# Llŷr Offshore Wind Farm

# Onshore Cable Route Otter Survey

# Freshwater West to Pembroke Power Station

**December 2025**

**Document:**

**P10-LLY-4.2.3-REP-0003**

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## 1. EXECUTIVE SUMMARY

An otter survey has been undertaken on land between Freshwater West and Pembroke Power Station in Pembrokeshire at the request off Llŷr Floating Wind Limited. The proposed development is for the installation of a terrestrial electric cable and a substation to connect off-shore wind turbines with the Pembroke Power station with the cable coming ashore at Freshwater West and, from there, through to the power station.

A desk-top survey was undertaken and evidence for the presence of otters was searched for along the proposed cable route with particular emphasis on searching for natal dens in response to consultation comments made by Natural Resources Wales (NRW).

Evidence for otter activity was found at several places along the cable route with desk-top data, including data from previous survey reports for other similar projects in the locality, giving an overall picture of otter activity in the cable route area.

There was no evidence, from the field surveys or desk-top, of natal dens within 200m of the cable route. However, several areas were identified as having the potential to be used by otters as breeding sites. These included areas of dense, impenetrable scrub (willow, blackthorn and bramble) that could not be assessed thoroughly during the survey. The presence of a natal dens cannot be ruled out from these areas.

**The overall assessment is that the proposed development will have a short-term impact on otters during the Construction Phase (but impacts can be reduced), and that in the long-term the development should not prevent otter use of the ponds, streams and scrub habitats along and close to the cable route if otter protection & mitigation measures are included in the scheme design & future site management**.

Otter protection & mitigation measures are described.

During the course of the survey incidental notes were made of signs of badger activity. Two additional badger setts were found that had not been identified in the original that are potentially impacted by the proposed works.

## 2. INTRODUCTION, LOCATION, SITE DESCRIPTION AND CONTEXT

**Timing**- Otter survey: 10/11/2025, 13/11/2025, 15-17/11/2025

**Surveyor** – Leander Wolstenholme

### 2.1 Site Location and Brief

The proposed terrestrial electric cable route site that runs from Freshwater West through to Pembroke Power Station broadly along the route shown by the red line in Figure 1.

### 2.2 Background to the activity/development

The proposal is to construct an offshore wind Farm located approximately 35 km off the coast of Pembrokeshire in the Celtic Sea. This Project is a test and demonstration wind farm development, comprising up to 10 wind turbine generators (WTGs). The electric cable from the wind turbines will make landfall at Freshwater West before connecting into Pembroke Dock power station and the national grid network. The onshore development area consists of a proposed cable route that runs from Freshwater West eastward to Pembroke Power Station and a potential substation.

