POWERFUEL

Portland energy recovery facility

Environmental statement
Technical appendices

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Natural heritage

POWERFUEL

Portland energy recovery facility

Environmental statement
Technical appendix K:

Natural heritage

(part 1 of 3)

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K1

Ecological assessment

CGO Ecology Ltd 27a Ridgefield Gardens Christchurch Dorset BH23 4QG UK

Ecological assessment for the proposed energy recovery facility at Peat Bay, Incline Road, Portland, Dorset

CGO Ecology Ltd

Christchurch

Version 3
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Author:
Dr Chris Gleed-Owen MCIEEM, Director & Principal Ecologist

For client:
Powerfuel Portland Ltd
Suite B, The Core
Gore Cross Business Park
Bridport
Dorset
DT6 3FH

(+44) 01202 798126
enquiries@cgoecology.com
www.cgoecology.com

Registered Company in England and Wales, number 6532052
Registered office: Suite 8 Bourne Gate, 25 Bourne Valley Road, Poole, Dorset, BH12 1DY, UK

Non-technical summary

Introduction

CGO Ecology Ltd was instructed by Powerfuel Portland Ltd to produce this overview of the ecology evidence and mitigation/enhancements needed for the proposed energy recovery facility (ERF) at Peat Bay, Incline Road, Portland, Dorset, DT5 1DB (SY 696 742). The planning application area ('the site') comprises the ERF, Portland Port and access via Lerret Road, Castle Road, Castletown and Main Road. This incorporates a Preliminary Ecological Appraisal (PEA) of the whole site, and targeted surveys for bats, birds, reptiles and flora.

Methodology

The desk study comprised: file review for previous ERF proposals at the site; MAGIC search for mitigation licences and protected sites within 5km; DERC search for bats within 5km, protected and notable species within 2km, and 'local sites' within 1km. Extended Phase 1 Habitat Survey walkovers took place in April and November 2019, and April 2020. The targeted surveys were: Breeding Bird Survey (June, July 2019); Wintering Bird Survey targeting black redstart (October 2019 to March 2020); reptile survey (September 2019); bat preliminary roost assessment (September 2019); botanical assessment (October 2019).

Results

The MAGIC search showed no European Protected Species mitigation licences within 5km. International site designations within 5km: Chesil Beach & The Fleet Ramsar, Chesil Beach & The Fleet SPA, Chesil & The Fleet SAC, Isle of Portland to Studland Cliffs SAC. National site designations within 5km: Chesil Beach and Stennis Ledges MCZ, Chesil & The Fleet SSSI, Isle of Portland SSSI, Nicodemus Heights SSSI, Portland Harbour Shore SSSI.

The DERC search showed records for protected plants, priority lichens, protected butterflies, protected reptiles, many protected birds, and a priority terrestrial mammal within 2km, and at least seven species of bat within 5km. There are four local sites within 1km.

The Phase 1 habitats on the ERF site are hardstanding, bare ground (rubble) with patches of open mosaic, and fringes of continuous scrub and ephemeral/short perennial. The access route and Port areas comprise hardstanding, buildings, and a strip of coastal grassland.

Bat roosts were ruled out for tunnels, walls and other structures on and adjacent to site. No birds nest on the ERF site. At least three black redstarts overwintered on and adjacent to the site, and may breed there. Reptiles are absent. Hedgehog could be present. The nationally-scarce maidenhair fern is present on the east edge of the ERF site.

Mitigation recommendations

- Safeguard the maidenhair fern plant on the inner breakwater wall.
- Keep vegetation cut short across site, to prevent bird nesting and reptile immigration.
- Brown roof(s) to offset loss of foraging habitat for black redstart, other birds, invertebrates.
- Biosecurity Plan to prevent import/spread of invasive species.

Enhancement recommendations

- Five batboxes, five hedgehog homes.
- Five black redstart nestboxes, and 25 other nestboxes.

Contents

1. Introduction

1.1. Background, brief

CGO Ecology Ltd was instructed by Powerfuel Portland Ltd to produce this ecological assessment to inform an Ecological Impact Assessment (EcIA) of a proposed energy recovery facility (ERF) at Peat Bay, Incline Road, Portland, Dorset, DT5 1DB (SY 696 742). The planning application area ('the site') comprises the ERF location, plus other areas that would service it. This includes much of Portland Port (Queens Pier, New Quay, Dock Road, Inner and Outer Coaling Piers, Deep Water Berth and Cruise Terminal) and an access route from the west (Lerret Road, Castle Road, Castletown, Incline Road).

Between April 2019 and April 2020, a Preliminary Ecological Appraisal (PEA) was conducted of the whole site (Gleed-Owen, 2019a, 2020a, 2020b), and targeted surveys were conducted for bats, birds (Day, 2019, 2020), reptiles (Gleed-Owen, 2019b) and flora (Edwards, 2019) at the proposed ERF location.

This report summarises the ecological evidence thus far, and gives recommendations for mitigation of impacts of habitats and species, and enhancements in line with National Planning Policy Framework (NPPF) (MHCLG, 2019).

The site was subject to a previous planning application for Portland Green Energy Plant to process vegetable oil biofuel in 2009, and a variation to process rubber crumb in 2013. Both were consented but not built. The consultancy file for these proposals form part of the desk study for this report.

As of 1st April 2019, the Local Planning Authority became Dorset Council, replacing the former Weymouth & Portland Borough Council.

Figure 1 – Planning application area and site boundary (red outline) provided by client.

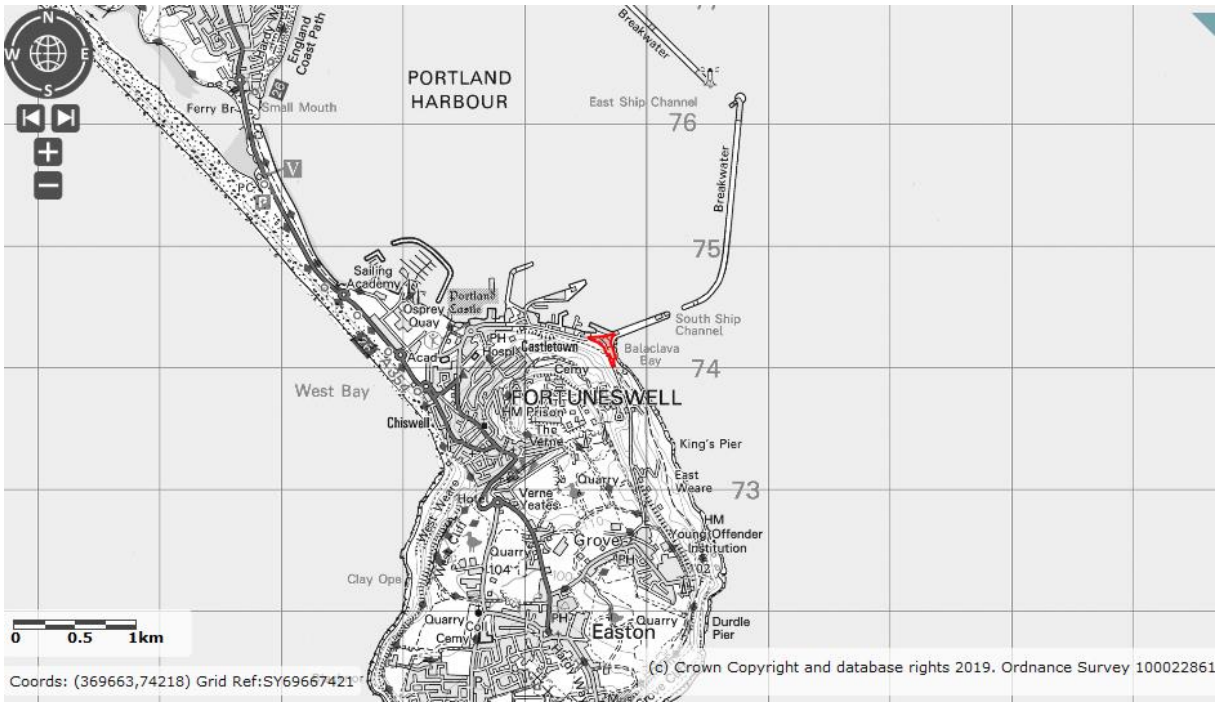

Figure 2 – Proposed ERF location (red boundary) on map from MAGIC website.

1.2. Legislation and planning

Many species of wildlife and habitat types in Britain are protected by laws such as the Wildlife and Countryside Act 1981 (WCA) (as amended), Protection of Badgers Act 1992, Habitats Regulations 2017, NERC Act 2006 (esp. Section 41), and Hedgerow Regulations 1997. Works that may harm or disturb protected species, or damage their habitats, must be impact-assessed by an ecologist, and mitigated/compensated as necessary.

