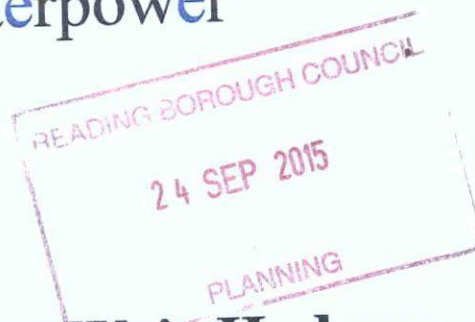
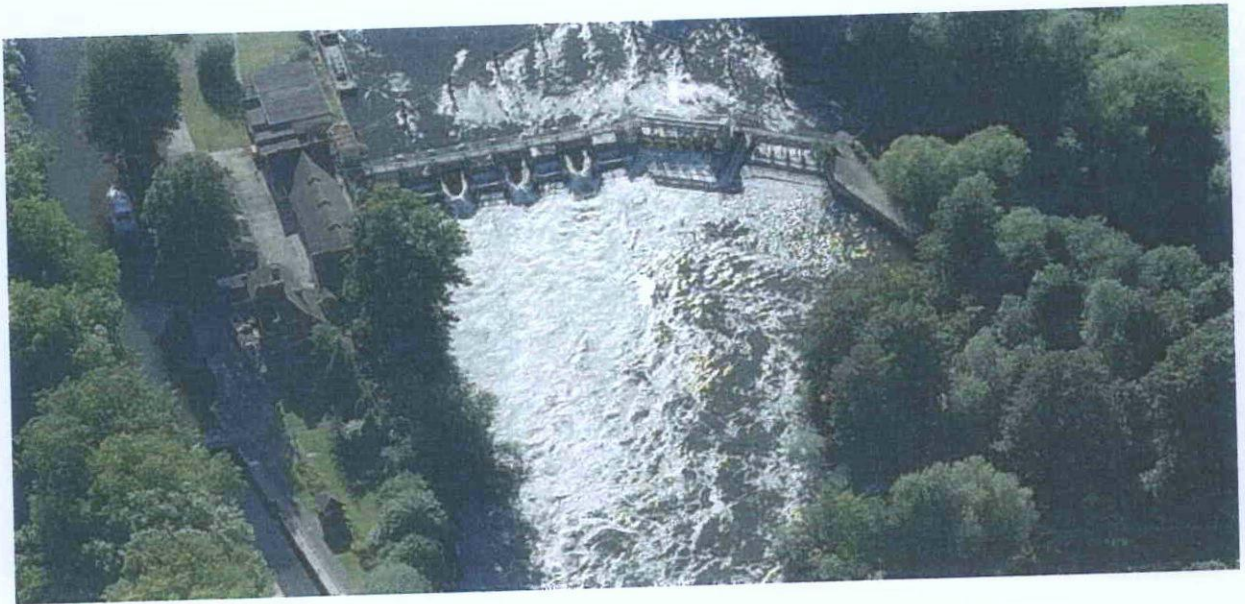




eWaterpower



Caversham Weir Hydropower Scheme Flood Risk Assessment



On Behalf of Reading Sustainable Centre CIC
17th September 2015

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Page 1

John 3:16

Electricity through waterpower

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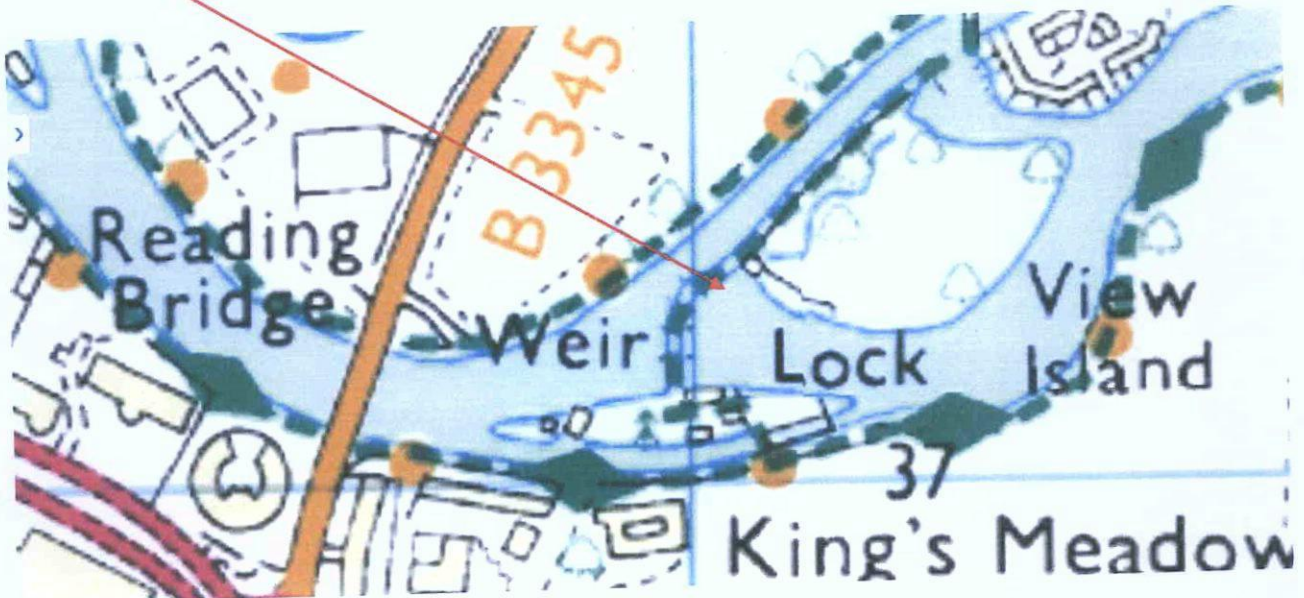


Overview

The Flood Risk Assessment (FRA) has been produced on behalf of the Reading Sustainable Centre CIC. The object of the FRA is to detail the effect of the proposed scheme on the location.

The site is within an EA designated Flood Zone 3.

