

Ecological Impact Assessment

Clifden Town Centre Public
Realm Enhancement
Project





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Table of contents

1.	INTRODUCTION	7
1.1	Background	7
1.2	Statement of Authority	7
1.3	Relevant Guidance	7
2.	DESCRIPTION OF PROPOSED PROJECT	8
2.1	Site Location	8
2.1.1	Description of the Proposed Works Areas	10
2.1.1.1	Clifden Town Centre	10
2.1.1.2	Harbour Park	10
2.1.1.3	Beach Road Quay	10
2.1.2	Description of the Proposed Works	10
2.1.3	Surface Water Drainage	12
2.1.3.1	Harbour Park	12
2.1.3.2	Beach Road	12
2.1.3.3	Clifden Town Centre	12
2.2	Construction and Environmental Management Plan (CEMP)	13
2.2.1	Proposed Construction Methodology	13
2.2.1.1	Resurfacing and Realignment of Roads and Parking Areas	13
2.2.1.2	Widening and Realignment of Existing Footpath Areas	13
2.2.1.3	Proposed Works at the Existing Playground	14
2.2.1.4	Development of all Other Ancillary and Components	14
2.2.1.5	Landscaping	15
2.3	Landscaping Proposals	15
2.3.1	Town Centre	15
2.3.2	Harbour Park	15
2.3.3	Beach Road	16
2.4	Flood Risk Assessment	17
3.	METHODOLOGY	18
3.1	Desk Study	18
3.2	Field Surveys	18
3.2.1	Multi-disciplinary ecological walkover surveys	18
3.2.1	Faunal Surveys	19
3.2.1.1	Badger & Mammal Survey	19
3.2.1.2	Otter Survey	19
3.3	Methodology for Assessment of Impacts and Effects	20
3.3.1	Determining Importance of Ecological Receptors	20
3.3.2	Characterisation of Impacts and Effects	20
3.3.3	Determining the Significance of Effects	21
3.4	Limitations	22
4.	DESK STUDY	23
4.1	Designated Sites	23
4.2	NPWS Article 17 Reporting	37
4.3	New Flora Atlas	39
4.4	Bryophytes	39
4.5	NPWS Records	39
4.6	Biodiversity Ireland Database	40
4.7	Water Quality	44
5.	FIELD STUDY	45
5.1.1	Habitats Present on the Site and Surrounding Area	45
5.1.2	Invasive species	57
5.1.2.1	Listed Third Schedule Invasive Species	57
5.1.2.2	Other Non-native Invasive Species	57
5.1.3	Fauna	63
5.1.3.1	Birds	63

5.1.3.2	Bats.....	63
5.1.3.3	Otter.....	63
5.1.3.4	Other fauna.....	63
5.1.4	Importance of Ecological Receptors	64
6.	ECOLOGICAL IMPACT ASSESSMENT	70
6.1	Do Nothing Impact	70
6.2	Impacts during Construction.....	70
6.2.1	Habitat Loss.....	70
6.2.1.1	Habitats of Local Importance (Lower Value).....	70
6.2.1.2	Habitats of Local Importance (Higher Value)	70
6.2.2	Impacts on Fauna During the Construction Phase.....	71
6.2.2.1	Birds 71	
6.2.2.2	Otters.....	72
6.2.3	Spread of Invasive Species During the Construction Phase.....	74
6.2.4	Deterioration of Water Quality During the Construction Phase	75
6.3	Impacts During the Operational Phase	78
6.3.1	Impacts on Habitats.....	78
6.3.2	Impacts on Fauna.....	78
6.3.3	Impacts on Water Quality During the Operational Phase.....	78
6.4	Impacts on Designated Sites.....	79
6.4.1	Impacts on European Sites.....	79
6.4.2	Impacts on European Designated Sites	79
6.4.3	Impacts on Nationally Designated Sites	80
7.	CUMULATIVE IMPACT ASSESSMENT	81
7.1	Other Projects	81
7.2	Plans	84
7.3.1	Conclusion of Cumulative Assessment	91
8.	CONCLUSION	93
	BIBLIOGRAPHY	94

TABLE OF FIGURES C

Figure 2-1 Site Location Map.....	9
Figure 4-1 European Designated Sites Within the Likely Zone of Influence.....	25
Figure 4-2 Nationally Designated Sites Within the Likely Zone of Influence.....	26
Figure 4-3 Annex I habitats mapped under Article 17 within the vicinity of the proposed works.....	38
Figure 5-1 Habitats Recorded Within the Proposed Works Boundary.....	48

TABLE OF TABLES

Table 3-1 Criteria for determining significance of effect, based on (EPA, 2022) guidelines.	21
Table 4-1 Nationally Designated Sites Within the Likely Zone of Influence.....	27
Table 4-2 Records of species recorded on the NPWS Flora (Protection) Order 2022 Map Viewer for Vascular Plants, Charophytes, and Lichens within Hectad L65.....	39
Table 4-3 Records for rare and protected species, NPWS.....	39
Table 4-4 NBDC records for protected fauna records (excl. birds).....	41
Table 4-5 NBDC records for Invasive species.....	42
Table 4-6 NBDC Records for Birds.....	43
Table 5-1 Importance of Ecological Receptors.....	64

Table 6-1 Impacts to Birds during the Construction Phase.....	71
Table 6-2 Impacts to Otters during the construction Phase.....	72
Table 6-3 Impacts on Invasive Species During the Construction Phase.....	74
Table 6-4 Impacts on Water Quality During the Construction Phase.....	75
Table 7-1 Review of Relevant Plans and Policies.....	85

TABLE OF PLATES

Plate 5-1 Area of Spoil and Bare Ground (ED2) to the northern parcel near the entrance of Harbour Park dominated by exposed gravel and stone, with sand and rubble heaps to the northern margin of this area.....	49
Plate 5-2 Playground area to the western margin of Harbour Park classified as Buildings and Artificial Surfaces (BL3)	49
Plate 5-3 Roadway, pathways, car parking, and buildings in Clifden Town Centre classified as Buildings and Artificial Surfaces (BL3)	50
Plate 5-4 Recolonising Bare Ground (ED3) , with exposed gravel to the western boundary of Harbour Park.....	50
Plate 5-5 Dry Meadows and Grassy Verges (GS2) to the eastern margin of Harbour Park.....	51
Plate 5-6 Scrub (WS1) present to the eastern boundary of Harbour Park.....	51
Plate 5-7 Scrub (WS1) present to the eastern boundary of Harbour Park, outside of the proposed works boundary, in private lands adjacent.....	52
Plate 5-8 An artificially canalised section of an unmapped EPA watercourse, classified as an Eroding Upland River (FW1) runs culverted under Main Street in Clifden Town Centre to the northeast parcel of the proposed works site. This artificially canalised watercourse continues to flow adjacent to the eastern margin of the proposed works site, in a southerly direction before discharging into the Owenglin River after approx 280m, which at this point is designated as part of the Twelve Bens/ Garraun Complex SAC.....	52
Plate 5-9 A section of the Owenglin River, classified as a Depositing Lowland River (FW2) , which is designated as part of the Twelve Bens/ Garraun Complex SAC, flows to the southern margin of the site, outside of the proposed works boundary in a westerly direction before discharging into Clifden Bay Estuary.....	53
Plate 5-10 A section of the Clifden Stream, classified as an Eroding Upland River (FW1) , a tributary of the Owenglin River which flows through the western margin of Harbour Park, flowing in a southerly direction before discharging into Clifden Bay Estuary.....	53
Plate 5-11 Hedgerow (WL1) recorded to the eastern boundary of Beach Road Quay, outside of the proposed works boundary.....	54
Plate 5-12 Treeline (WL1) recorded to the southern margin of Clifden Town, outside of the proposed works boundary. Plate 5-13 The southern margin of Harbour Park mapped as the Annex I habitat [1130] Estuaries, as per Article 17 Mapping. The habitats recorded in this area include Dry Meadows and Grassy Verges (GS2), Scrub (WS1), Recolonising Bare Ground (ED2), and Buildings and Artificial Surfaces (BL3). As such, this area does not conform to this Annex I habitat type- [1130] Estuaries.	54
Plate 5-14 The southern margin of Beach Road Quay mapped as the Annex I habitat [1130] Estuaries, as per Article 17 Mapping. The habitats recorded in this area include Dry Meadows and Grassy Verges (GS2) and Buildings and Artificial Surfaces (BL3). As such, this area does not conform to this Annex I habitat type- [1130] Estuaries.....	55
Plate 5-15 A small section of mapped Article 17 Annex I habitat [4010] Wet Heath overlaps with a section of the proposed works site, along Doonen Road to the southeast corner. The habitats recorded	

<i>in this area includes Buildings and Artificial Surfaces. As such, this area does not conform to this Annex I habitat type [4010] Wet Heath</i>	56
<i>Plate 5-16 Large stands of Giant rhubarb (Gunnera tinctoria) to the eastern margin of Harbour Park, within the proposed works boundary.</i>	59
<i>Plate 5-17 Japanese Knotweed (Fallopia japonica) stand recorded to the southeast margin of Harbour Park, within the proposed works boundary.</i>	59
<i>Plate 5-18 Rhododendron (Rhododendron ponticum) plant recorded along Beach Road, adjacent to the proposed works boundary.</i>	60
<i>Plate 5-19 Himalayan Balsam (Impatiens glandulifera) plant recorded along the banks of the unmapped EPA watercourse that flows through Clifden Town centre, outside of the proposed works boundary to the east</i>	60
<i>Plate 5-20 Butterfly Bush (Buddleja davidii) recorded to the northeast margin of Harbour Park, within the proposed works boundary.</i>	61
<i>Plate 5-21 A singular plant of Wall Cotoneaster (Cotoneaster horizontalis), a medium impact non-native invasive species of potential concern that is not listed on the Third Schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) recorded on Doonen Road, outside of the proposed works boundary to the south</i>	61
<i>Plate 5-22 Montbretia (Crocasmia x crocosmiiflora) a low impact, non-native invasive species of potential concern that is not listed on the Third Schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) recorded to the northern margin of Harbour Park, within the proposed works boundary.</i>	62

APPENDIX

Appendix 1.....	Invasive Species Management Plan (ISMP).
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1. INTRODUCTION

1.1 Background

MKO has been commissioned by Galway County Council (GCC) to conduct an Ecological Impact Assessment (EcIA) for an area proposed to be enhanced under the Clifden Town Centre Public Realm Enhancement Project in Clifden, Co. Galway (Grid Reference; ITM 465748, 750606).

The EcIA includes an accurate description of all aspects of the proposed works during construction, operation, and decommissioning (where relevant). It then provides a comprehensive description of the baseline ecological environment, which is based on an appropriate level of survey work that was carried out in accordance with the most appropriate guidelines and methodologies. The EcIA then completes a thorough assessment of the impacts of the proposed works on biodiversity. Where likely ecologically significant effects are identified, measures are prescribed to avoid or minimise or compensate for such effects.

1.2 Statement of Authority

An initial multidisciplinary ecological walkover survey was undertaken by Inga Reich (Honours degree in Biology, Ph.D. in Applied Ecology) on the 26th of November 2021. A follow multidisciplinary ecological walkover survey was undertaken on the 20th of September 2023 by Rachel Minogue (BSc., Env) and Timothy O'Ceallaigh (BSc., Env) of MKO. This report has been prepared by Rachel Minogue (BSc., Env). RM is an ecologist with MKO with relevant academic qualifications in Environmental Science. This report has been reviewed by Colin Murphy (B.Sc., MSc). Colin is an experienced project ecologist with over 4 years' professional consultancy experience.

1.3 Relevant Guidance

In addition, the guidelines listed below were consulted in the preparation of this document to provide the scope, structure, and content of the assessment:

- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018) (amended 2019).
- EPA guidelines on the information to be contained in Environmental Impact Statements (EPA, 2022).
- Environmental Impact Assessment of National Road Schemes –A Practical Guide (NRA, 2009).
- Guidelines for assessment of Ecological Impacts of National Road Schemes, (NRA, 2009).
- Environmental Assessment and Construction Guidelines (NRA, 2006)

2.