Trees can be protected individually or as a group/area by a Tree Preservation Order (TPO) under the Town and Country Planning Act 1990 (as amended) and/or the Town and Country Planning (Tree Preservation) (England) Regulations 2012.

LPAs also have a duty under the National Planning Policy Framework (NPPF) (MHCLG, 2019) to deliver measurable 'biodiversity net gain' (i.e. ecological enhancements) as part of the sustainable development agenda.

A Preliminary Ecological Appraisal (PEA) is the first stage of evidence gathering for an impact-assessment, typically involving an Extended Phase 1 Habitat Survey to assess the site's ecological value and potential impacts of the proposed development on protected and notable species, habitats and protected sites. This may be followed by targeted 'phase 2' species surveys and/or an Ecological Impact Assessment (EcIA) if required under The Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

An Environmental Impact Assessment will be required for a development of this size and type. As such, it does not fall under the Dorset Biodiversity Appraisal Protocol, and will not require a Biodiversity Plan certified by Dorset Council's Natural Environment Team.

2. Desk study

2.1. Review of previous applications

Documents relating to the previous planning applications for Portland Green Energy Plant, Balaclava Bay (the proposed ERF site), provided by the client, have been reviewed.

An application was made by W4B Renewable Energy Limited in 2009 for a plant to convert vegetable oil into energy. It presented data from a Phase 1 habitat and ecological scoping

survey in 2008, and bat surveys in 2009 (reports for neither of which have been seen by the current author). A Preliminary Roost Assessment (PRA) was conducted, and nocturnal bat surveys were carried out over one night (dusk and dawn) on 14th/15th April 2008. The timing and level of effort would not be acceptable under the current Bat Conservation Trust survey guidelines (Collins, 2016) which stipulate May-August period and two-week spacing for nocturnal surveys. Also, the level of roost potential was not classified, so it is difficult to know whether the effort level was appropriate. One night of nocturnal surveys would only be appropriate for a 'low' potential roost under the current guidelines, whereas 'medium' and 'high' potential would require two or three surveys, at least two weeks apart.

Communications from Weymouth & Portland Borough Council raised the proximity of nationally- and internationally-protected sites, and the value of the area for overwintering and breeding birds. It named the little tern *Sternula albifrons* specifically. Subsequent to the application, an anonymous delegate officer's report dated 06/01/2010 did not raise any ecological issues. The application (09/00646/FULES) was consented.

In October 2012, RPS Group produced an outline Construction Environmental Management Plan (CEMP) for the new developer entity, W4B Portland Ltd (Aplin, 2012). This raised the proximity of protected sites, stated that no bat roosts had been found, that hedgehog *Erinaceus europaeus* may be present, and that there was "limited habitat for birds, reptiles and invertebrates". No other protected or invasive species were considered relevant. Its ecological mitigation recommendations were, however, confined to avoiding the March-August bird-nesting season, and agreeing a methodology for site clearance to "minimise the risk of reptiles being harmed". This latter statement implied that reptiles might be present.

In early 2013, RPS Group sought a screening opinion from the LPA for a variation of condition 2 of the planning consent (09/00646/FULES) to process rubber crumb instead of biofuel (Moscrop, 2013).

The legislative and regulatory frameworks changed with the Habitats Regulations 2010, and the new Air Pollution Information Service (APIS) thresholds for terrestrial habitats and site-specific impact tool, which was introduced in 2012. The APIS impact tool enabled assessment of maximum thresholds ('critical loads') for acid and nitrogen deposition on Site of Special Scientific Interest (SSSI), Special Protected Area (SPA) and Special Area of Conservation (SAC) interests. The Environment Agency also introduced new guidance around this time.

2.2. MAGIC protected sites and species search

As search of the Defra MAGIC website (https://magic.defra.gov.uk/MagicMap.aspx) in April 2019 showed that no European Protected Species mitigation licences (EPSLs) have been issued by Natural England within 5km. There are multiple protected sites within 5km, however.

Sites with international designations within 5km are:

- Chesil Beach & The Fleet Ramsar site
- Chesil Beach & The Fleet SPA
- Chesil & The Fleet SAC
- Isle of Portland to Studland Cliffs SAC.

Nationally-protected sites within 5km are:

- Chesil Beach and Stennis Ledges MCZ (Marine Conservation Zone)
- Chesil & The Fleet SSSI
- Isle of Portland SSSI
- Nicodemus Heights SSSI
- Portland Harbour Shore SSSI.

The nearest protected sites are Isle of Portland to Studland Cliffs SAC and Isle of Portland SSSI, behind and above the proposed ERF location and access route. These support important bryophyte and lichen communities, and are the sites most likely to be affected.

Figure 3 – MAGIC map overview of protected sites within 5km.

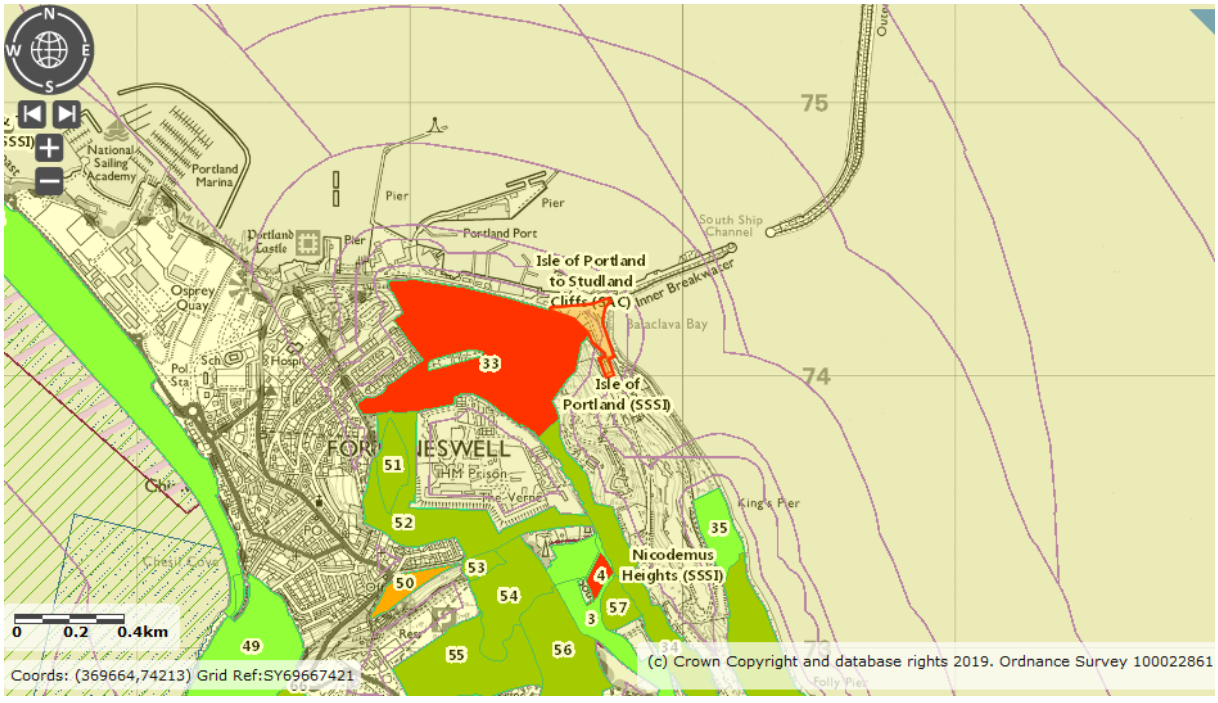

Figure 4 – Detail of protected sites adjacent to the site, with Impact Risk Zones.

There are also two Nitrate Vulnerable Zones (NVZs) within 5km, on the mainland: Coastal Streams to Fleet Lagoon NVZ for surface water (S710), and Fleet Lagoon Eutrophic NVZ (TraC) for eutrophic water (ET0).

Soils here are shallow freely-draining lime-rich loams over chalk or limestone. Natural vegetation/habitat cover is “herb-rich downland and limestone pastures; limestone pavements

in the uplands; beech hangers and other lime-rich woodlands". The Natural Character Area is Isle of Portland. Four marine mammals are known from the neighbouring waters.

2.3. DERC local sites, protected and notable species search

A Dorset Environmental Records Centre (DERC) search was conducted in April 2019 for bats to a 5km radius; protected, rare, threatened and notable ('Section 41') species to a 2km radius; and local sites to a 1km radius.

