Cumbrae Slipway Reconstruction: Ecological Impact Assessment

Document no: HP_104_1071-JAC-ZZ-CUM-RP-EN-0006
Revision: P01

Caledonian Maritime Assets Ltd (CMAL)
B2451100

Cumbrae Slipway Reconstruction
5 November 2024

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Client name:	Caledonian Maritime Assets Ltd (CMAL)		
Project name:	Cumbrae Slipway Reconstruction		
Client reference:	B2451100	**Project no:**	B2451100
Document no:	HP_104_1071-JAC-ZZ-CUM-RP-EN-0006	**Project manager:**	PM
Revision:	P01	**Prepared by:**	Env4
Date:	5 November 2024	**File name:**	HP_104_1071-JAC-ZZ-CUM-RP-EN-0006

Document status: Issue

Document history and status

Revision	Date	Description	Author	Checked	Reviewed	Approved
0	November 2024	ISSUE	Env4	Env5	Env5	PM

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Executive Summary

This Ecological Impact Assessment report considers the potential impacts of a proposed new slipway development on the island of Great Cumbrae on terrestrial and marine habitats and species. The approach to this assessment is based on guidance from the Chartered Institute for Ecology and Environmental Management's (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland (Terrestrial, Freshwater and Coastal).

The existing slipway was constructed in the 1970s and has been repaired frequently but is now at the end of its lifespan. A new slipway to the south of the existing one is therefore proposed including marshalling and pedestrian areas, and a terminal building. The marshalling area will be created adjacent to the B896 through land reclamation of the intertidal area. The old slipway will then be demolished once the new facilities are complete.

A desk study and field surveys were carried out with a site visit undertaken in January 2024. Field surveys comprised examination of terrestrial and intertidal surveys, and searches for signs of protected/notable species.

The proposed Scheme lies within the Bell Bay to Whitebay Local Wildlife Site designated for its coastal (terrestrial and intertidal) habitat; no other statutory or non-statutory designations were recorded within the close vicinity of the proposed Scheme. Habitats under the footprint of the proposed Scheme were assessed as being of Local or Less than Local importance.

No species with European or national protection were found under the footprint of the proposed Scheme although otters are known to utilise the coastal areas around Cumbrae and a nearby toilet block was identified as having Low potential for summer and hibernation roosting bats. Harbour porpoise and seal species were also identified as being likely to be present in very low numbers in the near shore waters. Habitat under the proposed Scheme footprint was also noted to be used by breeding birds. No non-native species were found under the footprint of the proposed Scheme but were recorded nearby.

Predicted impacts included habitat loss, potential disturbance and/or entrapment of European protected species (bats and otters), potential disturbance to pinnipeds and cetaceans, and transfer of non-native species. After mitigation, no significant impacts are predicted.

Mitigation comprised adherence to best working practice/guidelines and typical mitigation methods. They included:

- Production of a Construction Environmental Management Plan (CEMP), including Biosecurity Plan.
- Presence of an Ecological Clerk of Works.
- Production of Species Protection Plans.
- Pre-works checks for protected species.
- Vegetation clearance outwith the breeding bird season.
- Requirement for a marine mammal observer for the duration of piling activities.

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1. Introduction

1.1 Background

The existing Cumbrae slipway on the island of Great Cumbrae was constructed in the 1970s and has been repaired frequently over the years and is now deteriorating. An inspection of the facility in November 2020 identified that the general condition of the slipway was 'serviceable', but it was at the end of its lifespan. The conclusion was that maintaining a reliable lifeline ferry service might not be possible if the slipway was not replaced at the earliest opportunity.

1.2 Proposed Scheme

The proposed Scheme includes the construction of a replacement slipway approximately 27.5m to the south of the existing slipway. The existing slipway would be demolished following the new slipway becoming operational. The proposed Scheme includes the construction of a marshalling area, pedestrian area and terminal building.

The provision of a new marshalling area will provide vehicular marshalling lanes, allowing for additional safe pedestrian footpaths, additional space and improved sight lines for vehicles exiting the slipway onto the B896. The marshalling area will be created through land reclamation of the intertidal area, adjacent to the B896. The proposed Scheme layout is shown on Figure 1.

1.2.1 Slipway

The lower section of the replacement slipway will be built within a cofferdam of sheet piled walls which will be dewatered to allow these works to be undertaken in the dry. The construction of a cofferdam will provide a concrete surface with improved quality and long-term durability and is expected to take nine weeks. This area will be filled to the correct profile with granular fill material. This will create a solid base material to support the new concrete slab which will form the surface of the slipway. A review of the historical drawings for the existing slipway indicates that it was constructed by a similar method. Furthermore, construction in the dry allows the concrete slab to be created from an in-situ concrete pour, therefore avoiding joints running laterally across the slipway between the precast units which have been found to be problematic on some recently constructed slipways. Construction of the lower slipway is predicted to take eleven weeks. On completion the cofferdam will be cut to the level of the slipway.

The seaward edge of the upper section of the slipway will be formed by a rock armour revetment. Materials will be brought to site via barge, with construction of the upper slipway taking nine weeks.

1.2.2 Marshalling Area

Granular fill material will be imported to create the reclaimed marshalling area which would be surfaced with asphalt. The proposed new marshalling lanes have been orientated to avoid clashing with the existing marshalling lane thereby ensuring that the existing lane can remain fully operational during the construction phase. Drainage and service ducts for area lighting would be provided within the marshalling area. Construction of the marshalling area (including land reclamation) will take sixteen weeks.

The seaward edge of the marshalling area and footway passenger waiting area will primarily be formed by a revetment slope with a layer of rock armour and geotextile material protecting the granular material which forms the marshalling area. The section at the southern end of the marshalling area will be retained by a revetment.

The proposed vehicle marshalling area is located on reclaimed land from intertidal habitats to the east of the existing marshalling lane. Further reclamation is proposed to the west, to create a pedestrian waiting area and terminal building. The protection of the marshalling area with the rock revetment will take eight weeks, undertaken concurrently with the land reclamation.

1.2.3 Existing Slipway Removal

The existing slipway will remain in use during the construction of the proposed Scheme. On completion of the Scheme, the existing slipway will be removed using an excavator back to the line of the proposed revetment. Removal of the existing slipway is predicted to take five weeks, with a further four weeks of activity to tie into the new revetment levels.

1.2.4 Dredging

Dredging of approximately 1,660m^3 of material in total will be required and is broken down into three distinct areas (refer to Figure 2: Dredging Licence: Site Layout Plan):

Dredge Area A – Southern Revetment. The majority of the dredging in this area is the excavation for the toe of the revetment with some limited dredging for the pipe protection works for the Scottish Water incoming water supply pipe. The quantity to be dredged is 1,005m^3. The intention is that the material excavated for the toe of the revetment shall be placed over the rock armour once that has been installed. However, depending on phasing and methodology, the Contractor may look to dispose of the material at landfill.

Dredge Area B – Slipway. The dredging in this area is dredging at the toe of the revetment to accommodate the design vessels. The quantity to be dredged is 105m^3. There is also some limited dredging along the perimeter of the slipway to allow installation of scour protection.

Dredge Area C – Northern Revetment. The dredging in this area is the excavation for the toe of the revetment. The quantity to be dredged is 550m^3.

It is intended that the dredged material will be reused where possible by placing it over the rock armour or using it as part of the reclamation areas. However, depending on phasing and methodology, the Contractor may look to dispose of the material at landfill.

1.2.5 Lighting

The existing slipway and car parking area is currently lit and it is proposed that the new slipway, marshalling area and pedestrian area will also be lit. This will result in an increase in the number of lighting standards over the existing situation. In addition, additional lighting standards are proposed along the B896. It is expected to comprise standards at *c.* 25-30m spacing and extending approximately 70m to the north and 80m to the south of the proposed terminal layout.

1.2.6 Construction Works Programme

The programme has an indicative duration of 68 weeks (approx. 16 months) for the construction phase of the project. However, this programme may change as a result of further detailed design, assessment and procurement procedures, as well as any impacts of maintaining the ferry service during construction. The construction periods provided above in Sections 1.2.1 to 1.2.3 are therefore indicative.

The programme will require work to be carried out through the winter months and will have a number of deliveries (currently not determined) to be made to site via barge.

