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Lower Largo Preliminary Ecological Appraisal Report

Final Report

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Where field investigations are carried out, these have been restricted to a level of detail required to meet the stated objectives of the services. The results of any measurements taken may vary spatially or with time and further confirmatory measurements should be made after any significant delay in issuing this Report.

Acknowledgements

We would like to acknowledge the provision of species record data from the Fife Council Records Centre.

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Abbreviations

CIEEM	Chartered Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research and Information Association
EPS	European Protected Species
GIS	Geographical Information System
HabsRegs	Conservation (Natural Habitats, &c.) Regulations 1994 (HabsRegs) (as amended)
INNS	Invasive Non-Native Species
JNCC	Joint Nature Conservation Committee
OS	Ordnance Survey
PEA	Preliminary Ecological Appraisal
PEAR	Preliminary Ecological Appraisal Report
SAC	Special Area of Conservation
SBL	Scottish Biodiversity List
SEPA	Scottish Environment Protection Agency
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TN	Target Notes
W&CA	Wildlife and Countryside Act (W&CA) 1981 (as amended)
WANE	Wildlife and Natural Environment (Scotland) Act

Executive Summary

JBA Consulting has been commissioned by Fife Council to undertake a Preliminary Ecological Appraisal (PEA) in relation to works at Lower Largo, Fife. This PEA Update Report updates the findings of the original PEA undertaken in September 2024 (JBA Consulting, 2024) and considers a newly released methods statement of the proposed works from Fife Council. The purpose and scope of the PEA are unchanged since the previous PEA, and the works are set to occur at the same site (JBA Consulting, 2024).

The proposed works involve the reconstruction of a bulging section of the retaining wall on Keil Burn, Lower Largo, Fife (JBA Consulting, 2024). This will involve the use of adjoined anchors which penetrate both the wall and the bedrock in channel for stabilisation of the greater wall extent during construction. Construction will involve access via the road above the wall, and in channel via a slipway into the right side of the Keil Burn downstream of the Drummochy Road Bridge. Works will occur at low tide to facilitate in channel access.

The designated nature conservation sites that may be impacted by the works are the Firth of Forth Ramsar, Firth of Forth Special Protection Area (SPA), Firth of Forth Site of Special Scientific Interest (SSSI), the Outer Firth of Forth and St Andrews Bay Complex SPA and the East Fife Coast Geological Conservation Review Site.

There are updated records for the protected and notable species within 1km of the proposed works site, but the species that are considered likely to be affected by these works are unchanged since the previous PEA (JBA Consulting, 2024)

The sensitive habitats to be considered during the proposed works are unchanged, as are the protected species they are likely to support (JBA Consulting, 2024).

Recommendations are made relating to further surveys for bats and otter, precautionary working methods, pollution prevention, biosecurity, and potential ecological enhancements as previously (JBA Consulting, 2024).

1 Introduction

1.1 Project Background

JBA Consulting was commissioned by Fife Council to undertake a Preliminary Ecological Appraisal (PEA) in relation to works at Lower Largo, Leven, Fife. The survey was commissioned to update a previous PEA carried out in September 2024 (JBA Consulting, 2024). The scope and purpose of the PEA remain the same, however the availability of a more detailed methods statement of the proposed works from the Fife Council provides clarification to the recommendations made.

1.2 Site Location

The description and location of the site for the proposed works is as shown in the previous PEA (JBA Consulting, 2024).

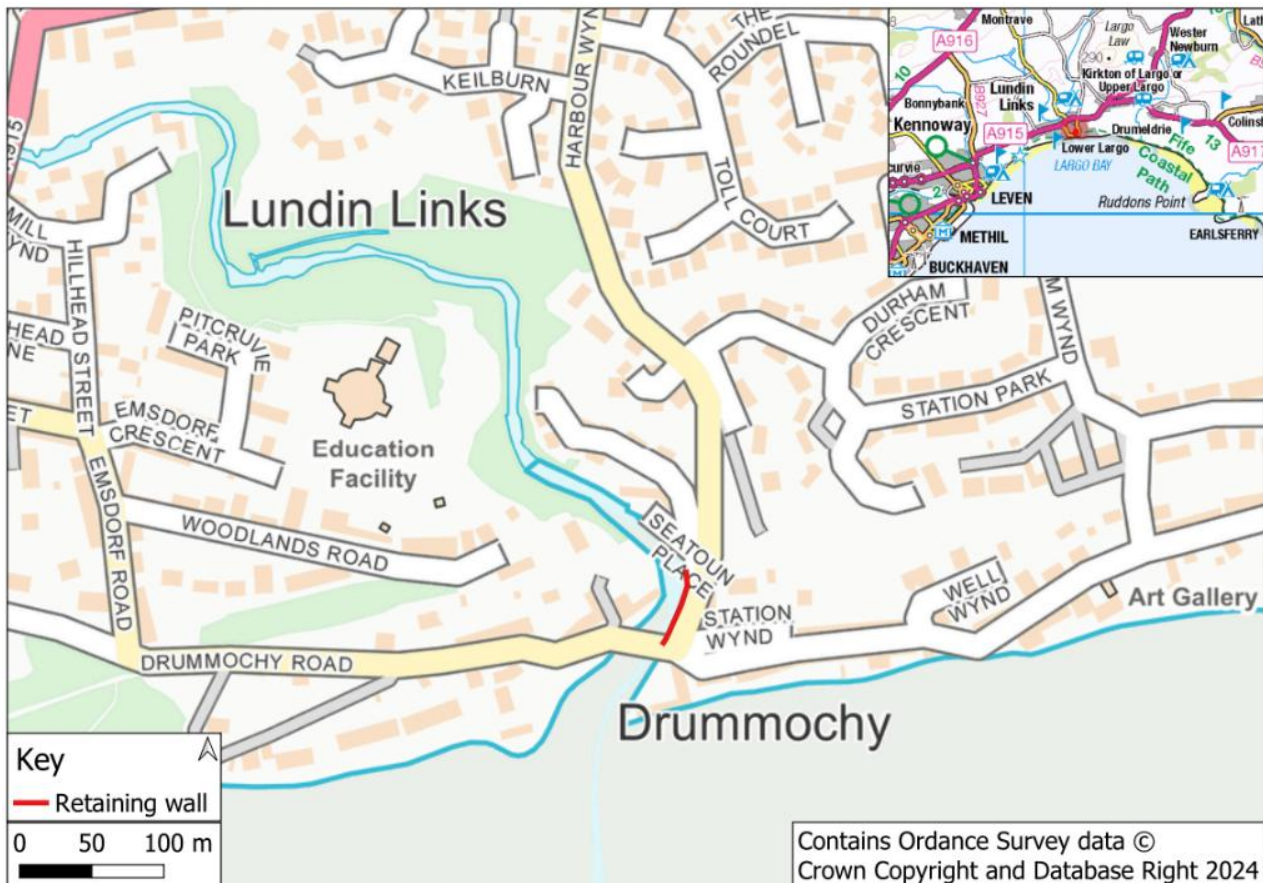


Figure 1-1: Location of proposed works site

1.3 Proposed works

The proposed works involve the stabilisation of a retaining wall which is showing signs of collapse. The retaining wall is situated on the left bank of the Keil Burn estuary and

supports the above road, Harbour Wynd (C9-10W, Figure 1-2). Works are expected to commence September 2026 and last 6 weeks, during daylight hours only to avoid artificial lighting disturbance to residents and wildlife. Proposed works involve the reconstruction of the bulging section of retaining wall, which requires stabilisation of the whole wall by the installation of anchors. This will involve the following steps:

1. Harbour Wynd will be closed to the public and a diversion route put in place, with only the town side of the pavement remaining accessible to pedestrians. The Old Station car park may be used as a works compound with vehicle access during construction, since the immediate site has limited storage.
2. A bulk bag cofferdam and inner sandbag dam will be constructed in channel adjacent to the wall to provide a dry lined working area and contain grout escape. The bulk bags would be lowered from the road, as access is otherwise restricted to a slipway on the right side of the Keil Burn requiring under bridge passage.
3. Voids in the retaining wall will be pointed by hand to limit losses during grouting and any exposed large voids within the wall will be packed with Soluform bags before coverage with facing stone.
4. The wall will be cored at the designed anchor contact points and self-drilling anchors installed at an angle to a depth that penetrates the lower bedrock (contact points marked Table 3:1 and Figure 1-3, cross section of anchor installation Figure 1-4). This is expected to use an excavator with a drill attachment, situated on the road. The road surface will be protected with bog mats during works.
5. Grout will be pumped into the anchor annulus, allowing any voids within the wall to be filled; clean-up of any grout leakage will be undertaken as works progress.
6. Bespoke lateral banding shall be site adjusted and installed to link the rows of anchors together.
7. Pattress plates will be installed to the specified torque to complete the anchor installation.
8. The bulged northern section of the wall (in red, Figure 1-2) will be taken down and rebuilt to match the adjacent section of wall reusing the original cope stones to match the existing wall.
9. Additional weepholes will be installed throughout the wall.
10. After clean-up of the cofferdam area, the bulk bag dam will be removed.
11. The contractor will remove works equipment from the site and reopen the road.



Figure 1-2: Picture of the retaining wall with proposed anchors and lateral bands

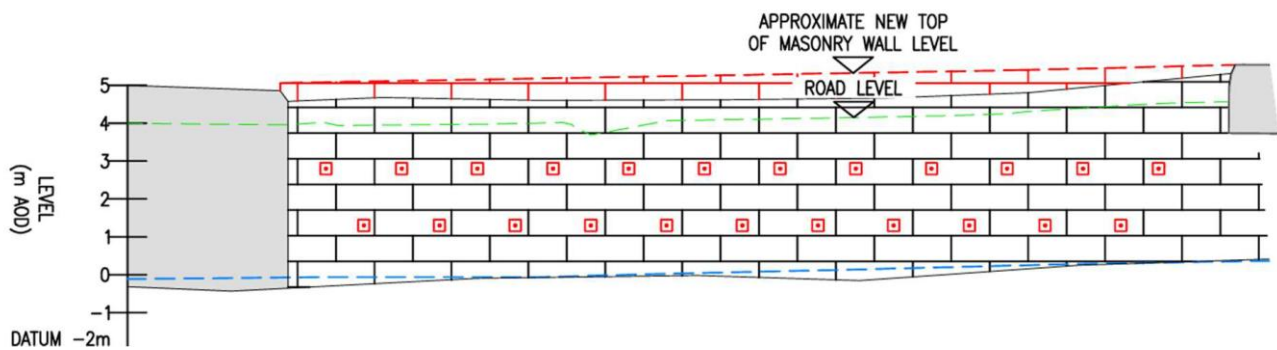


Figure 1-3: Front view drawing of the retaining wall with marks for anchor contact points

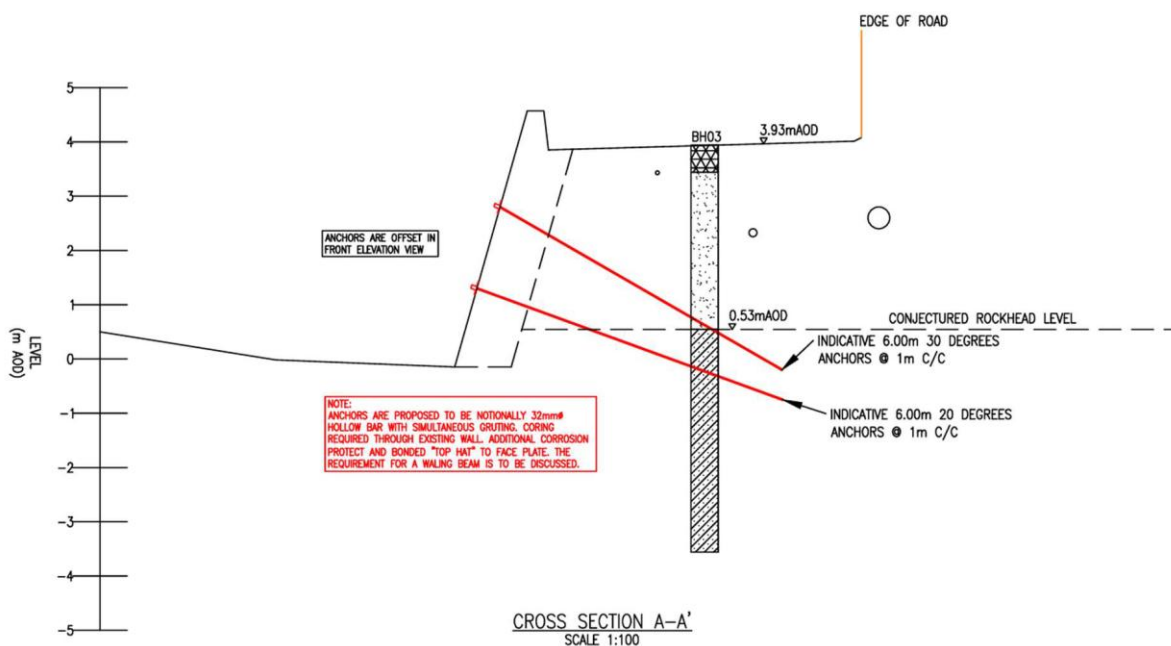


Figure 1-4: Cross section drawing of anchor installation into retaining wall and bedrock

2 Methods

A PEA of the site has been undertaken in line with current best practice guidance (CIEEM, 2017) and included:

- A desk-based assessment to identify any records of protected and/or notable habitats and species, and designated nature conservation sites in the vicinity of the proposed works.
- A site survey comprising a Phase 1 Habitat Survey and an assessment of the possible presence of protected or priority species, and (where relevant) an assessment of the likely importance of habitat features present for such species.
- An assessment of the potential impacts of the works on the habitats and species present at the site and the surrounding areas.

2.1 Desk-based Assessment

Prior to undertaking the site survey, searches of databases containing ecological records, priority habitats, and information on statutory and non-statutory designated sites were made. The following sources were included in these searches:

- MAGIC mapping service (www.magic.gov.uk)
- OS Open Maps (<https://osdatahub.os.uk/data/downloads/open>)
- NatureScot GIS data (<https://www.nature.scot/information-hub/naturescot-data-services>)
- Fife Nature Records Centre (<https://www.fife.gov.uk/kb/docs/articles/environment2/fife-nature-records-centre>)
- Fife Online Maps: Fife IHN and Natural Heritage Designations (<https://fifeonline-maps.maps.arcgis.com/apps/webappviewer/index.html?id=85c63a329faa45119fb31017ec432635>)

Due to the size of the site, it is considered that the zone of influence would be 12km from the proposed works location and therefore a desk-based assessment was conducted within this search area. The search was expanded to include statutory designated nature conservation sites within 5km, due to the proximity of the site to aquatic pathways for impacts.