The 5km bat search found roosts for at least four species (brown long-eared *Plecotus auritus*, noctule *Nyctalus noctula*, pipistrelle *Pipistrellus* sp, serotine *Eptesicus serotinus*) and records for at least eight species (common pipistrelle *Pipistrellus pipistrellus*, Daubenton's *Myotis daubentonii*, long-eared *Plecotus* sp, Nathusius' pipistrelle *Pipistrellus nathusii*, Natterer's bat *Myotis nattereri*, serotine, soprano pipistrelle *Pipistrellus pygmaeus*, whiskered *Myotis mystacinus*). Together, at least nine bat species are known within 5km of the proposed ERF site. The nearest known bat roosts are over 1km to the west and southwest.

Arctic tern	*Sterna paradisaea*	EPS, Bird (1979)
Arctic tern	*Sterna paradisaea*	EPS, Bird (1979)
Black kite	*Milvus migrans*	EPS, Bird (1979)
Black redstart	*Phoenicurus ochruros*	W&C (1981)
Black-necked grebe	*Podiceps nigricollis*	W&C (1981)
Brambling	*Fringilla montifringilla*	W&C (1981)
Common scoter	*Melanitta nigra*	W&C (1981)
Common tern	*Sterna hirundo*	EPS, Bird (1979)
Corncrake	*Crex crex*	EPS, Bird (1979), W&C (1981)
Golden plover	*Pluvialis apricaria*	EPS, Bird (1979)
Great northern diver	*Gavia immer*	EPS, Bird (1979), W&C (1981)
Leach's petrel	*Oceanodroma leucorhoa*	EPS, Bird (1979), W&C (1981)
Little gull	*Hydrocoloeus minutus*	EPS, Bird (1979), W&C (1981)
Long-tailed duck	*Clangula hyemalis*	W&C (1981)
Mediterranean gull	*Larus melanocephalus*	EPS, Bird (1979), W&C (1981)
Merlin	*Falco columbarius*	EPS, Bird (1979), W&C (1981)
Osprey	*Pandion haliaetus*	EPS, Bird (1979), W&C (1981)
Peregrine	*Falco peregrinus*	EPS, Bird (1979), W&C (1981)
Red-backed shrike	*Lanius collurio*	EPS, Bird (1979), W&C (1981)
Red-throated diver	*Gavia stellata*	EPS, Bird (1979), W&C (1981)
Redwing	*Turdus iliacus*	W&C (1981)
Sandwich tern	*Sterna sandvicensis*	EPS, Bird (1979)
Scopoli's shearwater	*Calonectris diomedea*	EPS, Bird (1979)
Slavonian grebe	*Podiceps auritus*	EPS, Bird (1979), W&C (1981)
Storm petrel	*Hydrobates pelagicus*	EPS, Bird (1979)
Velvet scoter	*Melanitta fusca*	W&C (1981)
Woodlark	*Lullula arborea*	EPS, Bird (1979), W&C (1981)

Table 1 – Protected bird species recorded within 2km. Data from DERC. W&C = Wildlife & Countryside Act 1981 (as amended); EPS = European Protected Species; Bird (1979) = Birds Directive 1979.

The 2km species search results included:

- four priority lichens (*Biatorella fossarum, Collema fragile, Lecania chlorotiza, Toninia sedifolia*)
- a protected moss (blackwort *Southbya nigrella*)

- a priority moss (pretty cord-moss *Funaria pulchella*)
- a priority liverwort (chalk threadwort *Cephaloziella baumgartneri*)
- 48 rare/scarce lichens and bryophytes
- two protected plants (early gentian *Gentianella anglica*, bluebell *Hyacinthoides non-scripta*).
- 47 rare/scarce and/or threatened higher plants
- five protected butterflies (adonis blue *Polyommatus bellargus*, chalk hill blue *Polyommatus coridon*, large tortoiseshell *Nymphalis polychloros*, Lulworth skipper *Thymelicus action*, silver-studded blue *Plebejus argus*, small blue *Cupido minimus*)
- One priority spider (silky gallows-spider *Phycosoma inornatum*)
- 57 rare/scare, priority and/or threatened invertebrates
- three protected reptiles (common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis,* adder *Vipera berus*)
- 26 protected birds
- 67 priority and/or threatened birds
- a priority mammal (hedgehog).

There are four local sites within 1km with *de facto* protection: two Sites of Nature Conservation Interest (East Weare Camp SNCI, Verne to Grove SNCI), one Local Nature Reserve (Verne Yeates LNR), and one Local Geological Site (The Isle of Portland LGS).

3. Field surveys

3.1. Survey dates

The PEA walkover for the proposed ERF location was conducted on 2nd April 2019 at 11:00-13:00. The desk study was conducted throughout April 2019. The PEA walkover for the Incline Road access route was conducted on 20th November 2019 at 11:00-12:10. The PEA walkover for the Port and access from Lerret Road to Castletown was conducted on 8th April 2020 at 11:00-13:50.

Breeding Bird Surveys (BBS) were undertaken on the 19th June and 3rd July 2019. Monthly Wintering Bird Surveys (WBS) were conducted on 24th October 2019, 20th November 2019, 19th December 2019, 17th January 2020, 25th February 2020, and 17th March 2020.

The reptile survey was conducted between 12th September 2019 and 4th October 2019. A bat PRA was conducted on 23rd September 2019. A botanical assessment was carried out on 25th October 2019.

3.2. Surveyors

The PEA surveys and reptile survey setup were conducted by Dr Chris Gleed-Owen BSc (hons) PhD MCIEEM. Ecological consultant since 2008 (12 years). First Aid at Work, CSCS/ROLO, FISC level 4 botanist. Survey licences: CL09 great crested newt (GCN) *Triturus cristatus*, sand lizard *Lacerta agilis*, smooth snake *Coronella austriaca*, natterjack toad *Epidalea calamita*, Roman snail *Helix pomatia*. Mitigation licence-holder for smooth snake (x5) and sand lizard (x5). Sett-closure licence-holder for badger *Meles meles* (x3). Experienced surveyor of Phase 1 habitats, flora, vertebrates and invertebrates.

The reptile, bat and bird surveys were carried out by Adam Day BSc (hons) MSc ACIEEM. Ecological consultant since 2012 (eight years). First Aid at Work, CSCS/ROLO. Survey licences: bats CL18, GCN CL08, and barn owl *Tyto alba* CL29. Mitigation licences held for multiple bat species and GCN. Experienced Breeding Bird and Winter Bird Surveyor, and Schedule 1 bird activity surveyor.

The botanical assessment was carried out by Bryan Edwards of DERC, an expert botanist with advanced identification skills in higher and lower plants, as well as lichens and invertebrates.

3.3. Methodology

The Extended Phase 1 Habitat Surveys mapped Phase 1 habitats according to the JNCC (2010) methodology, and collected a preliminary floral list for each area. Any birds, mammals, and other vertebrates seen were identified and recorded where possible, including searches for tracks, nests, burrows, droppings and other evidence. Invertebrates were recorded and identified where possible from an active search. This allowed for all protected and notable species and habitats to be considered, the potential development to be impact-assessed, and the mitigation responses and appropriate enhancements to be conceived.

The BBS methodology followed the British Trust for Ornithology (BTO) voluntary survey methodology, targeting suitable breeding habitat between April and June. A pre-determined transect was walked in dry mild weather between 07:00-09:30, using binoculars and scope to aid identification. All bird species encountered were recorded on a plan. In this instance, the low amount of suitable habitat required only two visits.

The WBS surveys followed the standard Common Bird Census methodology developed by Marchant (1983) for the BTO. A set route was followed on six occasions between October and March (monthly), in dry calm weather. Surveys began between 08:00 to 09:50, and lasted up to four hours. Any birds encountered were identified visually or from vocalisations. Binoculars and spotting scope were used to improve detection and identification. Black redstart was targeted, with little tern and other priority species also targeted, but all birds were recorded.

The reptile survey involved deployment of 32 artificial refugia (roofing felt mats) in all potential habitat areas, followed by seven survey visits in suitable conditions between two to four weeks later. In keeping with standard guidance (Froglife, 1999; HGBI, 1998; Natural England, 2011), visual search and refugia checks were conducted on each visit, and all reptiles recorded with location, species, lifestage and sex where possible.

The bat PRA followed standard Bat Conservation Trust guidelines (Collins, 2016). All suitable structures were assessed from the outside, and tunnels in the south wall of the ERF location were explored internally. The surveyor searched for bats, evidence of bats, and the potential to support roosting bats.