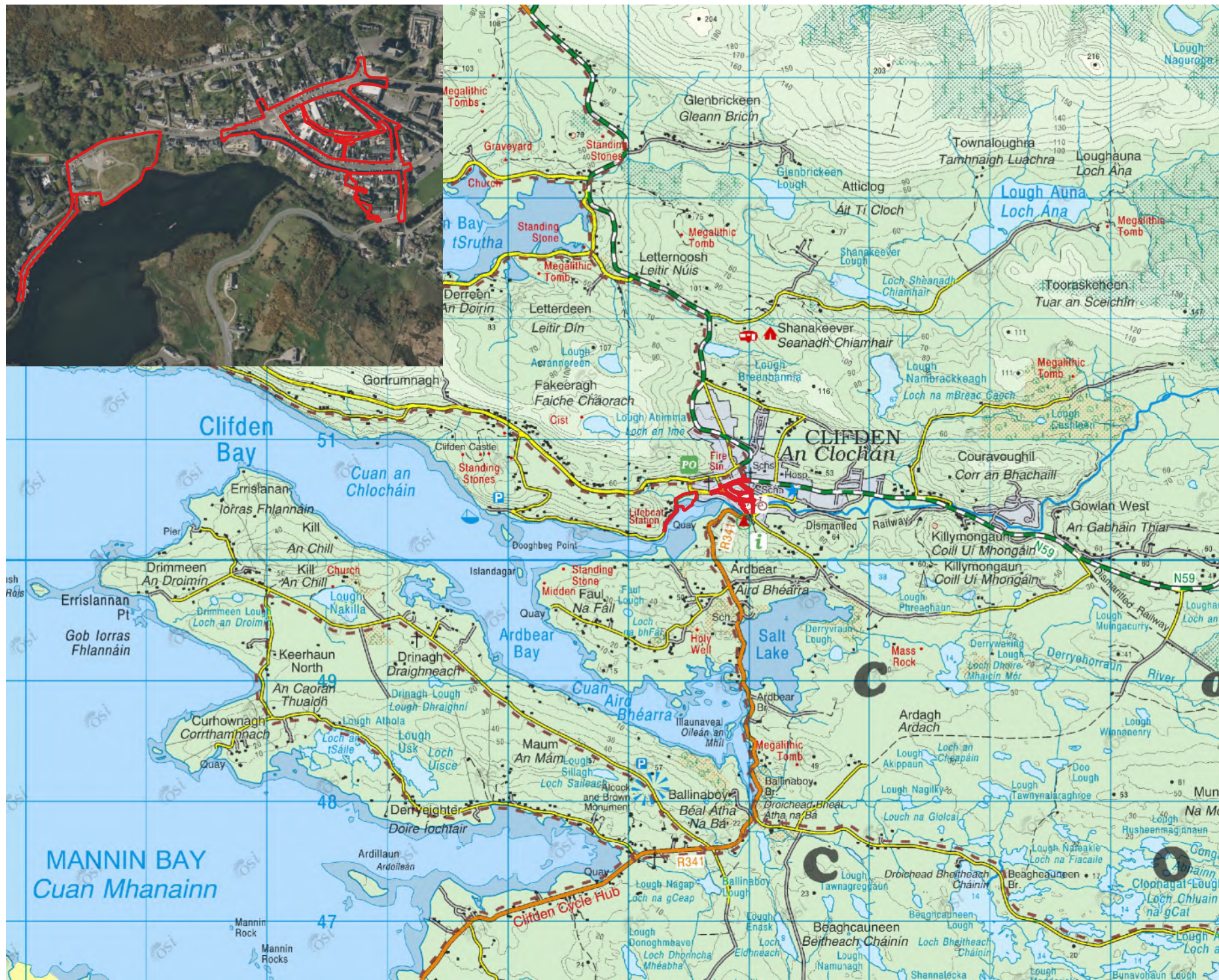
DESCRIPTION OF PROPOSED PROJECT

2.1

Site Location

The extent of the proposed public enhancement works extends to three sites in Clifden, Co. Galway, including the Town Centre, Harbour Park, and Beach Road Quay (Grid Reference; ITM 465748, 750606). To the south of the proposed works site is the Clifden Bay Estuary, and the Owenglin River which is designated as part of the Twelve Bens/ Garaun Complex SAC. To the east and north of the proposed works site is existing public buildings and residential dwellings. To the west of the site is large open areas of bog/ woodland/ scrub habitats. The site can be accessed from the north and east via the **N59**, and from the west via the **L1104** Sky Road.

The site location is shown in **Figure 2-1**



Map Legend

— Site boundary



Drawing Title

Site Location

40	Project Title
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Clifden Town Public Realm Enhancement

Drawn By

RM

Project No.	210327
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Scale 1:41,034

Checked By	CM
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Drawing No.
Figure 2.1

Date	16/08/2024
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2.1.1 Description of the Proposed Works Areas

The extent of the proposed enhancement works extends to three sites in Clifden, including the Town Centre, Harbour Park, and Beach Road Quay, as described below. The total area covered by the three sections where works are proposed is approx 3.83 hectares (ha).

2.1.1.1 Clifden Town Centre

The Town Centre study area is located directly in the centre of Clifden Town, at the intersection of Main Street and Bridge Street. The Town Centre includes the Main Street, Market Square, Bridge Street and Hulk Street. The area where works are proposed in this location is approximately 1.95ha in size.

2.1.1.2 Harbour Park

Harbour Park is located to the west of Clifden Town Centre approximately 300m away from the town square, near the shoreline of Clifden Bay. The site is accessed via the Beach Road, from the town centre. The eastern boundary is adjacent to residential buildings. The west is bounded by town centre uses such as Clifden Town Hall, and a number of residential dwellings. The north of the site is bounded by a road and the south of the site is bounded by the banks of Clifden Bay. The study area covers an area of 1.65ha.

2.1.1.3 Beach Road Quay

The quay in Clifden is located a short distance west of Harbour Park. The quay is currently used for moorings for leisure boats along with a commercial element in the form of fishing boats. This study area is adjacent to the Quay House Hotel and the Royal National Lifeboat Institution (RNLI) Lifeboat Station. The total area where works are proposed in this location is 0.23ha.

2.1.2 Description of the Proposed Works

Galway County Council are seeking approval from An Bord Pleanála for the proposed works of a public realm scheme in Clifden, Co. Galway.

- i. Alterations works to the Clifden Town Centre area on Seaview Road, Main Street, Market Street, Market Hill, Bridgewell Lane, Bridge Street, and Hulk Street comprising:
 - a. The reconfiguration and resurfacing of roads and realignment of parking spaces including removal of 58 no. on-street parking spaces leaving a total of 155 no. on street parking spaces,
 - b. The widening and realignment of existing footpath areas, including the provision of new soft and hard landscaping,
 - c. The installation of new and upgraded public lighting throughout the town,
 - d. Relocation of The Beacon Statue
- ii. Alterations to and resurfacing of Beach Road Quay public realm comprising:
 - a. The provision of pedestrian and seating areas on the quay side of Beach Road quay, including the installation of 6 no. seating areas, and ancillary paving and landscaping,
 - b. Remedial works to the quay wall (NIAH reg no. 30325017), including the resetting of dislodged stones, the removal of vegetation, and remedial masonry works,
 - c. The replacement of existing railings along the quay wall,
 - d. The installation of public lighting along the roadside,
- iii. Redevelopment of the Harbour Park area south of Beach Road and to the west of Clifden town centre.

- a. The demolition of the existing playground on site, and the construction of a new park including multi-age playground areas, including the provision of:
 - i. Cycle Parking,
 - ii. Timber Play Furniture,
 - iii. Picnic benches and seating areas,
 - iv. An Amphitheatre Performance Spaces,
 - v. Climbing Wall
 - vi. Pump track,
 - vii. Running Track,
 - viii. Car Park,
 - ix. Sports pitch,
 - x. Resurfacing, paving and hard & soft landscaping of the park area,
- iv. All other associated and ancillary works

A Natura Impact Statement (NIS) has been prepared and submitted as part of this application.

2.1.3 Surface Water Drainage

2.1.3.1 Harbour Park

A 150mm Gully Connection Pipe and new gullies of a min 150mm internal width, and a min 100mm internal height are proposed throughout Harbour Park.

Two 150mm filter drains are proposed along the proposed running track to the centre of harbour park. To the western margins of these filter trains, are two proposed Silt Trap Manholes. Further, various silt trap inspection chambers are proposed along the two filter drains.

A 225mm Surface Water Pipe is proposed to the western parcel of Harbour Park, connecting to a proposed Precast Manhole to the western parcel, and to a Silt Trap Manhole to the east. Numerous Precast Manholes are proposed along the northern and southern parcels of Harbour Park.

For full details on the proposed Surface Water Drainage refer to Drawings 11252-2345-01 titled 'Harbour Park Surface Water Drainage' submitted as part of this application.

2.1.3.2 Beach Road

A 225mm Surface Water Pipe is proposed to the western parcel of Beach Road. A 150mm Gully Connection Pipe and new gullies of a min 150mm internal width, and a min 100mm internal height are proposed throughout Beach Road.

For full details on the proposed Surface Water Drainage refer to Drawings 11252-2360-01 titled 'Beach Road Surface Water Drainage' submitted as part of this application

2.1.3.3 Clifden Town Centre

A 150mm Gully Connection Pipe and new gullies of a min 150mm internal width, and a min 100mm internal height are proposed throughout the town centre. A Precast Manhole is proposed to the northeastern parcel of Clifden Town. The proposed new surface water network will connect to the existing surface water system.

For full details on the proposed Surface Water Drainage for Clifden Town Centre refer to Drawings 11252-2320-01 to 11252-2320-05 titled 'Clifden Town Centre Surface Water Drainage' submitted as part of this application.

2.2

Construction and Environmental Management Plan (CEMP)

The **Construction and Environmental Management Plan (CEMP)** submitted as part of this application has been reviewed, and any information relating to the construction methodology for the proposed works is described below. The appointed contractor for the construction of the Proposed Works in Clifden will be required to comply with the methodologies as set out in the CEMP and any revisions made to this document throughout the construction phase of the proposed works.

2.2.1

Proposed Construction Methodology

2.2.1.1

Resurfacing and Realignment of Roads and Parking Areas

The existing roads and parking areas will be realigned and resurfaced. The construction methodology for road resurfacing is as follows:

- The area where excavations will be carried out and areas of resurfacing will be surveyed, and all existing services will be identified.
- The area of resurfacing will be marked out using ranging rods or wooden posts.
- Existing road or tarmac surfaces to be removed will be grubbed up by appropriately sized excavator or hand tools.
- Excavation depths will be down to a competent stratum as approved by the Design Engineer.
- All plant operators and general operatives will be inducted and informed as to the location of any services.
- Sub-base in the form of Type 1 aggregate material will be laid down and compacted. A geotextile woven membrane will be laid down if deemed necessary.
- Any drainage infrastructure such as channel drains or ACO drains will be installed at this point.
- Kerbings or edges if required will be installed. These will be set in concrete and allowed to set before application of the tarmac surface.
- The top layer of tarmacadam/asphalt is then added.
- The surface is then smoothed and compacted using a roller truck.

2.2.1.2

Widening and Realigning of Existing Footpath Areas

Realignment and extension of footpaths and paving areas will be carried out using the following construction methodology:

- Areas of the footpath that will be realigned or widened will be demarked.
- Areas of tarmac will be removed to allow for widening of footpaths. The top layer of tarmac will be removed using an appropriately sized excavator or hand tool.
- A layer of clause 804 gravel or other Type 1 bedding material will be laid, compacted and levelled to the appropriate thickness of a 150mm as per Drawing No. 11252-2370-06 prepared by Tobin's Consulting Engineers.
- A 100mm layer of concrete will be poured on top of the compacted bedding layer and stone paving slabs laid on top.

2.2.1.3 Proposed Works at the Existing Playground

2.2.1.3.1 Demolition of Existing Playground

The works entail the demolition of the existing playground. The demolition/decommissioning works which will be carried out at the existing playground will be carried out using the following methodology:

- Pre-check of the site for any hazards or existing services. These checks will be carried out by a competent person(s).
- An inventory of the waste types that will be generated by the demolition works will be carried out.
- Playground equipment or miscellaneous materials within the playground will be removed.
- Removal of all services, fixtures and supporting structures, swing sets etc.
- Demolition will be completed by trained personnel using appropriate equipment and tools and a mechanical excavator if required.
- The majority of the waste generated during the demolition and decommissioning of the playground will consist of metal, wood, and plastic. This material will be segregated from all other waste components and sent by an authorised waste collector to an authorised waste recovery facility.
- The remaining volume of waste material will not be large enough to warrant any further segregation therefore, all waste generated during the demolition of the playground will be deposited into a single skip that will be brought by a waste collector to an appropriately authorised facility.
- It is anticipated that some masonry/concrete generated during the demolition works will be reused at the site for backfilling.