The location for the development is Grid Reference is SU 72006 74124



The proposal has been adjudged by the EA not to require Flood Risk Modelling as part of their response to the licensing process. The scheme is Water Compatible.

The reasons for this are that there is no reduction in the flow capacity of the current weir complex. The scheme is on land adjacent to the weir structure.

The inclusion of two Archimedean Screws (Screws) and fish pass increases the current flow control capability at Caversham Weir.

The entrance channel, the structure supporting the Screws and the exit channel marginally increase the capacity of the flood plain.

Proposal Outline

The current layout of the site is shown below. An A3 printout is enclosed with the application.

The Standard Head Water Level (SHWL) at Caversham Lock is 36.585mAOD. The EA have specified a Hands off Level of SHWL+6", 36.735mAOD.



The proposal is to install two 2.7m diameter Screws in a new channel as shown in the drawings submitted with the application. The flow through each Screw at optimum operation will be $3.1\text{m}^3/\text{s}$ giving a total of $6.2\text{m}^3/\text{s}$

A fish pass will be installed. The design is under discussion with the EA. The proposed flow through the fish pass will be $0.6\text{m}^3/\text{s}$. The details are in the enclosed with the application as shown on the Caversham Weir Hydropower Scheme Documents List.

The planned location and layout of the Screws is shown in the drawings supplied. The Control Hut is on the Screws plinth and measures $8\text{m} \times 4\text{m}$. The floor of the control hut is set above the 100year modelled flood level, 37.91 mAOD. The EA modelled flood data is enclosed as shown on the Caversham Weir Hydropower Scheme Documents List.

The widened channel leading to the Screw channels will be 7m wide. The base of the channel will be at 34.03mAOD, 1.4m below SHWL 35.535mAOD at the entrance to the Screw and marginally deeper at the upstream entrance of the widened channel. This increases the capacity of the flood plain marginally by approximately 50m^3 .

This excludes the Screw channels, the semi-Natural Fish Pass and the exit channel from the Screws.

The spoil removed in the construction will be removed to land above the flood plain.

The underside of the plinth on which the upper bearing of the Screw, the gearbox and the generator are located is set at 54.90mAOD. The floor of the plinth is set at 55.40mAOD. This ensures that all sensitive equipment will be above the modelled flood level with an allowance for climate change.

Each Screw channel has a sluice gate that is 1.5m deep. When open the base of the sluice gate is level with the base of the plinth.

In a Flood event the downstream water level will rise and eventually “drown out” the Screw. Drown-out occurs when the level of water over the screw rises to 2/3rds of the way up the Screw. Drown-out will occur at 35.535mAOD. When this occurs there is zero generation and the gates shut mechanism will activate and the sluice gate will close automatically stopping any downstream flow through the Screw channel. In general the Sluice Gates are only closed for three reasons, apart from a flood event.



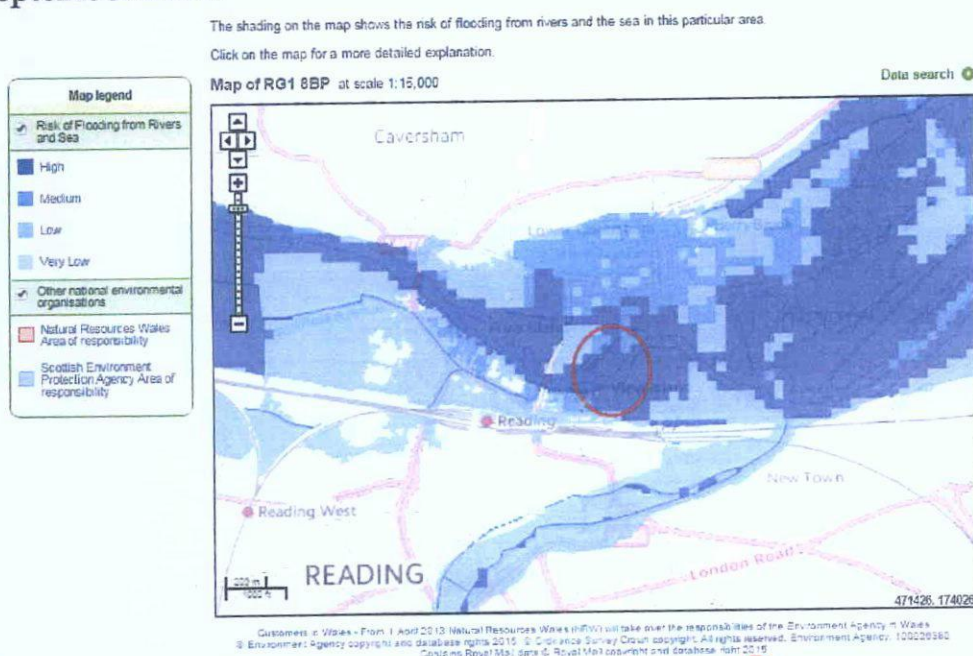
1. The flow in the river is below the Hands off Level and the Screws are not operating.
 2. The Screw is shut down for maintenance. This will only be scheduled to happen during low flows.
 3. There is insufficient flow for all of the Screws to be operating.
- None of the above will affect a flood event.

The pulling order of the weir will be changed to accommodate the Screws. The revised Pulling Order proposal document is enclosed. When the Screw is at full take then the Weir Gates start to be used to pass increasing flows. In a flood event the Screw Sluice Gates will shut. The Lock Keeper will use the weir gates to control the downstream flow levels. The current flow pattern will not be altered in a flood event

Assessment of the Flood Risk

The hydropower scheme proposed is at Caversham Weir on the River Thames. The site is located within an EA designated Flood Zone 3; the Sequential Test does not apply. The proposed development is Water Compatible. The National Planning Policy Framework (NPPF) requires an FRA to be submitted as part of the Planning Application and Licensing process. The FRA is based around the Exception Tests as required.

The flood map, below, for Caversham Weir was taken from the EA website on 17th September 2105.



The location of the scheme is within the red circle. ○





The sole source of flood risk is from fluvial flows. There is no risk from tidal flows the site is above the tidal reach of the River Thames.

There is no risk from surface water, groundwater and infrastructure failure as the site is within the River Thames.