The botanical assessment a walkover of the site, recording a full species list of plants, bryophytes and lichens. The frequency of each species was noted using the DAFOR (Dominant, Abundant, Frequent, Occasional, Rare) scale. The main plant communities were described, and the locations of any rare, scarce or notable species were marked on a map. Most species were identified in the field, but small samples of several lichen species were collected and identified by microscopic examination. Higher plant names followed Stace (2010); bryophytes followed Hill *et al* (2008); lichens followed Smith *et al* (2009).

3.4. Limitations

There were no significant constraints on any of the surveys.

4. Results and discussion

4.1. Phase 1 habitats, flora, fungi

The proposed ERF location comprises an open area of hardstanding and bare ground, much of it originating from demolition rubble, with patches of open mosaic vegetation developing on it. There is a fringe of continuous scrub around the south and west boundaries. Beneath the

scrub on the southwest edge of the site is an artificial cliff/slope cut into limestone with tunnels into it, made walls, and an overhead conveyor (Gleed-Owen, 2019a).

An asphalt road runs along the southwest edge of the site (Incline Road), leading uphill to the southeast and west through Portland Port. This has a narrow strip of ephemeral/short perennial alongside it. Access from Portland Port is at the northwest corner. A weighbridge is present near the entrance, and a shipping container. A large pipeline runs parallel to the east boundary, outside the site, with sea defences and Portland Harbour beyond. A harbour breakwater mole extends out to sea from the northeast boundary, and Portland Port lies to the west.

The proposed development will cause loss of around 0.5ha of open mosaic habitat, and small amounts of scrub and ephemeral/short perennial. Much of the site is hardstanding with no biodiversity interest. A floral list of 57 species was collected on the PEA walkover (Table 2). One common lichen was identified to genus level: *Cladonia* sp (cup/trumpet lichens).

Common name	**Species**
Alexanders	*Smyrnium olusatrum*
Annual meadow-grass	*Poa annua*
Bedstraw (fen or hedge)	*Galium* sp
Black medick	*Medicago lupulina*
Blackthorn	*Prunus spinosa*
Bramble	*Rubus fruticosus* agg.
Bristly oxtongue	*Picris echioides*
Butterfly-bush	*Buddleja davidii*
Canadian fleabane	*Conyza canadensis*
Cleavers	*Galium aparine*
Cock's-foot	*Dactylis glomerata*
Common chickweed	*Stellaria media*
Common figwort	*Scrophularia nodosa*
Common ivy	*Hedera helix*
Common nettle	*Urtica dioica*
Common ragwort	*Senecio jacobaea*
Common reed	*Phragmites australis*
Common sorrel	*Rumex acetosa* subsp. *acetosa*
Creeping buttercup	*Ranunculus repens*
Creeping cinquefoil	*Potentilla reptans*
Curled dock	*Rumex crispus*
Dandelion	*Taraxacum officinale* agg.
Fennel	*Foeniculum vulgare*
Field forget-me-not	*Myosotis arvensis*
Field horsetail	*Equisetum arvense*
Great mullein	*Verbascum thapsus*
Groundsel	*Senecio vulgaris*
Hedge mustard	*Sisymbrium officinale*
Hemp-agrimony	*Eupatorium cannabinum*
Herb-Robert	*Geranium robertianum*
Ivy-leaved toadflax	*Cymbalaria muralis*
a mouse-ear	*Cerastium* sp
Oxford ragwort	*Senecio squalidus*
Pellitory-of-the-wall	*Parietaria judaica*
Prickly sow-thistle	*Sonchus asper*
Red fescue	*Festuca rubra*
Red valerian	*Centranthus ruber*
Ribwort plantain	*Plantago lanceolata*
Rosebay willowherb	*Chamerion angustifolium*

Salad burnet	*Sanguisorba minor* subsp*. minor*
Sea beet	*Beta vulgaris* subsp*. maritima*
Sea mayweed	*Tripleurospermum maritimum*
Shining crane's-bill	*Geranium lucidum*
Smooth sow-thistle	*Sonchus oleraceus*
Spear thistle	*Cirsium vulgare*
a St John's-wort	*Hypericum* sp
a stonecrop	*Sedum* sp
a storksbill	*Erodium* sp
Sun spurge	*Euphorbia helioscopia*
Sycamore	*Acer pseudoplatanus*
Weld	*Reseda luteola*
White melilot	*Melilotus albus*
Wild madder	*Rubia peregrina*
Wild privet	*Ligustrum vulgare*
Wild teasel	*Dipsacus fullonum*
Wood sage	*Teucrium scorodonia*
Yorkshire-fog	*Holcus lanatus*

Table 2 – Preliminary floral list from proposed ERF location (57 species).

The access route from the proposed ERF location, through Portland Port, is a made road beginning as Incline Road, becoming Main Road, and then Castletown as it leaves the Port. It is surfaced with asphalt throughout. On its north side are port buildings and hardstanding. To the south is a narrow apron of hardstanding, and retaining wall with continuous scrub above it (Isle of Portland SSSI, Unit 33 – Verne Common). A floral list of 60 species was recorded from a walk along both sides of the access road (Table 3) (Gleed-Owen, 2020a).

Common name	**Species**
Annual meadow-grass	*Poa annua*
Barren brome	*Anisantha sterilis*
Bedstraw	*Galium* sp
Bittersweet	*Solanum dulcamara*
Bramble	*Rubus fruticosus* agg.
Bristly oxtongue	*Picris echioides*
Buddleia/butterfly-bush	*Buddleja davidii*
Canadian fleabane	*Conyza canadensis*
Cat's-ear	*Hypochaeris radicata*
Cleavers/goose-grass	*Galium aparine*
Cock's-foot	*Dactylis glomerata*
Common chickweed	*Stellaria media*
Common figwort	*Scrophularia nodosa*
Common ivy	*Hedera helix*
Common mouse-ear	*Cerastium fontanum*
Common nettle	*Urtica dioica*
Common ragwort	*Senecio jacobaea*
Common reed	*Phragmites australis*
Common toadflax	*Linaria vulgaris*
Creeping cinquefoil	*Potentilla reptans*
Creeping thistle	*Cirsium arvense*
Dandelion	*Taraxacum officinale* agg.
Dog-rose	*Rosa canina*
False oat-grass	*Arrhenatherum elatius*
Field horsetail	*Equisetum arvense*

Greater plantain	*Plantago major*
Grey willow	*Salix cinerea*
Groundsel	*Senecio vulgaris*
Hairy bitter-cress	*Cardamine hirsuta*
Hart's-tongue	*Phyllitis scolopendrium*
Hemp-agrimony	*Eupatorium cannabinum*
Herb-Robert	*Geranium robertianum*
Ivy-leaved toadflax	*Cymbalaria muralis*
Madder	*Rubia tinctorum*
Mayweed	Anthemideae
Mind-your-own-business	*Soleirolia soleirolii*
Navelwort	*Umbilicus rupestris*
Oxford ragwort	*Senecio squalidus*
Pellitory-of-the-wall	*Parietaria judaica*
Perennial sow-thistle	*Sonchus arvensis*
Polypody	*Polypodium vulgare*
Primrose	*Primula vulgaris*
Red fescue	*Festuca rubra*
Red valerian	*Centranthus ruber*
Ribwort plantain	*Plantago lanceolata*
Round-leaved crane's-bill	*Geranium rotundifolium*
Salad burnet	*Sanguisorba minor subsp. minor*
Sheep's-fescue	*Festuca ovina*
Shining crane's-bill	*Geranium lucidum*
Spanish-dagger	*Yucca gloriosa*
Spear thistle	*Cirsium vulgare*
Stonecrop	*Sedum sp*
Traveller's-joy	*Clematis vitalba*
Wayfaring-tree	*Viburnum lantana*
Wild carrot	*Daucus carota subsp. carota*
Wild privet	*Ligustrum vulgare*
Wood sage	*Teucrium scorodonia*
Wood spurge	*Euphorbia amygdaloides*
Yarrow	*Achillea millefolium*
Yorkshire-fog	*Holcus lanatus*

Table 3 - Preliminary floral list from proposed ERF location (60 species).

The Port comprises hardstanding (including reclaimed ground), pier structures over sea, and buildings/structures on piers/quays (Gleed-Owen, 2020b). A floral list of 45 species was recorded from the Port quays/Dock Road walkover (Table 4).