Figure 1: Proposed Scheme Site Layout

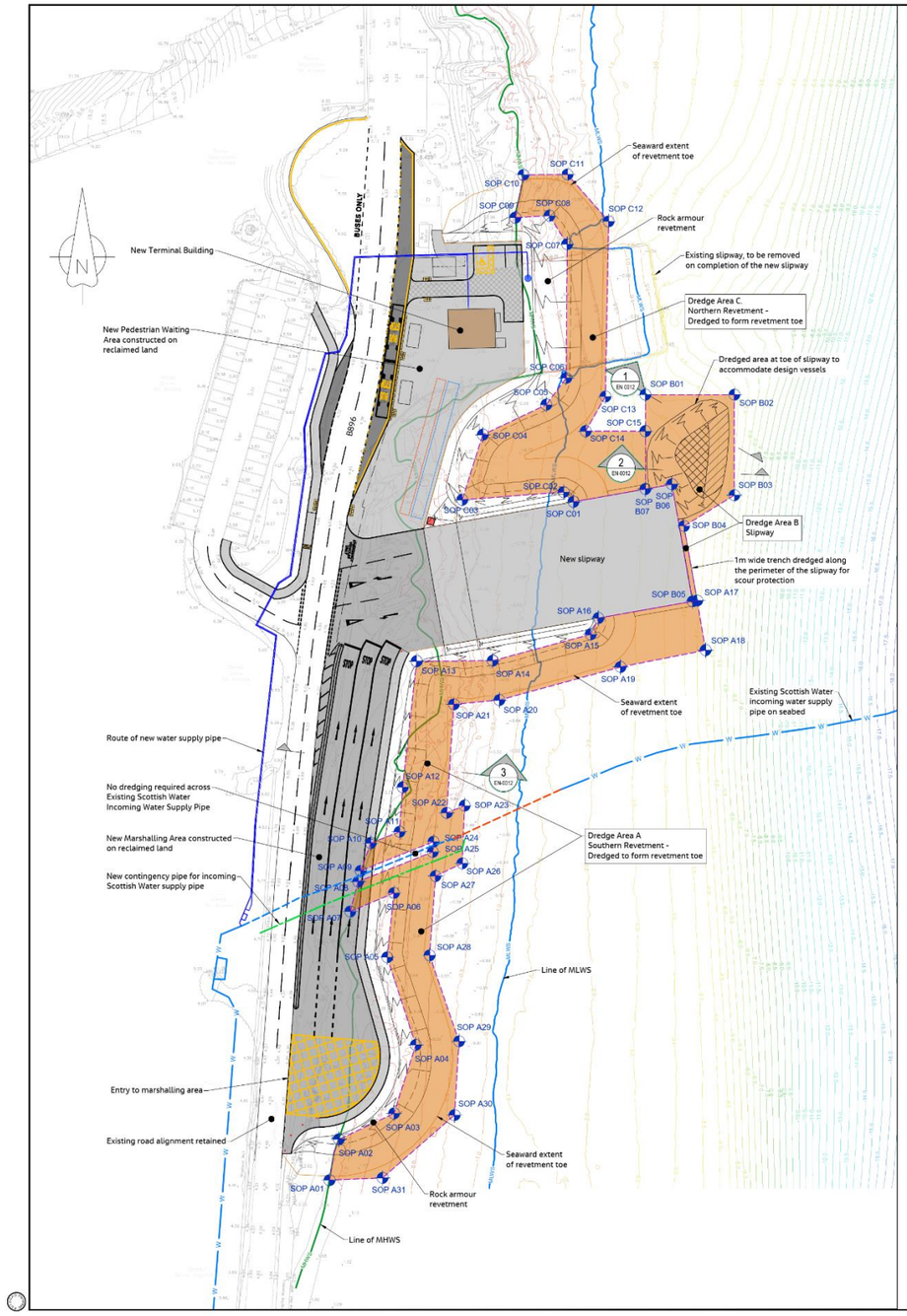

TABLE 1
DREDGE AREAS SETTING OUT POINTS

Reference	Easting	Northing
Dredge Area A - Southern Revetment		
SOP A01	218334.7	658439.5
SOP A02	218336.7	658448.2
SOP A03	218348.5	658453.8
SOP A04	218353.2	658468.5
SOP A05	218347.1	658487.3
SOP A06	218348.5	658501.1
SOP A07	218339.1	658497.1
SOP A08	218340.8	658503.5
SOP A09	218341.4	658505.9
SOP A10	218343.5	658511.8
SOP A11	218349.7	658514.2
SOP A12	218350.4	658523.8
SOP A13	218353.4	658550.8
SOP A14	218369.7	658550.9
SOP A15	218390.7	658556.6
SOP A16	218392.4	658560.1
SOP A17	218413.6	658563.8
SOP A18	218415.4	658553.2
SOP A19	218397.1	658549.6
SOP A20	218371.1	658542.5
SOP A21	218361.4	658541.6
SOP A22	218359.8	658518.3
SOP A23	218363.7	658519.8
SOP A24	218357.0	658512.1
SOP A25	218356.8	658509.9
SOP A26	218363.2	658507.5
SOP A27	218357.4	658504.7
SOP A28	218356.2	658487.7
SOP A29	218362.5	658469.3
SOP A30	218361.5	658453.4
SOP A31	218346.1	658440.0
Dredge Area B - Slipway		
SOP B01	218402.5	658608.0
SOP B02	218421.6	658608.0
SOP B03	218421.6	658586.5
SOP B04	218410.8	658579.8
SOP A17	218413.6	658563.8
SOP B05	218412.6	658563.7
SOP B06	218408.2	658588.8
SOP B07	218402.5	658587.8
Dredge Area C - Northern Revetment		
SOP C01	218387.0	658585.0
SOP C02	218384.9	658587.1
SOP C03	218363.2	658585.5
SOP C04	218367.6	658599.4
SOP C05	218381.2	658605.9
SOP C06	218385.5	658611.6
SOP C07	218385.7	658640.3
SOP C08	218381.9	658646.4
SOP C09	218374.6	658646.0
SOP C10	218376.3	658655.2
SOP C11	218385.8	658655.3
SOP C12	218394.6	658645.2
SOP C13	218393.9	658607.6
SOP C14	218389.6	658600.2
SOP C15	218402.5	658600.2
SOP B07	218402.5	658587.8

Notes:
1. All dimensions in metres unless otherwise stated.
2. Topographic survey has been undertaken by Aspect Surveys in September 2024 and Bathymetric survey has been undertaken by Aspect Surveys in August 2023. All levels are to Ordnance Datum (Newlyn).
3. Chart Datum is 1.62 m below Ordnance Datum.
4. Tide data (based on Millport from Admiralty Tide Tables)

   Highest Recorded Tide = +3.29m OD (+4.91m CD)
   Highest Astronomical Tide = +1.98m OD (+3.6m CD)
   Mean High Water Springs = +1.78m OD (+3.4m CD)
   Mean High Water Neaps = +1.08m OD (+2.7m CD)
   Mean Low Water Neaps =-0.62m OD (+1.0m CD)
   Mean Low Water Springs =-1.22m OD (+0.4m CD)
   Lowest Astronomical Tide =-1.62m OD (-0.0m CD)
   Lowest Record Tide = -1.92m OD (-0.3m CD)

   Note - HRT and LRT are based on analysis of tidal data supplied by CMAL for Largs Ferry Terminal covering the years 2018 to 2021.

Key:

Extent of areas to be dredged

0 10 20 30 40 50
SCALE 1:500 (A1)
SCALE 1:1000 (A3)
METRES

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P02	31/10/2024	Dredging Licence Application - Issued to MD	CAD1	SC2	PM	PM
P01	10/10/2024	Dredging Licence Application	CAD1	SC2	PM	PM

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Client: CMAL

Project: CUMBRAE SLIPWAY RECONSTRUCTION

Drawing title: DREDGING LICENCE SITE LAYOUT PLAN

Drawing status: Suitable for information

Scale	1:500	DO NOT SCALE
Jacobs No.	B2451100	Rev P02
Client no.	HP_104_1071	

Drawing number: HP_104_1071-JAC-ZZ-CUM-DR-EN-0011

Figure 2: Dredging Licence Site Layout Plan

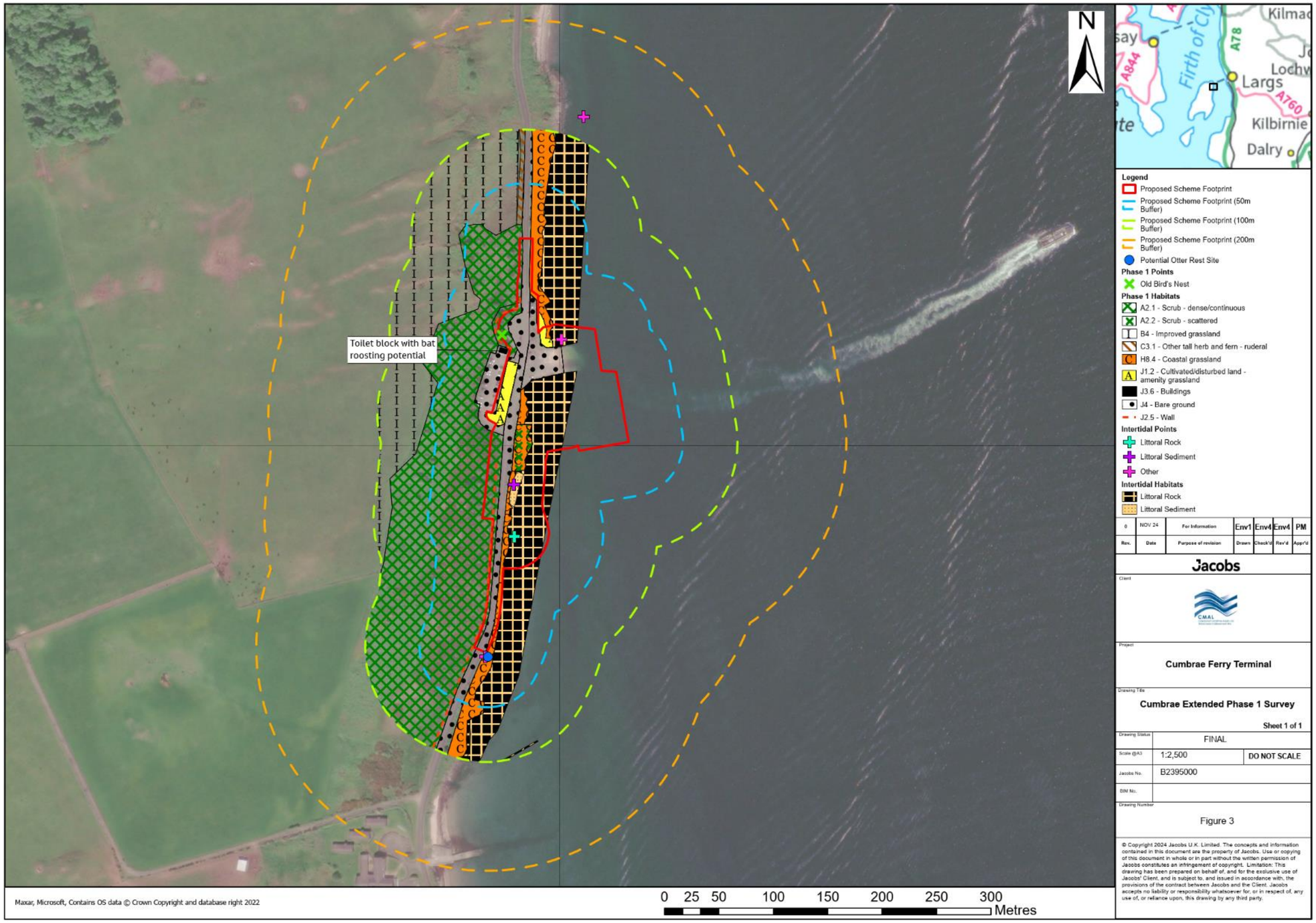


Figure 3: Phase 1 Habitat Map

2. Baseline

2.1 Data Collection

2.1.1 Study Area

The study area refers to the area of the proposed Scheme (the site boundary) plus relevant buffers, to encompass the zone of influence, for different ecological features as detailed in Section 2.1.3 Field Survey. Extended study areas were used in the desk study to capture information, such as protected species records, which would only be available at a low resolution.