Exception Test

The Exception Tests are primarily designed for major developments within a flood plain; however, they can and have been applied to this development. The minimum requirements for an FRA are covered and answered below. An FRA should:

- be proportionate to the risk and appropriate to the scale, nature and location of the development;
 - The major equipment and base of the control hut are all located above the 100year plus climate change flood level.
- consider the risk of flooding arising from the development in addition to the risk of flooding to the development;
 - The Screw channel and the Fish pass have increased the capacity of the flood plain and the sensitive part of the structure is above the 100 year plus climate change flood level. The scheme will not impede flow in flood conditions due to the introduction of the fish pass and new hydro channel.
- take the impacts of climate change into account;
 - this has been calculated into the flood level and used to set the lowest level of major equipment.
- consider both the potential adverse and beneficial effects of flood risk management infrastructure including raised defences, flow channels, flood storage areas and other artificial features together with the consequences of their failure;
 - the flood risk management infrastructure has not been altered by the addition of Screw channel at the Caversham Weir. There are no adverse effects. The flood plain capacity will have been increased, flood storage areas have therefore been increased also. There are no new artificial features that could fail and increase the flood risk over and above the present situation.



- consider the vulnerability of those that could occupy and use the development, taking account of the Sequential and Exception Tests and the vulnerability classification, including arrangements for safe access;
 - the control room is not occupied on a daily basis. Control of the system is by remote access. In the event of a 100 year plus climate change flood no access would be available to the Weir. If access to the Weir is affected during a flood event this will affect the control of the weir gates but not the control of the Screw.
- consider and quantify the different types of flooding (whether from natural and human sources and including joint and cumulative effects) and identify flood risk reduction measures, so that assessments are fit for the purpose of the decisions being made;
 - the site is within a flood plain and only affected by natural sources. The flood risk reduction measure is the increased flow capability and the increased flood plain capacity awarded by the scheme.
- consider the effects of a range of flooding events including extreme events on people, property, the natural and historic environment and river and coastal processes;
 - the scheme will have a positive effect. Extreme events on the river will be reduced by the increased flood plain capacity and increased flow capability afforded by the scheme.
- include the assessment of the remaining (known as 'residual') risk after risk reduction measures have been taken into account and demonstrate that this is acceptable for the particular development or land use;
 - there is no residual risk as the flow control capability of the site has not been diminished and the flood plain capacity has been increased.
- consider how the ability of water to soak into the ground may change with development, along with how the proposed layout of development may affect drainage systems;
 - The development will have no effect on the ability of water to soak into the ground. The development will have no effect on drainage systems, there are none associated with the site.



Conclusion

The capacity of the flood plain has been increased.

The flow capability of the Caversham Lock and Weir complex in a flood event remains unchanged.

It has been shown that the development will have a positive impact on the location.

The overall assessment is therefore that the proposed scheme will be beneficial to the local community in that it reduces the flood risk.

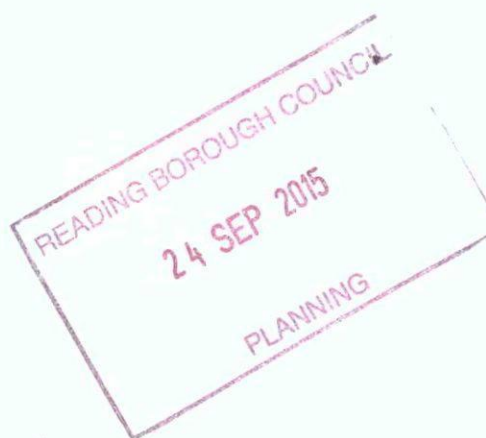
B.Barrow

17th September 2015

Extended Phase 1 Habitat Survey

Land at View Island, Reading, Berkshire

July 2015



151715



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NB. Information on legally protected, rare or vulnerable species may appear in ecological reports. In such cases it is recommended that appropriate caution be used when circulating copies. Whilst all due and reasonable care is taken in the preparation of reports, EcoConsult Ltd accepts no responsibility whatsoever for any consequences of the release of this report to third parties.

1 Introduction

1.1 Ecoconsult Ltd has been commissioned to carry out an extended phase 1 habitat survey of land at View Island, Reading, Berkshire. There is a proposal to construct a hydro-electric scheme on a section of the island and the adjacent bank of The River Thames.

1.2 The following work has been undertaken to inform this report:

- an ecological data search
- an extended phase 1 habitat survey of the site
- an otter survey for the site and surrounding land
- a water vole survey for the site and surrounding land
- great crested newt environmental DNA survey (eDNA)

1.3 Information has been used to describe habitats of nature conservation interest at the site and provide an assessment of potential ecological impacts.