Common name	**Species**
Annual meadow-grass	*Poa annua*
Bracken	*Pteridium aquilinum*
Bramble	*Rubus fruticosus* agg.
Bristly oxtongue	*Picris echioides*
Buck's-horn plantain	*Plantago coronopus*
Buddleia/Butterfly-bush	*Buddleja davidii*
Cock's-foot	*Dactylis glomerata*
Common chickweed	*Stellaria media*
Common ivy	*Hedera helix*
Common mallow	*Malva sylvestris*
Common Mouse-ear	*Cerastium fontanum*

Common nettle	*Urtica dioica*
Common reed	*Phragmites australis*
Common vetch	*Vicia sativa* subsp*. segetalis*
Dandelion	*Taraxacum officinale* agg.
Danish scurvygrass	*Cochlearia danica*
Elder	*Sambucus nigra*
False oat-grass	*Arrhenatherum elatius*
False-brome	*Brachypodium sylvaticum*
Great lettuce	*Lactuca virosa*
Great mullein	*Verbascum thapsus*
Groundsel	*Senecio vulgaris*
Hairy bitter-cress	*Cardamine hirsuta*
Hemp-agrimony	*Eupatorium cannabinum*
Hogweed	*Heracleum sphondylium*
Ivy-leaved toadflax	*Cymbalaria muralis*
Kidney vetch	*Anthyllis vulneraria*
Mediterranean spurge	*Euphorbia characias*
Oil-seed rape	*Brassica napus* subsp*. oleifera*
Oxford ragwort	*Senecio squalidus*
Pellitory-of-the-wall	*Parietaria judaica*
Perennial sow-thistle	*Sonchus arvensis*
Red valerian	*Centranthus ruber*
Sea mayweed	*Tripleurospermum maritimum*
Spear thistle	*Cirsium vulgare*
Stonecrop	*Sedum* sp
Traveller's-joy	*Clematis vitalba*
Wall cotoneaster	*Cotoneaster horizontalis*
Wallflower	*Erysimum cheiri*
Weld	*Reseda luteola*
Wild carrot	*Daucus carota* subsp*. carota*
Wild privet	*Ligustrum vulgare*
Wood sage	*Teucrium scorodonia*
Yarrow	*Achillea millefolium*
Yorkshire-fog	*Holcus lanatus*

Table 4 - Preliminary floral list from Port quays (45 species).

The western part of the access route - comprising Castletown, Castle Road and Lerret Road at its western end – is a made asphalt road. It is built up on both sides in Castletown, with amenity grass, ephemeral/short perennial and mixed woodland adjacent to the route through Castle Road and Lerret Road (Gleed-Owen, 2020b). A floral list of 26 species was recorded from the walkover along this part of the access route (Table 5).

Common name	**Species**
Bramble	*Rubus fruticosus* agg.
Bristly oxtongue	*Picris echioides*
Buck's-horn plantain	*Plantago coronopus*
Cock's-foot	*Dactylis glomerata*
Common mallow	*Malva sylvestris*
Common vetch	*Vicia sativa* subsp*. segetalis*
Daisy	*Bellis perennis*
Dandelion	*Taraxacum officinale* agg.
Danish scurvygrass	*Cochlearia danica*

False oat-grass	*Arrhenatherum elatius*
Gorse	*Ulex europaeus*
Greater plantain	*Plantago major*
Green alkanet	*Pentaglottis sempervirens*
Hemlock water-dropwort	*Oenanthe crocata*
Lesser celandine	*Ranunculus ficaria*
London plane	*Platanus x hispanica*
Red valerian	*Centranthus ruber*
Ribwort plantain	*Plantago lanceolata*
Wild teasel	*Dipsacus fullonum*
Yarrow	*Achillea millefolium*
Yorkshire-fog	*Holcus lanatus*

Table 5 - Preliminary floral list from access route from Castletown to Lerret Road (26 species).

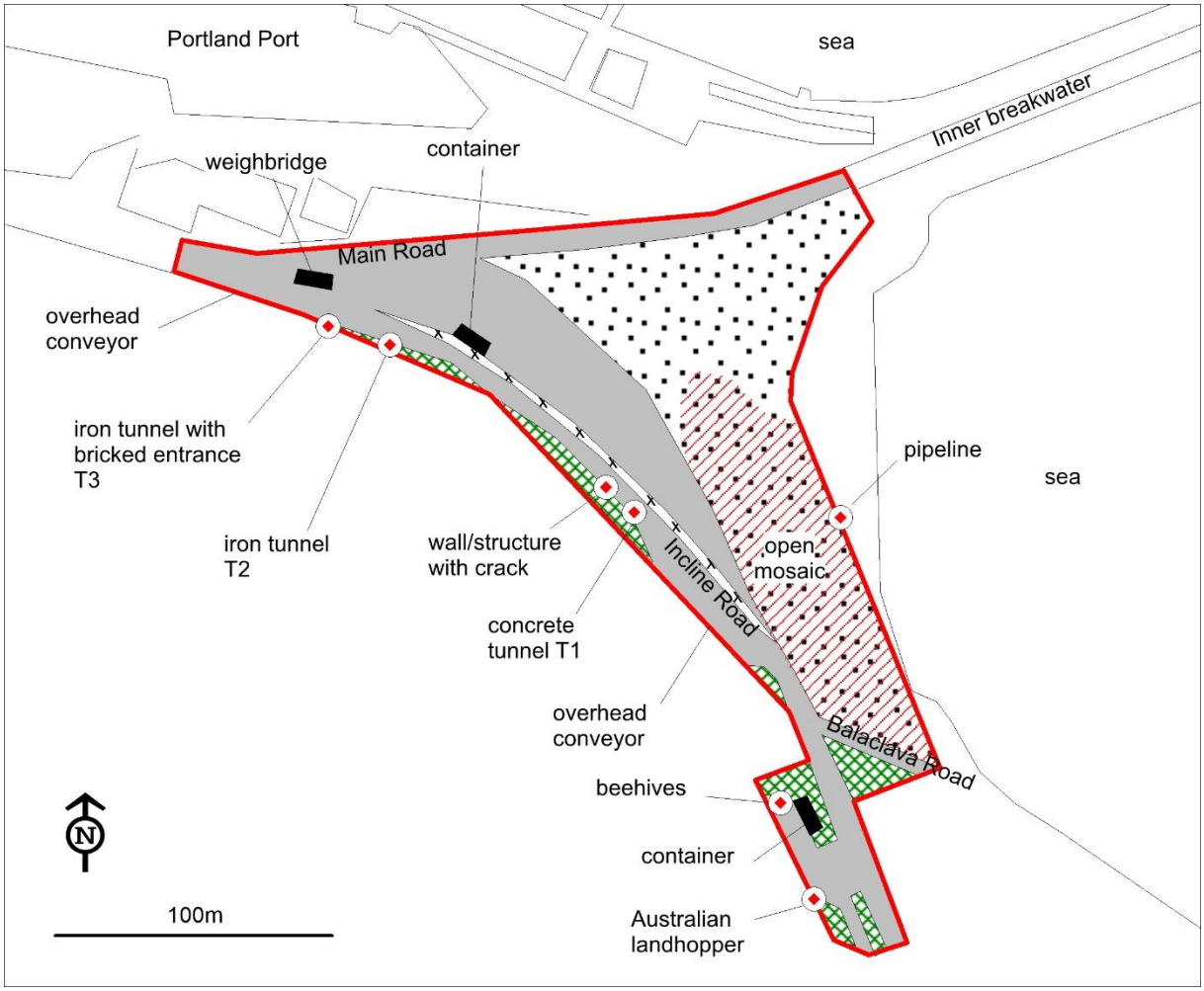

Figure 5 – Phase 1 habitats within the development boundary red line: hardstanding (grey), bare ground (white, stippled black), buildings (black), continuous scrub (green cross-hatching), ephemeral/short perennial (white with exes). Open mosaic area is hatched red. Target notes (red dots) are labelled directly with ecological observations and structures. After Gleed-Owen (2019a). Note that the southern tip of the habitat map is no longer included in the site.

The proposed ERF will mostly be on bare ground and hardstanding, with the loss of some open mosaic habitat and small areas of other seminatural habitats. These losses would be best compensated by incorporation of a green or brown roof onto the proposed development.

As the development will require an EcIA, and therefore does not fall under the remit of the Dorset Biodiversity Appraisal Protocol, a Dorset Council-certified Biodiversity Plan will not be required.

The on-site ecology was scoped out of the EcIA, and therefore will not form part of the Environmental Statement.