2.2 Site survey

A site survey was undertaken on 9 April 2026 by JBA ecologists Laura Hodgkinson BSc PhD CEcol MCIEEM and Isabel Blackburn BSc. The survey included the proposed works location and the immediate environs as stated in the previous PEA (JBA Consulting, 2024).

The PEA was based upon a Phase 1 Habitat Survey, conducted following the Joint Nature Conservation Committee (JNCC) survey methodology (JNCC, 2010). The method was extended to identify any features suitable for use by legally protected or notable species and locate evidence for their presence or likely absence based on standard techniques.

2.2.1 Habitats

Habitats within and adjacent to the site boundary were surveyed to the Phase 1 Habitat Survey methodology (JNCC, 2010). The Phase 1 habitat survey is a standard technique for classifying and mapping British habitats where the dominant plant species are recorded and habitats are classified according to their vegetation types. All habitats within the site were recorded during the site survey and a description of each habitat type collected. Target Notes (TN) cover additional important features noted during the survey. Botanical names follow Stace (2019).

2.2.2 Protected and Notable species

Habitats were assessed for their potential to support any legally protected species or species of conservation concern and incidental faunal sightings, or field signs discovered during the survey, were recorded. Details on the assessment of specific species are as previously outlined (JBA Consulting, 2024).

Legislative guidance relating to protected species is outlined in Appendix A, along with details of relevant policy and legislation.

During the site survey, any signs or sightings of other notable species were also recorded. In addition, any environmental features that might constrain the works were also recorded (e.g. access restrictions).

2.2.3 Invasive non-native species

Any Invasive Non-native Species (INNS) observed during the survey were recorded. For stand-forming plant species, the extents of such stands were noted.

2.2.4 Limitations

The limitations of this PEA remain unchanged from the previous assessment (JBA Consulting, 2024).

3 Results and Evaluation

3.1 Desk-based assessment

3.1.1 Statutory designated sites

There are four statutory designated nature conservation sites within 1km of the proposed works, and one statutory designated geological site; details are contained within Table 3:1.

Table 3:1: Statutory designated sites within 1km of the proposed works

Site name	Designation	Qualifying features / Site description	Proximity to site
East Fife Coast	Geological Conservation Review Site	Carboniferous-Permian Igneous. Excellent exposures and a wide variety of volcanic features (Stephenson <i>et al.</i> , 2003).	<0.1km downstream, along the coast
Firth of Forth	Wetland of International Importance (Ramsar)	The citation for the Ramsar site states qualification under Ramsar Criteria 2, 4, 5 and 6. These criteria recognise the site's importance as wetland supporting endangered ecological communities and species, and large numbers of waterbirds.	<0.1km downstream, along the coast
Firth of Forth	Special Protection Area (SPA)	Main reason for classification was to give greater protection to the internationally important numbers of waders and wildfowl which visit the area during winter and on migration (Ibid). The citation for the SPA states qualification under Articles 4.1 and 4.2.	<0.1km downstream, along the coast

Site name	Designation	Qualifying features / Site description	Proximity to site
Firth of Forth	Site of Special Scientific Interest (SSSI)	The citation states that this SSSI is of importance for a variety of geological and geomorphological features, coastal and terrestrial habitats, vascular plants, invertebrates, breeding, passage and wintering birds.	<0.1km downstream, along the coast
Outer Firth of Forth and St Andrews Bay Complex	Special Protection Area (SPA)	This site qualifies under Articles 4.1 and 4.2, with qualifying features including wintering and breeding birds, and bird assemblage.	0.2km downstream, on open water
Site name	Designation	Qualifying features / Site description	Proximity to site

All these statutory designated sites have connectivity to the proposed works through the channel of the Keil Burn, being positioned immediately downstream of the proposed works site. The locations of these sites relative to the proposed works are illustrated in Figure 1-1, below.

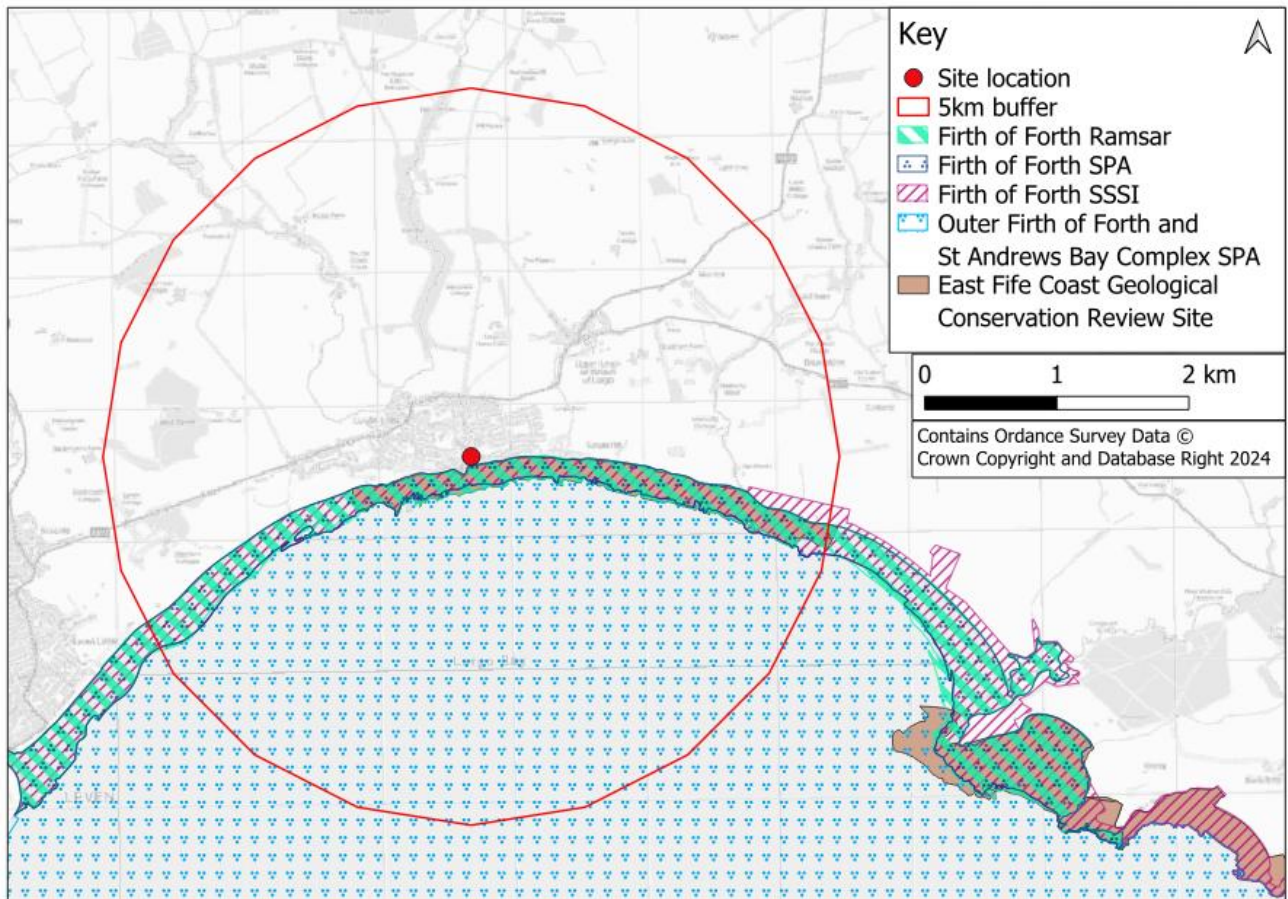


Figure 3-1: QGIS map of proposed works site with surrounding European designated sites

3.1.2 Non-statutory designated sites

There are two non-statutory designated sites within 1km of the proposed works site. The details of these are contained within Table 3:2 and are consistent with the findings of the initial PEA (JBA Consulting, 2024).