2.2.1.3.2 Construction Works of the New Park and Multi-Age Playground Areas

The construction works for a new park and multi-age playground area are anticipated to utilise the following construction methodology:

- A suitable surface will be installed. As per Drawing No. 116332-LUC-HP-XX-DR-L-0002 prepared by Land Use Consultants (LUC).
- The various park and playground components will be brought on site.
- The park and playground components will be securely fastened e.g., swing set and slides.
- Prior to commissioning of the new park and playground components the appropriate safety checks will be carried out by competent personnel.

2.2.1.4 Development of all Other Ancillary and Components

2.2.1.4.1 Remedial Masonry Works

Remedial masonry works are proposed to be carried out on the existing Quay. All remedial or repair works will be carried out by a competent stonemason with experience with such remedial works.

2.2.1.4.2 Replacement of Existing Railings

The existing railing is proposed to be removed and replaced. This process will involve the following:

- The existing railings will be removed, with the use of power tools.
- The locations for the new railings will be marked out and the appropriately sized holes will be drilled.
- Railings posts will be inserted and secured.

2.2.1.5 Landscaping

Upon completion of the construction works on the Proposed Works, the landscaping works will be carried out. The soft landscaping includes coastal feature planting, existing grass to be enhanced with coastal wildflower seeding, the introduction of ornamental planting, street tree planting. The existing soft landscape features are to be retained and protected from damage during the works. The soft Landscaping proposed is described fully in **Section 2.3** below.

In addition, hard landscaping will also be carried out and will consist of remedial works on structures such as existing water access step and the existing boundary wall. Additionally, the replacement of the existing railings, the installation of stone seating and installation of public lighting alongside the relocation of the beacon statue.

For full details on the proposed Construction Methodologies refer to the Construction and Environmental Management Plan (CEMP) submitted as part of this application.

2.3 Landscaping Proposals

2.3.1 Town Centre

It is proposed to plant an additional 90 street trees throughout Clifden Town Centre, some of which will comprise the vegetation of the proposed rain garden planting. Species to be planted include Common Alder (*Alnus glutinosa*), Strawberry tree (*Arbutus unedo*), Downy birch (*Betula pubescens*), Crab Apple (*Malus sylvestris*), Wild cherry (*Prunus avium*), Sessile oak (*Quercus petraea*), Rowan (*Sorbus aucuparia*), Wild service tree (*Sorbus torminalis*).

Ornamental species to be planted in the Rain Garden proposed throughout Clifden Town Centre include the following native shrubs, Tutsan (*Hypericum androsaemum*), Common Juniper (*Juniperus communis*), Bog Myrtle (*Myrica gale*), and Bilberry (*Vaccinium myrtillus*). Further nonnative perennial planting and ornamental grasses are proposed for these areas, as detailed fully in **Drawing 11623-LUC-TC-XX-DR-L-0400** titled '**Clifden Town Centre Soft Landscape Proposals (sheet 1)**' submitted as part of this application.

Further, it is proposed to plant an area of Wildflower seed mix to the southern parcel of the Town Centre. The wildflower mix will be comprised of EM1 Basic General-Purpose Meadow mix. Species to be planted include Yarrow (*Achillea millefolium*), Common Knapweed (*Centaurea nigra*), Oxeye Daisy (*Leucanthemum vulgare*), Musk Mallow (*Malva moschata*), Ribwort Plantain (*Plantago lanceolata*), Salad Burnet (*Poterium sanguisorba ssp sanguisorba*), Meadow Buttercup (*Ranunculus acris*), Yellow Rattle (*Rhinanthus minor*), Wild Carrot (*Daucus carota*), Common Bent (*Agrostis capillaris*), Crested Dogtail (*Cynosurus cristatus*), Red Fescue (*Festuca rubra*), Smaller Cat's-tail (*Phleum bertolonii*) and Smooth-stalked Meadow-grass (*Poa pratensis*).

Existing planting will be retained and protected from the proposed works to the southwest and northeast corners of the site.

For full details on the proposed landscaping for Clifden Town Centre and planting schedule refer to **Drawings 11623-LUC-TC-XX-DR-L-0400 to 11623-LUC-TC-XX-DR-L-0402** titled '**Clifden Town Centre Soft Landscape Proposals**' (Sheets 1 to 3), submitted as part of this application.

2.3.2 Harbour Park

The proposed works will result in the loss of approx 0.421ha of Scrub (WS1) habitat to the eastern parcel of Harbour Park, which is dominated by Invasive Species, and approx 0.474ha of Dry Meadows

and Grassy Verges (GS2) to the central parcel of Harbour Park. Further, there will be a loss of two alder trees within Harbour Park.

It is proposed to plant an additional 121 native trees throughout Harbour Park, including parkland trees, woodland planting, ornamental planting, and hedgerow planting. It is proposed to retain two tree species along the eastern boundary of Harbour Park. Native parkland tree species to be planted include Common Alder (*Alnus glutinosa*), Strawberry tree (*Arbutus unedo*), Downy birch (*Betula pubescens*), Crab Apple (*Malus sylvestris*), Wild cherry (*Prunus avium*), Sessile oak (*Quercus petraea*), Rowan (*Sorbus aucuparia*), Wild service tree (*Sorbus torminalis*). Native hedgerow and woodland species to be planted include Blackthorn (*Prunus spinosa*), Common Hawthorn (*Crataegus monogyna*), Common hazel (*Corylus avellana*), Common holly (*Ilex aquifolium*), and Wild privet (*Ligustrum vulgare*). Native shrub species to be planted include European Spindle (*Euonymus europaeus*), Tutsan (*Hypericum androsaemum*), Common Juniper (*Juniperus communis*), Bog Myrtle (*Myrica gale*), Grey Willow (*Salix cinerea*), Purple Willow (*Salix purpurea*), Osier Willow (*Salix viminalis*), European Blueberry (*Vaccinium myrtillus*), and Guelder Rose (*Viburnum opulus*).

Additionally, it is proposed to plant long meadow grass mixed areas as per EMI Basic General Purpose Meadows and amenity grass mix areas. Species to be planted within the long meadow grass mix include Yarrow (*Achillea millefolium*), Common Knapweed (*Centaurea nigra*), Oxeye Daisy (*Leucanthemum vulgare*), Musk Mallow (*Malva moschata*), Ribwort Plantain (*Plantago lanceolata*), Salad Burnet (*Poterium sanguisorba ssp sanguisorba*), Meadow Buttercup (*Ranunculus acris*), Yellow Rattle (*Rhinanthus minor*), Wild Carrot (*Daucus carota*), Common Bent (*Agrostis capillaris*), Crested Dogstail (*Cynosurus cristatus*), Red Fescue (*Festuca rubra*), Smaller Cat's-tail (*Phleum bertolonii*) and Smooth-stalked Meadow-grass (*Poa pratensis*).

For full details on the proposed landscaping for Harbour Park and details on the planting schedule refer to **Drawing:11632-LUC-HP-XX-DR-L-0400** titled 'Harbour Park Soft Landscape Proposals' and **Drawing:11632-LUC-HP-XX-DR-L-0002** titled 'Harbour Park Landscape General Arrangement' submitted as part of this application.

2.3.3 Beach Road

Soft landscaping proposed for Beach Road include coastal feature planting to the central parcel of Beach Road, including ornamental grasses, native shrubs and nonnative perennial planting. Further, existing grass area to the northern parcel of Beach Road will be enhanced with a coastal wildflower seed mix, comprised of wildflower suitable for sandy soils. The existing soft landscaping/vegetation to the northwest margin of the site, and adjacent will be retained and protected from damage during construction works.

For full details on the proposed landscaping for Beach Road and details on the planting schedule, refer to **Drawing 11632-LUC-BR-XX-DR-L-0002** titled 'Beach Road Quay Masterplan' and **Drawing 11632-LUC-BR-XX-DR-L-0400** titled 'Beach Road Quay Soft Landscape Proposals' submitted as part of this application.

2.4

Flood Risk Assessment

TOBIN Consulting Engineers were appointed by Galway County Council to conduct a Flood Risk Assessment (FRA) for the areas of the proposed works, including Harbour Park, Clifden Town Centre, and Beach Road Quay.

The Town centre is primarily located within Flood Zone A-there is less than 0.1% AEP of pluvial/ fluvial/ groundwater flooding, and less than 0.5% AEP of coastal flooding. Harbour Park and Beach Road Quay are located within Flood Zone A and may be liable to coastal flooding in an 0.1% AEP extreme event.

For full details, refer to the Flood Risk Assessment Report submitted as part of this application.

3. METHODOLOGY

The following sections describe the methodologies followed to establish the baseline ecological condition of the proposed works site and surrounding area. Assessing the impacts of any project and associated activities requires an understanding of the ecological baseline conditions prior to and at the time of the project proceeding. Ecological Baseline conditions are those existing in the absence of proposed activities (CIEEM, 2022).

3.1 Desk Study

A comprehensive desk study was undertaken to inform this ecological impact assessment. This study includes a thorough review of available information that is relevant to the ecology of the site of the proposed works. This information provides valuable existing data and also helps in the assessing the requirement for additional ecological surveys.

The following list describes the sources of data consulted:

- Review of online web-mappers: National Parks and Wildlife Service (NPWS), Environmental Protection Agency (EPA)
- NPWS records (data request)
- Review of the publicly available National Biodiversity Data Centre web-mapper
- Records from the NPWS web-mapper and review of specially requested records from the NPWS Rare and Protected Species Database for the hectad (**L65**) which overlap with the study area.

3.2 Field Surveys

3.2.1 Multi-disciplinary ecological walkover surveys

A multidisciplinary ecological walkover survey was undertaken by Inga Reich (Honours degree in Biology, Ph.D. in Applied Ecology) on the 26th of November 2021. A follow up multidisciplinary ecological walkover survey was undertaken on the 20th of September 2023 by Rachel Minogue (BSc., Env) and Timothy O'Ceallaigh (BSc., Env) of MKO in accordance with NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (NRA, 2009). This survey provided baseline data on the ecology of the study area and assessed whether further detailed habitat or species-specific ecological surveys were required. The multi-disciplinary ecological walkover survey comprehensively covered the entire study area.

Habitats were classified in accordance with the Heritage Council's 'Guide to Habitats in Ireland' (Fossitt, 2000). Plant nomenclature for vascular plants follows 'New Flora of the British Isles' (Stace, 2010), while mosses and liverworts nomenclature follows 'Mosses and Liverworts of Britain and Ireland - a field guide' (British Bryological Society, 2010).

The walkover survey was designed to detect the presence, or suitable habitat for a range of protected faunal species that may occur in the vicinity of the proposed works.

During the multidisciplinary surveys, a search for Invasive Alien Species (IAS), with a focus on those listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2011), was also conducted.

Despite the initial multidisciplinary ecological walkover survey having been undertaken in November 2021, outside the optimal survey season from April to September, the follow up multidisciplinary ecological walkover survey carried out in September 2023 was conducted within the optimal season for

surveying. As such, it is considered that a comprehensive assessment of all habitats and species within the works area has been achieved.

3.2.1 Faunal Surveys

3.2.1.1 Badger & Mammal Survey

During the multidisciplinary walkover surveys a search for signs of Badger (*Meles meles*) was undertaken. The Badger survey involved a search for all potential badger signs as per NRA (2009¹) standard best-practice guidance (latrines, badger paths and setts) and followed CIEEM best-practice competencies for species surveys (CIEEM, 2013). Badger surveys can be undertaken at any time of year and are most effective between November and April when vegetation cover is reduced (NRA, 2008). No limitations were identified, and a full and comprehensive survey was achieved.

During the survey, a search for signs of other protected mammal species including Birds, Bats, Red Squirrel (*Sciurus vulgaris*), Fox (*Vulpes vulpes*) and Pine Marten (*Martes martes*) was also undertaken.