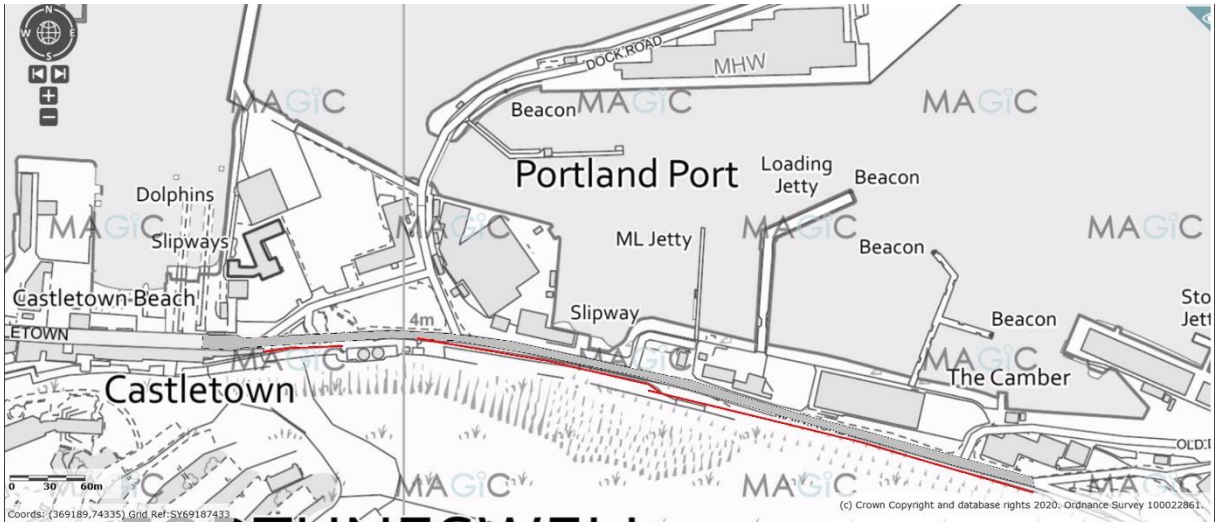

Figure 6 – Phase 1 habitats on the access route (after Gleed-Owen, 2020a): hardstanding (grey), bare ground (white, stippled black), buildings (black), dense/continuous scrub (green cross-hatching). Adjacent retaining walls to the south are shown as red lines. There are not target notes to display.

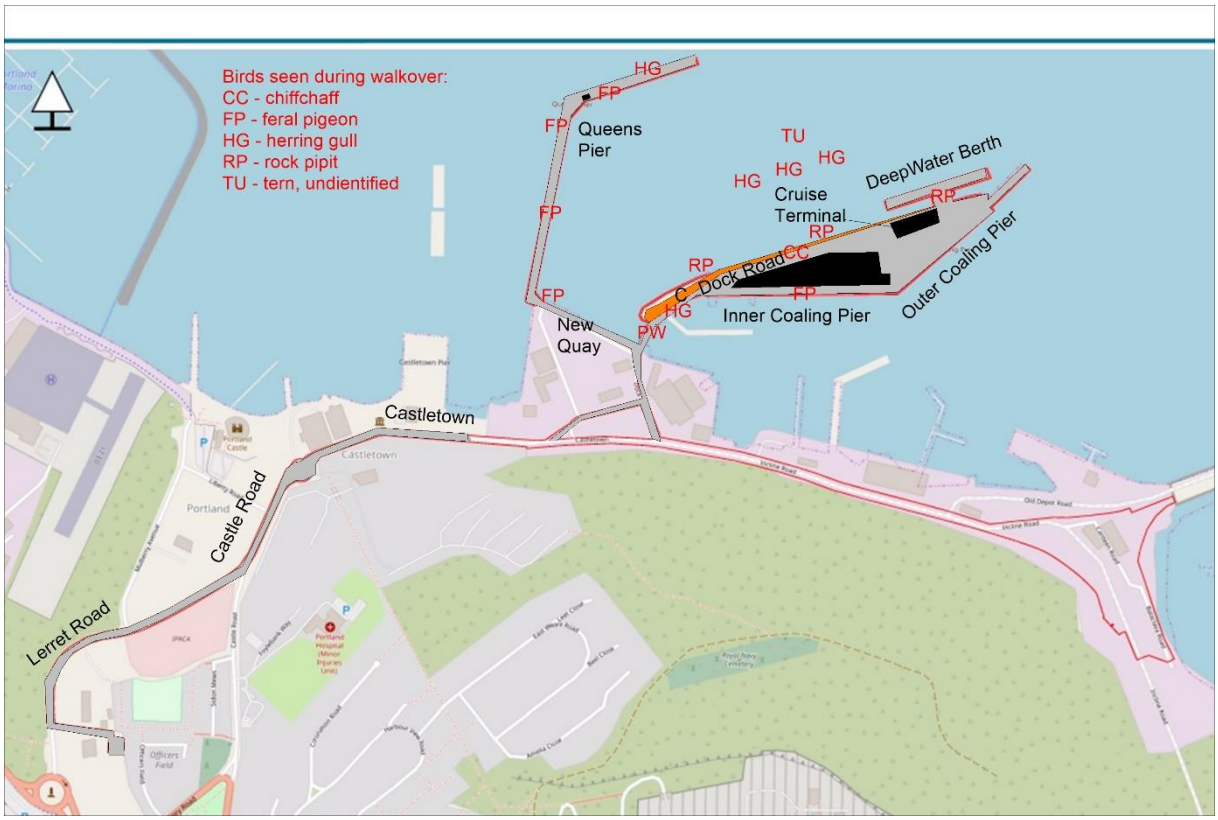

Figure 7 – Phase 1 habitats on the access route (after Gleed-Owen, 2020b): hardstanding (grey), buildings (black), coastal grassland (orange, 'C'). Birds seen during the walkover are target-noted. After Gleed-Owen (2020b).

The botanical assessment (Edwards, 2019) provided the following summary of the proposed ERF location's floral value:

> "The site is essentially an industrial brownfield site and the botanical interest for both higher and lower plants reflects this. The flora is essentially a ruderal one with the majority of the species indicative of recently disturbed ground in urban and post-industrial sites. Due to the location of the site and the geology there are species that also occur on disturbed calcareous and / clayey ground on or near the coast such as Viper's Bugloss *Echium vulgare* and Bristly Ox-tongue *Picris echioides*.

Of most interest is the small suite of maritime plants present along the eastern edge of the site where there is enough salt spray to maintain their requirements. Along the pipeline are Rock Samphire *Crithmum maritimum*, Golden Samphire *Inula crithmoides**, Greater Sea-spurrey *Spergularia media**, Sea-beet *Beta vulgaris* subsp. *maritima* and Portland Spurge *Euphorbia portlandica**. The old wall at the entrance of the Inner Breakwater has Rock Samphire, Rock Sea-spurrey *Spergularia rupicola**, Sea Spleenwort *Asplenium marinum** and the Nationally Scarce Maidenhair Fern *Adiantum capillus-veneris***.

All the plants recorded from the site are present elsewhere on the Island including the maritime notables which are much more frequent within the SSSI / SAC boundary further south along the eastern undercliffs and especially towards the Bill. The most interesting plant present is the Nationally Scarce Maidenhair Fern which is at its eastern native limit along the south coast on Portland. Only one small plant was found on the north side of the old Inner Breakwater wall in the north of the site. There are larger colonies of this species on the eastern undercliffs and in some of the older quarries.

* = Dorset Notable species ** = Nationally Scarce species"

Edwards (2019) also provided the following assessment of the lower plant interests of the adjacent SSSI which are material considerations in any pollution modelling and future impact monitoring:

"The site adjoins Site Management Unit (SMU) 33, Verne Common, of the Isle of Portland SSSI, much of which is included in the Portland to Studland Cliffs Special Area of Conservation (SAC). The SMU is now largely scrub and is shown as in Unfavourable Declining condition on the Natural England SSSI information website1. The lower section of the Common used to be much more open with areas of grassland, but the encroachment of scrub has led to a decline in this feature.

Lichens and bryophytes are both Notified Features of the Isle of Portland SSSI and are generally well recorded, but there has been little recent survey work within SMU33, and survey work within the area is now very difficult due to the dense nature of the scrub. During a vegetation survey in 1996 (Edwards, 1997) the very rare liverworts *Cephaloziella baumgartneri* (S41, Endangered) and *Southbya nigrella* (S41, Vulnerable) were recorded on a large limestone boulder within open scrub south of the Royal Naval Cemetery approximately 440 metres west – southwest of the proposed development. These species have not been looked for since as the scrub is now much more dense in this area. The nearest current sites for these species is 380 metres south – southwest above East Weare Camp, 1.6-km to the southwest in Tout Quarries and 1.17-km south – southeast on East Weares south of King's Pier.