2.1.2 Desk Study

A data request was made in August 2022 to South West Scotland Environmental Information Centre (SWSEIC) for all statutory and non-statutory designated sites and protected and notable species, as well as species of principal importance, within a 2km radius of the footprint of the proposed Scheme for all records within the last 10 years.

A search for all Ancient Woodlands as defined by the Scottish Ancient Woodland Inventory (AWI, NatureScot 2024a) within 2km of the footprint was carried out using Scotland's environment interactive mapping application (https://map.environment.gov.scot/sewebmap/, date accessed February 2024).

Ordnance Survey (OS) maps and publicly available aerial photography were examined to help locate waterbodies within 250m of the proposed works which could provide suitable habitat for aquatic species, and for the presence of habitats that may have the potential to support other protected species.

The MAGIC website (online mapping service) provided information on the intertidal substrate (Intertidal Substrate Foreshore (England and Scotland), British Geological Survey (BGS), 2004).

Records of the presence of protected species/species of interest (including non-native species) were obtained from the NBN Atlas (NBN Atlas Partnership, 2024); only records with licences for commercial use (such as Open Government Licence) are reported.

2.1.3 Field Survey

All surveys were carried out on 24 January 2024. Surveys for marine mammals were not undertaken.

Table 1: Summary of Ecological Features Recorded in the Study Area

Ecological Feature	Literature/References	Details
Habitats		
Terrestrial habitats	Joint Nature Conservation Committee (JNCC) 2010 CIEEM, 2018	Phase 1 habitat survey using the standard methodology. Habitats and points of ecological interest surrounding the proposed Scheme footprint, within a 100m radius, were identified and mapped.
Intertidal habitats	Connor et al. (2004)	Visual survey of intertidal habitats undertaken up to 200m from the proposed Scheme footprint. Substrates and dominant species were noted and used to assign biotopes. The survey was undertaken on a low spring tide.
Protected Species/Species of Conservation Interest		

Ecological Feature	Literature/References	Details
Bats	Collins (2023)	Daytime bat walkover (DBW) within 50m of the proposed Scheme footprint, to observe, assess and record any habitats suitable for bats to roost, commute and forage, both on site and in the surrounding area, taking into consideration the connectivity within the landscape. Any structures, trees and other features that could be suitable for bats to roost were identified. Any trees or other structures within 50m, were assigned a category related to its potential to support roosting bats
Badger	NatureScot (Undated)	Detailed badger (*Meles meles*) survey comprising a walkover of habitat within 50m of the proposed Scheme footprint, to identify badger setts and/or badger field signs including the following: tufts of hair caught on barbed wire fences or within hole entrances; badger paths between setts and feeding areas; footprints; latrines; foraging marks, such as 'snuffle holes' and scrapes; day nests; scratch marks on trees; and/or physical sightings of badger including badger Road Traffic Accidents (RTAs).
Birds	n/a	Walkover of habitats within 50m of the proposed Scheme footprint to identify suitable nesting habitat such as woodland, scrub and long grassland. Any old nests were also noted.
Hedgehog and Polecat	n/a	Walkover of habitats within 50m of the proposed Scheme footprint to identify suitable habitat for hedgehog (*Erinaceus europaeus*) and polecat (*Mustela putorius*) such as dense scrub and grassland.
Otter	NatureScot (Undated)	Detailed otter (*Lutra lutra*) signs survey 200m upstream and downstream of the proposed Scheme. A search was made for the following signs indicating otter presence: spraint; footprints; confirmed or potential resting sites; slides or other well-used access points to watercourses; feeding remains e.g. fish carcasses; and/or sightings, including otter RTAs. A couch/hover or holt was considered to be confirmed if other otter signs indicated its use (e.g. spraint/feeding remains).
Reptiles	n/a	Walkover of the habitats within 50m of the proposed Scheme footprint to identify suitable reptile habitat, such as heathland, moorland, grassland and/or a mosaic of habitats which provide foraging resources, cover from predation and basking opportunities.
Non-native species	n/a	A search for the presence of non-native plant species (NNS) within 50m of the proposed Scheme footprint, including but not limited to: Japanese knotweed (*Reynoutria japonica*); Giant hogweed (*Heracleum mantegazzianum*); Himalayan balsam (*Impatiens glandulifera*).

2.1.4 Limitations

The presence of desk study records for a species does not necessarily mean that this species is still present within or close to the site; conversely the absence of records for a species does not necessarily mean that it is absent from the site.

It was not possible to survey at the lowest state of the tide on the survey date due to fading daylight. However, visibility was sufficient that the surveyors were able to see the substrate type and lack of algae below the water line and make an assessment of the high-level biotope.

Access to the private land west of the road and car park was not available. Assessment of the habitat has been made from what was observed on site combined with aerial imagery.

As the survey was undertaken outwith peak flowering season some plant species may not have been visible at the time of survey, including NNS.

2.2 Results

This section summarises the existing ecological conditions within the study area that have been determined through desk study and site surveys. A summary is provided below with details in Figure 3 and Table 2.

The proposed Scheme footprint falls within the Bell Bay to Whitebay Local Wildlife Site (LWS), which stretches around the northern coast of the island. The site contains coastal habitat with high levels of species diversity.

The habitats within the Phase 1 survey area comprised mainly dense scrub, bare ground, improved grassland and coastal grassland (Figure 1). One small toilet building was present approximately 5m west of the proposed Scheme footprint. A small area of amenity grassland was also present.

The intertidal habitat, both the north and south of the existing and new slipways, was a mix of littoral rock and littoral mixed sediment biotopes (Figure 3), with zonation typical of a rocky shore (Photographs 6-9). At the very southern extent of the survey area was a section of littoral sand with sparse cobbles and attached egg wrack (*Ascophyllum nodosum*) (biotope LS.LSa) (Photograph 10).

No evidence for the presence of protected species was recorded within the survey area, although suitable habitat was identified (Table 2).

Table 2: Summary of Ecological Features Recorded in the Study Area

Ecological Feature	Baseline	Legal Status	Justification	Importance
Designated sites				
Ballochmartin Bay SSSI	**Desk based:** The site is designated for its coastland habitat comprising sandflats and herb rich grassland habitats which support a range of flora and fauna including slow-worms (*Anguis fragilis*) (Scottish Natural Heritage, 2000). Located approximately 500m to the south of the study area.	Designated under the Nature Conservation (Scotland) Act 2004.	No pathway to effect on these features predicted.	Screened out of further assessment
Bell Bay to Whitebay LWS	**Desk based:** The site contains coastal habitat with high levels of species diversity; it includes terrestrial and intertidal habitat. Scheme located within this LWS.	Local site designated through Nature Conservation (Scotland) Act 2004	LWSs (now known as Local Nature Conservation Sites (LNCS)) are identified by Local Authorities to safeguard biodiversity and geodiversity of at least local importance (NatureScot, 2024b).	Local
Barbay Hills LWS	**Desk based:** A diverse heather moor Ballochmartin Bay, Great Cumbrae LWS. Located within 2km of the Scheme.	Local site designated through Nature Conservation (Scotland) Act 2004	No pathway to effect on these features predicted.	Screened out of further assessment
Ballochmartin Bay, Great Cumbrae LWS	**Desk based:** a diverse grassland and intertidal habitats which support reptiles and uncommon plant species. Located within 2km of the Scheme footprint.	Local site designated through Nature Conservation (Scotland) Act 2004	No pathway to effect on these features predicted.	Screened out of further assessment
Habitats				
Unnamed ancient woodland	**Desk based:** An unnamed area of ancient woodland, Long-Established (of plantation origin), lies approximately 0.5km south of the proposed Scheme footprint. The Native Woodland Survey of Scotland classified the woodland as 'nearly native' (Forestry Commission Scotland, 2014).	AWI is regarded as an important and irreplaceable national resource (SNH, undated). Scottish Biodiversity List (SBL)	Woodland is listed on the SBL as a variety of types including broad-leaved and coniferous habitats. The Scottish Government's policy on control of woodland removal states that there is a strong presumption against removing ancient semi-natural woodland or plantations on ancient woodland sites.	National