3.2.1.2 Otter Survey

A targeted Otter (*Lutra lutra*) survey was undertaken on the 20th of September 2023 along the artificially canalised section of an unmapped EPA watercourse that runs culverted under Main Street in Clifden Town Centre to the northeast parcel of the proposed works site (Grid Reference: ITM 465910, 750682) and adjacent to the eastern margin of the proposed works site. The accessible areas of the Owenglin River which is designated as part of the Twelve Bens/ Garraun Complex SAC that flows to the southern margin of the site, outside of the proposed works boundary was also surveyed. Clifden Bay Estuary was also surveyed from the shore, along Harbour Park and Beach Road Quay.

The surveys were undertaken in line with NRA (2009) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes).

¹ TII/NRA (2009) guidelines (*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*).

3.3 Methodology for Assessment of Impacts and Effects

3.3.1 Determining Importance of Ecological Receptors

The importance of the ecological features identified within the study area was determined with reference to a defined geographical context. This was undertaken following a methodology that is set out in Chapter 3 of the ‘Guidelines for Assessment of Ecological Impacts of National Roads Schemes’ (NRA, 2009). These guidelines set out the context for the determination of value on a geographic basis with a hierarchy assigned in relation to the importance of any particular receptor. The guidelines provide a basis for determination of whether any particular receptor is of importance on the following scales:

- International
- National
- County
- Local Importance (Higher Value)
- Local Importance (Lower Value)

The Guidelines clearly set out the criteria by which each geographic level of importance can be assigned. Locally Important (lower value) receptors contain habitats and species that are widespread and of low ecological significance and of any importance only in the local area. Internationally Important sites are either designated for conservation as part of the Natura 2000 Network (SAC or SPA) or provide the best examples of habitats or internationally important populations of protected flora and fauna. Specific criteria for assigning each of the other levels of importance are set out in the guidelines and have been followed in this assessment. Where appropriate, the geographic frame of reference set out above was adapted to suit local circumstances. In addition, and where appropriate, the conservation status of habitats and species is considered when determining the significance of ecological receptors.

Any ecological receptors that are determined to be of Local Importance (Higher Value), County, National or International importance following the criteria set out in NRA (2009) are considered to be Key Ecological Receptors (KERs) for the purposes of ecological impact assessment if there is a pathway for effects thereon. Any receptors that are determined to be of Local Importance (Lower Value) are not considered to be Key Ecological Receptors.

3.3.2 Characterisation of Impacts and Effects

The proposed works will result in a number of impacts. The ecological effects of these impacts are characterised as per the CIEEM ‘Guidelines for Ecological Impact Assessment in the UK and Ireland (2022)’. The headings under which the impacts are characterised follow those listed in the guidance document and are applied where relevant. A summary of the impact characteristics considered in the assessment is provided below:

- **Positive or Negative.** Assessment of whether the proposed works result in a positive or negative effect on the ecological receptor.
- **Extent.** Description of the spatial area over which the effect has the potential to occur.
- **Magnitude** to size, amount, intensity and volume. It should be quantified if possible and expressed in absolute or relative terms e.g., the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.
- **Duration** is defined in relation to ecological characteristics (such as the lifecycle of a species) as well as human timeframes. For example, five years, which might seem short-term in the human context or that of other long-lived species, would span at least five generations of some invertebrate species.

- **Frequency and Timing.** This relates to the number of times that an impact occurs and its frequency. A small-scale impact can have a significant effect if it is repeated on numerous occasions over a long period.
- **Reversibility.** This is a consideration of whether an effect is reversible within a ‘reasonable’ timescale. What is considered to be a reasonable timescale can vary between receptors and is justified where appropriate in the impact assessment section of this report.

3.3.3 Determining the Significance of Effects

The ecological significance of the effects of the proposed works are determined following the precautionary principle and in accordance with the methodology set out in Section 5 of CIEEM (2022).

For the purpose of EcIA, ‘significant effect’ is an effect that either supports or undermines biodiversity conservation objectives for ‘important ecological features’ or for biodiversity in general. Conservation objectives may be specific (e.g., for a designated site) or broad (e.g., national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local (CIEEM, 2022).

When determining significance, consideration is given to whether:

- Any processes or key characteristics of key ecological receptors will be removed or changed.
- There will be an effect on the nature, extent, structure, and function of important ecological features.
- There is an effect on the average population size and viability of ecologically important species.
- There is an effect on the conservation status of important ecological habitats and species.

The EPA guidelines on information to be included in Environmental Impact Statements (EPA, 2022) and the *Guidelines for assessment of Ecological Impacts of National Road Schemes*, (NRA, 2009) were also considered when determining significance and the assessment is in accordance with those guidelines.

The terminology used in the determination of significance follows the suggested language set out in the EPA Guidelines (2022) as shown in **Table 3-1** below.

Table 3-1 Criteria for determining significance of effect, based on (EPA, 2022) guidelines.

Effect Magnitude	Definition
No change	No discernible change in the ecology of the affected feature.
Imperceptible effect	An effect capable of measurement but without noticeable consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight effect	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate effect	An effect that alters the character of the environment that is consistent with existing and emerging trends.
Significant effect	An effect which, by its character, its magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound effect	An effect which obliterates sensitive characteristics.

3.4

Limitations

The information provided in this document accurately and comprehensively describes the baseline ecological environment; provides an accurate prediction of the likely ecological effects of the proposed works; prescribes mitigation as necessary; and describes the residual ecological impacts. The specialist studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines. No significant limitations in the scope, scale or context of the assessment have been identified.

4. DESK STUDY

4.1 Designated Sites

The potential for the proposed works to impact on sites that are designated for nature conservation was considered in this Ecological Impact Assessment.

Special Areas of Conservation (SACs) and Special Protection Areas for Birds (SPAs) are designated under EU Habitats Directive and are collectively known as 'European Sites'. The potential for effects on European Sites is fully considered in the Natura Impact Statement (NIS) that accompanies this application. The European Sites that are within the Zone of Likely Impact are listed in the NIS and are not repeated in this document.

Natural Heritage Areas (NHAs) are designated under the Wildlife (Amendment) Act 2000 and their management and protection is provided for by this legislation and planning policy. The potential for effects on these designated sites is fully considered in this EcIA.

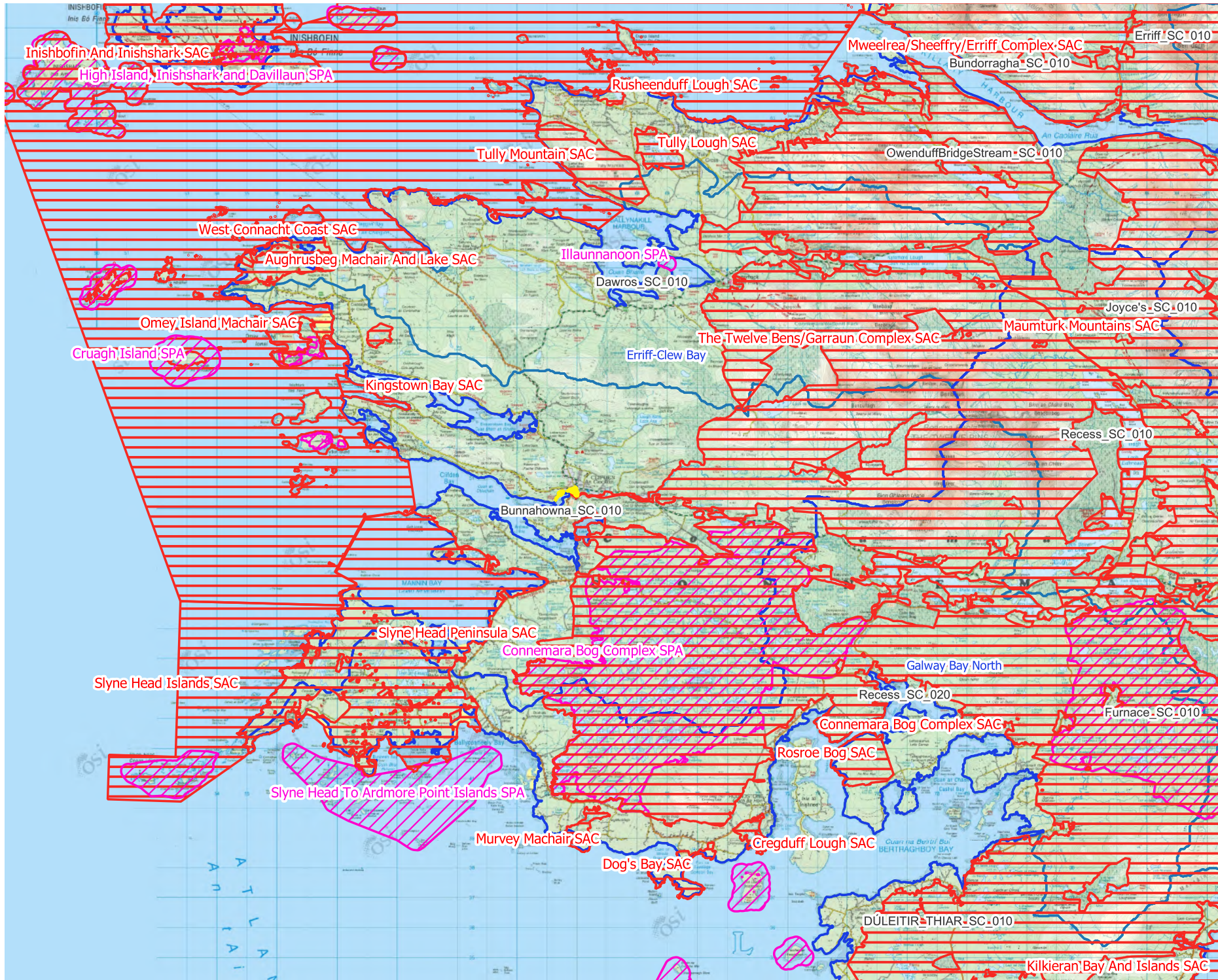
Proposed Natural Heritage Areas (pNHAs) were designated on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, the potential for effects on these designated sites is fully considered in this EcIA.

The following methodology was used to establish which nationally designated sites have the potential to be impacted by the proposed works:

- Initially the most up to date GIS spatial datasets for European and Nationally designated sites and water catchments were downloaded from the NPWS website (www.npws.ie) and the EPA website (www.epa.ie) on the 16/08/2024. The datasets were utilized to identify Designated Sites which could feasibly be affected by the proposed works.
- All Designated Sites that could potentially be affected were identified using a source-pathway - receptor model. To provide context for the assessment, European Designated Sites surrounding the development site are shown on **Figure 4.1** and Nationally Designated Sites surrounding the development site are shown on **Figure 4.2**. Information on these Designated sites according to the site-specific conservation objectives is provided in **Table 4.1 below**. Sites that were further away from the proposed works were also considered and, in this case, no complete source-pathway-receptor chain for significant effect was identified for any other Designated Site.
- Catchment mapping was used to establish or discount potential hydrological connectivity between the site of the proposed works and any Designated Sites. The hydrological catchments are also shown in **Figures 4.1 and Figure 4.2**.
- In relation to Special Protection Areas, in the absence of any specific European or Irish guidance in relation to such sites, the Scottish Natural Heritage (SNH) Guidance, 'Assessing Connectivity with Special Protection Areas (SPA)' (2016) was consulted. This document provides guidance in relation to the identification of connectivity between proposed works and Special Protection Areas. The guidance takes into consideration the distances species may travel beyond the boundary of their SPAs and provides information on dispersal and foraging ranges of bird species which are frequently encountered when considering plans and projects.
- **Table 4.1** provides details of all relevant Nationally Designated Sites as identified in the preceding steps and assesses which are within the likely Zone of Impact.
- The NIS accompanying this report provides details of all relevant European Designated Sites as identified in the preceding steps and assesses which are within the likely Zone of Impact.
- The assessment considers any likely direct or indirect impacts of the proposed works, both alone and in combination with other plans and projects, on Designated Sites by

virtue of criteria including the following: size and scale, land-take, distance from the European Site or key features of the site, resource requirements, emissions, excavation requirements, transportation requirements and duration of construction, operation and decommissioning were considered in this assessment.

- The site synopses and conservation objectives of these sites, as per the NPWS website (www.npws.ie), were consulted and reviewed at the time of preparing this report 16/08/2024.
- Where potential pathways for Likely Significant Effect are identified, the site is included within the Likely Zone of Impact and further assessment is required within the NIS.
- The potential for the proposed works to result in cumulative impacts on any Designated Sites in combination with other plans and projects was considered in the assessment that is presented in **Table 4.1**.