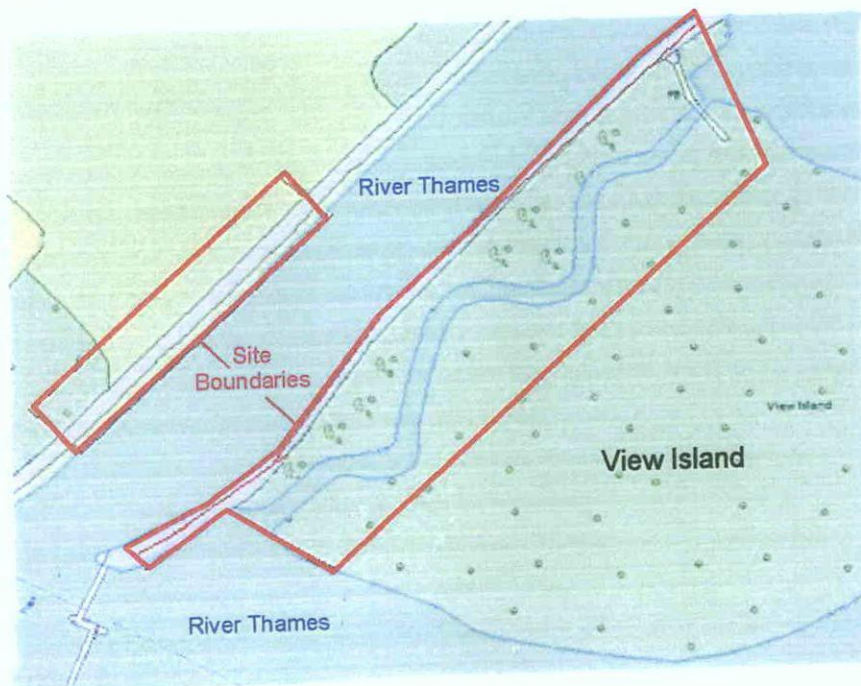


Figure 1: Survey site location (red line) in relation to View Island

2 Survey Methodology

Desk study

- 2.1 A data search was requested from The Thames Valley Environmental Records Centre (TVERC) for the site and 1km radius from the site boundary to provide records for designated sites and protected and notable species.
- 2.2 The MAGIC website was searched to provide information regarding international statutory nature conservation sites within 5km from the site boundary.
- 2.3 The site was assessed in relation to Natural England's Sites of Special Scientific Interest (SSSI) Impact Risk Zones (IRZs).
- 2.4 Aerial photographs and 1:10,000 Ordnance Survey maps were used to search for ponds within 500m of the site.

Field surveys

Phase 1 habitat survey

- 2.5 The extended phase 1 habitat survey was carried out on 2nd June 2015 and followed the methodology in *Handbook for Phase 1 Habitat Survey* (Joint Nature Conservation Committee, 2003) and *Guidelines for Baseline Ecological Assessment* (Institute of Environmental Management and Assessment, 1995).

Otter survey

- 2.6 An otter survey was carried out on 2nd June 2015 along The River Thames for the site and 200m up and downstream from the site boundary. The survey involved a walkover survey to identify the following field signs: holts and couches, spraints, footprints and visual sightings.

Water vole survey

- 2.7 A water vole water vole survey was carried out on 2nd June 2015 along The River Thames immediately adjacent to the site and 50m up and downstream from the site boundary. The ditch/pond running through the site was also surveyed. The survey focused on recording the following field signs: latrines, feeding stations, burrows, paths / runs and visual.

Great crested newt eDNA survey

- 2.8 Pond 1 (on site) and pond 2 (20m from site boundary on View Island) were tested for great crested newt environmental DNA (eDNA) following guidance in Biggs J *et al.* (2014). The samples were collected on 22nd June 2015 and analysed by SureScreen Scientifics.

3 Results of data search

Statutory Nature Conservation Sites

- 3.1 There are no international statutory nature conservation sites located within 5km from the site boundary.
- 3.2 There are no national statutory nature conservation sites located within 2km from the site boundary.

Site of Special Scientific Interest Impact Risk Zone (IRZ)

- 3.3 The site lies within a Site of Special Scientific Interest Impact Risk Zone. Risks where Natural England should be consulted by the Local Planning Authority are listed below:
- Discharges: Any discharge of water or liquid waste that is more than 20,000 litres/day. The water needs to either be discharged to ground (ie to seep away) or to surface water, such as a beck or stream. Discharges to mains sewer are excluded).

Non-Statutory Nature Conservation Sites

- 3.4 Two Local Wildlife Sites (LWS) are located within 1km from the site boundary. Please see details below:
- The Coal, Kennetmouth & Kings Meadow East LWS is located 415m east of the site. The site includes woodland, grassland and marginal habitat and is important for the presence of Loddon lily.
 - Henley Road Gravel Pit LWS is located 840m east of the site. The site is one of the best sites for wildfowl in South Oxfordshire.

Protected and Notable Species

Bats

- 3.5 The Thames Valley Environmental Records Centre currently holds twenty five bat records within 1km from the site boundary. The records include Daubenton's, common pipistrelle, soprano pipistrelle, brown long-eared and noctule bats. None of the records are specific for View Island, although a number of records are 1km records.

Badger

- 3.6 The Thames Valley Environmental Records Centre currently holds six badger sett records within 1km from the site boundary.

Water vole

- 3.7 The Thames Valley Environmental Records Centre does not currently hold any water vole records for the site or within 1km from the site boundary.

Otter

- 3.8 The Thames Valley Environmental Records Centre does not currently hold any otter records for the site or within 1km from the site boundary.

Hedgehog

- 3.9 The Thames Valley Environmental Records Centre currently holds two hedgehog records within 1km from the site boundary. None of the records are located within the site boundary.

Birds

- 3.10 Thames Valley Environmental Records Centre currently holds records for nine species of protected/notable bird species within 1km from the site boundary.

Amphibians

- 3.11 The Thames Valley Environmental Records Centre does not currently hold any great crested newt records for the site or within 1km from the site boundary.
- 3.12 There are records for common toad, common frog and smooth newt for the Caversham area within 1km from the site.

Reptiles

- 3.13 The Thames Valley Environmental Records Centre currently holds two records for grass snake and slow-worm within 1km from the site boundary. None of the records are located within the site boundary and the slow-worm record is from 1982.

Fish

- 3.14 The Thames Valley Environmental Records Centre currently holds a single European eel record for Blake's Lock located c.800m southeast of the site.

Invertebrates

- 3.15 The Thames Valley Environmental Records Centre currently holds twenty three records for stag beetle and two notable true fly records within 1km from the site boundary. The site provides suitable stag beetle habitat.

Plants

- 3.16 The Thames Valley Environmental Records Centre currently holds four records for summer snowflake at The Coal, Kennetmouth & Kings Meadow East LWS located 415m east of the site.

4 Results of Field Surveys

Local context

- 4.1 The site is comprised of two locations close to the centre of Reading on The River Thames. Hills Meadow Park is located immediately to the north of the site and includes areas of rough grassland, tall ruderal and planted woodland/trees. Immediately to the south and west is View Island supporting areas of semi-improved grassland, scrub, planted woodland and tall ruderal habitat. Beyond View Island is The River Thames and King's Meadow Park which is dominated by areas of amenity grassland with linear sections of planted woodland. To the west is The River Thames and Hills Meadow Carpark. The site is located at grid reference: SU 72076 74175.