Table 3:2: Non-statutory designated sites within 1km of the proposed works

Site name	Designation	Site description	Proximity to site
Drummochy (Massney Braes)	Wildlife Site	Mixed habitat dune system.	0.3km W
Keil's Den	Wildlife Site	Ancient gorge woodland with understorey of Bluebells <i>Hyacinthoides non-scripta</i> , Great Wood-rush <i>Luzula sylvatica</i> , Dog's Mercury <i>Mercurialis perennis</i> and Wild Garlic <i>Allium ursinum</i> . A small area at the north of the site is mapped as ancient woodland (of semi-natural origin) in the Ancient Woodland Inventory of Scotland (AWI).	0.7km NW

These sites have no ecological connectivity to the proposed works. Keil's Den Wildlife Site is located along the course of Keil Burn, but upstream of the proposed works, therefore it is considered that there is no hydrological or ecological pathway for impacts.

3.1.3 Protected species

The data presented in Table 3:3 below includes the most recent records of species within approximately 1km of the proposed works site, protected under the following relevant legislation:

- Wildlife and Countryside Act (W&CA) 1981 (as amended)
- Conservation (Natural Habitats, &c.) Regulations 1994 (HabsRegs) (as amended)
- Scottish Biodiversity List (SBL)

These records are provided in addition to those included within the original PEA (JBA Consulting, 2024). Note that due to the way in which several bird species are recorded, the precise location of record is not known, and these species have been recorded as present within 1km of the proposed works site.

Table 3:3: Most recent records of protected and notable species within 1km of the proposed works

Common name	Scientific name	Designation	Location and date
Birds			
Bullfinch	<i>Pyrrhula pyrrhula</i>	SBL	<500m SW (2025)
Curlew	<i>Numenius arquata</i>		<600m SW (2025)
Golden Plover	<i>Pluvialis apricaria</i>		<2km NW (2021)
Grey Partridge	<i>Perdix perdix</i>		<2km NW (2021)
Herring Gull	<i>Larus argentatus</i>		<2km NW (2021)
House Sparrow	<i>Passer domesticus</i>		<2km NW (2021)
Linnet	<i>Linaria cannabina</i>		<2km NW (2021)
Sandwich Tern	<i>Thalasseus sandvicensis</i>		<300m NE (2023)
Skylark	<i>Alauda arvensis</i>		<2km NW (2021)
Song Thrush	<i>Turdus philomelos</i>		<2km NW (2021)
Swift	<i>Apus apus</i>		<200m E (2023)
Tree Sparrow	<i>Passer montanus</i>		<2km NW (2021)
Yellowhammer	<i>Emberiza citrinella</i>		<2km NW (2021)
Terrestrial Mammals			
Brown Hare	<i>Lepus europaeus</i>	SBL	<2km NW (2021)
Hedgehog	<i>Erinaceus europaeus</i>		<800m W (2024)
Red Squirrel	<i>Sciurus vulgaris</i>	W&CA 1981 (as amended), Sch. 5, SBL	~650m NW (2024)
Marine Mammals			
Harbour Seal	<i>Phoca vitulina</i>	HabsRegs	<700m SW (2024)
Terrestrial Invertebrates			
Cinnabar	<i>Tyria jacobaeae</i>	SBL	<1km W (2022)
Double Dart	<i>Graphiphora augur</i>		<1km NW (2021)
Ear Moth	<i>Amphipoea oculea</i>		~800m W (2025)
Green-brindled Crescent	<i>Allophyes oxyacanthae</i>		~1km W (2025)

Common name	Scientific name	Designation	Location and date
Knot Grass	<i>Acronicta rumicis</i>		~600m W (2022)
Rustic	<i>Hoplodrina blanda</i>		~1km SW (2021)
Shoulder-striped Wainscot	<i>Leucania comma</i>		~1km SW (2021)
Small Phoenix	<i>Ecliptopera silaceata</i>		~600m W (2022)
Small Square-spot	<i>Diarsia rubi</i>		~600m W (2022)
Streak	<i>Chesias legatella</i>		~1km W (2024)
Wall	<i>Lasiommata megera</i>		On site (2025)
White Ermine	<i>Spilosoma lubricipeda</i>		~600m W (2022)
Flowering Plants			
Greater Knapweed	<i>Centaurea scabiosa</i>	SBL	<600m E (2021)

Note that only species likely to be impacted by the proposed works are considered further in the protected species assessment section.

3.1.4 Invasive non-native species

There were no invasive non-native species (INNS) recorded since the 2017 sighting of Canada Goose *Branta canadensis*, the spread of which is still considered unlikely to be affected by the proposed works.

3.2 Habitat Assessment

The results of the Phase 1 Habitat Survey were unchanged since the previous PEAR as shown in target note table (Table 3:4), with target notes reflecting those recorded previously (JBA Consulting, 2024).

Table 3:4: Habitat assessment photos linked to initial PEAR target notes

Target note number	Description and photograph
TN1	Broadleaved woodland lining both banks of the Keil Burn upstream of the works site. 
TN2	Disused viaduct structure spans the Keil Burn. 

Target note number	Description and photograph
TN3	Channel of Keil Burn hugs the wall on the left side of the channel, incising the channel bed against the wall.  A photograph showing a stone wall on the left side of a channel. The channel bed is incised against the wall, and the water flows along the base of the wall. In the background, there are buildings, including one with a sign that reads 'RAILWAY INN'.
TN4	Wall forming main works site.  A photograph showing a wall forming the main works site. The wall is made of stone and runs along the side of a channel. In the background, there are buildings, including one with a sign that reads 'RAILWAY INN'.

Target note number	Description and photograph
TN5	Drummochy Road bridge, in good repair. Washed-up Kelp on substrate of Keil Burn not present during previous survey. 
TN7	Channel of Keil Burn widens at shore, with small boats moored downstream of the road bridge. 

3.3 Assessment for protected species

Birds

No specific bird survey was undertaken as part of this PEA, but incidental sightings of bird species were recorded. Birds seen on site included:

- Black-headed Gull *Chroicocephalus ridibundus*
- Eider Duck *Somateria mollissima*
- Grey Heron *Ardea cinerea*
- Jackdaw *Corvus monedula*
- Knot *Calidris canutus*
- Lesser Black-backed Gull *Larus fuscus*
- Magpie *Corvidae spp*
- Mallard *Anas platyrhynchos*
- Oyster Catcher *Haematopus ostralegus*
- Pied Wagtail *Motecilla alba*

The previous PEA (JBA Consulting, 2024) additionally identified Herring Gull *Larus argentatus*.

As previously found (JBA Consulting, 2024), the bulging section of retaining wall to be reconstructed does not have potential for nesting birds, but several adjacent structures such as the viaduct and the Drummochy Road Bridge do. Multiple Woodpigeon nests were again observed under the carriageway and at least two of these were active at time of survey.