Ecological Feature	Baseline	Legal Status	Justification	Importance
Phase 1 habitat A2.1 Scrub: Dense/continuous Photograph 1	Field based: Dense scrub was present west of the proposed Scheme footprint bordering the road. The dense scrub was dominated by gorse (*Ulex europaeus*) with abundant bramble (Rubus fruticosus), frequent broom (*Cytisus scoparius*), hawthorn (*Crataegus monogyna*), bracken (*Pteridium aquilinum*), rosebay willowherb (*Chamaenerion angustifolium*), Yorkshire-fog (*Holcus lanatus*), perennial ryegrass (*Lolium perenne*). Occasional red fescue (*Festuca rubra*), soft-rush (*Juncus effusus*), ribwort plantain (*Plantago lanceolata*), common knapweed (*Centaurea nigra*), hogweed (*Heracleum sphondylium*). Creeping buttercup (*Ranunculus repens*) and creeping thistle (*Cirsium arvense*) were rare. There was a line of New Zealand broadleaf (*Griselinia littoralis*) around the edge of the existing bus turning area. Tree species sycamore (*Acer pseudoplatanus*), ash (*Fraxinus excelsior*), elder (*Sambucus nigra*), wych elm (*Ulmus glabra*), hazel (*Corylus avellana*), rowan (*Sorbus aucuparia*) and whitebeam (*Sorbus* sp.) were scattered within the scrub habitat.	None	This habitat is common and widespread. Often has low species diversity. 0.19 ha will be lost mainly along the edge of the B986 and the existing bus turning area.	Less than local
Phase 1 habitat B4. Improved grassland Photograph 2	**Field based**: Improved grassland was present west of the proposed Scheme footprint bordering the dense scrub habitat. This habitat was likely cattle grazed and was dominated by perennial ryegrass with frequent Yorkshire-fog and occasional cock's-foot (*Dactylis glomerata*), red fescue and creeping buttercup. The habitat also contained scattered gorse and bramble scrub as well as scattered hawthorn and sycamore.	None	This habitat is common and widespread. No improved grassland will be lost to the scheme	Less than local
Phase 1 habitat H8.4 Coastal grassland Photograph 3	**Field based:** Coastal grassland was present south and east of the proposed Scheme footprint, along the shore. This habitat consisted of abundant red fescue, false oat-grass (*Arrhenatherum elatius*) and reed canary-grass (*Phalaris arundinacea*), frequent soft-rush, jointed rush (*Juncus articulates*), ribwort plantain, bracken, rosebay willowherb, creeping buttercup, and rare sea rush (*Juncus maritimus*) and sea	None	This habitat is common and widespread. 0.16 ha will be lost mainly under the footprint of the marshalling area.	Less than local

Ecological Feature	Baseline	Legal Status	Justification	Importance
	plantain (*Plantago maritima*). The habitat also contained scattered gorse and hawthorn scrub.			
Phase 1 habitat J1.2 Cultivated/ Disturbed Land: Amenity Grassland Photograph 4	**Field based**: A small patch of amenity grassland was present west of the proposed Scheme footprint alongside the car park. This habitat was dominated by perennial ryegrass with occasional red fescue, ribwort plantain, creeping buttercup and cock's-foot.	None	This habitat has little potential to support protected species and has no inherent ecological importance. Small patches of amenity grassland (0.08 ha) will be lost to create a passenger drop off point and a footpath.	Less than local
Phase 1 habitat J3.6 Buildings Photographs 14-15	**Field based:** A toilet block was present approximately 5m west of the proposed Scheme footprint. The building was single storey with plastic panelling on the walls. It had a mono pitched, sheet metal roof which had wooden soffits underneath. The soffits were covered with plastic panelling and bordered with wooden beams. Metal flashing was also present between the sheet metal roof and soffit.	None	This feature has limited potential to support protected species (see 'Bats') and has little inherent ecological importance.	Less than local
Phase 1 habitat J2.5 Stone wall Photograph 18	**Field based:** A stone wall was noted running north-south through the survey area along the western side of the tarmac road (see J4 Bare Ground) and following the site boundary.	None	This habitat has little potential to support protected species and has limited inherent ecological importance.	Less than local
Phase 1 habitat J4 Bare ground Photograph 5	**Field based:** A tarmac road was present on and directly adjacent to the proposed Scheme footprint, running parallel to the coast (Photograph 4). A public car park was also present directly adjacent to the west of the proposed Scheme footprint.	None	This habitat has little potential to support protected species and has no inherent ecological importance.	Less than local
Intertidal	**Field based:** **Intertidal upper shore**: The upper shore comprised predominantly bedrock (sandstone) and boulder with lichens, barnacles, channelled wrack (*Pelvetia canaliculata*) and spiral wrack (*Fucus spiralis*). The survey area south of the slipway contains some areas of artificial seawall fronted by mobile cobble (Photograph 11) and one area of uniform pebble shore. North of the slipway were fewer areas of bare cobble upper shore.	SBL	Common habitat abundant locally. Sheltered muddy gravels listed as a priority feature on the SBL. 1,555m^3 of intertidal habitat will be lost under the footprint of the new slipway and as reclaimed land necessary for the marshalling area and associated revetment/scour protection.	Local

Ecological Feature	Baseline	Legal Status	Justification	Importance
	The following biotopes were present: • Barnacles and fucoids on moderately exposed shores (LR.LMR.BF) • Shingle (pebble) and gravel shores (LS.LCS.Sh) • Lichens or small green algae on supralittoral and littoral fringe rock (LR.FLR.Lic) **Intertidal mid shore**: The middle shore on both the north and south of the slipway comprised boulder and cobble dominated by bladder wrack (*F. vesiculosus*) with lesser amounts of spiral wrack and serrated wrack (*F. serratus*). Egg wrack was present but in relatively low abundance, with the exception of an area of boulder at the southern extent of the survey area where the coverage was dense. Faunal species included barnacles, common limpets (*Patella vulgata*), periwinkles (*Littorina* spp.), dog whelks (*Nucella lapillus*) and beadlet anemones (*Actinia equina*). The following biotopes were present: • *Fucus vesiculosus* on moderately exposed to sheltered mid eulittoral rock (LR.LLR.F.Fves) • *Ascophyllum nodosum* on very sheltered mid eulittoral rock (LR.LLR.F.Asc) **Intertidal lower shore**: The lower shore, at and below the water line at the time of survey, consisted of pebble and coarse sand with serrated wrack, and low abundance of egg wrack. Sparse occurrences of kelp (*Laminaria digitata* and *L. saccharina*) were observed in the infralittoral zone around the existing slipway, more so on the northern side. The following biotopes were present: • *Fucus serratus* on full salinity lower eulittoral mixed substrata (LR.LLR.F.Fserr.X) • Infralittoral coarse sediment (SS.SCS.ICS)			
Subtidal	**Desk based:** Subtidal sediment in the vicinity of the scheme are predominantly boulders and loose rock (BGS, 2004). To the	None	Habitats are widely distributed and relatively common. Coarse material is stable and likely to	Local

Ecological Feature	Baseline	Legal Status	Justification	Importance
	south (600m) this gives way to sandy gravels, whilst to the north (550m) bedrock with gravel banks		support a wide range of marine flora and fauna. Dredging of approximately 1,660m^3 of material in total will be required including 105m^3 of subtidal habitat at the slipway to allow ferry operations.	
Species				
Otter Photograph 16	**Desk based:** Seven records within 2km of the site with the last recorded in 2024. Otter known to utilise the coastal areas around Cumbrae. **Field survey:** Potential couch was identified immediately south of the site boundary, centred at grid reference NS 18197 57161. The potential rest site is a gap underneath the concrete of the sea wall. The gap was approximately 0.5m wide at the entrance, narrowing down as it continued back into the sea wall. The back of the feature was not visible however was at least 1.5m deep. No other evidence such as spraint or prints were identified near the potential feature, however, this could have been washed away by the tide.	European Protected Species (EPS) under the Conservation (Natural habitats &c) Regulations1994 (as amended in Scotland). Otter is listed on the SBL.	Recent publications by SNH/NatureScot indicate that otter populations are increasing and that they are now widespread within Scotland, (Findlay et al., 2015). Otter may use intertidal habitat which will be lost from the proposed Scheme.	Regional
Bats Photographs 14-15 Photograph 18	**Desk based:** Records of common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*P. pygmaeus*) and brown long-eared bat (*Plecotus auratus*) within 2km of the site. **Field based**: The toilet block west of the proposed Scheme footprint (NS 18327 58633) was in good condition overall. However, gaps were present beneath the metal flashing along the roof, which have potential to lead into the internal roof space. The building is considered to have Low potential (Collins, 2023) for summer roosting bats and Low hibernation potential. The stone wall has Negligible potential (Collins, 2023) for summer roosting bats and for hibernating bats.	All UK bat species are EPS under the Conservation (Natural habitats &c) Regulations 1994 (as amended in Scotland). There are nine species of bat known to occur in Scotland and all are listed on the SBL.	No bat features will be affected by the proposed Scheme, which will largely require intertidal land take and construction activities on the foreshore and adjacent existing hard standing.	Local