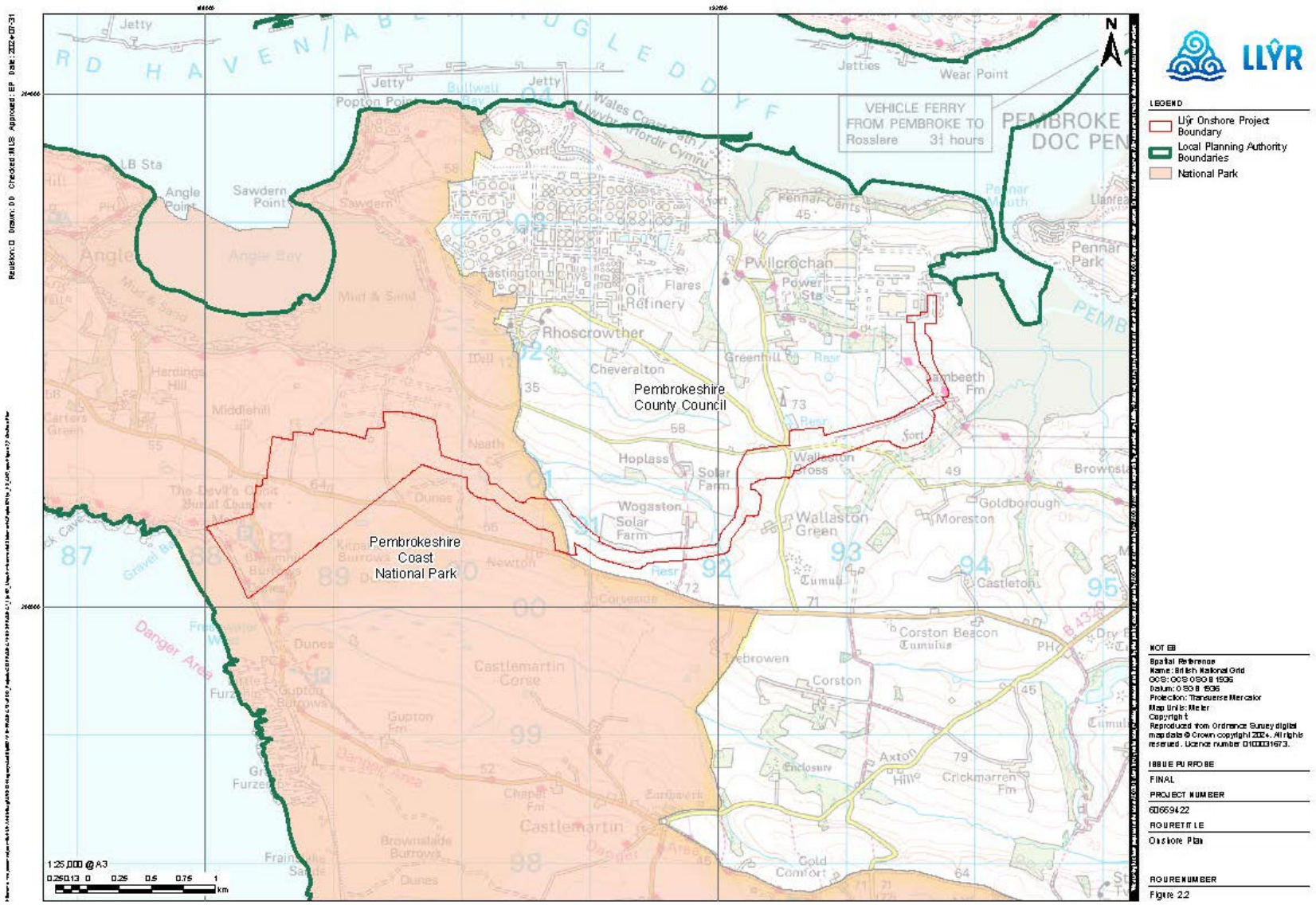


*Figure 1 - Llŷr Onshore Cable Route*


*Figure 2 - Otter Survey Boundary*

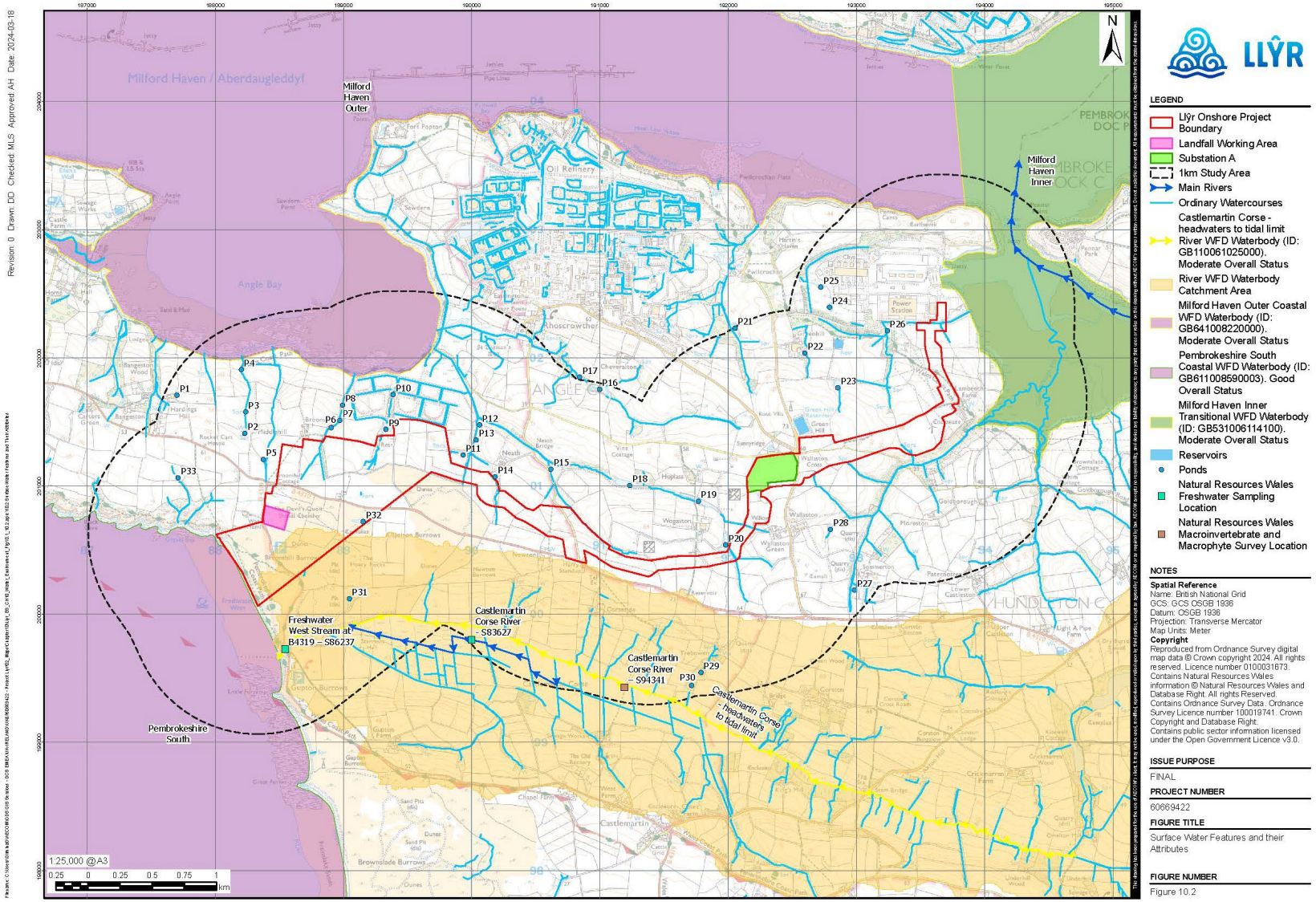


*Figure 3 - Surface Water Features close to the proposed cable route*

Two consultation letters in 2025 from Natural Resources Wales (NRW) provided advisories in relation to otters. These letters have informed the focus of the current otter survey. The first letter is dated the 20th of February 2025 and the second the 27th of July 2025.

Paragraphs 325 and 326 of the February letter states that, in relation to otters:

"*325…We advise that otter surveys are required to assess the extent to which otters utilise the application site and in particular to assess whether the works are likely to cause disturbance to any natal holts which may be present within 200m. In the absence of this information, we consider that the determining authority has insufficient information with which to assess the likely impacts of the proposals on otters.*

*326. If further surveys can rule out the likely presence of a natal holt within this distance of the works, we are content that the arising impacts can be managed with the inclusion of appropriate pre-construction checks, contingencies, and good practice working measures in any CEMP agreed for the scheme, and a lighting condition on any consent issued for the scheme (as indicated above).*"

In relation to otters, Paragraph 163 of the July letter says:

"*163. The Applicant's response confirms that no specific otter surveys have been carried out and, as such, it is not possible to ascertain whether an otter natal holt is present in close proximity to the shore where the cabling works will make landfall. In the absence of such survey information, significant effects cannot be ruled out. If further surveys can rule out the likely presence of a natal holt within 200m of the works, we would be content to agree with a conclusion of no likely significant effect on this feature of both SACs."*

The objective of the current survey is to provide the level of detail required to meet these requirements.

Construction details are given in the Llyr 1 Floating Offshore Wind Farm Bat Mitigation Plan, November 2025. They key aspects of this are:

- Vegetation clearance - clearance of hedgerows and other vegetation to facilitate the construction of the substation, associated access roads and, in some cases along the onshore cable route.
- Establishment of temporary compounds and access tracks.
- Installation of onshore cables – open trench cutting
- Installation of onshore cables - trenchless installation (HDD).
- Establishment of onshore substations.
- Operation and movement of construction plant / vehicles.
- Employment and movement of construction workforce (human activity).
- Construction lighting

The following activities will be undertaken prior to the commencement of construction:

- **Soil strip**: prior to cable installation, topsoil will be removed, set aside and handled in accordance with the project Soil Handling and Storage Plan.
- **Vegetation clearance**: clearance of hedgerows and other vegetation to facilitate the construction of the substation, associated access roads and, in some cases along the onshore cable route. This will be undertaken only where completely necessary and will be kept to a minimum.

The onshore export cable will be 7.1km long. The maximum trench width for the cable will be up to 1.2m wide, and the ground disturbance will be typically 25m wide (and no more than 35m wide) and

this will include space for the creation of haul roads if required (as shown in Figure 4) The minimum burial depth is 0.9m, except for agricultural lands where the minimum burial depth is 1.1m.

The cable installation trench excavations will proceed sequentially along the cable route and will progress at around 50 m to 60 m per day. It will be a process where if the cable trench is excavated and a duct is laid, then it is likely to be covered daily.