Map Legend

- Site Location
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- EPA Hydrological Catchments
- EPA Hydrological Subcatchments



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Drawing Title	
European Designated Sites Within the Likely Zone of Influence	
Project Title	
Clifden Town Public Realm Enhancement	
Drawn By	Checked By
RM	CM
Project No.	Drawing No.
210327	Figure 4.1
Scale	Date
1:164,841	16/08/2024



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Map Legend

- Site Location
- Natural Heritage Area (NHA)
- Proposed Natural Heritage Area (pNHA)
- EPA Hydrological Catchments
- EPA Hydrological Subcatchments

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Drawing Title
Nationally Designated Sites Within the Likely Zone of Influence

Project Title
Clifden Town Public Realm Enhancement

Drawn By	RM	Checked By	CM
Project No.	210327	Drawing No.	Figure 4.2
Scale	1:164,841	Date	16/08/2024

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Table 4-1 Nationally Designated Sites Within the Likely Zone of Influence

Natural Heritage Area (NHA)			
Cloon And Laghtanabba Bog NHA [002374] Distance: 5.5km	> N/A	• N/A	The proposed works site is located outside the boundary of this NHA and as such there is no potential for direct effect. The proposed works area is located approx.5.5km northwest of Cloon and Laghtanabba Bog NHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on this Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
Tooreen Bog NHA [002436] Distance: 5.7km			The proposed works site is located outside the boundary of this NHA and as such there is no potential for direct effect. The proposed works area is located approx.5.7km north of. Tooreen Bog NHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on this Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
Proposed Natural Heritage Area (pNHA)			
Connemara Bog Complex pNHA [002034] Distance: 0.7km	N/A	N/A	The proposed works site is located outside the boundary of this pNHA and as such there is no potential for direct effect. There is no direct hydrological connectivity between the proposed works site and this pNHA. The proposed works site is located approx 0.7km north of this pNHA. The site is located within the same groundwater bodies- Clifden Marbles [IE_WE_G_0013] and Clifden Castlebar [IE_WE_G_0017] as this pNHA. As per EPA Map the majority of the site, including Clifden Town Centre, is located within an area of Moderate Groundwater Vulnerability, with smaller

			sections located within areas of Extreme Vulnerability and in areas with rock at or near the surface. The Geological Survey Ireland's (GSI) groundwater body description report for both Clifden Marbles (August 2004) and Clifden Castlebar (July 2004) groundwater bodies states that groundwater will discharge locally to streams and rivers crossing the aquifers, as well as small streams/ seeps. Further, groundwater flow directions are expected to follow local topography, overall, in a westerly direction., towards the coast. As such, after reviewing the Geological Survey Ireland's (GSI) report for the Clifden Marbles and Clifden Castlebar groundwater bodies, there is no potential for indirect impacts on this SAC in the form of groundwater pollution due to the buffering distance of 0.7km, and the nature (including discharge and direction of flow pathways) of the groundwater bodies. Therefore, no complete source-pathway-receptor chain was identified and potential for indirect impacts on this Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
The Twelve Bens/Garraun Complex pNHA [002031] Distance: 2.4km			The proposed works site is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works area is located approx.2.4km southwest of the Twelve Bens/ Garraun Complex pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on this Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required
Slyne Head Peninsula pNHA [002074] Distance: 2.5km Surface water distance: 6.5km			The proposed works site located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works area is located approx 2.5km northeast of this pNHA. An artificially canalised unmapped EPA watercourse flows through the northeastern boundary of the

			proposed works site, in a southerly direction before discharging into the Owenglin River, which at this point is designated as part of the Twelve Bens/ Garraun Complex SAC. The Owenglin River flows in a westerly direction before discharging into the Clifden Bay Estuary. Further, the Clifden Stream, a tributary of the Owenglin River flows culverted through the western margin of Harbour Park, flowing in a southerly direction into Clifden Bay Estuary. Clifden Bay Estuary flows in a westerly direction discharging into the Slyne Head Peninsula pNHA after approx 6.5km. As such, taking a precautionary approach, the construction phase of the proposed works may result in pollution to surface waters, adversely impacting this site, via the deterioration of water quality, in the absence of mitigation. Therefore, on a precautionary basis, this Nationally Designated Site is considered to be within the likely zone of impact of the proposed works.
Leagaun Machair pNHA [001289] Distance: 7.6km			The proposed works site is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works area is located approx.7.6km southeast of the Leagaun Machair pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on this Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
Ballynakill Bay And Lamb's Island pNHA [001233] Distance: 7.8km			The proposed works is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works area is located approx.7.8km south of Ballynakill Bay and Lamb's Island pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on the Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.

Ballyconneely Bay pNHA [001231] Distance: 8.3km			The proposed works is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works area is located approx.8.3km northwest of Ballyconneely Bay pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on the Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
Letterfrack Hostel pNHA [002080] Distance: 8.4km			The proposed works site is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works area is located approx.8.4km southwest of Letterfrack Hostel pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on the Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
Slyne Head Islands pNHA [000328] Distance: 9km Surface water distance: 11.2km			The proposed works site is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works area is located approx.9km southeast of Slyne Head Islands pNHA. An artificially canalised unmapped EPA watercourse flows through the northeastern boundary of the proposed works site, in a southerly direction before discharging into the Owenglin River, which at this point is designated as part of the Twelve Bens/ Garraun Complex SAC. The Owenglin River flows in a westerly direction before discharging into the Clifden Bay Estuary. Further, the Clifden Stream, a tributary of the Owenglin River flows culverted through the western margin of Harbour Park, flowing in a southerly direction into Clifden Bay Estuary. Clifden Bay Estuary flows in a westerly direction discharging into the Slyne Head Islands pNHA after approx 11.2km.

			As such, taking a precautionary approach, the construction phase of the proposed works may result in pollution to surface waters, adversely impacting this site, via the deterioration of water quality, in the absence of mitigation. Therefore, on a precautionary basis, this Nationally Designated Site is considered to be within the likely zone of impact of the proposed works.
Eeshal Island pNHA [000265] Distance: 9.4km			The proposed works site is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works area is located approx.9.4km southeast of Eeshal Island pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on the Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
Omey Island Machair pNHA [001309] Distance: 9.5km			The proposed works site is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works area is located approx.9.5km southeast of Omey Island Machair pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on the Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
Tully Mountain pNHA [000330] Distance: 9.6km			The proposed works site is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works area is located approx.9.6km south of Tully Mountain pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and

			this designated site. As such, potential for direct or indirect impact on the Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
Aughrusbeg Machair And Lake pNHA [001228] Distance: 10.5km			The proposed works site is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works site is located approx. 10.5km southeast of Aughrusbeg Machair and Lake pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on the Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
Horse Island Complex pNHA [000276] Distance: 11.1km			The proposed works site is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works site is located approx. 11.1km northeast of Horse Island Complex pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on the Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
Old Domestic Building, Heath Island, Tully Lough pNHA [002062] Distance: 11.4km			The proposed works site is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works site is located approx. 11.4km south of Old Domestic Building, Heath Island, Tully Lough pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on the Nationally Designated Site can be excluded.

			Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
Hen Island pNHA [000274] Distance: 11.6km			The proposed works site is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works site is located approx. 11.6km northeast of Hen Island pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on the Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
Bertraghboy Bay pNHA [001234] Distance: 11.9km			The proposed works site is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works site is located approx. 11.9km northwest of Bertraghboy Bay pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on the Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
Rosroe Bog pNHA [000324] Distance: 12km			The proposed works site is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works site is located approx. 12km northwest of Rosroe Bog pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on the Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.

Cregduff Lough pNHA [001251] Distance: 12.1km			The proposed works is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works site is located approx. 12.1km northwest of Cregduff Lough pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on the Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
Dog's Bay pNHA [001257] Distance: 12.3km			The proposed works site is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works site is located approx. 12.3km northwest of Dog's Bay pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on the Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
Cruagh Island pNHA [001973] Distance: 12.4km			The proposed works is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works site is located approx. 12.4km southeast of Cruagh Islands pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on the Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
Rusheenduff Lough pNHA [001311]			The proposed works is located outside the boundary of this pNHA and as such there is no potential for direct effect.

Distance: 12.7km			The proposed works site is located approx. 12.7km southwest of Rusheenduff Lough pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on the Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
Crump Island Complex pNHA [001917] Distance: 13.9km			The proposed works site is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works site is located approx. 13.9km southwest of Crump Island Complex pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on the Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
Friar Island pNHA [001972] Distance: 14.5km			The proposed works site is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works site is located approx. 14.5km southeast of Friar Island pNHA. No source-pathway-receptor chain for impact was identified between the site of the proposed works and this designated site. As such, potential for direct or indirect impact on the Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
Inishbofin and Inishshark pNHA [000278] Distance 15km			The proposed works site is located outside the boundary of this pNHA and as such there is no potential for direct effect. The proposed works site is located approx. 15km southeast of Inishbofin and Inishshark pNHA. No source-pathway-receptor chain for impact was identified between the site of the



			proposed works and this designated site. As such, potential for direct or indirect impact on the Nationally Designated Site can be excluded. Therefore, this Nationally Designated Site is not within the likely zone of impact, and no further assessment is required.
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4.2

NPWS Article 17 Reporting

A review of the Irish Reports for Article 17 of the Habitats Directive (92/42/EEC), including the Heath, Bogs and Mires, Irish Semi-Natural Grassland Survey datasets, National Survey of Native Woodlands and Ancient and Long-Established Woodland datasets was conducted as part of the desk study for the proposed Development.

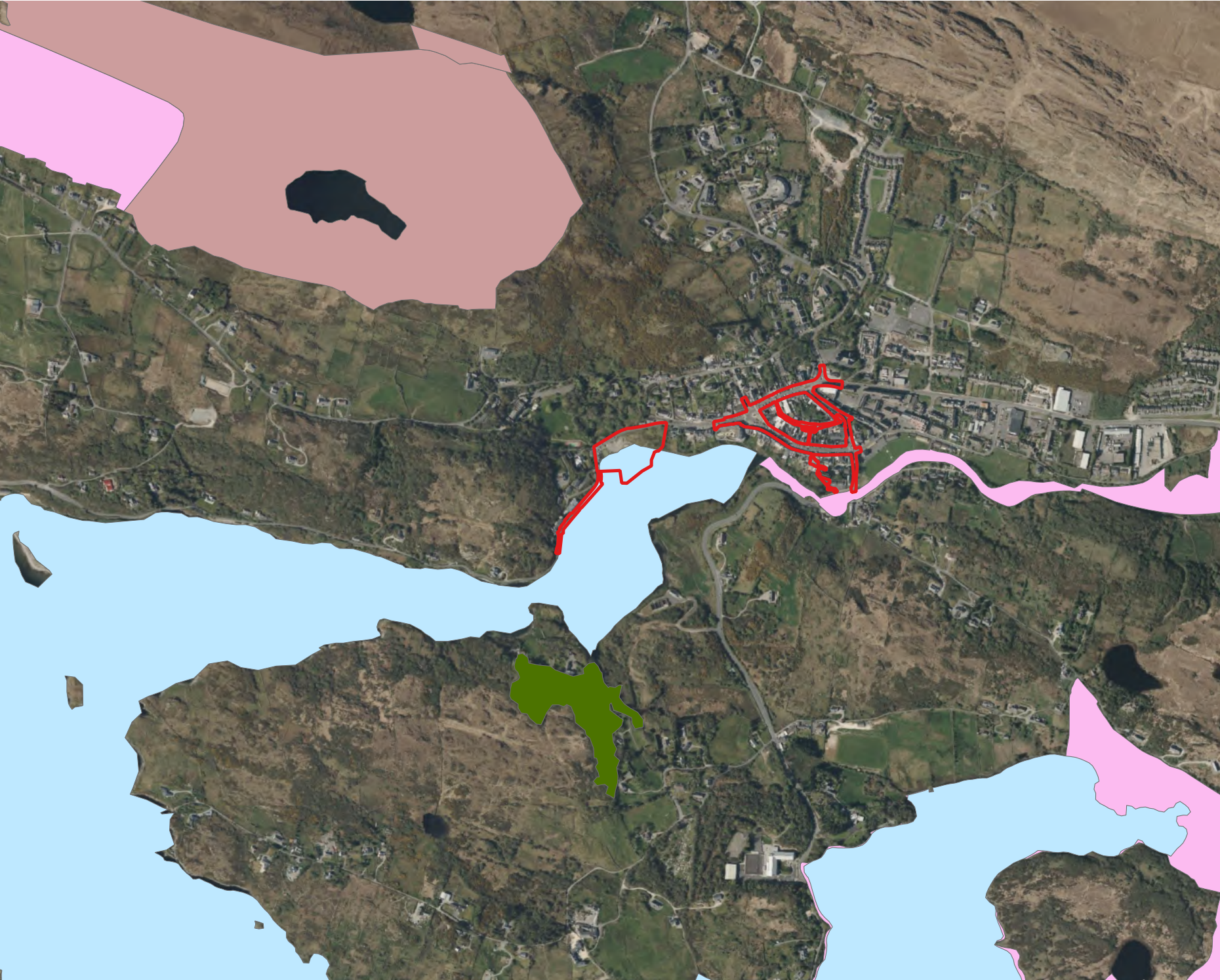
A search of the NPWS Article 17 datasets, was undertaken on the 21/08/2024 as part of the desk study for the proposed works.