Ecological Feature	Baseline	Legal Status	Justification	Importance
	The scrub and grassland habitats within the survey area and the woodland, river and reservoir habitats within the wider landscape would provide a foraging and commuting resource for bat species.			
Badger	**Desk based**: No records of badger. The lack of records indicate that badger may not be present on the island. **Field based**: No evidence of badger presence was identified. The scrub and grassland habitats within the survey area and the woodland within the wider landscape provide primary and secondary foraging habitat for badger. Suitable habitat for sett creation is available within the wider landscape, however, as the survey area has high levels of anthropogenic activity and is subject to inundation from the coast, it is considered unlikely to be suitable for sett creation.	None	No evidence of badger present.	Screened out of further assessment
Reptiles	**Desk based:** Common lizard (*Zootoca vivipara*) recorded within 2km of the site, with 37 records, the last being in 2023. No other reptile species recorded. **Field based:** Grassland habitats within the survey area with short vegetation and patches of bare ground provide a basking resource for reptiles. Scrub and scattered trees provide shelter and a foraging resource for reptiles. The stone wall would also provide a shelter and hibernating resource. Therefore, the habitats within the survey area are considered to be highly suitable for reptiles.	Adder, common lizard and slow worm are listed on Schedule 5 of the WCA and the SBL.	Suitable habitat for these species is abundant within the land surrounding the proposed Scheme. No land take of suitable habitat is proposed.	Local
Breeding birds	**Desk based**: 47 species of bird have been recorded from the study area (Appendix A). **Field based:** Wren (*Troglodytes troglodytes*), grey heron (*Ardea cinerea*), herring gull (*Larus argentatus*), cormorant (*Phalacrocorax carbo*), buzzard (*Buteo buteo*), common gull (*Larus canus*), oystercatcher (*Haematopus ostralegus*), woodpigeon (*Columba palumbus*) and pheasant (*Phasianus*	Protected whilst breeding under WCA. Species are also listed on the SBS/SBL and six farmland bird species are listed on the North Ayrshire	Of data gathered during the desk study, 14 species are listed on the Wildlife and Countryside Act and 35 species listed on SBL.; 20 species are red listed and 18 are amber listed (Appendix A). Of the species identified on site, herring gull is red listed, whilst common gull, oystercatcher,	Regional

Ecological Feature	Baseline	Legal Status	Justification	Importance
	colchicus) were identified during the survey. An old nest was also identified within the site boundary adjacent to the bus turning area. Scrub and grassland habitats within the survey area provide foraging and nesting resources for any species of birds. The intertidal habitats also provide a foraging resource for coastal and migratory species.	Local Biodiversity Action Plan (LBAP) (North Ayrshire Council, 2019).	woodpigeon and wren are amber listed. Herring gull is also an SBL species; no species observed are listed on the North Ayrshire LBAP. Records of three North Ayrshire LBAP species – linnet, reed bunting and skylark – were returned in the desk study.	
Hedgehog	**Desk based**: Hedgehog presence was confirmed by desk study records, with five records returned, last recorded in 2017. **Field based**: The grassland and scrub habitats within the survey area provide optimal foraging and commuting habitat for hedgehog. The dense scrub may also provide hibernation habitat for hedgehog.	Listed on the SBL	Suitable habitat for this species is abundant within the land surrounding the proposed Scheme. No land take of suitable habitat is proposed.	Local
Polecat	**Desk based**: No available records of polecat were returned. **Field based**: The grassland and scrub habitats within the survey area provide optimal foraging and commuting habitat for polecat. Evidence of rabbit (*Oryctolagus cuniculus*) was identified during the survey, polecats are known to hunt rabbit and utilise their burrows.	Listed on the SBL	No evidence of polecat present.	Screened out of further assessment
Pinnipeds	**Desk based:** Harbour and grey seals are present in Scottish water year-round. In the waters surrounding Cumbrae, harbour seal are reported at densities of 1-5 per 5km^2 and grey seal reported at 5-10 individuals per 5km^2. The scheme lies outside of Important Marine Mammal Areas (IMMA)	European Protected Species (EPS) under the Conservation (Natural habitats &c) Regulations1994 (as amended in Scotland). Listed on the SBL	Likely to be present in very low numbers within the study area. Sensitive to underwater noise and vibration but demonstrate some habitualisation to operational conditions.	Regional
Cetaceans	**Desk based:** Harbour porpoise are present in Scottish water year-round, but present in near shore waters in higher density in summer months. Maximum density in the waters adjacent to Cumbrae are 0.3-0.5 animals/km^2.	European Protected Species (EPS) under the Conservation (Natural habitats &c)	Likely to be present in very low numbers within the study area. Sensitive to underwater noise and vibration but demonstrate some habitualisation to operational conditions.	Regional

Ecological Feature	Baseline	Legal Status	Justification	Importance
	The scheme lies outside of Important Marine Mammal Areas (IMMA)	Regulations1994 (as amended in Scotland). Listed on the SBL		
Non-native species (NNS)	**Desk based:** No records of NNS were identified within 50m of the proposed Scheme. **Field based:** New Zealand broadleaf (a non-native shrub) was identified within 50m of the proposed Scheme.	WCA (as amended in Scotland). Code of Practice on Non-Native Species (Scottish Government, 2012).	Although not identified within the redline area during desk or field-based study, NNS can be highly mobile. Under the WCA (as amended), it is an offence to: • release an animal to a location outside its native range; • allow an animal to escape from captivity to a location outside its native range; • otherwise cause an animal not in the control of any person to be at a location outside its native range; and • plant, or otherwise cause to grow, a plant in the wild at a location outside its native range.	Not applicable NNS have no conservation status

3. Predicted Impacts

3.1 Introduction

Predicted impacts on important ecological features for the proposed Scheme are described below in Table 3.

Impacts on features of Less than Local importance are not assessed further.

No impacts are predicted for the following features either during the construction or operational phases of the proposed Scheme as no effects pathways were identified. Therefore, these ecological features are not discussed further in the impact assessment:

- Ballochmartin Bay SSSI and LWS, and Barbary Hills LWS. No pathway to affect designated features of any of these habitat sites.
- Scrub (dense, continuous) improved grassland, coastal grassland, cultivated/disturbed grassland, buildings, stone wall and bare ground. These habitats are generally present in low density, poor quality (associated with the urban area of the existing ferry terminal) And unlikely to be significantly affected by works to the foreshore or adjacent terrestrial environment.
- Badger and polecat. Whilst habitats may be present in the wider study area, no records of either species were returned and the likelihood of these species being affected by the scheme are considered negligible.

3.2 Construction

Construction is estimated to take place over a 16-month period (including enabling and construction works). Impacts may include:

- permanent loss of habitats under footprint of the proposed Scheme;
- injury or mortality of protected species due to vegetation removal, vehicle movements or becoming trapped in uncovered holes and pipes;
- temporary habitat fragmentation due to disturbance;
- temporary disturbance to protected species from noise, vibration, lighting and movement of vehicles/vessels;
- sediment release and run-off from construction works;
- remobilisation of sediments and sediment bound contaminates from dredging; and
- generation of dust from use of haul routes, material storage and demolition.

3.3 Operation

The proposed Scheme would replace the existing slipway. No increase in operation is predicted and therefore there will be no change from the current baseline condition in terms of vehicle usage. The proposed Scheme includes increased lighting provision.

Table 3: Description of Potential Impacts (without Mitigation)

Ecological Feature	Impact	Effect	Significance
Construction			
Bell Bay to Whitebay Local Wildlife Site (LWS)	Habitat loss under the Scheme footprint.	Loss of 4,332m^2 of terrestrial habitat (amenity grassland, coastal grassland and scrub) and loss of 1,555m^3 of intertidal habitat. In addition, removal of the slipway should lead to a gain of intertidal and/or marine habitat. This effect would be permanent.	Not significant
Unnamed ancient woodland	Air quality – increase in nitrogen oxides (NOx) and ammonia (NH_3) from vehicle emissions.	Emissions will be generated by construction traffic (both land and marine based). Whilst this may be an increase in emissions over the current baseline, the distance from the proposed Scheme (0.5km) and predominant working over water will reduce the likelihood of effect on ancient woodlands.	Not significant
Intertidal habitat	Habitat loss from land reclamation.	1,555m^3 of intertidal habitat loss is predicted from the scheme.	Significant
Subtidal habitat	Habitat loss from capital dredge programme.	Dredging of approximately 1,660m^3 of material in total will be required including 105m^3 of capital dredging at the slipway. This includes largely ubiquitous habitat common to Scottish subtidal areas.	Not significant
Otter	Construction related activities, including vehicle movements.	Direct mortality of individuals from collisions or entrapment in Scheme boundary. This is unlikely to occur in sufficient numbers to affect the wider population, but mortality of otter poses risks of breaching the Conservation (Natural habitats &c.) Regulations 1994 (as amended in Scotland) if not mitigated. Although the effect will only occur over the duration of the construction period, this effect would be permanent and negative.	Not significant
	Noise, vibration and light spill associated with construction related operations including earth movement.	Disturbance of an EPS leading to its avoidance of foraging habitat and places of shelter and rest. No confirmed resting sites were recorded within 200m of the proposed Scheme. It is not therefore considered that any disturbance would cause declines in population, although disturbance of otter poses risks of breaching the Conservation (Natural habitats &c.) Regulations 1994 (as amended in Scotland) if not mitigated. This effect would be short-term over the duration of the construction period, reversible and negative.	Not significant
	Disturbance as a result of light spill as a result of the increased lighting provision	Disturbance of an EPS leading to its avoidance of foraging habitat and places of shelter and rest. No confirmed resting sites were recorded within 200m of the proposed Scheme. In addition, there is extensive alternative habitat available around the coast of Great Cumbrae.	Not significant