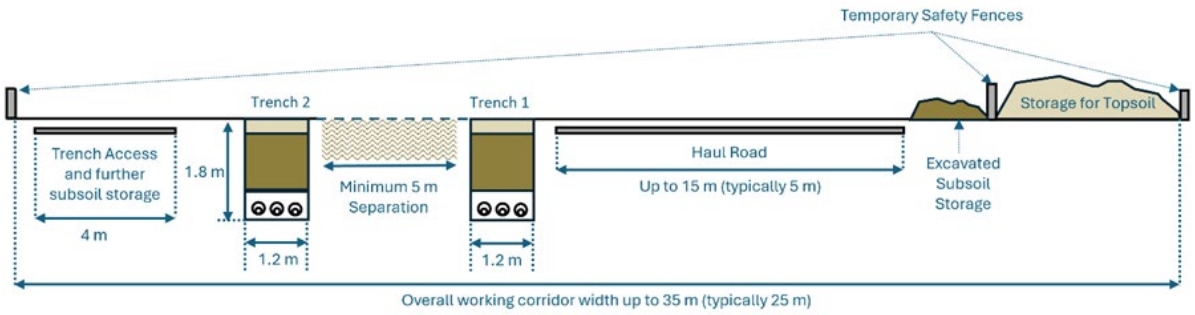


*Figure 4 - Cable Route Installation Working Corridor*

Following completion of cable installation, all work areas will be reinstated to pre-construction conditions. Each CJB requires approximately 10 days for completion, starting from the delivery of the jointing tent until its removal and reinstatement. This timeframe encompasses joint creation, cable jointing, and ground reinstatement.

### 2.3 Survey Requirements:

The aims of the otter survey are to:

- Determine otter presence / use of ponds, waterways & associated areas of scrub and woodlands
- Locate key sites for otters (i.e. potential breeding, resting, feeding sites);
- Identify likely / actual otter travel routes;
- Identify likely impacts of the proposal on otters;
- Recommend protection / mitigation measures and/or further surveys for otters where applicable.

The survey involved the investigation of all watercourses & ditches within the proposed Llŷr Offshore Wind cable route boundary (shown by the green line in Figure 2); incl. 30m outside the boundary (shown by the orange line in Figure 2) and up to 200m upstream and downstream of watercourses and ditches (the red line in Figure 2 shows the distance 200m from the green line cable route boundary.

### 2.4 Survey Limitations

The survey was undertaken in early to mid-November 2025. The weather prior to the survey dates had been poor with heavy rain which may have removed some otter signs, such as spraints and footprints. The weather in the weeks following the survey was much worse and the survey was undertaken during the most amenable weather conditions in that month.

The steep gradient of the banksides and density of scrub prevented access to some sections of the survey area. In these locations, adjoining the fields were comprehensively inspected for mammal paths entering inaccessible areas.

### 2.5 Surveyor's experience and qualifications

The survey was undertaken by Leander Wolstenholme. Leander is an ecologist with over twenty-five years' experience in field survey work. He has a degree and PhD in botany and plant genetics from the University of Aberystwyth and formerly worked as an ecological consultant with The Environment

Partnership (TEP) based in Warrington. Following this he spent some 10 years working as the Head of Botany at the World Museum Liverpool and the Curator of Botany at the Manchester Museum during which time he conducted surveys as a freelance ecologist for TEP and other clients. He is now based in southwest Wales working as a freelance ecologist, often in association with other ecologists in the area. Whilst specialising principally in botany he has also undertaken a wide range of professional surveys for other species too including bird, bat, great crested newt, water vole and otter surveys.

## 3. LEGISLATION

Otters are classed as a European Protected Species (EPS) under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). It is therefore an offence to deliberately or recklessly:

- kill, injure, capture or harass an otter;
- disturb an otter whilst it is occupying a holt (underground den) or other place it uses for shelter or protection, or while it is rearing or otherwise caring for its young, or in any way that impairs its ability to survive or breed, or significantly affects the local distribution or abundance of otters;
- obstruct access to an otter breeding site or resting place, or otherwise prevent their use.

and whether or not deliberate or reckless:

- to damage or destroy an otter breeding site or resting place.

This means that if otters could be affected in these ways by a development, and no action is taken to prevent it, an offence may be committed.

In addition, otters are a feature of both the Pembrokeshire Marine SAC and the Limestone Coast of South West Wales SAC (and also the Pembrokeshire Bat Sites & Bosherston Lakes SAC). As a feature of these SACs, impacts on otters would be considered an impact on the respective SACs as well as on the species itself.

## 4. METHODOLOGY

The survey undertaken comprised of two parts: a desk top study and a field-based habitat survey.

### 4.1 Desk Top Study

The objectives of the desk study were to review the existing information available in the public domain concerning otters.

Several otter surveys have been conducted within and close to the current survey area for similar projects i.e. the Greenlink undersea cable, the Blue Gem Erebus off-shore wind project and the BESS battery storage plant, all of which have or will run electric cables to the Pembroke Power Station. The following reports were studied:

- BlueGem, Erebus: Onshore Cable Route, Technical Appendix 20.4: Protected Species Report, August 2021
- Greenlink Environmental Statement – Onshore Wales, Appendix 6.5 Riparian Mammals Survey Report, March 2019
- Otter Survey Report, Goldborough Road BESS, September 2024

The Otter Project on-line map of otter casualties was consulted for records of otter road casualties in the vicinity of the cable route (https://www.cardiff.ac.uk/otter-project/research/map).

Other otter reports e.g. Otter (Lutra lutra) activity on the open coast & islands within the Pembrokeshire Marine Special Area of Conservation, G. Liles, 2009) were studied and relevant records extracted.

### 4.2 Limitations to Desk Top Study

Biological records can be received from a wide variety of sources and may or may not be comprehensive and accurate. However, if assessed in conjunction with an in-the-field otter survey, they can contribute to a robust ecological assessment of a site.

### 4.3 Field Survey

During surveys a search was made for:

- signs of otters – spraints (droppings), footprints, rolling places;
- resting sites - actual, possible or potential sites where otters are or can lie up during the day;
- breeding sites – in particular, for paths through vegetation from the areas of water to suitable cover that could lead to a natal den;
- feeding areas – in particular, sites with abundant amphibians;
- travelling routes – mammal paths along the bank, and short cuts.

Sites are identified as being resting sites if they are typical of the places known to be used by otters for lying up, and show evidence of use. Two categories are used to describe resting sites, depending on the strength of evidence available.

- *Actual Resting Site* – signs that the site is well used by otters are present, including a well trampled entrance, otter spraints or footprints.
- *Possible Resting site* - the site is typical of an otter resting site, with obvious evidence that it is being used by a mammal, but no signs are present that otters use the site.

A third category is used (Potential Resting site) to record the existence of cover or sites which could be used as resting sites by otters, but where no signs of past mammal use are present.

Otter Breeding Sites are typically large areas of undisturbed cover free from flooding and within easy reach of a good food supply (Liles, 2003). Information collected during the survey was marked on a large scale map of the site and described in notes. Key sites were located using a hand-held GPS giving a ten figure grid reference, and photographs were taken using a digital camera.

Breeding Sites require:

- Security from disturbance.
- One or more potential natal den sites.
- Play areas for cubs.
- No risk of flooding.
- Access to a good food supply.