The nearest Annex I habitats mapped under Article 17 includes **[1130] Estuaries**, mapped to the southern margin of Harbour Park (Grid Reference; ITM 465479, 750489), and to the southern parcel of Beach Road Quay (Grid Reference; ITM 465347, 750389). However, following the multidisciplinary ecological surveys undertaken on the site, the habitats recorded in these areas include Dry Meadows and Grassy Verges (GS2), Scrub (WS1), Recolonising Bare Ground (ED2), and Buildings and Artificial Surfaces (BL3) (Plate 5.13 & 5.14). As such, these areas do not conform to this Annex I habitat type- **[1130] Estuaries**. Further, as per Article 17 Annex I habitat mapping, a small section mapped as **[4010] Wet Heath** overlaps with a section of the proposed works site, along Doonen Road to the southeast corner (Grid Reference; ITM 466008, 750416). However, following the multidisciplinary ecological surveys undertaken on the site, the habitats recorded in this area includes Buildings and Artificial Surfaces (BL3) (Plate 5.15). As such, these areas do not conform to this Annex I habitat type **[4010] Wet Heath**. A mosaic of **[7130] Blanket bog/ [4030] Dry Heath/ [4010] Wet Heath** is mapped approx 430m northwest of the proposed works site.

Following a review of the Irish Semi-Natural Grassland Survey database, there is no mapped Annex I grasslands in close proximity to the proposed works site.

There are no Native Woodlands and Ancient and Long-Established Woodlands within the Site according to both datasets. The nearest woodland mapped in these datasets is **[91A0] Old Oak Woodlands**, mapped approx 260m southwest of Beach Road Quay.

Distribution of relevant Article 17 habitat records is detailed below in **Figure 4.3** below



Map Legend

- Site Location
- Blanket bogs, Dry heath, Wet heath
- Estuaries
- Old oak woodlands
- Wet heath



Drawing Title
Annex I habitats mapped under Article 17 within the vicinity of the proposed works site.

Project Title
Clifden Town Public Realm Enhancement

Drawn By RM	Checked By CM
Project No. 210327	Drawing No. Figure 4.3
Scale 1:12,290	Date 21/08/2024

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4.3

New Flora Atlas

A search was made on the NPWS Flora (Protection) Order 2022 Map Viewer for Vascular Plants, Charophytes, and Lichens on the 21/08/2024 to investigate whether any sensitive or rare species protected under the Flora (Protection) Order, 1999 (as amended 2015 & 2022) had been recorded in the relevant 10km square in which the study site is situated (L65), during the 1987-1999 atlas survey. Species of conservation concern are given in **Table 4-2**.

Table 4-2 Records of species recorded on the NPWS Flora (Protection) Order 2022 Map Viewer for Vascular Plants, Charophytes, and Lichens within Hectad L65

Common Name	Scientific Name	Hectad	Status
Hydrilla	<i>Hydrilla verticillata</i>	L65	FPO, EN
Pillwort	<i>Pilularia globulifera</i>		FPO, VU
Slender Naiad	<i>Najas flexilis</i>		Annex II, IV, FPO, NT

Red List of Irish Flowering Plants (Wyse Jackson et al., 2016): NT – Near Threatened, EN- Endangered, VU- Vulnerable, FPO- Flora Protection Order

4.4

Bryophytes

A search of the NPWS online data map for bryophytes (NPWS, 2018) was also undertaken with no protected bryophytes recorded within or adjacent to the proposed works site.

4.5

NPWS Records

National Parks and Wildlife Service (NPWS) online records were searched to see if any rare or protected species of flora or fauna have been recorded from hectad **L65**. An information request was also sent to the NPWS scientific data unit requesting records from the Rare and Protected Species Database on the 31/10/2023. A response was received on the 07/11/2023. **Table 4-3 lists** rare and protected species records obtained from NPWS.

Table 4-3 Records for rare and protected species, NPWS.

Common name	Scientific name	Designation
Red Deer	<i>Cervus elaphus</i>	WA
Cladonia portentosa	<i>Cladonia portentosa</i>	Annex V
Cladonia rangiferina	<i>Cladonia rangiferina</i>	Annex V
Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	Annex V, WA
Pine Marten	<i>Martes martes</i>	Annex V, WA
Slender Naiad	<i>Najas flexilis</i>	Annex II, Annex IV, VU
Eurasian Otter	<i>Lutra lutra</i>	Annex II, Annex IV, WA
Common Dolphin	<i>Delphinus delphis</i>	Annex IV, WA
West European Hedgehog	<i>Erinaceus europaeus</i>	WA

Common name	Scientific name	Designation
Esthwaite Waterweed	<i>Hydrilla verticillata</i>	FPO, EN
Harbour Seal	<i>Phoca vitulina</i>	Annex II, Annex V, WA
Marsh Fritillary	<i>Euphydryas aurinia</i>	Annex II
Irish Stoat	<i>Mustela erminea subsp. hibernica</i>	WA
Smooth Brome	<i>Bromus racemosus</i>	NT
Irish Whitebeam	<i>Sorbus hibernica</i>	VU
Irish Stoat	<i>Mustela erminea subsp. hibernica</i>	WA
Pillwort	<i>Pilularia globulifera</i>	FPO, VU
Common frog	<i>Rana temporaria</i>	Annex V, WA
Slender Cottongrass	<i>Eriophorum gracile</i>	FPO, NT
Heath cudweed	<i>Gnaphalium sylvaticum</i>	FPO, EN
Rough Poppy	<i>Papaver hybridum</i>	FPO. RE* [neo]
Marsh Clubmoss	<i>Lycopodiella inundata</i>	Annex V, FPO, VU
Parsley Fern	<i>Cryptogramma crispa</i>	FPO, VU
Bog Hair Grass	<i>Deschampsia setacea</i>	FPO, NT
Slender Cottongrass	<i>Eriophorum gracile</i>	FPO, NT
Hydrilla	<i>Hydrilla verticillata</i>	FPO, EN
Pale Dog Violet	<i>Viola lactea</i>	FPO, VU
Forked Spleenwort	<i>Asplenium septentrionale</i>	FPO, VU
Alpine clubmoss	<i>Diphasiastrum alpinum</i>	Annex V

Annex II, Annex IV, Annex V – Of EU Habitats Directive; WA – Irish Wildlife Acts (1976-2021); FPO – Floral Protection Order; NT – Near Threatened, VU – Vulnerable, of Red Data List (Curtis and McGough 1988)

4.6 Biodiversity Ireland Database

The National Biodiversity Data centre database was accessed on 31/10/2023 and on the 22/08/2024 and the following information was obtained. **Table 4-4** lists the protected faunal species (excluding birds) recorded within the hectad L65 which pertains to the current study area. The database was also searched for records of Third Schedule non-native invasive species within the hectad. **Table 4-5** lists the non-native invasive species recorded within the hectad. **Table 4-6** lists all the protected bird species recorded within the hectad which pertains to the current study area.

Table 4-4 NBDC records for protected fauna records (excl. birds).

Common name	Scientific name	Designation
Marsh fritillary	<i>Euphydryas aurinia</i>	Annex II
Common frog	<i>Rana temporaria</i>	Annex V, WA
Common lizard	<i>Zootoca vivipara</i>	WA
Leathery Turtle	<i>Dermochelys coriacea</i>	Annex IV, WA
Atlantic White-sided Dolphin	<i>Lagenorhynchus acutus</i>	Annex IV, WA
Bottle-nosed Dolphin	<i>Tursiops truncatus</i>	Annex II, Annex IV, WA
Common Dolphin	<i>Delphinus delphis</i>	Annex IV, WA
Common Seal	<i>Phoca vitulina</i>	Annex II, Annex V, WA
Grey Seal	<i>Halichoerus grypus</i>	Annex II, Annex V, WA
Long-finned Pilot Whale	<i>Globicephala melas</i>	Annex IV, WA
Sowerby's Beaked Whale	<i>Mesoplodon bidens</i>	Annex IV, WA
Sperm Whale	<i>Physeter macrocephalus</i>	Annex IV, WA
Striped Dolphin	<i>Stenella coeruleoalba</i>	Annex IV, WA
White-beaked Dolphin	<i>Lagenorhynchus albirostris</i>	Annex IV, WA
Brown long-eared bat	<i>Plecotus auritus</i>	Annex IV, WA
Daubenton's bat	<i>Myotis daubentonii</i>	Annex IV, WA
Eurasian Badger	<i>Meles meles</i>	WA
Eurasian Red squirrel	<i>Scuirus vulgaris</i>	WA
European Otter	<i>Lutra lutra</i>	Annex II, IV, WA
Fallow Deer	<i>Dama dama</i>	WA
Lesser Noctule	<i>Nyctalus leisleri</i>	Annex I, WA
Pine Marten	<i>Martes martes</i>	Annex V, WA
Red Deer	<i>Cervus elaphus</i>	WA
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	Annex IV, WA
West European hedgehog	<i>Erinaceus europaeus</i>	WA

Annex II, Annex IV, Annex V – Of EU Habitats Directive, WA – Irish Wildlife Acts (1976-2021)

Table 4-5 NBDC records for Invasive species.

Common Name	Scientific Name
Greylag Goose	<i>Anser anser</i>
Giant-rhubarb	<i>Gunnera tinctoria</i>
Indian Balsam	<i>Impatiens glandulifera</i>
Japanese knotweed	<i>Fallopia japonica</i>
Rhododendron	<i>Rhododendron ponticum</i>
Three-cornered garlic	<i>Allium triquetrum</i>
Harlequin ladybird	<i>Harmonia axyridis</i>
American Slipper Limpet	<i>Crepidula fornicata</i>
Fallow deer	<i>Dama dama</i>
Brown rat	<i>Rattus norvegicus</i>
European Rabbit	<i>Oryctolagus cuniculus</i>
Wireweed	<i>Sargassum muticum</i>
Flatworm (Turbellaria)	<i>Arthurdendyus triangulatus</i>
Butterfly-bush	<i>Buddleja davidii</i>
Giant-rhubarb	<i>Gunnera tinctoria</i>
Himalayan Honeysuckle	<i>Leycesteria formosa</i>
Indian Balsam	<i>Impatiens glandulifera</i>
Japanese Rose	<i>Rosa rugosa</i>
Sycamore	<i>Acer pseudoplatanus</i>
Three-cornered Garlic	<i>Allium triquetrum</i>

Table 4-6 NBDC Records for Birds.