Habitats

- 4.2 The majority of the site is dominated by semi-natural broadleaved woodland with the northern section of the site supporting areas of poor semi-improved grassland. Please refer to phase 1 habitat map in Figure 2 below. Habitats represented within the site include:

- semi-natural broadleaved woodland
- poor semi-improved grassland
- marginal vegetation
- scattered scrub
- scattered tall ruderal
- pond
- individual tree
- river
- dry ditch
- hard-standing

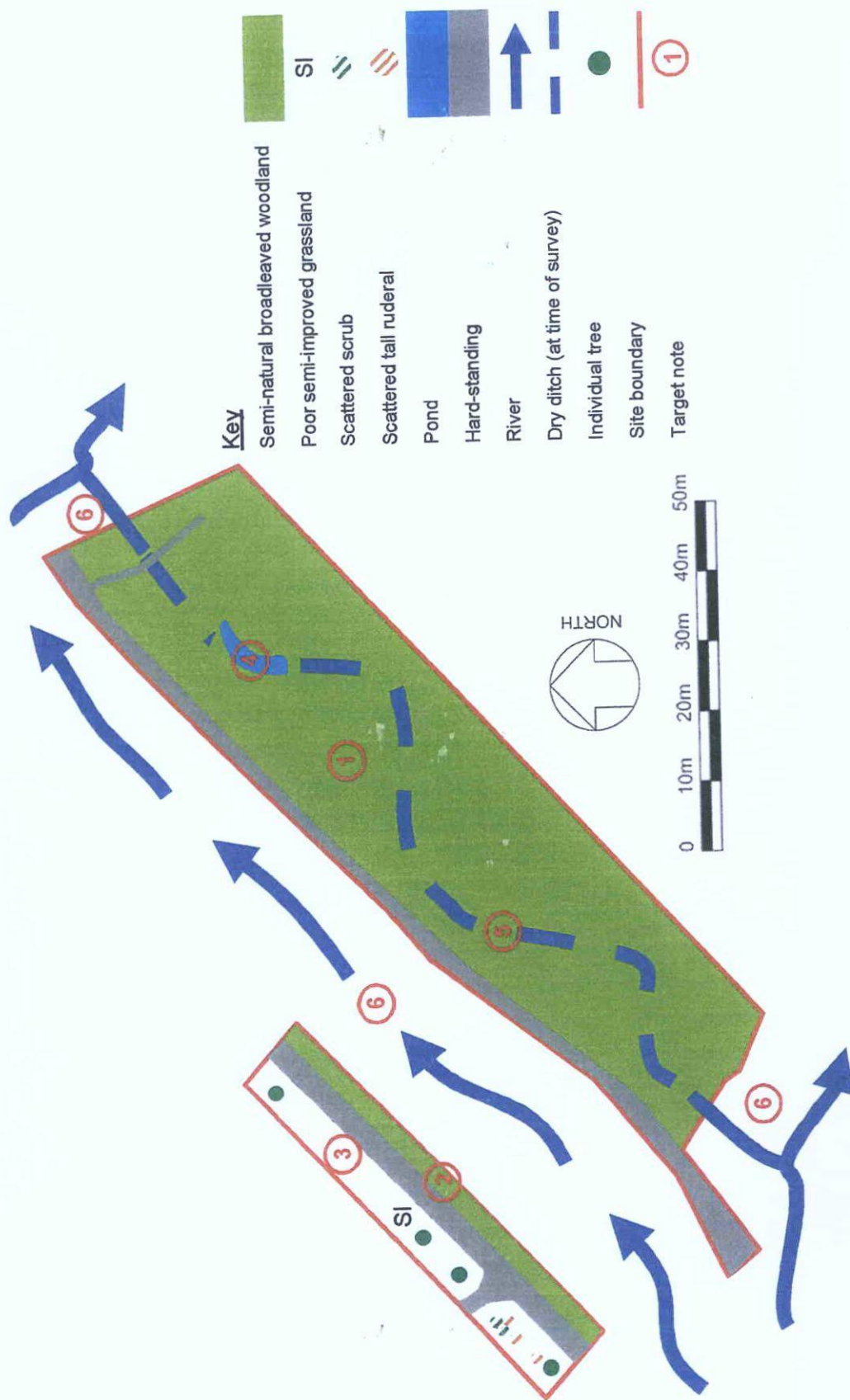


Figure 2: Phase 1 habitat map

Semi-natural broadleaved woodland

- 4.3 The majority of the site is dominated by semi-natural broadleaved woodland which is a UK Biodiversity Action Plan priority habitat (UKBAP priority habitat) (see Figure 2, target notes 1 and 2). The larger area of woodland is located on View Island and dominates the location of the hydro scheme (target note 1).



The canopy supports locally abundant ash and sycamore and only occasional crack willow. Large diameter fallen deadwood and stumps are present and a dry ditch runs through the centre. Mature trees include seven bird boxes and a single bat box with a number clad in thick-stemmed ivy. The field-layer is relatively species-poor and includes a number of invasive non-native species including Japanese knotweed and Himalayan balsam. A dry ditch runs through the centre of the woodland that appears to hold water seasonally. People and their dogs use the woodland and a tarmac footpath runs along the northern section. Please see botanical species and their respective abundance scores in tables below.

Canopy species		
Scientific Name	Common Name	Abundance score
<i>Acer pseudoplatanus</i>	Sycamore	LA
<i>Fraxinus excelsior</i>	Ash	LA
<i>Salix fragilis</i>	Crack willow	O

Understorey species		
Scientific Name	Common Name	Abundance score
<i>Acer pseudoplatanus</i>	Sycamore	F
<i>Crataegus monogyna</i>	Hawthorn	F
<i>Fraxinus excelsior</i>	Ash	F
<i>Ilex aquifolium</i>	Holly	R
<i>Lonicera nitida</i>	Wilson's honeysuckle	LF
<i>Prunus domestica</i>	Plum	R
<i>Ribes nigrum</i>	Black currant	LF
<i>Rubus fruticosus</i> agg.	Bramble agg.	LF
<i>Sambucus nigra</i>	Elder	O