## 5. RESULTS

### 5.1 Desk Study Results

The network of waterways associated with the proposed cable route can broadly be divided into three categories/areas:

1. Those flowing out to Angle Bay
2. Those flowing out to Pembroke River

3. Those flowing out to Milford Haven (via Pwllcrochan)

There are also the network of streams flowing out to Freshwater West from Castlemartin, although this network is outside of the cable route area.

Previous surveys of electric cable routes have found evidence of otter activity along all these networks of streams, rivers and waterbodies.

The records of otters recorded from other electric cable surveys that are within and close to the proposed cable route are summarised in Figure 6 on the following page.

Figure 5 below shows records of otter casualties from the Cardiff University Otter Project.

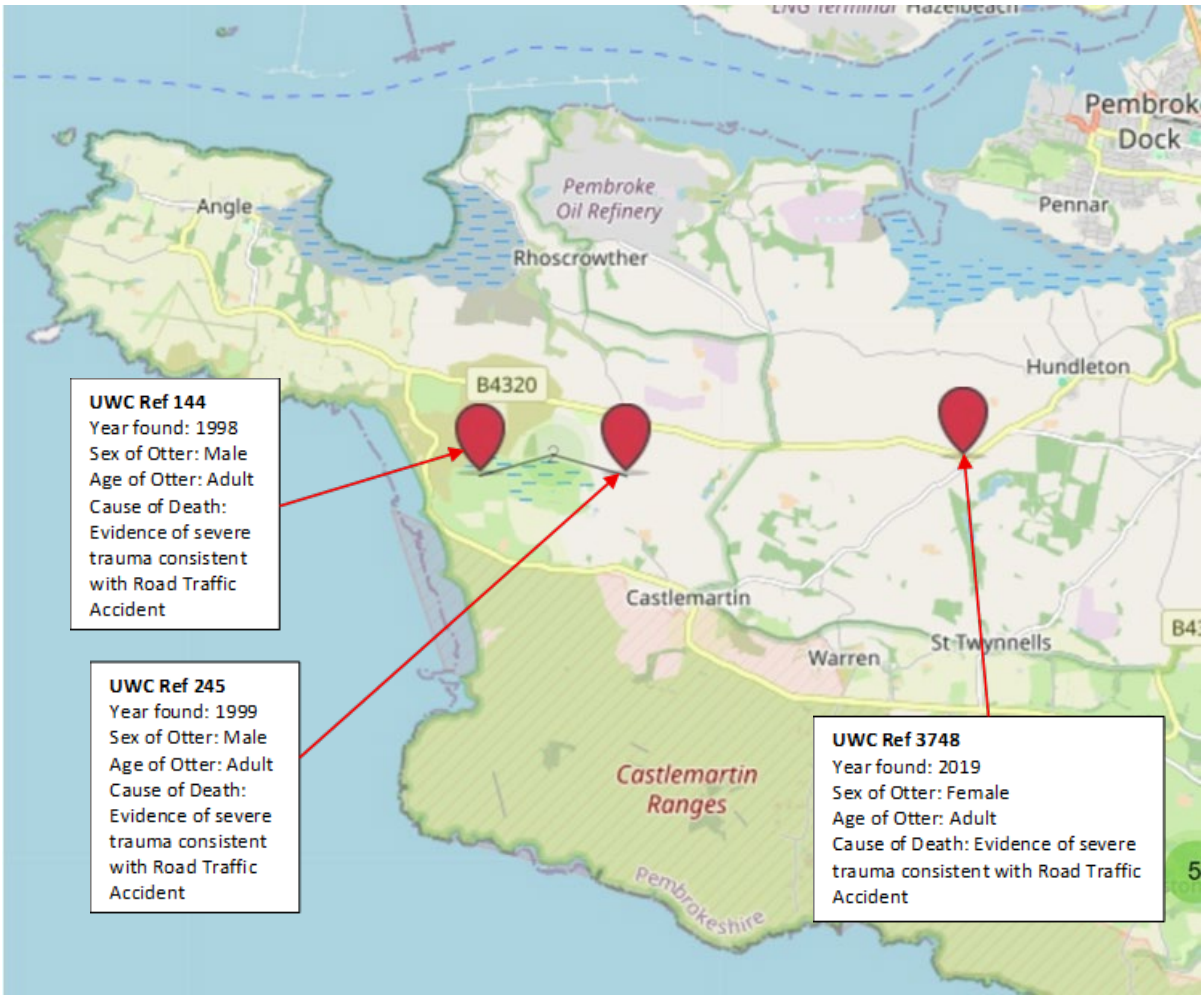


*Figure 5 Otter Casualty records held at the Cardiff University Otter Project*

## 5.2 Other Records

Two otter sighting records gleaned from Liles (2009):

- Freshwater West 31/05/2008 - Otter seen at 8.30pm to the left of Rabbit Island when tide was coming in. Otter ran along the shore then went into the sea in the middle of the bay.
- Frainslake Beach Winter 2007/2008 – otter seen eating fish on Frainslake beach.