With very little rock or grassland now present or accessible the other habitat with lower plant interest on Verne Common is the more mature scrub which locally supports an abundance of epiphytic bryophytes and lichens, these being better developed here than elsewhere on the Island by the relative shelter provided by the cliffs. Lichens are most abundant on well-lit thorn twigs particularly the leafy species of the *Parmelia* family (Parmeliaceae) and shrubby species of *Ramalina*. Most are widespread species which are present elsewhere on the Island but there two species of particular note that have not been recorded elsewhere. These are *Usnea articulata* (S41, Near Threatened) and *Usnea esperantiana* (Near Threatened), both of these beard lichens are very pollution sensitive both Sulphur Dioxide and to Nitrogen or Ammonia compounds. The *Usnea articulata* was recorded in 2008 from a large thorn bush approximately 215 metres southwest of the proposed development site, the *U. esperantiana* was found on blackthorn twigs in scrub 350 metres to the west – southwest.

It should be noted that this Unit has not had a systematic survey for lichens or bryophytes and the above assessment is based on existing data and therefore may not be a true reflection of the interest."

The DERC 2km search results (Gleed-Owen, 2019a) included: four priority lichens, a protected moss, a priority moss, a priority liverwort, 48 rare/scarce lichens and bryophytes, two protected plants, and 47 rare/scarce and/or threatened higher plants.

4.2. Tree protection

There are no mature trees on site, and only a few saplings in the scrub at the south end of the site. No TPO or Conservation Area affects the site.

4.3. Bats

The DERC search showed at least nine species to be present within 5km. However, Portland is known to have a relative paucity of bats compared to the other coastal areas of Dorset nearby. The previous surveys in 2009 recorded occasional pipistrelle passes, but they were timed too early in the season (mid-April) and were of insufficient effort level to meet current survey guidelines (Collins, 2016). Therefore, they could not inform reliable conclusions about bat presence-absence, foraging and commuting behaviour, and roosting on site.

The tunnels and a stone wall adjacent to the proposed ERF location were assessed by licensed bat worker Adam Day ACIEEM in September 2019. Internal inspection of the tunnels found no bat evidence, and ruled out roosts there. Nocturnal bat surveys were deemed unnecessary. The green southwest fringe of the site could present an attractive commuting and foraging route for bats, but the likelihood of the constant nocturnal lighting that is already present is likely to put off most bats, though possibly not pipistrelles.

4.4. Other mammals

DERC holds numerous records of hedgehog within 2km, and this species could be present on site, sheltering in scrub and debris. No records of badger or other protected mammals were produced within 2km, and no other protected mammals are likely to be present.

4.5. Birds

The following birds were recorded during the Phase 1 walkover of the ERF location (Gleed-Owen, 2019a): blue tit *Cyanistes caerulea*, dunnock *Prunella modularis*, great tit *Parus major*, herring gull *Larus argentatus*, wood pigeon *Columba palumbus*, wren *Troglodytes troglodytes*. Most or all of these, and more species, could forage and nest on site, particularly in scrub margins. Of the protected and notable species listed by DERC within 2km, none are particularly likely to utilise this site.

Additional birds were recorded during the Phase 1 walkover of the access route from Incline Road to Castletown (Gleed-Owen, 2020a): blackbird *Turdus merula*, chaffinch *Fringilla coelebs*, goldcrest *Regulus regulus*, great tit, herring gull, robin *Erithacus rubecula*, stock dove *Columba oenas*, wren. The walls, scrub and buildings adjacent to the route have nesting potential, but the road itself does not.

Only a few birds were recorded during the Phase 1 walkover of the Port quays (Gleed-Owen, 2020b): a pair of foraging chiffchaff *Phylloscopus collybita*, foraging and probable nesting feral pigeon *Columba livia domestica,* possibly including *Columba livia*, numerous herring gull, several pairs of foraging rock pipit *Anthus petrosus*, and an unidentified tern foraging. The road surfaces of the access route and quays do not present nesting habitat, but the rock armour beside Dock Road, and the various buildings and pier structures provide nesting opportunities. No additional species were recorded on the access route walkover from Castletown to Lerret Road.

The DERC search in April 2019 returned records of 26 species. Of these, only five could potentially breed on the proposed ERF location. These were arctic tern, black redstart, common tern, Mediterranean gull, sandwich tern *Thalasseus (Sterna) sandvicensis* and woodlark. The tern and gull species are very unlikely to breed at the site due to the potential exposure to predators and high levels of disturbance; however, black redstart and woodlark could utilise the on-site habitats for breeding.

The BBS in June/July 2019 recorded nine species, none of them showing evidence of breeding on site (Day, 2019).

Species	Record type
Black-headed gull	Flyovers of site
Common blackbird	Singing in scrub adjacent to site
Common chiffchaff	Singing in scrub adjacent to site
Greater black-backed gull *Larus marinus*	Flyovers of site
Herring gull	Flyovers of site
Lesser black-backed gull	Flyovers of site
Lesser whitethroat *Sylvia curruca*	Singing in scrub adjacent to site
Peregrine falcon *Falco peregrinus*	Flyover of site (female, three juveniles)
Wren	Singing in scrub adjacent to site

Table 6 – Birds recorded during the BBS (after Day, 2019).

All records that were recorded during the BBS related to flyovers or birds observed in habitats adjacent to the site. There are low amounts of habitats suitable for ground-nesting birds, and the levels of disturbance and high availability of better nesting habitat nearby, currently make the site unattractive (Day, 2019). The viability of the site may increase as the site is left vacant for a longer period.

Species	Latin name	Number of visits species was recorded	Maximum count on one visit
Common sandpiper	*Actitis hypoleucos*	1	1
Long-tailed tit	*Aegithalos caudatus*	3	4
Razorbill	*Alca torda*	1	1
Rock pipit	*Anthus pestrosus*	3	6
Grey heron	*Ardea cinereal*	5	3
Turnstone	*Arenaria interpres*	1	1
Buzzard	*Buteo buteo*	5	3
Purple sandpiper	*Calidris maritima*	1	1
Black-headed gull	*Chroicocephalus ridibundus*	5	12
Stock dove	*Columba oenas*	2	3
Pigeon	*Columba palambus*	4	4
Carrion crow	*Corvus corone*	5	6
Blue tit	*Cyanistes caeruleus*	5	4
Little egret	*Egretta garzetta*	2	1
Robin	*Erithacus rubecula*	5	3
Peregrine	*Falco peregrinus*	1	2
Kestrel	*Falco tinnunculus*	1	1
Chaffinch	*Fringilla coelebs*	1	3
Great northern diver	*Gavia immer*	1	1
Mediterranean gull	*Icthyaetus melanocephalus*	2	5
Herring gull	*Larus argentatus*	5	16
Greater black-backed Gull	*Larus marinus*	5	4
Pied wagtail	*Motacilla alba*	5	2
Grey wagtail	*Motacilla cinereal*	3	1

Wheatear	*Oenanthe oenanthe*	1	1
Great tit	*Parus major*	2	7
Shag	*Phalacrocorax aristotelis*	1	2
Cormorant	*Phalacrocorax carbo*	5	16
Black redstart	*Phoenicurus ochruros*	5	9
Dunnock	*Prunella modularis*	5	4
Goldcrest	*Regulus regulus*	1	9
Stonechat	*Saxicola rubicola*	1	1
Wren	*Troglodytes troglodytes*	5	4
Blackbird	*Turdus merula*	2	2

Table 7 – Birds recorded during the WBS (after Day, 2020).

Overwintering black redstart were recorded on every survey between October 2019 and March 2020 within and adjacent to the proposed ERF location and access route through the Port. The peak count was on the final (March 2020) visit, where nine individuals were recorded, including five on the proposed ERF site. Potential evidence of breeding was also observed on the March survey (Day, 2020).

It is likely that the whole access route and Port provide potential foraging habitat; and structures and rock-armour slopes adjacent to the application area could provide nesting habitat.

Figure 8 – Distribution of nine black redstart (five of them within the proposed ERF site) recorded during the final winter bird survey in March 2020 (after Day, 2020).

4.6. Amphibians

The only amphibian recorded within 2km is palmate newt *Lissotriton helveticus* which receives no conservation protection. There is a spring pond about 100m upslope to the south, and several small ponds around 500m to the west marked on the Ordnance Survey 1:10,000 map. Nevertheless, no amphibians are likely on site, as the habitat is predominantly unsuitable.

4.7. Reptiles

The site has localised areas of grass, ruderals and scrub fringes that could support common lizard and slow-worm in theory. However, the reptile survey showed reptiles to be absent from

the proposed ERF location (and scarce on land immediately south of it). If the site is left for several more years without being developed, and the habitats on it mature, it may be naturally colonised by reptiles.