There are multiple pre-2020 records for Schedule 1 bird species within 1km of the site (JBA Consulting, 2024) but none post -2020, as returned in the data search above. Schedule 1 bird species receive additional protections while nesting.

Records for species that comprise qualifying features for the designated sites within 1km of the works have been recorded within those sites (JBA Consulting, 2024). These species have the potential to commute and forage within the proposed works site. The site is considered suitable for foraging and commuting waterfowl and waders, including those associated with designated sites, and for breeding birds that will nest within urban structures.

Badger

In line with previous findings (JBA Consulting, 2024), there was no evidence for presence of Badger during the site survey, and no records for Badger were returned by Fife Nature Records Centre. As previously described (JBA Consulting, 2024), the habitat around the proposed works area is sub-optimal for Badger and the presence of Badger is considered highly unlikely.

Bats

One record for a Pipistrelle bat was returned by the data search in the initial PEA (JBA Consulting, 2024); no additional records of bats were returned post 2020.

The suitability of the works site and the surrounding area likely to be affected by the works is as previously set out (JBA Consulting, 2024).

Pine Martin

No records for Pine Martin were returned by the records centre since the year 2000, but the range of this species is currently rapidly expanding in Scotland as conservation efforts improve numbers of individuals. No evidence of Pine Martin was found during this site survey. The urban environment around the proposed works is considered unsuitable for this species, and it is highly unlikely that they would den around the works site. This is in keeping with previous site survey evidence (JBA Consulting, 2024).

Red Squirrel

Four records of Red Squirrel within 1km of the site were submitted in 2024 (JBA Consulting, 2024). However, the species is still considered highly unlikely to pass through the works area since the works site is considered sub-optimal habitat for this species.

Otter

There were no records for Otter within 1km of the site since 2010, where it was recorded within 0.1km south-west of the site (JBA Consulting, 2024). However, the proposed works site and surrounding area is still considered to provide highly suitable habitat for commuting and foraging Otter. The immediate surroundings are unlikely to support a holt or couch site, but it is considered possible that such rest areas could be located upstream, however, the limited area of the works, largely out of channel, mean no impacts on any potential rest sites are anticipated.

Water Vole

No records of Water Vole have been submitted within 1km of the site since 2000 (JBA Consulting, 2024). The site remains sub-optimal for Water Vole and unlikely to support their presence.

Herptiles

Common Frog was recorded in 2023 within 1km of the proposed works site, although the immediate works area is still considered unsuitable for all amphibians and all notable reptiles except for Common Lizard *Zootoca vivipara*, for which it has some potential.

Fish

The evidence supporting the presence of fish is unchanged since the previous site visit (JBA Consulting, 2024) and still shows that while fish are unlikely to be present on site during the works due to the low tide, there is the potential for works to impact on marine fish species downstream, through release of sediment or pollution unless suitable mitigations are put in place.

Invertebrates

There are several records of protected species of terrestrial invertebrates within 1km of the site since 2000. Terrestrial invertebrates are not expected to be affected by the proposed

works, however marine and freshwater invertebrates may be affected. Marine invertebrates are expected to predominate over freshwater invertebrates for the site and downstream area. Impacts are most likely to be the result of release of sediment or pollution unless suitable mitigations are put in place.

Marine Mammals

There were two sighting of Harbour Seal hauled up on the rocks of the beach to the right of the Keil Burn estuary from the site visit. The data search revealed that the most recent records for Harbour Seal within 1km of the site was for three individuals in 2024. There are also numerous records of Harbour Seal prior to 2020 near the site (JBA Consulting, 2024). While it is unlikely that marine mammals would be encountered on site, they could be impacted through the ecological connectivity of the proposed works to the Firth of Forth.

3.4 Invasive non-native species

While there was no Himalayan Balsam *Impatiens glandulifera* found during this site visit, previous sightings (JBA Consulting, 2024) suggest continued presence. This considers that Himalayan Balsam was early in development during the survey time and as a result difficult to differentiate with surrounding vegetation. In keeping with previous advice (JBA Consulting, 2024), suitable biosecurity measures will be required to prevent spread of this species off-site.

4 Conclusions and Recommendations

4.1 Conclusions

4.1.1 Designated sites

There are four statutory designated nature conservation sites located downstream of the proposed work, with ecological connectivity through the Keil Burn. These sites are:

- Firth of Forth SPA, Ramsar and SSSI
- Outer Firth of Forth and St Andrews Bay Complex SPA

No impacts are anticipated on any non-statutory designated sites, due to a lack of connectivity pathways.

4.1.2 Important habitats

The habitats within and immediately adjacent to the site that are sensitive to impact from the proposed works are as previously stated (JBA Consulting, 2024) and include:

- Running freshwater
- Running brackish/sea water
- Intertidal substrates
- Urban structures (the wall, the viaduct, and the Drummochy Road bridge)

4.1.3 Protected species

The proposed works site is considered suitable to support some protected species including those listed in the previous PEAR (JBA Consulting, 2024). Additional advice is provided below regarding birds.

4.1.4 Opportunities for enhancement

The limited area of the site, in a predominantly urban setting, make significant enhancements unviable. However, there is a potential opportunity to create additional niches for marine creatures through installation of features such as Vertipools™ on the repaired wall.

4.2 Recommendations

4.2.1 General avoidance measures

General avoidance measures that should be incorporated within the scheme include:

- Any vegetation clearance required to permit works and access should be carried out outside of the bird breeding season (i.e. avoiding March to September inclusive). If works are proposed for the bird breeding season, or if following initial clearance, it becomes apparent that some further de-vegetation is necessary

during the bird breeding season, an experienced ecologist should first check all areas for the presence of nesting birds. Structures along the access route should also be checked. Should any nests be found, they should have an appropriate exclusion zone put in place, to safeguard the nests until the chicks have successfully fledged.

- Works should be timed to avoid the key months for fish spawning for salmonid species, including the upstream migration period (i.e., works should not take place in channel after October or through winter months).
- Limit the hours of working to daylight hours, to limit disturbance to nocturnal and crepuscular animals.
- Due to the potential presence of bats and Otters the use of lighting at night should be avoided. If the use of lighting is essential, then a directional cowl should be fitted to all lights to prevent light spill and to be directed away from the watercourse outside of the immediate works area.
- Contractors must ensure that no harm comes to wildlife by maintaining the site efficiently and clearing away materials which are not in use, such as wire or bags in which animals can become entangled; and
- Any pipes should be capped when not in use (especially at night) to prevent animals becoming trapped. Any excavations should be covered overnight to prevent animals from falling and getting trapped. If that is not possible, a strategically placed plank should be placed to allow animals to escape.

4.2.2 Biosecurity

Measures will need to be put in place to ensure that there is no spread of invasive non-native species or diseases. The Check-Clean-Dry approach should be followed, ensuring that all PPE and equipment is cleaned before leaving site. For more information go to: www.nonnativespecies.org/checkcleandry.

4.2.3 Further surveys

It is recommended that further surveys are undertaken by a suitably licensed ecologist to confirm the likely presence/absence of bat roosts from within the wall structure to be repaired prior to undertaking repairs.

4.2.4 Construction considerations

4.2.4.1 Toolbox Talks

Due to the potential presence of protected species, all staff working on the site should receive a toolbox talk from an ecologist on the following protected habitats and species:

- Nesting birds
- Otter
- Harbour Seal
- Bats

The toolbox talk should cover recognition of the species and evidence of its presence, what to do if evidence is seen and a summary of the relevant legislation.