Common name	Scientific name	Designation
Barn Owl	<i>Tyto alba</i>	BoCCI Red List
Black-headed Gull	<i>Larus ridibundus</i>	BoCCI Red List
Black-throated Diver	<i>Gavia arctica</i>	Annex I
Common Kingfisher	<i>Alcedo atthis</i>	Annex I
Common Redshank	<i>Tringa totanus</i>	BoCCI Red List
Common Scoter	<i>Melanitta nigra</i>	Annex I, BoCCI Red List
Corn Crake	<i>Crex crex</i>	Annex I, BoCCI Red List
Eurasian Curlew	<i>Numenius arquata</i>	BoCCI Red List
European Golden Plover	<i>Pluvialis apricaria</i>	Annex I, BoCCI Red List
Herring Gull	<i>Larus argentatus</i>	BoCCI Red List
Northern Lapwing	<i>Vanellus vanellus</i>	BoCCI Red List
Red Grouse	<i>Lagopus lagopus</i>	BoCCI Red List
Yellowhammer	<i>Emberiza citrinella</i>	BoCCI Red List
Common Tern	<i>Sterna hirundo</i>	Annex I
Dunlin	<i>Calidris alpina</i>	Annex I
Great Northern Diver	<i>Gavia immer</i>	Annex I
Little Egret	<i>Egretta garzetta</i>	Annex I
Little Gull	<i>Larus minutus</i>	Annex I
Mediterranean Gull	<i>Larus melanocephalus</i>	Annex I
Merlin	<i>Falco columbarius</i>	Annex I
Peregrine Falcon	<i>Falco peregrinus</i>	Annex I
Red-billed Chough	<i>Pyrrhocorax pyrrhocorax</i>	Annex I
Red-throated Diver	<i>Gavia stellata</i>	Annex I
Sandwich Tern	<i>Sterna sandvicensis</i>	Annex I
Snowy Owl	<i>Bubo scandiaca</i>	Annex I
Whooper Swan	<i>Cygnus cygnus</i>	Annex I

Annex I - Of EU Birds Directive, BoCCI Red List - Birds of Conservation Concern in Ireland Red List

Water Quality

The EPA web-mapper (<https://gis.epa.ie/EPAMaps/>) was consulted on the 16/08/2024 regarding the water quality and status of waterbodies that are located in the wider area of the proposed works.

The proposed works site is located within the Erriff-Clew Bay Catchment and the Bunnahowna Sub catchment. The proposed works site is located within the Clifden Marbles [IE_WE_G_0013] Groundwater body to the south/ southeast parcel, and the Clifden Castlebar [IE_WE_G_0017] Groundwater Body to the north/ northwestern parcel. The majority of the site, including Clifden Town Centre, is located within an area of Moderate Groundwater Vulnerability, as per EPA Maps. Smaller sections of the site to the east and west of Harbour Park, and to the southwest and southeast of Clifden Town are located within areas of Extreme Vulnerability, making these areas extremely vulnerable to contamination by human activities, as per EPA Maps. Beach road is located in areas with rock at or near the surface.

Further, the Geological Survey Ireland's (GSI) groundwater body description report for both Clifden Marbles (August 2004) and Clifden Castlebar (July 2004) groundwater bodies states that groundwater will discharge locally to streams and rivers crossing the aquifers, as well as small streams/ seeps. Further, groundwater flow directions are expected to follow local topography, overall, in a westerly direction., towards the coast.

An artificially canalised section of an unmapped EPA watercourse runs culverted under Main Street in Clifden Town Centre to the northeast parcel of the proposed works site (Grid Reference: ITM 465910, 750682)). This artificially canalised watercourse continues to flow adjacent to the eastern margin of the proposed works site, in a southerly direction before discharging into the Owenglin River after approx 280m, which at this point is designated as part of the Twelve Bens/ Garraun Complex SAC. The Owenglin River continues to flow to the southern margin of the site, outside of the proposed works boundary in a westerly direction before discharging into Clifden Bay Estuary. Further, the Clifden Stream, a tributary of the Owenglin River flows culverted through the western margin of Harbour Park, flowing in a southerly direction before discharging into Clifden Bay Estuary.

The closest downstream water quality monitoring station was at the bridge at Doonen Road and Riverside and the 2020 Q Value at this point was 4 (good). The river waterbody Water Framework Directive (WFD) status for 2016-2021, 2013-2018, and 2010-2015 for the Owenglin River was 'Good'. The River Waterbodies Risk 2010-2015 awarded the Owenglin River a 'Good' Status. The transitional waterbody WFD status 2016-2021 for Clifden Bay was 'Good'.

5.

FIELD STUDY

5.1.1

Habitats Present on the Site and Surrounding Area

An initial multidisciplinary walkover survey was undertaken by Inga Reich (Honours degree in Biology, Ph.D. in Applied Ecology) on the 26th of November 2021. A follow up multidisciplinary walkover survey was undertaken on the 20th of September 2023 by Rachel Minogue (BSc., Env) and Timothy O’Ceallaigh (BSc., Env) of MKO in line with NRA (2009) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes). The habitats recorded during the site visit are described below and a habitat map is provided in **Figure 5.1**.

The main habitats recorded within the boundary of the proposed works site are classified as **Dry Meadows and Grassy Verges (GS2)**, **Scrub (WS1)**, **Recolonising Bare Ground (ED3)**, **Spoil and Bare Ground (ED2)**, **Eroding/upland rivers (FW1)**, and **Depositing Lowland Rivers (FW2)**. Habitats recorded to the margins of the proposed works site, outside of the proposed works boundary include **Treelines (WL2)** and **Hedgerows (WL1)**.

Areas of **Spoil and Bare Ground (ED2)** are present within Harbour Park, to the northern parcel near the entrance. This habitat is dominated by gravel, stone, and sand and rubble heaps. (**Plates 5.1**)

Roadways, pathways, car parks, concrete walls, metal fencing, public and private buildings, boat yards, playground, and Astro turf within the proposed works site are classed as **Buildings and Artificial Surfaces (BL3)**. This habitat occurs throughout the site (**Plates 5.2 & 5.3**).

Recolonising Bare Ground (ED3) is present throughout the site, on areas of exposed gravel and former pathways. The ground flora recolonising the bare ground with areas of exposed gravel include species of Nettle (*Urtica dioica*), Creeping Buttercup (*Ranunculus repens*), Germander Speedwell (*Veronica chamaedrys*), Ragwort (*Jacobaea vulgaris*), Dandelion (*Taraxacum vulgaria*), Horsetail (*Hippuris vulgaris*), Creeping Thistle (*Cirsium arvense*), Bush Vetch (*Vicia sepium*), Red Clover (*Trifolium pratense*), and Hawkweed (*Hieracium hibernicum*). White clover (*Trifolium repens*), Meadow buttercup (*Ranunculus acris*), Ribwort Plantain (*Plantago lanceolatum*), Charlock (*Sinapsis arvensis*), Ragwort (*Senecio jacobaea*), Silverweed (*Potentilla anserina*), Perennial Ryegrass (*Lolium perenne*), Yorkshire Fog (*Holcus lanatus*), Oxeye Daisy (*Leucanthemum vulgare*), Bird’s Foot trefoil (*Lotus corniculatus*), and Sheep’s Fescue (*Festuca ovina*). (**Plate 5.4**).

Dry Meadows and Grassy Verges (GS2) are present throughout the site. There were no signs of mowing, grazing, or fertilizer application at the time of the site visit (20/09/2023). Species recorded include Curled dock (*Rumex crispus*), Red clover (*Trifolium pratense*), White clover (*Trifolium repens*), Meadow buttercup (*Ranunculus acris*), Nettle (*Urtica dioica*), Ribwort Plantain (*Plantago lanceolatum*), Charlock (*Sinapsis arvensis*), Ragwort (*Senecio jacobaea*), Silverweed (*Potentilla anserina*), Dandelion (*Taraxacum spp.*), Creeping Thistle (*Cirsium arvense*), Goat’s Willow (*Salix caprea*), Oxeye Daisy (*Leucanthemum vulgare*), Bird’s Foot trefoil (*Lotus corniculatus*), Sheep’s Fescue (*Festuca ovina*), Field Bindweed (*Convolvulus arvensis*), Bull Thistle (*Cirsium vulgare*), Common Hogweed (*Heracleum sphondylium*), Nettle (*Urtica dioica*), Perennial Ryegrass (*Lolium perenne*), Yorkshire Fog (*Holcus lanatus*), Creeping Bent (*Agrostis stolonifera*), Common Knapweed (*Centaurea nigra*), Red Valerian (*Centranthus ruber*), Cocksfoot (*Dactylis glomerata*), Field Horsetail (*Equisetum arvense*), Gorse (*Ulex europaeus*), Black medick (*Medicago lupulina*), Alder (*Alnus glutinosa*), and Soft Rush (*Juncus effusus*) (**Plate 5.5**). Further, various invasive species were recorded within this habitat, including Giant rhubarb (*Gunnera tinctoria*), listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011), Butterfly-bush (*Buddleja davidii*), a medium impact invasive species, as per the second schedule of invasive species in Ireland, and Montbretia (*Crocsmia x crocosmiiflora*), a low impact invasive species.

Scrub (WS1) is present to the north and eastern boundaries of Harbour Park, with species recorded including Bramble (*Rubus fruticosus agg.*), Gorse (*Ulex europaeus*), Ash (*Fraxinus excelsior*), Nettle (*Urtica dioica*), Ivy (*Hedera hibernica*), Field Horsetail (*Equisetum arvense*), Bull Thistle (*Cirsium vulgare*), Common Hogweed (*Heracleum sphondylium*), Curled dock (*Rumex crispus*), and Soft Rush (*Juncus effusus*). Further, various invasive species were recorded within this habitat, including Giant rhubarb (*Gunnera tinctoria*) and Japanese Knotweed (*Fallopia japonica*), listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011), Butterfly-bush (*Buddleja davidii*), a medium impact invasive species, as per the second schedule of invasive species in Ireland, and Montbretia (*Crocsmia x crocosmiiflora*), a low impact invasive species. (**Plates 5.6- 5.7**).

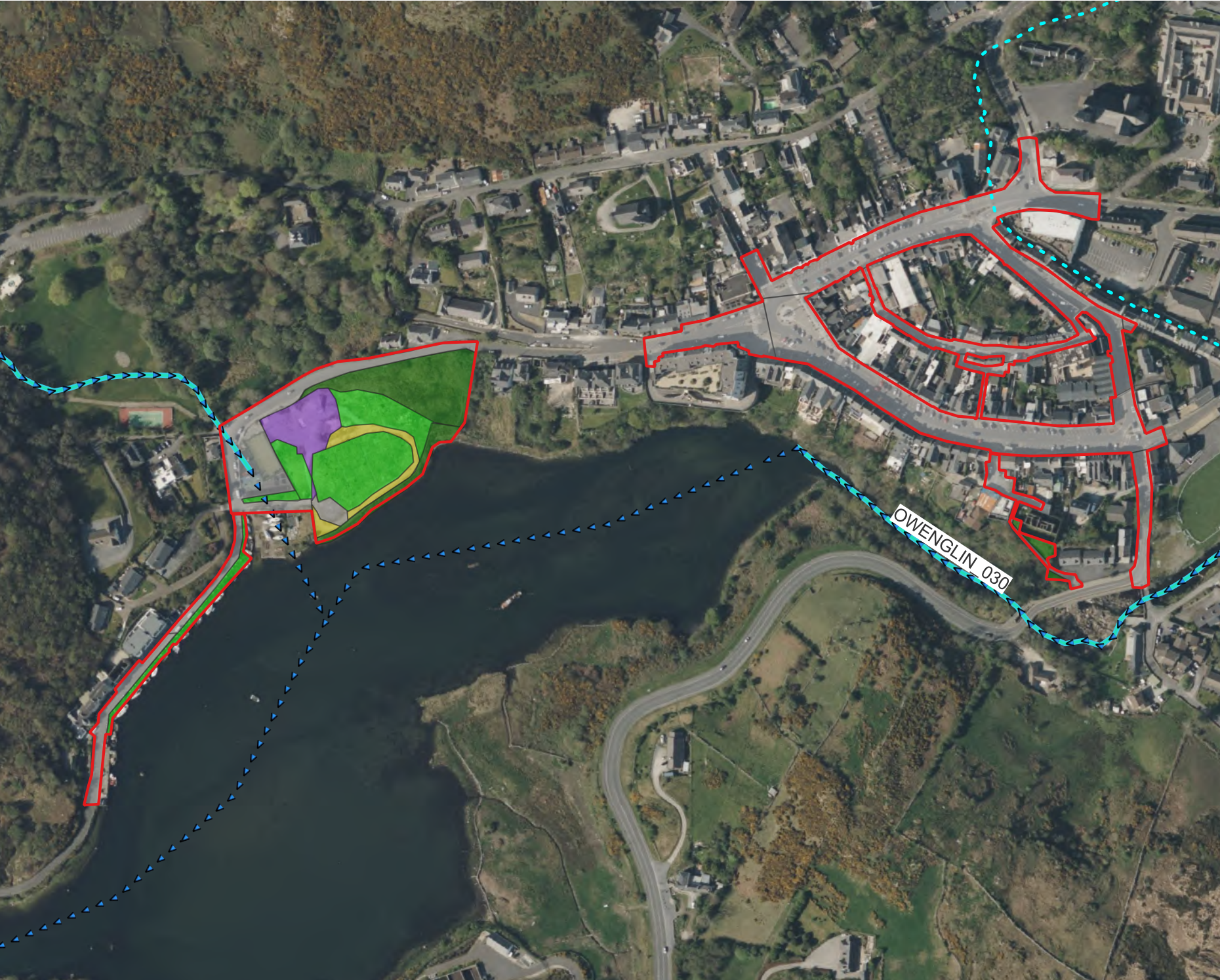
An artificially canalised section of an unmapped EPA watercourse runs culverted under Main Street in Clifden Town Centre to the northeast parcel of the proposed works site (Grid Reference: ITM 465910, 750682) (**Plate 5.8**). This artificially canalised watercourse continues to flow adjacent to the eastern margin of the proposed works site, in a southerly direction before discharging into the Owenglin River after approx 280m, which at this point is designated as part of the Twelve Bens/ Garraun Complex SAC (**Plate 5.9**). Based on the flow types, and artificial nature of this section of the watercourse, it is classified as an **Eroding/ Upland Rivers (FW1)**-. The Owenglin River continues to flow to the southern margin of the site, outside of the proposed works boundary in a westerly direction before discharging into Clifden Bay Estuary. Due to the flow types, size this watercourse is classified as a **Depositing Lowland River (FW2)**. Further, the Clifden Stream, a tributary of the Owenglin River flows culverted through the western margin of Harbour Park, flowing in a southerly direction before discharging into Clifden Bay Estuary. (**Plate 5.10**). Based on the flow types, and artificial nature of this section of the watercourse, it is classified as an **Eroding/ Upland Rivers (FW1)**.