Field-layer species		
Scientific Name	Common Name	Abundance score
<i>Angelica sylvestris</i>	Wild angelica	O
<i>Anthriscus sylvestris</i>	Cow parsley	O
<i>Aster</i> agg.	Michaelmas-daisy agg.	R
<i>Brachypodium sylvaticum</i>	Wood false-brome	LF
<i>Carex pendula</i>	Pendulous sedge	R
<i>Carex remota</i>	Remote sedge	O
<i>Carex riparia</i>	Greater pond sedge	LF
<i>Dryopteris filix-mas</i>	Male fern	R
<i>Eupatorium cannabinum</i>	Hemp agrimony	O
<i>Fallopia japonica</i>	Japanese knotweed	R
<i>Festuca gigantea</i>	Giant fescue	R
<i>Galium aparine</i>	Cleavers	LF
<i>Hedera helix</i>	Common ivy	A
<i>Impatiens glandulifera</i>	Indian balsam	LA
<i>Iris pseudacorus</i>	Yellow flag	O
<i>Lycopus europaeus</i>	Gipsywort	R
<i>Lysimachia nummularia</i>	Creeping Jenny	O
<i>Narcissus pseudonarcissus major</i>	Spanish daffodil	O
<i>Oenanthe crocata</i>	Hemlock water-dropwort	O
<i>Parthenocissus quinquefolia</i>	Virginia creeper	R
<i>Pentaglottis sempervirens</i>	Green alkanet	LF
<i>Phyllitis scolopendrium</i>	Hart's-tongue	R
<i>Poa trivialis</i>	Rough-stalked meadow-grass	O
<i>Rumex conglomeratus</i>	Clustered dock	LF
<i>Symphytum officinale</i>	Comfrey	O
<i>Urtica dioica</i>	Common nettle	LF

- 4.4 A narrow linear section of semi-natural broadleaved woodland runs adjacent to The River Thames in the northern section of site (see Figure 2, target note 2). Large diameter fallen deadwood is present and a 1m wide strip of regularly mown grassland runs adjacent to the footpath. A number of mature trees are present clad in thick-stemmed ivy. Marginal vegetation extends into the river and in some places a swampy field-layer has developed. Please see botanical species and their respective abundance scores in tables below.



Canopy species		
Scientific Name	Common Name	Abundance score
<i>Acer pseudoplatanus</i>	Sycamore	F
<i>Fraxinus excelsior</i>	Ash	O
<i>Prunus domestica</i>	Plum	R
<i>Salix caprea</i>	Goat willow	O
<i>Salix fragilis</i>	Crack willow	F

Understorey species		
Scientific Name	Common Name	Abundance score
<i>Acer pseudoplatanus</i>	Sycamore	F
<i>Fraxinus excelsior</i>	Ash	O
<i>Rubus fruticosus</i> agg.	Bramble agg.	A
<i>Salix cinerea</i>	Grey willow	R
<i>Sambucus nigra</i>	Elder	R

Field-layer species		
Scientific Name	Common Name	Abundance score
<i>Carex remota</i>	Remote sedge	R
<i>Carex riparia</i>	Greater pond sedge	LA
<i>Epilobium hirsutum</i>	Great willowherb	R
<i>Epipactis helleborine</i>	Broad-leaved helleborine	R (one plant)
<i>Galium aparine</i>	Cleavers	O
<i>Geum urbanum</i>	Wood avens	R
<i>Hedera helix</i>	Common ivy	LA
<i>Iris pseudacorus</i>	Yellow flag	R
<i>Narcissus pseudonarcissus major</i>	Spanish daffodil	R
<i>Symphytum officinale</i>	Comfrey	LF
<i>Urtica dioica</i>	Common nettle	O

Poor semi-improved grassland

- 4.5 A narrow linear section of poor semi-improved grassland runs along the northern section of the site (see Figure 2, target note 3 and image below). The grassland is mown intermittently, and more frequently cut towards the east almost becoming amenity grassland. Scattered tall ruderal and scrub has developed in the western section and large diameter dead wood trunks are present (see image below). Individual trees are present including a mature London Plane *Platanus hybrid*. Please see botanical species and their respective abundance scores in table below.



Scientific Name	Common Name	Abundance score
<i>Poa trivialis</i>	Rough-stalked meadow-grass	A
<i>Lolium perenne</i>	Perennial rye-grass	A
<i>Cirsium arvense</i>	Creeping thistle	LA
<i>Poa annua</i>	Annual meadow-grass	LA
<i>Taraxacum officinale</i> agg.	Dandelion sp.	LF
<i>Urtica dioica</i>	Common nettle	LF
<i>Dactylis glomerata</i>	Cock's-foot	O
<i>Festuca rubra</i> agg.	Red fescue agg.	O
<i>Hordeum murinum</i>	Wall barley	O
<i>Rumex obtusifolius</i>	Broadleaved dock	O
<i>Trifolium repens</i>	White clover	O
<i>Carex hirta</i>	Hairy sedge	R
<i>Plantago lanceolata</i>	Ribwort plantain	R

Individual tree

- 4.6 Four individual trees have been planted in the northern section of site above the poor semi-improved grassland (see Figure 2). The trees include a single mature London plane (see image to right), young London plane and two silver birch. The mature London plane includes a single rot hole that was upturned and provided low suitability to support roosting bats.



Pond

- 4.7 A single pond is present within the site boundary on View Island (see Figure 2, target note 4 and image to right). The linear pond has developed in the ditch and measured c.15mL x 2mW with a maximum depth of c.150mm. The pond appeared to have been larger with a wide drawdown zone. Please see marginal and aquatic botanical species and their respective abundance scores in table below.



Scientific Name	Common Name	Abundance score
<i>Callitriche stagnalis</i>	Common water starwort	R
<i>Carex remota</i>	Remote sedge	LF
<i>Carex riparia</i>	Greater pond sedge	O
<i>Eupatorium cannabinum</i>	Hemp agrimony	O
<i>Iris pseudacorus</i>	Yellow flag	LF
<i>Lycopus europaeus</i>	Gipsywort	O
<i>Mentha aquatica</i>	Water mint	O
<i>Oenanthe crocata</i>	Hemlock water-dropwort	O

Dry Ditch

- 4.8 A dry ditch runs through the centre of the semi-natural broadleaved woodland (see Figure 2, target note 5). The ditch appeared to be seasonally inundated with the remains of water ponded in the eastern section (see pond section above). The majority of the ditch supported bare-earth with marginal species beginning to develop from the woodland field-layer. People and dogs regularly enter the ditch area.