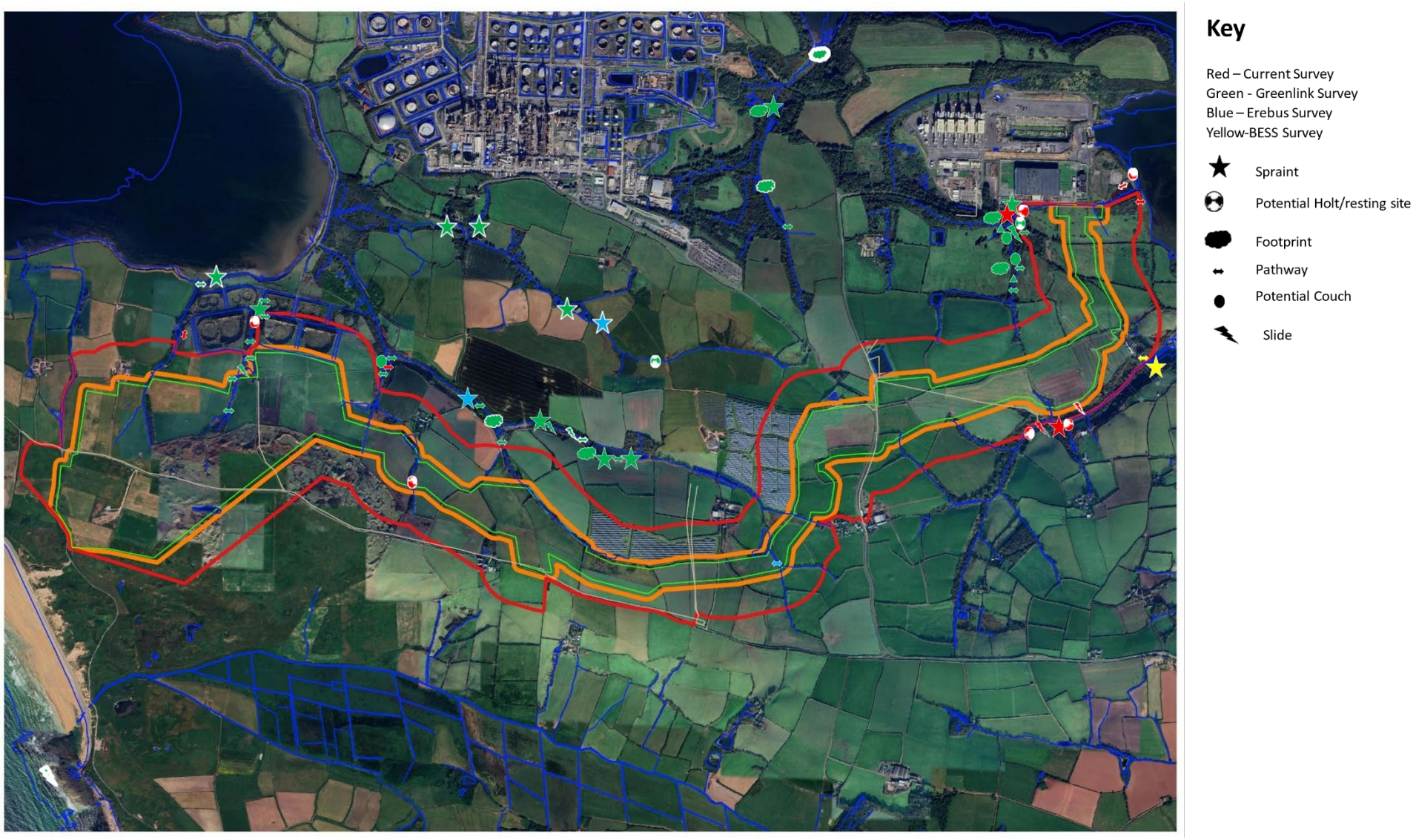


*Figure 6 - Otter findings from current and previous surveys*

Greenlink Survey data search records:

- Gupton Farm (2014), within a fen meadow drainage channel approximately 1.8km south east of the landfall site.
- Otter were also recorded at Somerton Farm (2010) alongside the B4320.
- Spraint was found approximately 1.2km south of Pembroke Power Station (2013).
- Seven spraints and crab remains were found at Freshwater West (2009). Within the same record, a spraint was found at the side of the road at the road bridge over the stream; indicating that otters cross the road because the bridge is too low, especially when flooded.
- 1.6km southeast of Pembroke Power Station, six spraints and tracks were found by a culvert, in addition to a well-used run. This area is a suspected lying up site (2009).

BESS data search:

The desk study undertaken as part of the PEA identified records of otter from 10 different areas within 2km of the site:

- Four of these areas are located to the south of the site. The closest of these is 0.53 km south of the proposed BESS, where there are three records of otter close to a wooded corridor which connects to the wooded valley south of the site.
- A further four areas where otters have been recorded are to the south-east of the site, in close proximity to a further wooded corridor which connects to the Pembroke River. The closest of these records is 0.97 km south-east of the proposed cable route.
- Otters have also been recorded at two locations close to the coastline, 1.72 km to the north and 2.44 km to the west of the site.

### 5.3 Field Survey Results

The field survey results are summarised in Figure 6. A table of field notes and photographs are given in Appendices A and B.

## 6. CONCLUSIONS AND DISCUSSION

### 6.1 Otter Signs and Habitats

The desk top survey shows that all networks of waterways within and close to the survey area are being or have been used by otters. The current survey showed definite signs of otter activity at the eastern end of the survey area. However, there were several areas of dense impenetrable scrub that could not be searched because access was not possible.

It is likely that otters will use these features throughout the year, at any point in the year.

Several Areas have been identified as having good potential within 200m of the cable route boundary (the green line) to be used as a breeding site by otters. These are shown in Figure 7. Potential breeding sites have been identified if they show the following features:

- Undisturbed
- Scrub/long grass habitat
- At least 0.5ha
- Close to a food source
- No/little risk of flooding

