or buildings. Boxes should be facing towards the scrub and watercourse as these offer attractive foraging resources for bats. A recommended bat box is the Vivara Pro WoodStone Bat Box, as this is hardwearing and maintains a consistent internal temperature.

Both boxes are available from nhbs.com, and suitable locations are provided within the Biodiversity Enhancement Plan.

6. Background Investigations

Desktop Study

Statutory Protected Sites

A total of 5 statutory designated sites were recorded within the search area, the details of which are summarised in Table 4 below. The site is located within the IRZ of SSSI River Dee England, categories of which are listed below.

- **All Planning Applications**
- **Infrastructure:** Airports, helipads and other aviation proposals.
- **Air Pollution:** Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons > 750m² & manure stores > 3500t).
- **Combustion:** General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion

It should be noted that these IRZ categories regarding the section of the River Dee is in England and as such, are not reflective of the fact that the section of the Dee within Wales is also designated. Consultation with local planning authorities should still be sought, and a Habitat Regulations Assessment produced.

Table 4: Statutory Designated sites

Site Name	Designation	Location	Brief Description
Afon Dyfrdwy (River Dee Wales)	SSSI	Adjacent SE	The Afon Dyfrdwy (River Dee) SSSI supports the following habitats and species listed in the EC Habitats Directive (Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora): Rivers with floating vegetation often dominated by water crowfoot - Annex I Otter – Annex II & IV Sea lamprey – Annex II River lamprey – Annex II & V Brook lamprey – Annex II Atlantic salmon – Annex II & V Bullhead – Annex II Freshwater pearl mussel – Annex II & V Grayling – Annex V. The otter and the freshwater pearl mussel are listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended)
River Dee and Bala lake	SAC ²	Adjacent SE	Species that are primary reason for conservation of this site include, Atlantic Salmon <i>Salmo salar</i> , Floating water-plantain <i>Luronium natans</i> . Species present as qualifying feature but not a primary reason for site selection includes Sea Lamprey <i>Petromyzon marinus</i> , Brook Lamprey <i>Lampreta planeri</i> , River Lamprey <i>Lampreta fluviatilis</i> , Bullhead <i>Cottus gobio</i> and Otter <i>Lutra lutra</i> . The habitats that

Cloy Brook pastures	SSSI	3.7km SSE	The pastures support a range of uncommon species including a large population of dyer's greenweed <i>Genista tinctoria</i> , pepper saxifrage <i>Silaum silaus</i> and spiny restharrow <i>Ononis spinosa</i> . Other typical species of this type of grassland include quaking grass <i>Briza media</i> , cowslip <i>Primula veris</i> , betony <i>Stachys officinalis</i> and hoary ragwort <i>Senecio erucifolius</i> . Other species such as devil's-bit scabious <i>Succisa pratensis</i> and common agrimony <i>Agrimonia eupatoria</i> are also widespread.
River Dee (England)	SSSI ¹	4.7km NE	The River Dee lies within both England and Wales, and is notified as separate SSSIs. Species of water crowfoot <i>Ranunculus fluitans</i> x <i>aquaticus</i> and <i>Ranunculus peltatus</i> , and also floating water plantain <i>Luronium natans</i> . Otters <i>Lutra lutra</i> and water vole <i>Arvicola terrestris</i> have been recorded. The Dee supports Atlantic Salmon <i>Salmo salar</i> , sea trout <i>Salmo trutta trutta</i> , eel <i>Anguilla anguilla</i> , river lamprey <i>Lampetra fluviatilis</i> , and sea lamprey <i>Petromyzon marinus</i> . kingfisher <i>Alcedo atthis</i> and sand martin <i>Riparia riparia</i> are found along the Dee. The club-tailed dragonfly <i>Gomphus vulgatissimus</i> is nationally scarce and present along the lower Dee including several parts of the River Dee (England)
Sontley Marsh	SSSI	4.8km WNW	Extensive areas of alder carr (woodland) occur, particularly adjacent to the Gefeiliau Brook and along spring-fed water courses. Alder <i>Alnus glutinosa</i> dominates, but there are extensive stands of Common Sallow <i>Salix cinerea</i> and Goat Willow <i>S. caprea</i> together with Bird Cherry <i>Prunus padus</i> and Guelder Rose <i>Viburnum opulus</i> . tall fen vegetation dominates with stands of Great Pond-sedge <i>Carex riparia</i> , Meadow-sweet <i>Filipendula ulmaria</i> , Lesser Pond-sedge <i>Carex acutiformis</i> and Great Horsetail <i>Equisetum telmateia</i>

¹ SSSI - Sites of Special Scientific Interest

² SAC – Special Area of Conservation

European protected species licences

European Protected Species Licences (EPSL) were not identified due to there been no records accessible.