River

- 4.9 The River Thames runs through and around the site (see Figure 2, target note 6). 'Rivers' is a UK Biodiversity Action Plan Priority habitat (UKBAP priority habitat). The section of river associated with the site includes two weir pools with long stretches of reinforced banks. Marginal vegetation is present, although limited within, and



adjacent to the site boundary due to heavy shading from woodland. Please see marginal and aquatic botanical species and their respective abundance scores in table below.

Scientific Name	Common Name	Abundance score
<i>Carex remota</i>	Remote sedge	R
<i>Carex riparia</i>	Greater pond sedge	LD
<i>Epilobium hirsutum</i>	Great willowherb	O
<i>Eupatorium cannabinum</i>	Hemp agrimony	R
<i>Iris pseudacorus</i>	Yellow flag	LF
<i>Lycopus europaeus</i>	Gipsywort	O
<i>Mentha aquatica</i>	Water mint	R
<i>Nuphar lutea</i>	Yellow water lily	LF
<i>Oenanthe crocata</i>	Hemlock water-dropwort	O

Hard-standing

- 4.10 Footpaths run through the northern and southern sections of the site (see Figure 2).

Species

Otter

- 4.11 No otter holts were recorded on site or within 200m of the site boundary. The site and surrounding land is heavily used by pedestrians and dogs, boats and fishing, consisting of parkland, residential properties and public footpaths. Although no evidence of use by otters was recorded (spraints or foot prints), otters will use the river for commuting and foraging.

Water vole

- 4.12 No evidence of use by water voles was recorded during the survey for the site or within 100m from the site boundary. Large sections of the bank are reinforced, and woodland within the site promotes dense shade preventing growth of marginal vegetation along sections of bank.

Great crested newt

- 4.13 A single pond is present within the site boundary that has developed within the dry ditch on View Island (see Figure 2, target note 4). A second pond is located within 20m of the site boundary on View Island. No additional ponds are located within 500m of the site boundary. The ponds have been scored for their suitability to support great crested newts (see Table 1 below). Pond 1 on site scored 0.39 which is categorised as providing poor habitat to support great crested newts. Pond 2 located 20m from the site boundary scored 0.80 which is categorised as providing excellent habitat to support great crested newts. The two ponds on View Island are isolated from the surrounding environment by The River Thames which encircles the entire View Island. A single narrow pedestrian access bridge joins View Island to Heron Island to the east and runs across the weir to the lock to the west.
- 4.14 An environmental DNA (eDNA) survey was carried out on Pond 1 and Pond 2. Pond 1 tested positive for presence of great crested newts. Pond 2 tested negative for presence of great crested newts. Please see Table 2 below for results.

Table 1: Great crested newt habitat suitability scores for ponds on View Island

Suitability indices	Pond reference	
	Pond 1 (on site)	2 View Island
SI1 - Location	1	1
SI2 - Pond area	0.1	0.6
SI3 - Pond drying	0.1	0.9
SI4 - Water quality	0.33	0.67
SI4 - Shade	0.2	1
SI6 - Fowl	1	1
SI7 - Fish	1	0.67
SI8 - Ponds	0.45	0.45
SI9 - Terr'l habitat	1	1
SI10 - Macrophytes	0.3	1
HSI score	0.39	0.80
Categorisation of HSI score	Poor	Excellent
Distance from site	0m	20m

Table 2: Results of great crested newt eDNA test

**Results**

Sample	Co-Ordinates	Positive Replicates	Negative Replicates	Result
D0956-1	SU 72114 74190	1	11	Positive
D0956-2	SU 72106 74139	0	12	Negative

Bats

- 4.15 There are no buildings present on site. The timber bridge does not provide suitable roosting bat habitat.
- 4.16 Seven trees associated with the semi-natural broadleaved woodland (see Figure 2, target note 1) provide suitable bat roosting habitat ranging from high to low/medium potential to support bats. Features associated with the trees that could provide suitable bat roosting habitat include woodpecker holes, rot holes, bat/bird boxes, thick-stemmed ivy, cavities and flaking bark (see plates 1 to 6 below for examples). Additional trees in the woodland include seven bird boxes that could also provide suitable bat roosting habitat.
- 4.17 Six trees associated with the linear section of semi-natural broadleaved woodland (see Figure 2, target note 2) provide suitable bat roosting habitat behind thick-stemmed ivy. The potential for the trees to support roosting bats has been assessed as being low/medium.
- 4.18 Bats will use the site for foraging and commuting, particularly areas of woodland and river. Features suitable for use by commuting bats will be retained within the proposed scheme and habitat links between surrounding semi-natural habitat will not be affected.



Plate 1: Thick-stemmed ivy



Plate 2: Bird box and rot hole in distant tree



Plate 3: Crevice in tree

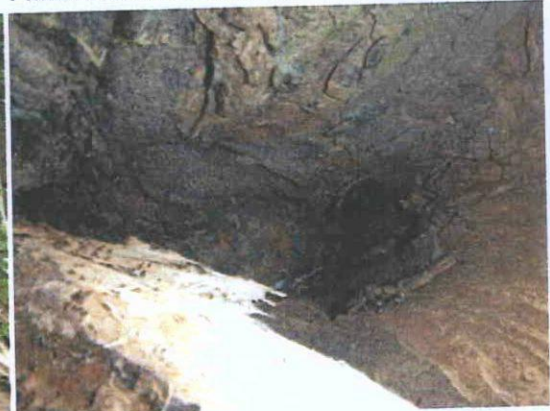


Plate 4: Cavity in tree



Plate 5: Bat box with woodpecker hole below



Plate 6: Flaking bark

Badger

- 4.19 No badger setts were recorded on site or located within close proximity to the site boundary. No evidence of foraging or commuting by badgers was recorded within the site boundary.