The access route has no suitable reptile habitat, and is heavily shaded by the Verne Common slope south of the Port. Pockets of habitat adjacent to Dock Road are ostensibly suitable for reptiles, but their isolated location makes the chances of reptile immigration unlikely.

4.8. Fish

No waterbodies, watercourses or fish are present on site.

4.9. Invertebrates

Eight non-marine molluscs were recorded during the ERF location walkover (Gleed-Owen, 2019a): brown-lipped banded snail *Cepaea nemoralis*, cellar snail *Oxychilus cellarius*, common garden snail *Cornus aspersum*, greenhouse slug *Ambigolimax valentianus*, grey field slug *Deroceras agreste*, Kentish snail *Monacha cantiana*, round-mouthed snail *Pomatias elegans*, wrinkled snail *Candidula intersecta*. A range of other species is also likely to be present. With targeted searching, the nationally-rare British whorl snail *Truncatellina cylindrica* would not be unexpected.

Other invertebrates recorded from the ERF location (Gleed-Owen, 2019a) were: buff-tailed bumblebee *Bombus terrestris*, common centipede *Lithobius forficatus*, common garden snail *Cornu aspersum*, common grey woodlouse *Oniscus asellus*, seven-spot ladybird *Coccinella septempunctata*, and the invasive Australian landhopper *Arcitalitrus dorrieni* which is widespread on the Dorset coast.

The walkover of the access route from Incline Road to Castletown yielded the following invertebrates (Gleed-Owen, 2020a): brown-lipped banded snail *Cepaea nemoralis*, common garden snail *Cornu aspersum*, dull glass snail *Aegopinella nitidula*, an unidentified harvestman Opiliones, heath snail *Helix itala*, rotund disc snail *Discus rotundatus*, round-mouthed snail *Pomatias elegans*, wrinkled snail *Candidula intersecta*. A wide range of invertebrates is likely in adjacent habitats, but not the road itself.

The walkover of the Port quays and access route from Castletown to Lerret Road yielded the following invertebrates (Gleed-Owen, 2020b): buff-tailed bumblebee *Bombus terrestris*, common black ant *Lasius niger*, common garden snail *Cornu aspersum*, common pill woodlouse *Armadillidium vulgare*, common woodlouse *Oniscus asellus*, ladybird Coccinellidae indet., small white butterfly *Pieris rapae*, and wrinkled snail *Candidula intersecta*.

The DERC search returned local records of a wide range of protected, rare and notable invertebrates, many of which could be present on or near the site. A wide range of other invertebrates is also likely, potentially including other protected and/or rare invertebrates not returned by the DERC search. Open mosaic habitat is well-known for its value to invertebrates.

4.10. Invasive species

No WCA Schedule 9 species (illegal to release in the wild etc) were observed during the walkover of the proposed ERF location (Gleed-Owen, 2019a) and access route through the Port (Gleed-Owen, 2020a). The invasive Australian landhopper (widespread in coastal Southwest England) was seen in leaf litter beneath scrub adjacent to Incline Road to the south of the ERF site though.

Wall cotoneaster, a WCA Schedule 9 species, was observed as occasional plants in the coastal grassland and fence-line on the north side of Dock Road (Gleed-Owen, 2020b).

5. Mitigation, compensation and enhancement recommendations

5.1. Protected sites, habitats, flora, fungi

The development will take place entirely on existing hardstanding and bare ground resulting from demolition, but some of this (less than 0.5ha) has developed into open mosaic, and will require appropriate compensation/offsetting. Other minor habitat impacts, such as loss or tidying of marginal scrub, may be necessary. Brown or green roofs on the new building(s) will be necessary to offset the loss of open mosaic habitat at the ERF location (also note this recommendation in the bird section below).

Biodiversity net gain is required by the current NPPF (MHCLG, 2019). This could be achievable through simple enhancements such as planting of native berry-rich and nectar-rich shrubs, appropriate wildflower seeding, and other solutions such as green roofs (see also the bird section).

5.2. Tree protection

No tree protection issues are anticipated.

5.3. Bats

No bat roosts will be affected by the proposals, but foraging habitat and commuting routes might be impacted. Therefore, any impacts must be mitigated as far as possible. The site currently has nocturnal lighting that would dissuade bats from Incline Road, but other areas may be more attractive where currently dark at night. Sensitive (directional) lighting must be used in the new development, to avoid lighting of currently-dark areas, and prevent disturbance of foraging/commuting bats. The lighting solutions must in line with recent guidance from the BCT and Institution of Lighting Professionals (BCT & ILP, 2018).

As an enhancement, five batboxes (e.g. Schwegler 2FN https://www.nhbs.com/2fn-schwegler-bat-box) should be installed on site in suitable dark locations.

5.4. Other mammals

Care should be taken when clearing vegetation, debris, stockpiles and other stored materials during the development process, as hedgehogs may seek refuge in such locations. An ecologist must be present during site clearance, to check for hedgehogs at regular intervals. No other mammal mitigation is required.

As an enhancement, five hedgehog hibernation homes (e.g. https://www.nhbs.com/igloo-hedgehog-home) should be installed in undisturbed fringes of the site.

5.5. Birds

Little or no nesting habitat is likely to be lost to the development, and no breeding bird mitigation is likely to be needed. Habitat enhancements such as sympathetic shrub planting and wildflower seeding of green areas would benefit birds.

Winter foraging habitat for black redstart is likely to be lost however. To offset this, the new building(s) must have a green or brown roof, to provide compensatory foraging habitat (Day, 2020). Five black redstart nestboxes must also be installed in appropriate locations by an ecologist.

As an enhancement, at least 25 other nestboxes should be installed by an ecologist in suitable locations on and adjacent to the site, utilising existing structures and new buildings/structures. These should be for a range of species recorded on site, including grey wagtail, pied wagtail, common and widespread passerines such as blue tit, and important Section 41 species including swift *Apus apus*.

5.6. Amphibians

No amphibians will be affected, and no mitigation is necessary. No enhancements can usefully be provided.

5.7. Reptiles

No reptiles will be affected, and no mitigation is necessary. No enhancements can usefully be provided.

5.8. Fish

Fish are not present, no mitigation is required, and no enhancements are worthwhile.

5.9. Invertebrates

An appropriate mitigation response for the loss of open mosaic and other habitats used by invertebrates must be the creation of green/brown roof(s) in the development. New planting of nectar-rich shrubs and herbs on the ground would also be beneficial.

5.10. Invasive species

A Biosecurity Plan must be operated throughout the entire development process, to prevent accidental import or spread of damaging invasive plants such as Japanese knotweed *Fallopia japonica* and Himalayan balsam *Impatiens glandulifera*, but also cotoneasters and other invasive garden shrubs on WCA Schedule 9 (i.e. species that are illegal to plant or allow to spread to the wild). No non-native shrubs should be planted as enhancements, and WCA Schedule 9 invasive garden shrubs must be avoided. The proximity to a protected site makes this more important than usual.

The Biosecurity Plan must be prominently posted on site, on fencing and any site cabins. Toolbox talks must be given to all contractors and site visitors, and posters of invasive plant identification must be posted and circulated. Procurement systems must involve vetting of contractors and suppliers, to check for awareness of invasive species risks, and to ensure that equipment and materials come from invasive-free sites.

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7. Photographs


Plate 1 – a) entrance at northwest end of proposed ERF location; b) general view southeast across site.


Plate 2 – a) building outside north boundary; b) SSSI/SAC protected slopes southwest of site.


Plate 3 – a) Incline Road, looking east; b) open mosaic habitat, with Incline Road to right.


Plate 4 – a) open mosaic habitat, looking northwest; b) overhead conveyor adjacent to Incline Road.

Plate 5 – a-b) tunnels outside southwest boundary, adjacent to Incline Road.

Plate 6 – a) tunnel adjacent to Incline Road; b) low wall and scrub adjacent to Incline Road/Main Road.

Plate 7 – a) Castletown, looking west; b) Castle Road, looking east.

Plate 8 – a) Castle Road, looking west; b) Lerret Road, looking east.

Plate 9 – a) New Quay; b) Queens Pier.

Plate 10 – a) coastal grassland adjacent to Dock Road; b) Coaling Piers, looking east.

Plate 11 – a) general view of ERF site; b) pipeline on east edge of ERF site; both after Edwards (2019).

Plate 12 – a) wall at entrance to Inner Breakwater, with many lichens, mosses, ferns; b) maidenhair fern in fossil hole on north side of wall (leaves dying back in autumn/winter); both after Edwards (2019).