4.2.4.2 Pollution prevention measures

Appropriate mitigation measures should be implemented prior to the construction phase to ensure that the water quality is not adversely affected through pollution incidents and the release of contaminants from the site. This mitigation should include:

- Following relevant pollution prevention measures e.g. CIRIA Guidance: Control of water pollution from construction sites. Guidance for consultants and contractors (C532D) (Masters-Williams, 2001). Information useful for Toolbox Talks on working near water and pollution prevention can be found at: https://www.ciria.org/Resources/All_toolbox_talks/Env_toolbox_talks/Working_on_or_near_watercourses.aspx [site accessed 14th June 2017].
- Minimising the impacts of oil and fuel leaks can be achieved by the following actions:
 - Any chemical, fuel and oil stores should be located on impervious bases within a secured bund with a storage capacity 110% of the stored volume.
 - Biodegradable oils and fuels should be used where possible.
 - Drip trays should be placed underneath any standing machinery to prevent pollution by oil/fuel leaks. Where practicable, refuelling of vehicles and machinery should be carried out on an impermeable surface in one designated area well away from any watercourse or drainage (at least 10m).
 - Emergency spill kits should be available on site and staff trained in their use.
 - Operators should check their vehicles on a daily basis before starting work to confirm the absence of leakages. Any leakages should be reported immediately.
 - Daily checks should be carried out and records kept on a weekly basis and any items that have been repaired/replaced/rejected noted and recorded. Any items of plant machinery found to be defective should be removed from site immediately or positioned in a place of safety until such time that it can be removed.
- Silt run off should be prevented by incorporating the following actions:
 - Silt curtains, or other appropriate method of silt containment, should be used to prevent silt from the construction works entering the watercourse.
 - All silt containment measures should be agreed with SEPA before implementation.
- Water quality downstream of the works should be monitored regularly to detect any changes in water quality that could indicate a pollution incident. Should monitoring indicate potential pollution from the construction activities, works should be stopped and a solution found to prevent the pollution source entering the watercourse. Monitoring could include:

- Visual monitoring to see if water colour has changed or if a plume is visible indicating sediment input.
- Water quality meter measurements for Dissolved Oxygen and pH.
- Environmentally sensitive products should be used where possible.

A Relevant policy and legislation

The primary legislation in Scotland covering nature conservation and wildlife protection is outlined below. The legislation discussed below is intended as a guide only and does not replace formal legal advice.

A.1 National Planning Framework 4 (NPF4)

The National Planning Framework 4 (NPF4) sets out the Government's planning policies for Scotland and how these are expected to be applied with a presumption in favour of sustainable development a core element of the framework.

Of relevance to the proposed works in this report, the document states in relation to conserving and enhancing the natural environment, that: "Development proposals which by virtue of type, location or scale will have an unacceptable impact on the natural environment, will not be supported." Minister for Public Finance, Planning and Community Wealth (2023)

It also states that: "Development proposals that will affect a National Park, National Scenic Area, Site of Special Scientific Interest or a National Nature Reserve will only be supported where: The objectives of designation and the overall integrity of the areas will not be compromised; or Any significant adverse effects on the qualities for which the area has been designated are clearly outweighed by social, environmental or economic benefits of national importance." Minister for Public Finance, Planning and Community Wealth (2023).

Additionally, it states: "Proposals will be required to contribute to the enhancement of biodiversity, including by restoring degraded habitats and building and strengthening nature networks." and for developments "significant biodiversity enhancements are provided, in addition to any proposed mitigation. This should include nature networks, linking to and strengthening habitat connectivity within and beyond the development, secured within a reasonable timescale and with reasonable certainty. Management arrangements for their long-term retention and monitoring should be included, wherever appropriate." Minister for Public Finance, Planning and Community Wealth (2023).

A.2 Habitats Directive and Conservation (Natural Habitats, &c.) Regulations 1994

In Scotland, the Habitats Directive is transposed through a combination of the Habitats Regulations 2017 (in relation to reserved matters) and the 1994 Regulations. These Regulations afford protection to certain species identified in the Habitats Directive, including those requiring strict protection (European Protected Species (EPS)). Section 2.3 below provides further details on specific species.

The Habitats Regulations 1994 (as amended in Scotland) implement the species protection requirements of the Habitats Directive in Scotland on land and inshore waters (0-12 nautical miles). There are various Schedules attached to the Habitats Regulations including Schedule 2 and 4 which relates to European protected species (fauna and flora,

respectively) and Schedule 3 with relates to those animals in Annex V of the Habitats and Species Directive whose natural range includes Great Britain.

The designation and protection of domestic and European Sites e.g., Sites of Special Scientific Interest (SSSIs), Special Protection Areas (SPA) and Special Areas of Conservation (SAC) falls within these Regulations.

Public bodies (including the Local Planning Authority) have a duty to have regard to the requirements of the Habitats Directive in carrying out their duties i.e., when determining a planning application.

A.3 Wildlife and Countryside Act 1981 (as amended)

The Wildlife and Countryside Act (W & CA) 1981 (as amended) constitutes an important statute relating to the protection of flora, fauna and the countryside within Great Britain. Part 1 of the Act deals with the protection of wildlife. Most EPS are now covered under the Conservation of Habitats and Species Regulations (as amended) however certain species and activities are still covered by the W & CA. The W & CA also covered possession of species listed in the various schedules. In Scotland, the W & CA is amended by The Nature Conservation (Scotland) Act 2004 and The Wildlife and Natural Environment (Scotland) Act 2011.

A.4 Nature Conservation (Scotland) Act 2004

The Act serves to make provisions in relation to the conservation of biodiversity; to make further provision in relation to the conservation and enhancement of Scotland's natural features; to amend the law relating to the protection of certain birds, animals and plants; and for connected purposes. Under Section 2(4) of the Act a Scottish Biodiversity List, a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland, was compiled.

A.5 Wildlife and Natural Environment (Scotland) Act 2011

The Wildlife and Natural Environment (Scotland) Act (WANE Act) is an Act of the Scottish Parliament to make provision in connection with wildlife and the natural environment and related purposes.

A.6 Protected species

Several species are protected under UK and international legislation. In the UK, primary protection is provided under the Wildlife and Countryside Act 1981 (as amended). Species of European importance receive additional protection in Scotland under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended); others may receive protection through specific legislation. Further details on specific species and their levels of protection are provided below.

Badger

Badgers *Meles meles* and their setts are protected under the Protection of Badgers Act 1992 as amended by the Wildlife and Natural Environment (Scotland) Act 2011.

Offences under the Act include:

- wilfully taking, injuring or killing a badger
- cruelty to a badger
- intentional or reckless interference with a badger sett
- sale or possession of a badger
- marking or ringing of a badger.

Interfering with a Badger sett includes:

- damaging or destroying a sett or any part of it
- obstructing access to a sett
- disturbing a badger while it is in a sett
- causing or allowing a dog to enter a badger sett.

Bats

All UK bat species are European Protected Species (EPS), as such they receive full protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). This makes it an offence to deliberately or recklessly:

- capture, injure or kill a bat
- harass a bat or group of bats
- disturb a bat in a roost (any structure or place it uses for shelter or protection)
- disturb a bat while it is rearing or otherwise caring for its young
- obstruct access to a bat roost or otherwise deny an animal use of a roost
- disturb a bat in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species
- disturb a bat in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young
- disturb a bat while it is migrating or hibernating.