Ecological Feature	Impact	Effect	Significance
		It is not therefore considered that any disturbance would cause declines in population, although disturbance of otter poses risks of breaching the Conservation (Natural habitats &c.) Regulations 1994 (as amended in Scotland) if not mitigated.	
Bats	Habitat loss	Minor works to a highly disturbed and well used area of grassland adjacent of the B896. All other works undertaken in intertidal or urbanised areas.	Not significant
	Disturbance	Disturbance of an EPS leading to its avoidance of foraging habitat and places of shelter. This effect would be short-term over the duration of the construction period, reversible and negative.	Significant
Reptiles	Habitat loss Direct morality from construction activities	Minor works to a high disturbed and well used area of grassland adjacent of the B896. All other works undertaken in intertidal or urbanised areas.	Not significant
Breeding birds	Construction related activities, including vehicle movement and disturbance.	Direct injury or mortality, loss of their eggs or disturbance due to vegetation and site clearance/preparation works if carried out during the breeding season. Short-term but significant effect due to habitat loss, mortality and disturbance caused by construction.	Significant
Hedgehog	Habitat loss Direct morality from construction activities	Minor works to a high disturbed and well used area of grassland adjacent of the B896. All other works undertaken in intertidal or urbanised areas.	Not significant
Pinnipeds	Disturbance from underwater noise	Pinnipeds can be sensitive to through underwater noise. Southall et al. (2019) report that seals in water are at risk of temporary auditory damage when exposed to impulsive noise over 170 dB re 1 μ Pa^{2}s (SEL) and permanent injury at 185 dB re 1 μ Pa^{2}s (SEL). Thresholds in air are reported to be slightly lower at 123 dB re 20 μ Pa^{2}s and 138 dB re 20 μ Pa^{2}s. The area is already subject to regular boat movements from ferry operations therefore background noise levels will already be high and any pinnipeds using the area will be habituated to elevated underwater noise. Underwater noise from piling operations has the potential to reach levels of up to 177 dB re 20 μ Pa^{2}s (SEL) at 10m from the source (assuming water depths of >6 meters and percussive driving of sheet H pile (Rodkin and Pommerenck (2014)). Underwater noise levels such as this has the potential to result in behavioural avoidance of pinnipeds using the area, and potential permanent injury at source. This is considered unlikely as the sightings in the area are infrequent and construction operations are likely to detected before any damage is incurred with temporary displacement from the area. Owing to the infrequent sightings it is unlikely that this area is used as a feeding ground	Not significant

Ecological Feature	Impact	Effect	Significance
		therefore temporary displacement will not have a detrimental effect on pinnipeds. There are no known haul out locations within the zone of influence of the scheme.	
	Vessel strike	The construction will require barge deliveries to site which increases the potential for vessel strike. These vessels will be slow moving and the infrequent sightings in the area would mean that effects from strike would be considered unlikely.	Not significant
	Reduction in water quality	Construction activities may release sediment and pollutants into the environment through refuelling, remobilising and accidental discharge. The new slipway will be constructed within a cofferdam, reducing the potential for chemical and sediment loss from the site.	Not significant
Cetaceans	Disturbance from underwater noise	Underwater noise and vibration as a result of construction works has the potential to cause disturbance and physical injury to cetaceans. Harbour porpoise are considered to be one of the more sensitive marine mammal species, generally with lower noise thresholds than other species. Reviews of the hearing abilities of marine mammals have indicated that exposure to noise above 140 dB re 1µPa results in profound and sustained avoidance behaviour (Southall et al., 2007) and that non-impulsive noise over 153 dB re 1µPa (sound exposure level (SEL)) has the potential to result in temporary effects on the hearing of harbour porpoise (Southall, et al., 2019). The area is already subject to regular boat movements from ferry operations therefore background noise levels will already be high and any cetaceans using the area will be habituated to elevated underwater noise. Underwater noise from piling operations has the potential to reach levels of up to 177 dB re 20 μ Pa^{2}s (SEL) at 10m from the source (assuming water depths of >6 meters and percussive driving of sheet H pile (Rodkin and Pommerenck (2014)). This is above the effect level for Harbour porpoise, however owing to their low density in the Firth of Clyde and their ability to avoid areas the construction works could result in temporary displacement of Harbour porpoise from the construction area.	Significant
	Vessel strike	The construction will require barge deliveries to site which increases the potential for vessel strike. These vessels will be slow moving and the infrequent sightings in the area would mean that effects from strike would be considered unlikely.	Not significant
	Reduction in water quality	Construction activities may release sediment and pollutants into the environment through refuelling, remobilising and accidental discharge.	Not significant

Ecological Feature	Impact	Effect	Significance
		The new slipway will be constructed within a cofferdam, reducing the potential for chemical and sediment loss from the site.	
NNS	Transfer of NNS during construction	Reduction in biodiversity through loss of habitat, reduction in species-richness and a loss of species which the habitat(s) support. Long-term, irreversible (without management) and likely. With the potential for the effects to spread beyond the scope of the initial impact area.	Significant

4. Mitigation Measures

4.1 Introduction

Mitigation will follow a hierarchical approach to mitigation design, in the following order (CIEEM, 2018; SNH, 2013; Scottish Government, 2013a):

- avoid adverse impacts in the first instance;
- where avoidance is not possible, reduce the adverse impacts through mitigation; and
- where significant adverse residual impacts remain, measures to offset the adverse impacts at a site-specific level may be required (compensation).

This section outlines mitigation measures proposed to avoid, reduce or offset the potential adverse effects of the proposed Scheme on biodiversity and nature conservation in accordance with best practice guidance and Scottish and local government environmental impact, planning and sustainability policies. Where impacts can be fully mitigated, they would not be considered significant under the terms of the EIA Regulations.

It is expected that all non-significant impacts would be mitigated through the application of best working practice (e.g. mitigation of potential dust pollution impacts through adherence to standard best practice and guidelines, such as dust suppression methods on site as set out in Table 4). Potential significant ecological impacts are expected to be mitigated through a combination of best practice/typical mitigation methods.

Mitigation measures listed in this Ecological Impact Assessment will be specified as environmental commitments in the contract documents to ensure implementation by the appointed Contractor.

4.2 Generic Mitigation Measures

4.2.1 Construction Environmental Management Plan (CEMP)

A Construction Environmental Management Plan (CEMP) will be produced by the construction Contractor. The CEMP will set out the intended methods of effectively managing potential environmental impacts resulting from construction of the proposed Scheme. It will contain specific environmental objectives, environmental risks and the proposed mitigation such as dust and soil management, storage of chemicals and use of NetRegs PPGs (NetRegs, 2023). It will also contain, where relevant, method statements as a means of controlling environmental risks including biosecurity maintenance.

4.2.2 Ecological Clerk of Works (ECoW)

A suitably qualified (or team of suitably qualified) Ecological Clerk of Works (ECoW) will be employed by the Contractor to supervise the construction works, undertake pre-construction surveys for protected species in the areas affected by the proposed Scheme and ensure mitigation measures are implemented to avoid and reduce impacts on ecological features.

4.2.3 Vegetation Clearance

- Vegetation clearance must be kept to a minimum to that which is required to facilitate the works being undertaken.
- An ECoW will advise on any additional mitigation required once areas required for vegetation clearance are identified.
- Vegetation clearance should be limited to scrub, tall ruderal vegetation and saplings. Where removal/pruning of trees other than saplings cannot be avoided, this must first be discussed with the ECoW to determine if any additional mitigation is required.

- Any works in the vicinity of trees should be in accordance with the British Standard *Trees in Relation to Design, Demolition and Construction* BS 5837:2012.

4.2.4 Species Protection Plans

Species Protection Plans will be prepared for EPS (and other species as determined by the ECoW) by the Contractor as part of the CEMP. The Species Protection Plans will be prepared to ensure that essential mitigation strategies required for safeguarding protected species are implemented as part of the contract, and will be updated as appropriate if any derogation licences are identified as being required following further surveys.

Some Species Protection Plans may be required to avoid potential breaches of conservation legislation arising from mortality or disturbance, even if these effects are not of a magnitude to be ecologically significant.

4.3 Specific Mitigation

Specific mitigation for habitats and species is described below in Table 4.

- It will be the contractual responsibility of the appointed Contractor to ensure that mitigation is implemented during the works and that all relevant licences, should they be required, are in place prior to commencement of works.
- It should be noted that NatureScot consider ecological data acquired on EPS to have a limited time frame of up to eighteen months before becoming outdated.
- Should the presence of any protected species within the study area change, additional mitigation may be required.

Table 4: Ecological Mitigation for Habitats and Species

Ecological Feature	Impact	Mitigation	Phase	Residual Impact
Construction				
Intertidal habitats	Habitat loss from land reclaim associated with the proposed marshalling area and slipway	• Scheme design represents the smallest footprint to meet project objectives. • Large rock revetment will be used to protect the marshalling area, instead of piling. This will provide habitat diversity in the mid and upper intertidal for the colonisation of marine fauna and flora. • On commissioning of the new slipway, the existing slipway will be demolished, and materials removed from the marine environment, allowing re-naturalisation of the current slipway area. Demolition of the existing slipway will create some intertidal habitat. • Marine enhancements will be included in the new slipway design. Enhancements may include vertipools or texture tiles. Exact nature of marine enhancements to be agree with NatureScot. Marine enhancements will increase the potential for biodiversity to utilise non-operational areas of the slipway and associated infrastructure.	Construction	Non-significant
Otter	Mortality or injury of individuals from construction related activities, including entrapment and vehicle movements.	• All trenches, holes and pits will be kept covered at night or provide a means of escape for mammals that may become entrapped. • Temporary mammal resistant fencing will be provided around construction compounds following a specification agreed through consultation with NatureScot. • Pre-works checks should also be carried out for otter within 48 hours of works. • Compound gates will be sensitively designed to prevent mammals from gaining access to compounds and will be closed at night.	Construction	Non-significant
	Disturbance due to noise, vibration and light spill associated with construction related operations including earth movement. Disturbance due to light-spill during operation.	• Species Protection Plans for EPS and other species of conservation interest will be created by the Contractor in consultation with NatureScot; plans will be updated and amended as required during the construction programme. • Pre-construction surveys for protected species under the footprint of the proposed Scheme plus a buffer of at least 200m (or as determined in the Species Protection Plans) will be undertaken: Surveys will inform the need for any protected species licences required and/or any additional measures to be undertaken by the contractor to obtain the necessary licences; and locations of protected species will be communicated to construction staff in strict confidence to ensure no direct mortality of protected species during site clearance, and allow for the development of additional mitigation should it be required.	Pre-construction Construction Operation	Non-significant