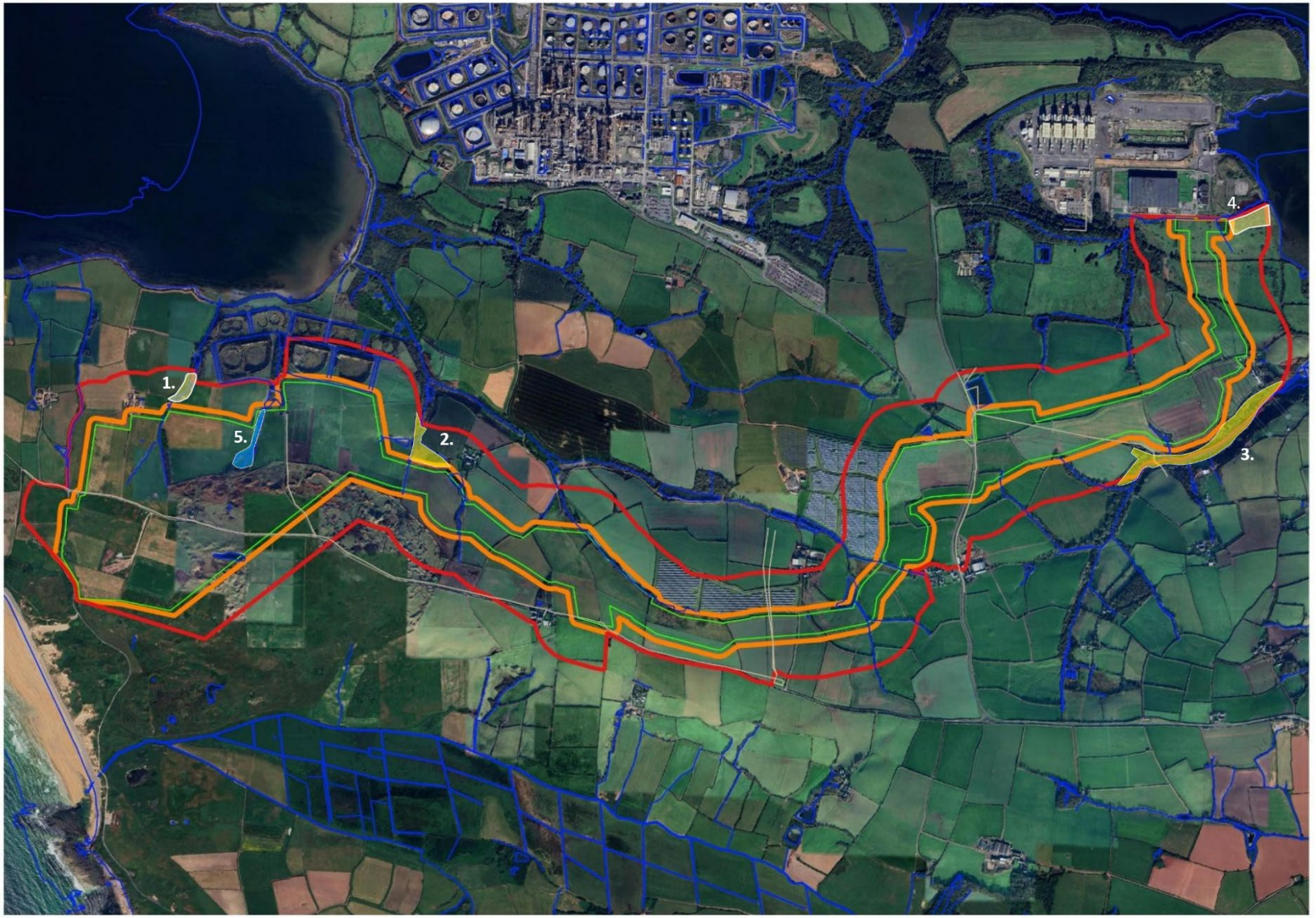


*Figure 7 - Areas that offer good habitat for potential otter breeding sites*

**Site 1:**

*Habitat:* Willow and bramble scrub with ponds with stream leading down to Angle Bay.

*Food source:* Likely good - Angle Bay plus ponds

*Disturbance:* undisturbed.

*Flooding Risk:* Steep sided valley slopes provide opportunity to escape flooding.

*Risk of cub predation:* possibly from badgers – signs of badger activity in the vicinity

**Site 2:**

*Habitat:* Willow and bramble scrub adjacent to stream leading to ponds -

*Food source:* Good connectivity to Angle Bay via networks of streams and ponds – food source likely good

*Disturbance:* Mostly undisturbed but farming activity in adjacent fields.

*Flooding Risk:* Steep sided valley slopes provide opportunity to escape flooding.

*Risk of cub predation:* possibly from badgers – signs of badger activity in the vicinity

**Site 3:**

*Habitat:* Woodland, blackthorn, gorse and extensive bramble scrub on both sides of stream

*Food source:* Good connectivity to Goldborough Pill food source likely good

*Disturbance:* Largely undisturbed although clay pigeon shooting range will result in sudden loud noises when active.

*Flooding Risk:* Steep sided valley slopes provide opportunity to escape flooding.

*Risk of cub predation:* possibly from badgers

**Site 4:**

*Habitat:* Blackthorn/gorse/bramble scrub adjacent large brackish pool and the coast (Pembroke River) to the east

*Food source:* Pembroke River – likely good.

*Disturbance:* Undisturbed – scrub dense and impenetrable.

*Flooding Risk:* Steep sided slopes of the brackish pool provide opportunity to escape flooding.

*Risk of cub predation:* possibly from badgers - a lot of signs of badger activity in this area (latrines, snuffle holes and pathways)

**Site 5:**

*Habitat:* Bramble, blackthorn and willow scrub associated with the headwaters. The area of scrub thinning out downstream and being replaced by areas of tall herb (great willowherb, soft rush, fool's watercress, yellow flag etc.).

*Food source:* Ponds 6 & 7 for amphibians (and possibly also fish) – connectivity down to Angle not continuous

*Disturbance:* Scrub dense and impenetrable in places although potentially close to cattle and other farming activities. Areas of none dense scrub present along the stream made up of tall herbs

*Flooding Risk:* Steep sided slopes of the stream banks missing but flood risk likely low.

*Risk of cub predation:* possibly from badgers - a lot of signs of badger activity in this area (latrines, snuffle holes and pathways)

Sites 1-4 show good potential to be used as otter breeding sites. Site 5 shows less good potential because the area of dense scrub is less and it is closer to farming activities than the other sites. Ponds 6 & 7 may not provide a reliable food source. Historic Google Earth images show that pond 6 dries out periodically. There is not a continuous scrub and waterway corridor downstream to Angle Bay (which will provide a reliable food source.

The travel route(s) of otters throughout the area is not known but they are likely using the various watercourses as commuting routes but will also, on occasion, be crossing open land.

### 6.2 Natal Dens

It is important to note that a distinction is made between the breeding site and the natal den. The term breeding site is used to describe an area of land, whereas the natal den is taken to be the small space occupied by the female when she gives birth and where the cubs stay for up to three months. Different natal dens within a single breeding site may be used from year to year or even within the same year.

Several areas have been identified as potential breeding sites (i.e. sites 1-4 in Figure 7 with site 5 showing less good potential). The presence of natal dens in these areas cannot be ruled out.

### 6.3 Potential Impacts of Development on Otters

*Operational Phase.*

All impacts will be temporary during the period of construction and will be confined to the section of cable-run that is being worked on at that particular time. So, no long-term impact on otter habitat and commuting routes is envisaged as a result of the works.

Otters learn to cope with low-level disturbance, and are more able to do so in areas where dense bank-side cover provides a screen from disturbance and a refuge in which they can hide. The geography and scrub structure of sites 1-4 is such that if a natal is disturbed at the onset of works (noise and vibration etc.) there is scope there is scope for the mother to move the natal further away from the works i.e. the avenues of scrub/waterway will not be severed by the works. There is potential for site 5 for the continuity of scrub habitat to be severed by the works.

*Construction Phase.*

Construction works are likely to create disturbance (mainly noise and vibration). Disturbance from cable laying works are likely to be significant if:

a) Works are carried out at a time when otter activity is high, e.g. if a female with cubs is using a pond/watercourse, or if the pond is providing an important seasonal food resource;
b) Key areas of scrub are removed or reduced;
c) There is encroachment by contractors (& machinery and materials) into pond, watercourses or side habitats (e.g. scrub).

*Overall Assessment.*

The laying of the cable will have a short-term impact on otters during the Construction Phase (but impacts can be reduced). In the long-term the cable and restoring the cable route landscape to its original form will not prevent otter use of the ponds, stream and scrub habitats if otter protection & mitigation measures are included in the scheme design, construction phase & future site management.

### 6.4 Otter Protection & Mitigation Measures

Mitigation measures to ensure that impacts on otters are not significant proposed for the project are:

- Two months before site clearance & construction works are due to start, trail cameras should be set up at key areas of scrub and checked by the ecologist 2 weeks before start of works, and on the day before start of works. If a female with cubs is recorded during this period it may be necessary to delay the start of works until the family group has left that area of scrub.
- Key areas of scrub must be retained intact (i.e untrimmed) and should be protected from accidental damage and disturbance.
- The cable route should be adjusted to be as far from potential breeding sites as possible. With regard to site 5, positioning the cable route to the south of the linear band of scrub would avoid severing a corridor of habitat and allow any otter present to move northwards away from the works.
- Night-time working is to be avoided
- Key scrub habitats close to the main development area should be protected from damage & disturbance by erecting barrier fencing (e.g. Heras fencing).