Reptiles

- 4.20 The majority of the site supports woodland and is heavily shaded. Small areas of habitat that could support reptiles include poor semi-improved grassland adjacent to the public footpath in the northern section of site, woodland edge along the southern section of woodland and river.

Nesting birds

- 4.21 Habitats present on site that provide suitable nesting bird habitat include woodland, river, marginal and individual trees. Birds recorded nesting on or adjacent to the site included great crested grebe, mute swan, blue tit and coot.
- 4.22 The following red listed Birds of Conservation Concern were recorded on site during the survey: Starling. The following amber listed Birds of Conservation Concern were recorded on site during the survey: mallard, black-headed gull, grey wagtail, great crested grebe and dunnoek. A detailed list of all birds recorded during the phase 1 habitat survey can be seen in Appendix B.

5 Conclusions and Recommendations

- 5.1 An extended Phase 1 Habitat Survey, water vole survey, otter survey, great crested newt eDNA test and ecological data search have been undertaken for land at View Island, Reading, Berkshire.

Nature conservation sites

- 5.2 There are no likely impacts to any statutory or non-statutory nature conservation sites.

Habitats

- 5.3 The site is dominated by semi-natural broadleaved woodland. The River Thames runs through the centre of the site.
- 5.4 Habitats to be affected by the proposals include semi-natural broadleaved woodland (UKBAP Priority Habitat), river (UKBAP Priority Habitat), poor semi-improved grassland, scattered tall ruderal and scrub, pond and ditch.

The River Thames

- 5.5 The intake channel for the hydrodynamic screws will modify the existing river bank. The majority of the bank in the proposed intake channel location is reinforced with concrete and supports limited marginal vegetation and therefore is of low ecological value. However, creation of the channel and hydrodynamic screws will result in the direct loss of trees associated with the semi-natural broadleaved woodland.
- 5.6 The location of the proposed fish pass will affect a small section of river bank in the east and west of the site that provides habitat of low ecological value due to heavy shading and reinforced banks.

Semi-natural broadleaved woodland

- 5.7 A section of semi-natural broadleaved woodland habitat will be lost and disturbed as a result of the proposed hydrodynamic screws and route of the fish pass. The existing structure of the woodland will be affected with areas of dead and dying wood removed and under-story and field layer reduced in area and disturbed. The woodland includes mature trees that provide suitable bat roosting habitat.

Pond

- 5.8 Creation of the fish pass will result in de-silting and re-profiling the banks of the existing ditch running through the woodland. This will result in the loss of a pond that supports great crested newts.

Habitat recommendations / enhancements

- 5.9 Where possible, mature trees will be retained.
- 5.10 The landscape plan should include the planting of new native trees and shrubs that are representative of the geographical location of the site.
- 5.11 Large diameter dead wood will be retained on site. This includes existing deadwood and trees felled as a result of the proposals.
- 5.12 The new fish will be designed to provide new wetland habitat including marginal vegetation along the fish pass.

Legally protected speciesBats

- 5.13 Trees within the proposed development scheme include features that provide suitable bat roosting habitat. If these trees are affected by works a daytime climbing inspection survey will be required to categorise the potential for trees to support bat roosts and advise if further dusk emergence/dawn surveys are required.
- 5.14 If bats are confirmed to be roosting within any of the trees a Natural England bat licence will be required prior to the commencement of any works.
- 5.15 If trees are to be removed then it is recommended that an appropriate number of suitable bat boxes are erected on remaining trees to replace the loss of potential bat roosting habitat.

Great crested newts

- 5.16 Great crested newt eDNA tests have returned a positive result of Pond 1 within the site boundary. Great crested newt surveys will be carried out on Ponds 1 and 2 between mid-March to mid-June to determine presence/absence and if present a population class size estimate. Great crested newt surveys will follow guidance in Great Crested Newt Mitigation Guidelines (English Nature, 2001).
- 5.17 If present, a mitigation strategy will be prepared and Natural England licence to disturb great crested will be sought.

Nesting birds

- 5.18 Habitats present on site that provide suitable nesting bird habitat include woodland, scattered scrub, river, marginal and individual trees.
- 5.19 Nesting birds and their nests are protected under the Wildlife and Countryside Act 1981 (as amended). Disturbance to nesting birds will be avoided by carrying out works and/or by excluding birds from suitable nest sites outside the main nesting season. The main nesting season is generally March to August inclusive. However, birds may nest outside the main nesting period, in which case, works that would result in nest disturbance will cease until birds have fledged.
- 5.20 If affected by proposals, existing bird boxes will be re-positioned and a suitable number of additional bird boxes erected on retained trees.

Appendix A: Bibliography

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- Freshwater Habitats Trust, Oxford.

Appendix B: List of birds recorded

Scientific Name	Common Name	Birds of Conservation Concern 3 listing
<i>Anas platyrhynchos</i>	Mallard	AMBER
<i>Ardea cinerea</i>	Grey Heron	
<i>Branta canadensis</i>	Canada goose	
<i>Carduelis chloris</i>	Greenfinch	
<i>Columba livia</i>	Feral Pigeon	
<i>Columba palumbus</i>	Woodpigeon	
<i>Corvus corone</i>	Carrion Crow	
<i>Cygnus atratus</i>	Black Swan	
<i>Cygnus olor</i>	Mute Swan	
<i>Erithacus rubecula</i>	Robin	
<i>Fulica atra</i>	Coot	
<i>Gallinula chloropus</i>	Moorhen	
<i>Larus ridibundus</i>	Black-headed Gull	AMBER
<i>Motacilla cinerea</i>	Grey Wagtail	AMBER
<i>Parus caeruleus</i>	Blue Tit	
<i>Parus major</i>	Great Tit	
<i>Phylloscopus collybita</i>	Chiffchaff	
<i>Podiceps cristatus</i>	Great Crested Grebe	AMBER
<i>Prunella modularis</i>	Duncock	AMBER
<i>Regulus regulus</i>	Goldcrest	
<i>Sturnus vulgaris</i>	Starling	RED
<i>Sylvia borin</i>	Garden warbler	
<i>Troglodytes troglodytes</i>	Wren	
<i>Turdus merula</i>	Blackbird	