It is also an offence to:

- damage or destroy a breeding site or resting place of a wild bat
- keep, transport, sell or exchange, or offer for sale or exchange any wild bat (or any part or derivative of one).

Birds

All wild birds are protected under the Wildlife and Countryside Act 1981 (as amended). Further protection is given to some rarer species and to species vulnerable to disturbance and/or persecution. This is done through various schedules attached to the Act. This makes it an offence to:

- kill, injure or take a bird

- take, damage, destroy or interfere with a nest of any bird while it is in use or being built
- obstruct or prevent any bird from using its nest
- take or destroy an egg of any bird.

Certain species, such as the Barn Owl *Tyto alba*, receive additional protection under Schedule 1, which makes it an offence to disturb:

- any bird while it is building a nest
- any bird while is in, on, or near a nest containing eggs or young
- any bird while lekking
- the dependent young of any bird.

For any wild bird species listed on Schedule 1A, it is an offence to intentionally or recklessly harass any bird.

For any wild bird species listed on Schedule A1, it is an offence to intentionally or recklessly take, damage, destroy or interfere at any time with a nest habitually used by any bird.

It is also an offence to:

- possess or control a living or dead wild bird
- possess or control an egg of a wild bird (or any such derivatives)
- knowingly cause or permit any of the above acts to be carried out.

Cetaceans (dolphins, whales and porpoises)

All cetacean species found in Scottish territorial waters are classed as European protected species. They are given protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).

Cetaceans in waters more than 12 nautical miles from land are protected under the Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2017.

In Scottish inshore waters, it is an offence to deliberately or recklessly:

- kill, injure or capture a cetacean
- disturb or harass a cetacean

It is also an offence to:

- damage or destroy a breeding site or resting place of such an animal
- keep, transport, sell or exchange, or offer for sale or exchange any cetacean (or any part or derivative of one) obtained after 10 June 1994

Fish

Full protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) is given to the Basking Shark *Cetorhinus maximus*, Vendace *Coregonus vandesius* and Powan *Coregonus clupeoides*. Allis Shad *Alosa alosa* and Twaite Shad *Alosa fallax* are protected under Schedule 5 only in terms of regulating how they can be killed or taken.

For fully protected Schedule 5 species, it's an offence to:

- intentionally or recklessly kill, injure or take fish
- possess or sell fish
- intentionally or recklessly disturb or harass fish.

Other species are listed on Schedule 3 of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), and it is an offence to use certain methods to catch or take these fish in freshwater.

The Sturgeon *Acipenser sturio*, a rare visitor to Scotland, is an EPS.

Great Crested Newt and other amphibians

The Great Crested Newt *Triturus cristatus* is an EPS under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), as is the Natterjack Toad *Epidalea calamita*. This makes it an offence to:

- kill, capture or disturb a Great Crested Newt or Natterjack Toad
- take or destroy the eggs of a Great Crested Newt or Natterjack Toad
- damage or destroy the breeding or resting places of Great Crested Newt or Natterjack Toad
- obstruct access to a breeding site or resting place of a Great Crested Newt or Natterjack Toad, or otherwise deny the animal use of that site
- disturb a Great Crested Newt or Natterjack Toad in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species
- disturb a Great Crested Newt or Natterjack Toad in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young.

Both species also receive additional protection under the Wildlife and Countryside Act 1981 (as amended) making it illegal to possess or control any Great Crested Newt or Natterjack Toad.

Other amphibians are also protected under the Wildlife and Countryside Act 1981 (as amended), but only against trade (i.e. sale, barter, exchange, transport for sale, or advertise for sale or to buy).

Hares

Mountain Hares *Lepus timidus* are included on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and so have full protection. Anyone who intentionally or recklessly kills, injures or takes Mountain Hare without a licence will be acting unlawfully. The Mountain Hare is also a species of 'Community interest' listed on Annex V of the Habitats Directive. To ensure a favourable conservation status, the taking of these animals and their exploitation may be subject to management measures.

Brown Hares *Lepus europaeus* and are protected in the closed season (1 February to 30 September) under the Wildlife and Countryside Act 1981 (as amended). Brown Hares are a quarry species and may be legally controlled in open season, however it is an offence to intentionally or recklessly kill, injure or take a Brown in its closed season or without a legal right to do so (i.e. poaching).

It is also an offence to possess or control, sell or offer for sale, or transport for the purpose of sale any living or dead hare (or rabbit), or any derivative of such an animal, which has been killed without a legal right to do so.

Invertebrates (aquatic and terrestrial)

Numerous invertebrate species receive international protection under the following legislation:

- The Conservation of Habitats and Species Regulations 2017 (as amended); Annex IIa, Annex Iva and Annex Va
- Council of Europe Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) Appendix II and III
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- EU CITES Regulations

Approximately 70 species of invertebrate species receive legal protection through Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). There are various levels of protection according to the rarity of the species. Offences include combinations of the following:

- Sale, or offering / exposing for sale
- Possession
- Intentional taking, killing or injuring
- Intentionally / recklessly damaging or destroying its place of shelter / protection
- Intentionally / recklessly disturbing it whilst occupying its place of shelter / protection
- Intentionally / recklessly obstructing access to its place of shelter / protection

Species with full protection under the Act include the Marsh Fritillary *Euphydryas aurinia*, Southern Damselfly *Coenagrion mercuriale* and Violet Click Beetle *Limoniscus violaceus*.

Otter

The European Otter *Lutra lutra* is an EPS protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), making it an offence to:

- capture, injure or kill an Otter
- harass an otter or group of Otters
- disturb an Otter in a holt or any other structure or place it uses for shelter or protection
- disturb an Otter while it is rearing or otherwise caring for its young
- obstruct access to a holt or other structure or place Otters use for shelter or protection, or otherwise deny the animal use of that place
- disturb an Otter in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species

- disturb an Otter in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young.

It is also an offence to:

- damage or destroy a breeding site or resting place of such an Otter (whether or not deliberately or recklessly)
- keep, transport, sell or exchange, or offer for sale or exchange any wild Otter (or any part or derivative of one) obtained after 10 June 1994.

Otter shelters are legally protected whether or not an Otter is present.

Pine Marten

Pine Marten *Martes martes* are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Certain methods of killing or taking pine martens are illegal under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). It is an offence to intentionally or recklessly:

- kill, injure, or take a Pine Marten
- damage, destroy or obstruct access to any structure or place a Pine Marten uses for shelter or protection (a den)
- disturb Pine Marten when it is occupying a structure or place for that purpose
- possess or control, sell, offer for sale or possess or transport for the purpose of sale any live or dead Pine Marten or any derivative thereof.

Plants and fungi

All wild plant and fungi species receive a level of protection under the Wildlife and Countryside Act 1981 (as amended). Some more rare or vulnerable species are given added protection under Schedule 8 of the same Act. Three Scottish plant species are European protected species: Killarney Fern *Vandenboschia speciosa*, Slender Naiad *Najas flexilis* and Yellow Marsh Saxifrage *Saxifraga hirculus*. These species receive protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).

It is an offence to intentionally or recklessly uproot any wild plant (which the 1981 Act defines as including fungi) without the permission of the owner or occupier of the land it grows on.