Priority Habitats

There are 3 Habitats of Principle Importance under Section 41 of the NERC Act, 2006 located within a 1km radius of the site. These are shown in a table below, with the distance and direction of the closest habitats in regard to the site referenced. The closest is a parcel of deciduous woodland on the site.

Table 5: Habitats of principal importance

Habitat	Quantity	Closest Habitat - Distance to Site	Closest Habitat - Direction to Site
Restored Ancient woodland site	2	0.66km	West southwest
Ancient semi natural woodland	1	0.73km	West southwest

Non-Statutory Protected Sites

Two non-statutorily designated sites were also identified within the search radius, details of which are provided in Table 6 below.

Table 6: Non- Statutory Designated sites

Site Name	Designation	Location	Brief Description
Bangor On Dee Meadows	LWS ²	57m	

Protected and Notable Species

Table 7: Summary of protected species

Common Name	Scientific Name	Records	Conservation Status
Amphibians			
Great crested newts	<i>Triturus cristatus</i>	42 records; closest record 0.9km NW	EPS ³ , NERC ⁴ , WCA (5) ⁵
Mammal			
European otter	<i>Lutra lutra</i>	28 records; closest record 39m SE	EPS, WCA, NERC
Unknown bat species	<i>Chiroptera</i>	1 record 0.86km SE	

² LWS – Local Wildlife Site

³ EPS – European Protected Species - protected by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019

⁴ NERC – Species of Principle Importance under Section 41 of the Natural Environment Rural Communities Act (2006) Species of Principal Conservation Importance; UKBAP & LBAP

⁵ WCA (5) – Schedule 5 protected species - Wildlife & Countryside Act (1981)

¹⁰ WCA – Wildlife & Countryside Act (1981) Section 5 protecting against trade or sale of species

European hedgehog	<i>Erinaceus europaeus</i>	2 records; closest record 0.5km N	NERC
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	1 record 0.97km S	EPS, WCA
Polecat	<i>Mustela putorius</i>	1 record 1.4km SSE	NERC
Eurasian badger	<i>Meles meles</i>	2 records within 2km of the site.	PBA ⁶
Birds			
Lapwing	<i>Vanellus vanellus</i>	5 records; closest record 347m SW	BoCCRed, NERC
Woodcock	<i>Scolopax rusticola</i>	1 record 380m ESE	BoCCRed
Barn owl	<i>Tyto alba</i>	23 records; closest record 380m ESE	BoCCGreen, WCA (1)
Bullfinch	<i>Pyrrhula pyrrhula</i>	2 records, closest record 0.51km SE	BoCCAmber, NERC
Common redstart	<i>Phoenicurus phoenicurus</i>	2 records; closest record 0.51km SE	BoCCAmber
Common sandpiper	<i>Actitis hypoleucos</i>	2 records; closest record 0.51km SE	BoCCAmber
Curlew	<i>Numenius arquata</i>	3 records; closest record 0.51km SE	BoCCRed, NERC
Dunnock	<i>Prunella modularis</i>	7 records; closest record 0.51km SE	BoCCAmber
Fieldfare	<i>Turdus pilaris</i>	7 records; closest records 0.51km SE	BoCCRed, WCA (1)
House sparrow	<i>Passer domesticus</i>	12 records; closest record 0.51km SE	BoCCRed, NERC
Kestrel	<i>Falco tinnunculus</i>	4 records; closest record 0.51km SE	BoCCAmber
Kingfisher	<i>Alcedo atthis</i>	9 records; closest record 0.51km SE	BoCCAmber, WCA (1)
Mallard	<i>Anas platyrhynchos</i>	6 records; closest record 0.51km SE	BoCCAmber
Marsh tit	<i>Poecile palustris</i>	3 records; closest record 0.51km SE	BoCCRed, NERC
Meadow pipit	<i>Anthus pratensis</i>	2 records; closest record 0.51km SE	BoCCAmber
Mute swan	<i>Cygnus olor</i>	8 records; closest record 0.51km SE	BoCC4 Amber