### 6.5 Badgers

During the course of the survey incidental notes were made of badger activity. Two setts that are potentially impacted by the proposed works were found that had not previously been identified by the badger survey. These setts were both active at the time of the otter survey (i.e. fresh spoil was evident outside of burrows) and found at grid references SM91457 00314 and SM92295 00978.

## 7. APPENDIX A – FIELD SURVEY NOTES

| NGR | Photo No. | Otter Spraint | Otter Trail | Otter Potential Resting Site | Otter Potential Holt | Otter Potential Breeding Site | Notes |
|---|---|---|---|---|---|---|---|
| SM93260 02198 | 1 & 2 | ✓ | | | | | On tree route – appears to be the same tree where an otter was photographed by a trail camera for the Greenlink Survey in 2018. |
| SM93252 02215 | 3 | | | | | | Swan Mussel Shells – likely otter feeding remains |
| SM93254 02215 | 4 | | | | ✓ | | Potential holt – also identified as holt for the Greenlink Survey in 2018 |
| SM93376 02275 | 5 | | ✓ | | | | A mammal path running parallel with concrete fence of the power station – potentially an otter path linking pond 26 and associated habitat with saline lagoon and coastal habitat but unclear as many badger pathways also in the vicinity. |
| SM93819 02344 | 8, 9 & 17 | | | | | ✓ | Brackish lagoon with dense scrub banks – undisturbed. |
| SM93836 02419 | 10 | | | | | | Strong mammal pathway adjacent to brackish lagoon fence |
| SM93911 02314 | 13 | | | | | | Mammal path running parallel with shore |
| SM93883 02352 SM93889 02334 | 14, 15 & 16 | | ✓ | | | | Mammal paths running from shore into scrub adjacent to brackish lagoon |
| SM93870 02378 | 18 | | | ✓ | | | Shoreline concrete slab with gap underneath |
| SM93416 01159 | 19 | | | | | | Stream running eastwards towards Goldborough Pill |
| SM93452 01159 | 20 | | | | | ✓ | Dense impenetrable scrub on both sides of Goldborough Pill River |
| SM93462 01167 | 21 | ✓ | | | | | Fresh spraint on log adjacent to fallen tree – south side of river |
| SM93462 01167 | 22 | | | ✓ | ✓ | | Holes under fallen tree adjacent to otter spraint – potential holt/resting site – south side of river. |
| SM93469 01152 | 23 | | | ✓ | ✓ | | Mammal slide on south side of river near spraint site |
| SM93507 01148 | 24 | | | | | | Clay pigeon targets from nearby shooting range – periodic bouts of loud noises may discourage otters from setting up a natal den in this area. |
| SM9331 01144 | 25 & 26 | | | ✓ | ✓ | | Potential holt/resting site under fallen tree with associated mammal slides – although no spraint present. |

| NGR | Photo No. | Otter Spraint | Otter Trail | Otter Potential Resting Site | Otter Potential Holt | Otter Potential Breeding Site | Notes |
|---|---|---|---|---|---|---|---|
| SM90185 00756 | 27 & 28 | | | | | | Woodland strip with stream running northwards to Neath Farm. Ground cover too sparse for Natal Holt and area prone to disturbance by cattle. |
| SM90186 00786 | 29 | | | ✓ | ✓ | | Hole in streamside bank – potential holt/resting site |
| SM90182 01079 | 30 | | | | | | Garden pond (Pond 14) at Neath Farm – no signs of the presence of otters |
| SM90013 01385 | 31 | | | | | ✓ | Undisturbed, impenetrable scrub adjacent to stream provides potential breeding site. |
| SM90030 01344 | 32 | | ✓ | | | | Well-worn mammal path through reeds and bramble scrub connecting to stream. |
| SM89943 01243 | 33 & 34 | | | | | | Pond 11. Dead toad noted in this pond – likely food source for otters. |
| SM89168 01105 | 35,36 & 37 | | | | | | Stream running down to ponds 9 & 10. Dense scrub covering head waters and downstream, together with tall herbs and grass. Does hold some potential to be used as a breeding site but somewhat distant from good source of food at Angle Bay. |
| SM89346 01456 | 38 | | | | | | Pond 9 |
| SM89380 01722 | 39 | | | | | | Pond 10 |
| SM89374 01663 | 40 | | | | | | Woodland to the south of Pond 10 – ground cover too sparse to be used as breeding site – although the site is very undisturbed. Close to Angle Bay as food source but otters will need to cross open ground to get there. |
| SM89365 01645 | 41 | | | ✓ | ✓ | | Potential holt/resting site under fallen tree in woodland to south of Pond 10. |
| SM88862 01135 | 42 & 43 | | | | | | Strip of woodland to the south of Broomhill Farm running alongside small stream. Ground cover somewhat sparse. Limited potential as a breeding site – much better potential further downstream. |
| SM88901 01449 | 44 | | | | | | Pond 6 |
| SM88964 01511 | 45 & 46 | | | | | ✓ | Pond 7 – and associated undisturbed, impregenable, dense scrub. These stream valley with a series of 3 ponds and |

| NGR | Photo No. | Otter Spraint | Otter Trail | Otter Potential Resting Site | Otter Potential Holt | Otter Potential Breeding Site | Notes |
|---|---|---|---|---|---|---|---|
| | | | | | | | associated scrub habitat linking the watercourse with Angle Bay offers very favourable potential for an otter breeding site |
| SM88973 01509 | 47 & 48 | | ✓ | | | | Mammal path connecting Ponds 6 and 7. Likely badger but could be used by otters. Photograph 7 shows possible entry point into Pond 7 from mammal pathway. |
| SM89147 00724 | 49 | | | | | | Pond 32 |
| SM88369 00696 | 50 | | | | | | Very well worn mammal path leading to proposed landfall area – likely badger |
| SM88403 0072 | 51 &52 | | | | | | Bramble and gorse scrub at the proposed landfall area. |
| SM88399 00603 | 53 | | | | | | Scrub habitat – west side of road near landfall area – leading down to Freshwater West beach. |