Ecological Feature	Impact	Mitigation	Phase	Residual Impact
		• A lighting plan will be developed for low light conditions and during the hours of darkness. The use of construction lighting will be in accordance with BS 5489 requirements and applicable guidance on lighting (e.g. Institute of Lighting Engineers (2011)). This will include, but is not limited to: - avoidance of working during the hours of darkness where possible; - the use of directional lighting; and - preventative measures (e.g. installation of shields, hoods or limiting the height of lighting columns). • Operational lighting will be designed to limit light-spill where possible, especially along the B896, and avoid illuminating sensitive habitats, and will be in accordance with applicable guidance on lighting (e.g. Institute of Lighting Engineers (2011)).		
Bats	Disturbance due to noise, vibration and light spill associated with construction related operations.	• Species Protection Plans for EPS and other species of conservation interest will be created by the Contractor in consultation with NatureScot; plans will be updated and amended as required during the construction programme. • One bat emergence survey should be undertaken during the peak activity season (May to August) to confirm the presence or likely absence of roosting bats, and inform the need for any species licence and/or any additional measures (such as avoidance of nighttime working and use of directional lighting).	Construction	Non-significant
Breeding birds	Mortality and disturbance due to construction related activities, including vehicle movement and vegetation clearance.	• Vegetation clearance will be undertaken outwith the bird breeding season (typically March to August inclusive) where applicable and practicable. • Where clearance must be undertaken during these times, pre-works checks will be undertaken to identify active nests no more than two days prior to tree felling works. If found, clearance must be postponed until chicks have left the nest. • Checks will be made for the presence of ground nesting birds prior to commencement of works (including the movement of dredged material along the shore). • Any methods required to exclude and deter birds from breeding in working areas will be developed in consultation with SNH and implemented ahead of the breeding bird season. • All cleared material will be rendered unsuitable for nesting birds or removed from the works area.	Construction	Non-significant
Marine mammals	Disturbance from underwater noise and vibration	• Adherence to the JNCC Guidelines (JNCC, 2010b) for the prevention of injury or harm to marine mammals will be followed, demonstrating Best Available Technique Not Entailing Excessive Costs (BATNEEC). This may include: - Requirement for a marine mammal observer (MMO) for the duration of piling activities (pre piling search, delay to commencement if marine mammals detected);	Construction	Non-significant

Ecological Feature	Impact	Mitigation	Phase	Residual Impact
		- Preference for piling during daylight hours only; - Soft or ramp start to allow marine mammal to avoid the piling zone; - Use of vibro piling, sleeved or muffler hammer piling or gravity based piling to avoid the noise generation of impact or percussive piling. - Where possible, piling operations will be avoid summer months, when porpoise density is known to be higher in the Firth of Clyde.		
NNS	Transfer of NNS during construction	A Biosecurity Plan should be developed in line with SEPA guidelines on NNS (SEPA, undated) and NatureScot guidance on marine biosecurity planning (Payne et al., 2014) and in line with the *Code of Practice on Non-Native Species* (Scottish Government, 2012) to avoid the spread of NNS and manage their removal and disposal during construction.	Construction	Non-significant

4.4 Residual Impacts

Potentially significant construction impacts on intertidal habitats, otter, breeding birds, marine mammals and spread of NNS are anticipated to be fully mitigated through the proposed use of species protection plans, construction environmental management plans and the implementation of an Biosecurity Plan as set out in Table 4.

No significant operational impacts are predicted.

There are no significant long-term residual impacts on ecological features predicted, provided that there is successful implementation of proposed mitigation measures which include adherence to environmental plans such as the CEMP and Species Protection Plans.

4.5 Cumulative Impacts and Impact Interrelations

No cumulative impacts are anticipated between the proposed Scheme and any other proposed or consented schemes within the surrounding area.

5. References

British Geological Survey (2004). Intertidal Substrate Foreshore (England and Scotland). Available online: https://magic.defra.gov.uk/ [Accessed August 2024]

Chartered Institute for Ecology and Environmental Management (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

Collins, J. (ed.) (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th ed.). The Bat Conservation Trust, London.

Connor, D.W., J.H. Allen, N. Golding, K.L. Howell, L.M. Lieberknecht, K.O. Northen and J.B. Reker (2004). The Marine Habitat Classification for Britain and Ireland Version 04.05 ISBN 1 861 07561 8. In: JNCC (2022) The Marine Habitat Classification for Britain and Ireland Version 22.04. [Accessed January 2024]. Available online: https://mhc.jncc.gov.uk/resources#version0405 [Accessed August 2024]

Findlay M., Alexander L. and Macleod C. (2015). Site conditions for monitoring otters (*Lutra lutra*) in 2011-2012. Scottish Natural Heritage Commissioned Report No. 521.

Forestry Commission Scotland (2014). Scotland's Native Woodlands, Results from the Native Woodland Survey of Scotland.

Institute of Lighting Engineers (2011). Guidance Notes for the Reduction of Obtrusive Light GN01:2011. Avalable online: http://www.bats.org.uk/pages/bats_and_lighting.html

JNCC (2010a). *Handbook for Phase 1 habitat survey – a technique for environmental audit*. JNCC, Peterborough, ISBN 0 86139 636 7.

JNCC (2010b). Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise. Available online: https://data.jncc.gov.uk/data/31662b6a-19ed-4918-9fab-8fbcff752046/JNCC-CNCB-Piling-protocol-August2010-Web.pdf [Accessed August 2024]

NatureScot (Undated). Protected Species [online] Available online: https://www.nature.scot/professional-advice/protected-areas-and-species/protected-species/protected-species-z-guide [Accessed August 2024]

NatureScot (2024a). A guide to understanding the Scottish Ancient Woodland Inventory (AWI). [Online] https://www.nature.scot/doc/guide-understanding-scottish-ancient-woodland-inventory-awi [Accessed August 2024]

NatureScot (2024b). Guidance on Establishing and Managing Local Nature Conservation Site Systems in Scotland – 2023 update. Available online at: https://www.nature.scot/doc/local-nature-conservation-sites-lncs-guidance [Accessed August 2024]

NBN Atlas Partnership (2024). NBN Atlas [online] https://nbnatlas.org/ [Accessed August 2024]

NetRegs (2023). Guidance for Pollution Prevention (GPPs) Available online: www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents [Accessed August 2024]

North Ayrshire Council (2019). Local Biodiversity Action Plan 2019-2031. Available online: https://www.north-ayrshire.gov.uk/Documents/CorporateServices/Finance/approved-lbap.pdf [Accessed August 2024]

Payne R.D., Cook E.J. and Macleod A. (2014). *Marine Biosecurity Planning – Guidance for producing site and operation-based plans for preventing the introduction of non-native species*. Report by SRSL Ltd. in conjunction with Robin Payne to the Firth of Clyde Forum and Scottish Natural Heritage 39 pp.

Rodkin R., and Pommerenck K. (2014.) Caltrans compendium of underwater sound data from pile driving - 2014 update. Available online: https://www.acoustics.asn.au/conference_proceedings/INTERNOISE2014/papers/p690.pdf [Accessed August 2024]

Scottish Environmental Protection Agency (Undated). *SEPA: Biosecurity and management of INNS for construction sites and Controlled Activities*. Available online: https://www.sepa.org.uk/media/163480/biosecurity-and-management-of-invasive-non-native-species-construction-sites.pdf [Accessed August 2024]

Scottish Executive. 2000. Planning Advice Note 60: Planning For Natural Heritage. Available online: https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/landscapes/landscape-and-planning#:~:text=Planning%20for%20Natural%20Heritage%3A%20Planning%20Advice%20Note%2060%3A,in%20relation%20to%20landscape%20drawn%20from%20across%20Scotland [Accessed August 2024]

Scottish Government (2012). *Code of Practice on Non-Native Species*. Available online: https://www.gov.scot/publications/non-native-species-code-practice/ [Accessed August 2024]

Scottish Government (2013a). Planning Advice Note 1/2013: Environmental Impact Assessment. Available online: https://www.gov.scot/publications/planning-advice-note-1-2013-environmental-impact-assessment/ [Accessed August 2024].

Scottish Government (2013b). Scottish Biodiversity List (SBL) (22 April 2013 version). Available at: https://www.nature.scot/doc/scottish-biodiversity-list [Accessed August 2024].

Scottish Government (2015). Scotland's National Marine Plan. Available online: https://www.gov.scot/publications/scotlands-national-marine-plan/ [Accessed August 2024]

Scottish Government (2024). National Planning Framework 4. Available online: https://www.gov.scot/publications/national-planning-framework-4/ [Accessed August 2024]

Scottish Natural Heritage (2000). SSSI Management Statement, Ballochmartin Bay SSSI. SNH Ref No: 132 (15/02/2000).

Scottish Natural Heritage (2013). *A handbook on environmental impact assessment: Guidance for Competent Authorities, Consultees and others involved in the Environmental Impact Assessment Process in Scotland*. 4th Edition. Scottish Natural Heritage, Battleby, Perth.

Southall B.L., Bowles A.E., Ellison W.T., Finneran J.J., Gentry R.L., Greene C.R.Jr., Kastak D., Ketten D.R., Miller J.H., Nachtigall P.E., Richardson W.J., Thomas J.A. and Tyack P.L. (2007). Marine Mammal Noise Exposure Criteria: Initial Scientific Recommendations. *Aquatic Mammals* 33(4): 411-521.

Southall B.L., Finneran J.J., Reichmuth C., Nachtigall P.E., Ketten D.R., Bowles A.E., Ellison W.T., Nowacek D.P. and Tyack P.L. (2019). Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects. *Aquatic Mammals*, 45(2), p.125.