⁶ PBA – Protection of Badgers Act 1992

Peregrine	<i>Falco peregrinus</i>	1 record 0.51km SE	WCA1
Redwing	<i>Turdus iliacus</i>	8 records; closest record 0.51km SE	BoCCRed, WCA (1)
Reed bunting	<i>Emberiza schoeniclus</i>	2 records; closest record 0.51km SE	BoCCAmber, NERC
Sand martin	<i>Riparia riparia</i>	4 records; closest record 0.51km SE	BoCCGreen
Yellowhammer	<i>Emberiza citrinella</i>	2 records; closest records 0.51km SE	BoCCRed, NERC
Snipe	<i>Gallinago gallinago</i>	1 record 0.51km SE	BoCCAmber
Song thrush	<i>Turdus philomelos</i>	4 records; closest records 0.51km SE	BoCCRed, NERC
Spotted flycatcher	<i>Muscicapa striata</i>	3 records; closest record 0.7km SE	BoCCRed, NERC
Starling	<i>Sturnus vulgaris</i>	13 records; closest record 0.51km SE	BoCCRed, NERC
Swallow	<i>Hirundo rustica</i>	6 records; closest record 0.51km SE	BoCCGreen
Swift	<i>Apus apus</i>	2 records; closest record 0.51km SE	BoCCAmber
Brambling	<i>Fringilla montifringilla</i>	1 record 1.4km SSE	BoCCGreen, WCA (1)
Skylark	<i>Alauda arvensis</i>	1 record 1.5km SSW	BoCCRed, NERC
Linnet	<i>Linaria cannabina</i>	1 record 1.5km SSW	BoCCRed, NERC
Tree sparrow	<i>Passer montanus</i>	1 record 1.5km SSW	BoCCRed, NERC
Knot	<i>Calidris canutus</i>	1 record 1.5km SSW	
Lesser black-backed gull	<i>Larus fuscus</i>	1 record 1.7km WNW	BoCCAmber
Fish			
Sea Lamprey	<i>Petromyzon marinus</i>	6 records; closest record 0.58km SSE	
Atlantic Salmon	<i>Salmo salar</i>	2 records; closest record 0.89km S	
European eel	<i>Anguilla anguilla</i>	1 record 1km S	Eel Regs ⁷ , NERC
Invertebrates			

⁷ Eel (England and Wales) Regulations 2009

Wall	<i>Lasiommata megera</i>	1 record 0.8km SSE	NERC
Invasive Species			
Monekyflower	<i>Mimulus guttatus</i>	4 records; closest record 349m SSE	WCA (9)
American mink	<i>Neovison vison</i>	1 record 379m ESE	WCA (9)
Himalayan balsam	<i>Impatiens glandulifera</i>	8 records; closest records 454m SSW	WCA (9)
Japanese knotweed	<i>Reynoutria japonic</i>	5 records; closest record 721m SW	WCA (9) ⁸
Canadian waterweed	<i>Elodea canadensis</i>	1 record 0.51km SE	WCA (9)

7. References and Abbreviations

References

CIEEM, 2017. Guidelines for Preliminary Ecological Appraisal, 2nd edition. Chartered Institute of Ecology and Environmental Management.

Amphibian and Reptile Groups of the United Kingdom, 2010. 'ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index'. s.l.:s.n.

Institution of Lighting Professionals and Bat Conservation Trust, 2018. 'Bats and Artificial Lighting in the UK – Bats and the Built Environment Series Guidance Note'. 08/18

BS 42020:2013 'Biodiversity – Code of Practice for Planning and Development 2013: The British Standards Institution'.

Chartered Institute of Ecology and Environmental Management (CIEEM), 2019. 'Advice Note: on the Lifespan of Ecological Report and Surveys'. Winchester: CIEEM.

Chartered Institute of Ecology and Environmental Management, 2018. 'Guidelines for Ecological Impact Assessment in the UK and Ireland'. Terrestrial, freshwater and Coastal. 2nd ed. Winchester: CIEEM.

Chartered Institute of Ecology and Environmental Management, 2017. 'Guidelines for Preliminary Ecological Appraisal. 2nd ed. Winchester: CIEEM.

Collins J eds. 2016. 'Bat Surveys: Good Practice Guidelines, 3rd Edition'. London: Bat Conservation Trust.

Gent, A. H., and Gibson, S. D., eds. 2003, 'Herpetofauna Workers' Manual'. Peterborough, Joint Nature Conservation Committee.

⁸ WCA (9) - Schedule 9 Wildlife and Countryside Act 1981 (as amended)

Joint Nature Conservancy Council, 2010. 'Handbook for Phase 1 habitat survey'. Peterborough: JNCC.

Office of the Deputy Prime Minister, 06/2005.' Government Circular: Biodiversity and Geological Conservation - Statutory Obligations and their impact within the planning system'. London: ODPM.

Crested Newt (*Triturus cristatus*)'. Herpetological Journal 10 (4), 143-155.

Roper T.J., 2010, 'Badger'. Collins New Naturalist.

www.nhbs.com (Accessed 04/08/2021) Bat and Bird Boxes

Abbreviations

PEA	Preliminary Ecological Appraisal
SSSI	Site of Special Scientific Interest
LWS	Local Wildlife Site
BOCC	Birds of Conservation Concern
WCA	Wildlife and Countryside Act (1981)
PBA	Protection of Badger Act (1992)
EPS	European Protected Species
NERC	Natural Environment and Rural Communities Act 2006
BEP	Biodiversity Enhancement Plan
GCN	Great Crested Newt

APPENDIX 1

Additional Maps