For European protected species of plant, it is an offence to:

- intentionally or recklessly pick, collect, cut, uproot or destroy such a plant or anything derived from it
- possess specimens or derivatives of plants
- sell, exchange or offer for sale or exchange these plants or derivatives of them.
- For any Schedule 8 plant and fungus species, it is an offence to:
- intentionally or recklessly pick, uproot or destroy any wild plant or fungus (or its seeds or spores)
- sell, offer for sale, possess or transport for the purpose of sale any living or dead plant or fungus.

Partial protection of a species under Schedule 8 generally prohibits selling or advertising for sale any plant or fungus, but it is not an offence to pick such plants or fungi.

Floating-leaved Water Plantain *Luronium natans* has been introduced to Scotland. As this species isn't found naturally in Scotland, it doesn't have European protected species status here. But, as an Annex IV species, it is protected in Scotland from possession, transport and sale.

Red Squirrel

Red Squirrels *Sciurus vulgaris* are listed on Schedule 5 and 6 of the Wildlife and Countryside Act 1981 (as amended). It is an offence to intentionally or recklessly:

- kill, injure or take a Red Squirrel
- damage, destroy or obstruct access to any structure or place which a Red Squirrel uses for shelter or protection (a drey)
- disturb Red Squirrel when it is occupying a structure or place for that purpose
- possess or control, sell, offer for sale or possess or transport for the purpose of sale any live or dead Red Squirrel or any derivative of such an animal.

Reptiles

All marine turtles are EPS and receive full protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) while in Scottish waters.

Scottish reptile species, Adder *Vipera berus*, Common Lizard *Zootoca vivipara* and Slow Worm *Anguis fragilis* have limited protection under the Wildlife and Countryside Act 1981 (as amended) making it an offence to:

- intentionally or recklessly kill and/or injure a wild reptile
- trade – i.e. sale, barter, exchange, transport for sale, or advertise for sale or to buy any wild reptile.

Seals

The main legislation that protects seals in Scottish waters is the Marine (Scotland) Act 2010. This Act also provides for Scottish Ministers to designate Seal Conservation Areas. The Protection of Seals (Designation of Haul-Out Sites) (Scotland) Order 2014 also applies, and the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) prohibit certain methods of catching or killing seals.

It is an offence to intentionally or recklessly kill, injure or take a seal at any time of year, except:

- to alleviate suffering
- where Marine Scotland has issued a licence to do so.
- It is also an offence to intentionally or recklessly harass seals at significant haul-out sites.

Water Vole

The Water Vole *Arvicola amphibius* receives partial protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). In Scotland, this legal protection is currently restricted to the water vole's places of shelter or protection and doesn't extend to the animal itself. Full protection, to also cover the animal, is proposed.

It is an offence to intentionally or recklessly:

- damage, destroy or obstruct access to any structure or place that Water Voles use for shelter or protection
- disturb a Water Vole while it is using any such place of shelter or protection.

A.7 Invasive non-native species

In Scotland, INNS are covered by Section 14 of the Wildlife and Countryside Act 1981. The regulation was amended in 2012 when the non-native species section of the Wildlife and Natural Environment (Scotland) Act 2011 came into force.

The regulations state that it is an offence to:

- release or allow to escape from captivity any animal to a place outwith its native range
- cause any animal outwith the control of any person to be at place outwith its native range
- plant or otherwise cause to grow any plant in the wild outwith its native range.

Examples of INNS most likely to be encountered include Japanese Knotweed *Reynoutria japonica*, Himalayan Balsam *Impatiens glandulifera*, Giant Hogweed *Heracleum mantegazzianum* and Signal Crayfish *Pacifastacus leniusculus*. Some species are also classed as 'controlled waste' and must be disposed of appropriately (i.e. Japanese Knotweed and Giant Hogweed).

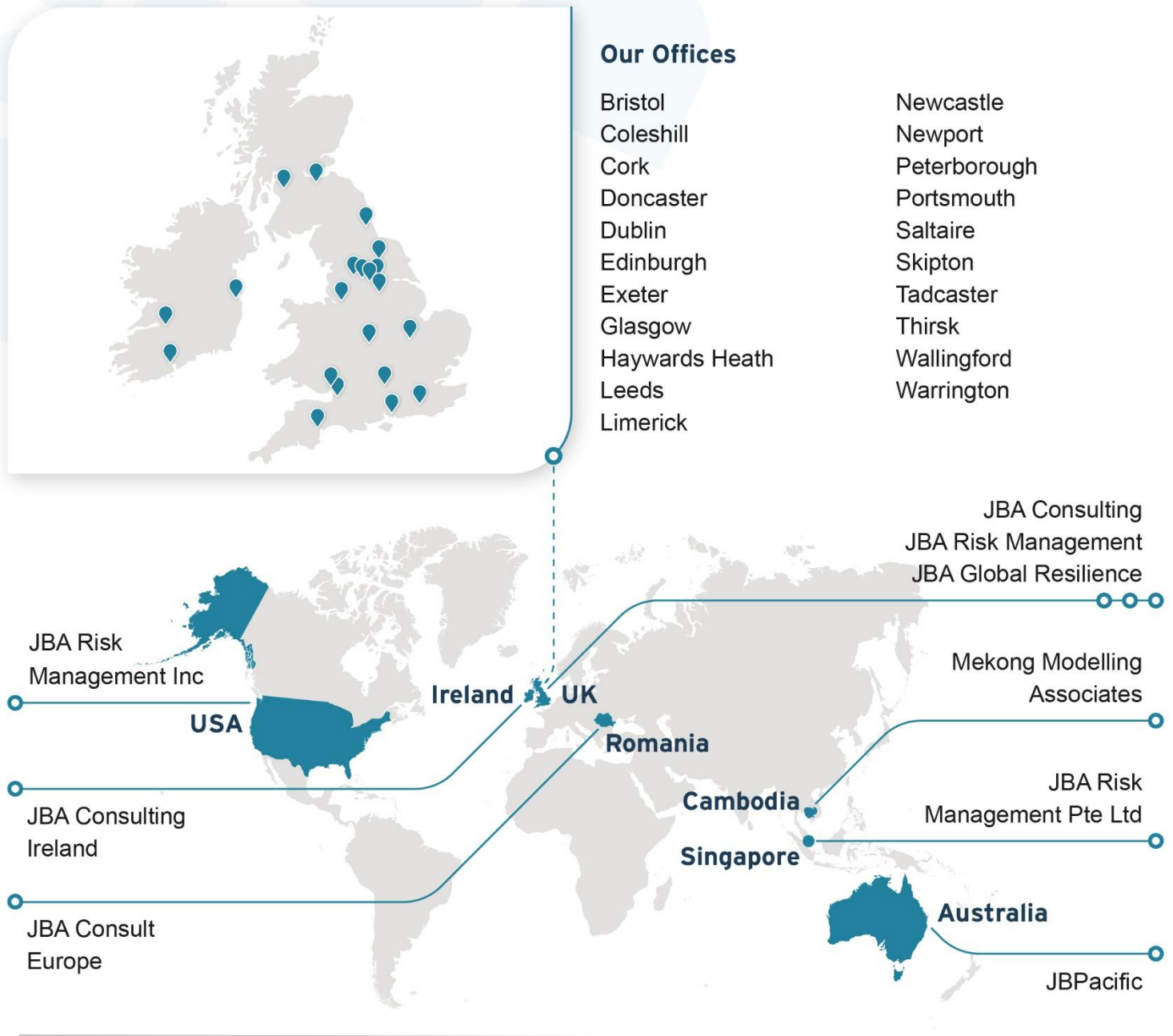
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