Tyler-Walters, H., James, B., Carruthers, M. (eds.), Wilding, C., Durkin, O., Lacey, C., Philpott, E., Adams, L., Chaniotis, P.D., Wilkes, P.T.V., Seeley, R., Neilly, M., Dargie, J. and Crawford-Avis O.T. (2016). *Descriptions of Scottish Priority Marine Features (PMFs).* Scottish Natural Heritage Commissioned Report No. 406.

Appendix A. Protected Bird Species

Table A1: Records of protected birds returned from the desk study. CS = UK Conservation Status (Red, Amber, Green), from Birds of Conservation Concern (Stanbury et al., 2021).

Scientific Name	Common Name	CS	Designations
Acanthis cabaret	Lesser redpoll		SBL
Alauda arvensis	Skylark		North Ayrshire Local Biodiversity Action Plan (LBAP) Scottish Biodiversity List (SBL)
Anser albifrons	White-fronted goose		SBL
Anser anser	Greylag goose		Wildlife and Countryside Act 1981 (WCA) (Schedule 1 Part 2)
Apus apus	Swift		SBL
Asio flammeus	Short-eared owl		SBL
Aythya ferina	Pochard		SBL
Branta leucopsis	Barnacle goose		SBL
Bucephala clangula	Goldeneye		WCA 1981 (Schedule 1 Part 2)
Calidris alpina	Dunlin		SBL
Chroicocephalus ridibundus	Black-headed gull		SBL
Clangula hyemalis	Long-tailed duck		WCA 1981 (Schedule 1 Part 1)
Corvus cornix	Hooded crow		SBL
Cuculus canorus	Cuckoo		SBL
Emberiza schoeniclus	Reed bunting		LBAP, SBL
Falco tinnunculus	Kestrel		SBL
Gavia immer	Great northern diver		WCA 1981 (Schedule 1 Part 1), SBL
Gavia stellata	Red-throated diver		WCA 1981 (Schedule 1 Part 1), SBL
Hydrobates pelagicus	Storm petrel		SBL
Hydrocoloeus minutus	Little gull		WCA 1981 (Schedule 1 Part 1)
Ichthyaetus melanocephalus	Mediterranean gull		WCA 1981 (Schedule 1 Part 1)
Larus argentatus	Herring gull		SBL
Limosa lapponica	Bar-tailed godwit		SBL
Linaria cannabina	Linnet		LBAP, SBL

Scientific Name	Common Name	CS	Designations
Locustella naevia	Grasshopper warbler		SBL
Loxia curvirostra	Crossbill		WCA 1981 (Schedule 1 Part 1)
Melanitta nigra	Common scoter		WCA 1981 (Schedule 1 Part 1), SBL
Muscicapa striata	Spotted flycatcher		SBL
Numenius arquata	Curlew		SBL
Numenius phaeopus	Whimbrel		WCA 1981 (Schedule 1 Part 1)
Passer domesticus	House sparrow		SBL
Phoenicurus ochruros	Black redstart		WCA 1981 (Schedule 1 Part 1)
Phylloscopus sibilatrix	Wood warbler		SBL
Pluvialis apricaria	Golden plover		SBL
Puffinus puffinus	Manx shearwater		SBL
Pyrrhula pyrrhula	Bullfinch		SBL
Scolopax rusticola	Woodcock		SBL
Spinus spinus	Siskin		SBL
Stercorarius parasiticus	Arctic skua		SBL
Sterna hirundo	Common tern		SBL
Sterna paradisaea	Arctic tern		SBL
Thalasseus sandvicensis	Sandwich tern		SBL
Tringa nebularia	Greenshank		WCA 1981 (Schedule 1 Part 1)
Turdus philomelos	Song thrush		SBL
Tyto alba	Barn owl		WCA 1981 (Schedule 1 Part 1), SBL
Vanellus vanellus	Lapwing		SBL

Appendix B. Photographs

Photograph 1: Scrub – dense/continuous

Photograph 2: Improved grassland

Photograph 3: Coastal grassland

Photograph 4: Amenity grassland

Photograph 5: Bare ground (road)

Photograph 6: View of intertidal area south of the existing slipway

Photograph 7: View of intertidal area north of the existing slipway

Photograph 8: Habitat at new slipway location

Photograph 9: Habitat at new slipway location

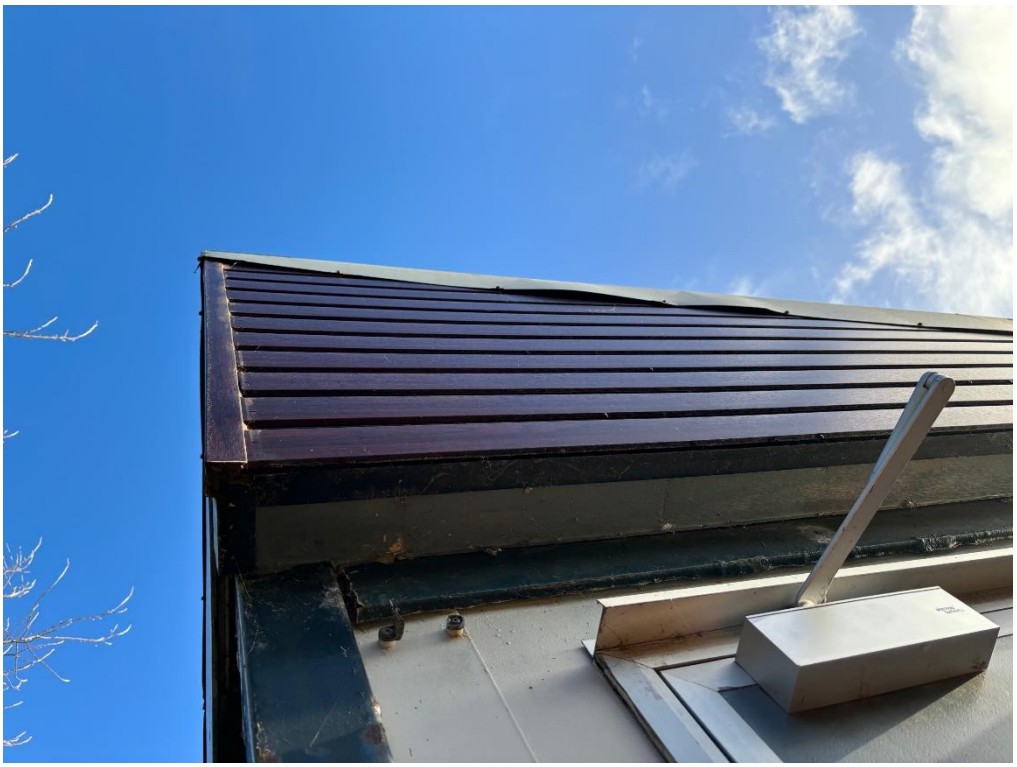
Photograph 10: Sandy area at southern extent of survey area

Photograph 11: Seawall, bedrock (sandstone) and cobble upper shore south of the slipway

Photograph 12: Pebble beach upper shore area south of slipway

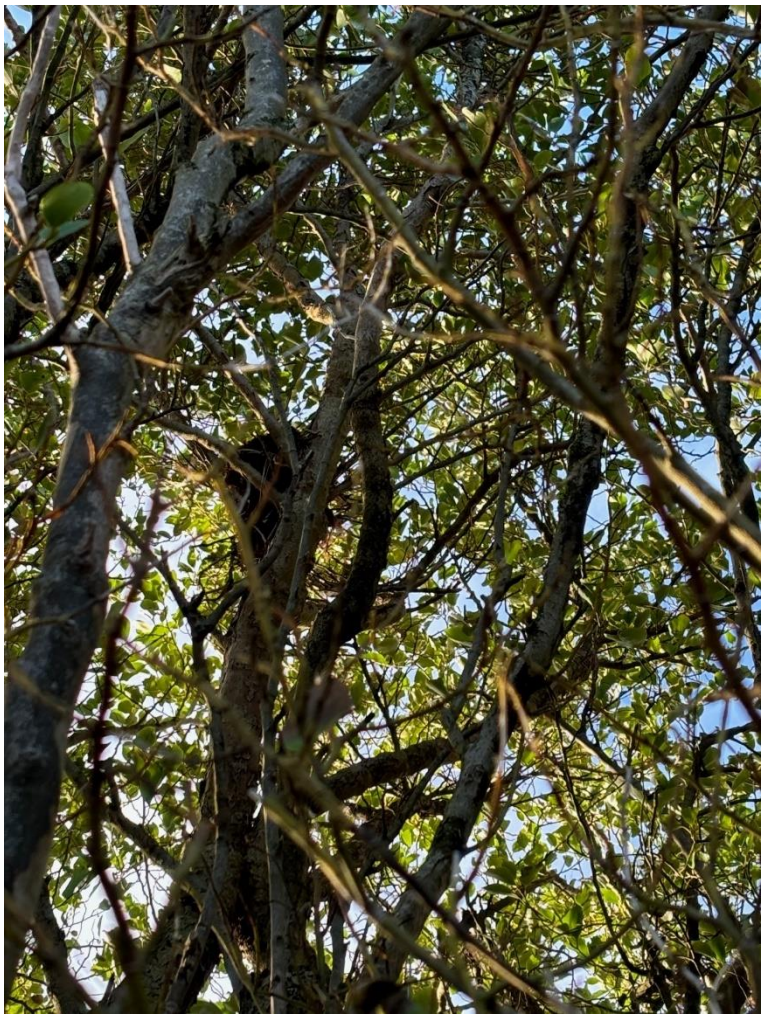
Photograph 13: Boulder with dense egg wrack at southern extent of survey area

Photograph 14: Toilet block approximately 20m west of the proposed Scheme footprint



Photograph 15: PRF on toilet block

Photograph 16: Potential rest site for otter



Photograph 17: Old bird's nest

Photograph 18: Drystone wall