## 8. APPENDIX B – SITE PHOTOGRAPHS

1. Pond 26 – Otter Spraint

2. Pond 26 – Otter sprainting tree in context

3. Swam mussel shells adjacent to Pond 26 – likely otter feeding remains

4. Pond 26 – possible former holt adjacent to Pond 26 – also identified as holt for Greenlink survey

5. Mammal path alongside power station concrete fence

6. Freshwater flowing into brackish lagoon

7. Mammal paths close to brackish lagoon

8. Brackish lagoon with thick scrub on sloping banks

9. Brackish lagoon

10. Mammal path adjacent to brackish lagoon

11. Mammal path under chainlink fence – towards brackish lagoon.

12. Scrub adjacent to Pond 26.

13. Mammal path running parallel with the shoreline

14. Mammal paths running from shore towards bramble scrub

15. Mammal path entering bramble scrub close to shore

16. Mammal path from shore to saline lagoon close to chainlink fence

17. Saline lagoon as viewed from the shoreline

18. Potential shoreline holt/resting site

19. Stream/river flowing towards Goldborough Pill

20. Scrub adjacent to Goldborough Pill River

21. Otter spraint on log – Goldborough Pill River

22. Potential holt site adjacent to otter spraint

23. Mammal slide into river

24.Clay pigeon targets from nearby shooting range

25. Potential otter holt

26. Potential otter slide

27. Woodland strip to the south of Neath Farm

28. Ground cover of this woodland strip to open for natal dens

29. Potential holt/resting site inwoodland strip to the south of Neath Farm

30. Pond 14 – Neath Farm

31. Scrub area west Neath Farm with natal den potential

32. Mammal path through scrub area

33. Pond 11

34. Dead toad in Pond 11 – food source for otters

35. Stream running northwards to Pond 9

36. Woodland strip to the south of Neath Farm

37. Scrub - headwaters of stream running to

38. Pond 9

39. Pond 10

40. Woodland to the south of Pond 10 – ground cover too sparse for natal den.

41. Potential holt in woodland to south of Pond 10

42. Strip of woodland near, and to the south of, Broomhill Farm

43. Ground cover – Broomhill woodland

44. Pond 6

45. Pond 7 and associated scrub

46. Scrub habitat from Pond 7 down to Angle Bay

47. Mammal path between Ponds 6 and 7

48. Possible entry point into Pond 7

49. Pond 32

50. Well worn mammal path near Freshwater West

51. Bramble scrub – landfall area

52. Bramble scrub – landfall area

53. Scrub habitat down to the shore at Freshwater West

## 9. APPENDIX C - BACKGROUND TO OTTER ECOLOGY

Otters are nomadic, and each animal inhabits a large home range (up to 40 km of waterway for an adult male). Otters use every type of water habitat, including rivers and streams; ditches; wetlands; lakes, ponds and reservoirs; estuaries & the coast. They live at all altitudes in the UK, and utilize even the smallest watercourses. Although mainly nocturnal, otters will travel and hunt during the day.

Within the home range many different daytime resting sites will normally be available to the otter. Each resting site may be used only infrequently, with otters sleeping in a different place almost every day. The level of security provided by a particular resting site required by an otter is partly dependent on the general level of disturbance in the area. In undisturbed rural areas, otters will sleep in relatively exposed places (e.g. within grass tussocks). Where disturbance is high (close to a footpath, or near towns and villages for example), otters need to be well hidden and choose secure resting sites such as tunnels or cavities under tree root systems and man-made structures, and large areas of dense scrub.

Typical resting sites include: tree root systems (especially oak, ash and sycamore); dense scrub thickets; piles of timber or rocks; earth tunnels and ledges; and couches in rough grassland and reedbeds. Otter resting sites are protected from damage and destruction, & disturbance, under the Wildlife & Countryside Act 1981 and the EC Habitats Directive 1992.

Breeding can take place at any time of year, but most births occur during the autumn & winter. Otter breeding sites are usually very large areas (> 0.5ha) of undisturbed cover such as woodland, scrub, reed beds and wetlands. Cub rearing is carried out by the female alone – an arduous job because cubs remain with, and are dependent on their mother for almost a year.

Otters feed mainly on fish (both fresh water and marine species) choosing those species (such as eels) that are abundant and easily caught. The diet also includes amphibians (particularly important in the late winter / early spring), birds and some small mammals.

Otters will travel for several kilometres during a night. Although much of their travel is along watercourses they regularly take short-cuts across land (e.g. across river meanders), sometimes travelling long distances away from water.

The level of otter activity in an area, and whether otters have been present in the recent past, can usually be determined by searching for otter spraints (droppings) left by otters as territory markers at prominent sites. In habitats with soft substrates (mud or sand) otter footprints can also be used. An absence of otter signs on the day of the survey does not indicate that a site or area is not used by otters. Otters are widespread throughout much of the UK: it should be assumed that otters are using all water & wetland habitats.

We are not yet able to count individual animals in an area to get an idea of population size. However, because otters are solitary and each animal needs a large home range, it is likely that the number of otters living on a river system will be low.

Whilst single, ‘one-off’ surveys provide an initial overview of habitats & sites available to otters (e.g. for breeding, lying up and feeding) and the likely key issues, some habitats and areas are used by otters on a seasonal basis (e.g. for feeding or breeding) and a proper assessment of otter use, and identification of important features such as breeding, resting & feeding sites, and travel routes, can be made only through detailed surveys carried out in each season over a 12 month period. For example, otter breeding can take place at any time throughout the year. An otter breeding site will be used intensively for the three months during which the cubs are at the natal den. Once the cubs begin to travel away from the breeding site with their mother, the site where they were born may be visited only infrequently for the rest of the year. Where potential breeding sites, and other habitats likely to

be used / visited by otters seasonally, are identified during one-off surveys, further investigations may be recommended in order to properly evaluate the importance of the site & how best to protect it.

Geoff Liles

## 10. APPENDIX D - REFERENCES

All UK and legislation for countries within the UK can be viewed at: http://www.hmso.gov.uk/legis.htm

Biodiversity 2020: A strategy for England's wildlife and ecosystem services http://www.defra.gov.uk/publications/2011/08/19/pb13583-biodiversity-strategy-2020/

Defra (2007b) *An Introductory Guide to Valuing Ecosystem Services*. PB12852. Defra, London. https://assets.publishing.service.gov.uk/media/5a79b99340f0b642860da43d/pb12852-eco-valuing-071205.pdf (accessed 10 April 2010)

Institute of Ecology and Environmental Management (2006) *Guidelines for Ecological Impact Assessment in the United Kingdom* (CIEEM website – as above) Institute of Environmental Assessment (1995)

*Guidelines for Baseline Ecological Assessment*. E & FN Spon. London. Joint Nature Conservation Committee Phase 1 Habitat Classification, Joint Nature Conservation Committee (2005) http://jncc.defra.gov.uk/page-4258

*Handbook for Phase 1 habitat survey - a technique for environmental audit*, ISBN 0 86139 636 8 Millennium Ecosystem Assessment (2005) – for further details visit http://www.maweb.org/en/About.aspx

RSPB (2009) Birds of Conservation Concern 3. RSPB Sandy, Beds. https://archive.nationalredlist.org/files/2012/08/UK-Birds-of-Conservation-Concern-3.pdf

The National Planning Policy Framework http://www.communities.gov.uk/publications/planningandbuilding/nppf

The Natural Choice: securing the value of nature http://www.official-documents.gov.uk/document/cm80/8082/8082.asp

Welsh Assembly Government (2009) Technical Advice Note (TAN) 5 - Nature Conservation and Planning

Liles, G. (2003). Otter Breeding Sites: Conservation and Management. Conserving Natura 2000 Rivers Conservation Techniques Series No. 5. English Nature, Peterborough.