Habitats recorded to the margins of the proposed works site, outside of the works boundary include **Hedgerows (WL1)** (**Plate 5.11**) and **Treelines (WL2)** (**Plate 5.12**). Species present within the **Hedgerow (WL1)** include individual Ash (*Fraxinus excelsior*), Gorse (*Ulex europaeus*), Field Bindweed (*Convolvulus arvensis*), Goat's Willow (*Salix caprea*), Ivy (*Hedera Hibernica*), and Bramble (*Rubus fruticosus agg.*). The ground flora is composed of species including Nettle (*Urtica dioica*), Creeping Buttercup (*Ranunculus repens*), Germander Speedwell (*Veronica chamaedrys*), Broadleaved-Willowherb (*Epilobium montanum*), Bitter Dock (*Rumex obtusifolius*), Bull Thistle (*Cirsium vulgare*), Montbretia (*Crocsmia x crocosmiiflora*), and Rhododendron (*Rhododendron ponticum*), an invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011). Species present within the **Treelines (WL2)** included Willow (*Salix spp*), Ash (*Fraxinus excelsior*), Sycamore (*Acer pseudoplatanus*), Alder (*Alnus glutinosa*), Horse chestnut (*Aesculus hippocastanum*), Gorse (*Ulex europaeus*), Field Bindweed (*Convolvulus arvensis*), Goat's Willow (*Salix caprea*), Wych Elm (*Ulmus glabra*), and Ivy (*Hedera Hibernica*).

According to Article 17 Annex I habitat mapping, the Annex I habitat **[1130] Estuaries** extends into the southern parcel of Harbour Park (Grid Reference; ITM 465479, 750489), and to the southern parcel Beach Road Quay (Grid Reference; ITM 465347, 750389). However, following the multidisciplinary ecological surveys undertaken on the site, the habitats recorded in these areas include Dry Meadows and Grassy Verges (GS2), Scrub (WS1), Recolonising Bare Ground (ED2), and Buildings and Artificial Surfaces (BL3) (**Plate 5.13 & 5.14**). As such, these areas do not conform to this Annex I habitat type- **[1130] Estuaries**. Further, as per Article 17 Annex I habitat mapping, a small section mapped **[4010] Wet Heath** overlaps with a section of the proposed works site, along Doonen Road to the southeast corner (Grid Reference; ITM 466008, 750416). However, following the multidisciplinary ecological surveys undertaken on the site, the habitats recorded in this area includes Buildings and Artificial Surfaces (BL3) (**Plate 5.15**). As such, these areas do not conform to this Annex I habitat type **[4010] Wet Heath**.

The distribution of the relevant Article 17 Habitats within the vicinity of the proposed works is detailed on **Figure 4.3** above.

No other habitats listed under Annex I of the EU Habitats Directive were identified within the project boundary. The watercourses within and adjacent to the proposed works site, and Clifden Bay Estuary may be used by Otters (*Lutra lutra*), Salmon (*Salmo salar*), Grey Seal (*Halichoerus grypus*) and Common Bottlenose Dolphin (*Tursiops truncatus*), which are QI species of several EU sites in the vicinity of the proposed works boundary.



Map Legend

- Site boundary
- Dry Meadows and Grassy Verges (GS2)
- Buildings and Artificial Surfaces (BL3)
- Recolonising Bare Ground (ED3)
- Scrub (WS1)
- Spoil and Bare Ground (ED2)
- Unmapped EPA Watercourse
- EPA River Waterbodies

River Flow Direction

Microsoft product screen shots reprinted with permission from Microsoft Corporation

Drawing Title

Habitats Present Within the Site Boundary

Project Title

Clifden Town Public Realm Enhancement

Drawn By	Checked By
RM	CM
Project No.	Drawing No.
210327	Figure 5.1
Scale	Date
1:3,469.886	16/08/2024

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Plate 5-1 Area of **Spoil and Bare Ground (ED2)** to the northern parcel near the entrance of Harbour Park dominated by exposed gravel and stone, with sand and rubble heaps to the northern margin of this area.



Plate 5-2 Playground area to the western margin of Harbour Park classified as **Buildings and Artificial Surfaces (BL3)**.



Plate 5-3 Roadway, pathways, car parking, and buildings in Clifden Town Centre classified as **Buildings and Artificial Surfaces (BL3)**.



Plate 5-4 **Recolonising Bare Ground (ED3)**, with exposed gravel to the western boundary of Harbour Park.



Plate 5-5 *Dry Meadows and Grassy Verges (GS2)* to the eastern margin of Harbour Park.



Plate 5-6 *Scrub (WS1)* present to the eastern boundary of Harbour Park.



Plate 5-7 **Scrub (WS1)** present to the eastern boundary of Harbour Park, outside of the proposed works boundary, in private lands adjacent.



Plate 5-8 An artificially canalised section of an unmapped EPA watercourse, classified as an **Eroding Upland River (FW1)** runs culverted under Main Street in Clifden Town Centre to the northeast parcel of the proposed works site. This artificially canalised watercourse continues to flow adjacent to the eastern margin of the proposed works site, in a southerly direction before discharging into the Owenglin River after approx 280m, which at this point is designated as part of the Twelve Bens/Garraun Complex SAC.



Plate 5-9 A section of the Owenglin River, classified as a **Depositing Lowland River (FW2)**, which is designated as part of the Twelve Bens/ Garraun Complex SAC, flows to the southern margin of the site, outside of the proposed works boundary in a westerly direction before discharging into Clifden Bay Estuary.



Plate 5-10 A section of the Clifden Stream, classified as an **Eroding Upland River (FW1)**, a tributary of the Owenglin River which flows through the western margin of Harbour Park, flowing in a southerly direction before discharging into Clifden Bay Estuary.



Plate 5-11 **Hedgerow (WL1)** recorded to the eastern boundary of Beach Road Quay, outside of the proposed works boundary.



Plate 5-12 **Treeline (WL1)** recorded to the southern margin of Clifden Town, outside of the proposed works boundary.



Plate 5-13 The southern margin of Harbour Park mapped as the Annex I habitat [1130] Estuaries, as per Article 17 Mapping. The habitats recorded in this area include Dry Meadows and Grassy Verges (GS2), Scrub (WS1), Recolonising Bare Ground (ED2), and Buildings and Artificial Surfaces (BL3). As such, this area does not conform to this Annex I habitat type- [1130] Estuaries.



Plate 5-14 The southern margin of Beach Road Quay mapped as the Annex I habitat [1130] Estuaries, as per Article 17 Mapping. The habitats recorded in this area include Dry Meadows and Grassy Verges (GS2) and Buildings and Artificial Surfaces (BL3). As such, this area does not conform to this Annex I habitat type- [1130] Estuaries.



Plate 5-15 A small section of mapped Article 17 Annex I habitat [4010] Wet Heath overlaps with a section of the proposed works site, along Doonen Road to the southeast corner. The habitats recorded in this area includes Buildings and Artificial Surfaces. As such, this area does not conform to this Annex I habitat type [4010] Wet Heath

5.1.2 Invasive species

5.1.2.1 Listed Third Schedule Invasive Species

Four invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011) were recorded during the surveys undertaken. The most extensive areas of Invasive Species recorded were in Harbour Park. For full details on the Invasive Species recorded within and adjacent to the proposed works area, and the relevant management and control, refer to the Invasive Species Management Plan (ISMP) in **Appendix 1**.

Giant rhubarb (*Gunnera tinctoria*) was recorded throughout Harbour Park, within the proposed works boundary (**Plate 5.16**) and in the lands adjacent, and throughout Clifden Town, with extensive areas recorded within the vicinity of the unmapped EPA watercourse that flows to the eastern margin of Clifden Town. Large, well established, mature patches, with sustainable strands were recorded in the north-east corner, along the southern edge of the site, and to the southwest margin of Harbour Park. Single plants, that are young, and immature were also recorded throughout Harbour Park. Further, large singular plants of *Gunnera* were recorded along the unmapped EPA watercourse that flows through Clifden town, to the eastern margin of the proposed works area. Further, singular plants were recorded along the tributary of the Owenglin River that flows through the western margin of Harbour Park. Single plants of this species were found in other parts throughout Clifden town, including one larger patch east of the fire station. However, the latter is located outside the proposed works area.

One large, well-established area of **Japanese knotweed (*Fallopia japonica*)** consisting of several plants located less than 7m from each other was also recorded in the south-east of Harbour Park, within the proposed works boundary (**Plate 5.17**). Further a large, well-established area was identified in the lands adjacent to the southeast of Harbour. Further, a single plant was recorded from private premises at the corner of Church Hill and Sky Road.

Rhododendron (*Rhododendron ponticum*) plants were recorded from private premises adjacent to the proposed works area, along Church Hill and Sky Road and a singular Rhododendron plant was recorded along Beach Road, outside of the proposed works boundary. (**Plate 5.18**).

Himalayan Balsam (*Impatiens glandulifera*) plants were recorded along the banks of the unmapped EPA watercourse that flows through Clifden Town centre, outside of the proposed works boundary (**Plate 5.19**).

An **Invasive Species Management Plan** has been prepared for the control and management of Giant rhubarb and Japanese knotweed, both recorded within the proposed works boundary, and is available in **Appendix 1**.

5.1.2.2 Other Non-native Invasive Species

Butterfly Bush (*Buddleja davidii*) a medium impact non-native invasive species of potential concern that is not listed on the Third Schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) was identified and recorded throughout the proposed works boundary. A large, well-established area of Butterfly Bush was recorded to the northeast margin of Harbour Park (**Plate 5.20**), along the unmapped EPA watercourse that flows through Clifden Town, and to the southern margin of the proposed works area, near Bridewell Brewery. Further, singular plants of this species were recorded within Harbour Park, and throughout Clifden Town.

A singular plant of **Wall Cotoneaster (*Cotoneaster horizontalis*)**, a medium impact non-native invasive species of potential concern that is not listed on the Third Schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) was recorded on Doonen Road, to the southern margin of the works area. (**Plate 5.21**).

Montbretia (*Crocsmia x crocosmiiflora*) a low impact, non-native invasive species of potential concern that is not listed on the Third Schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) was recorded throughout Clifden, in Harbour Park, along Beach Road and in the Town Centre. (**Plate 5.22**).



Plate 5-16 Large stands of Giant rhubarb (*Gunnera tinctoria*) to the eastern margin of Harbour Park, within the proposed works boundary.



Plate 5-17 Japanese Knotweed (*Fallopia japonica*) stand recorded to the southeast margin of Harbour Park, within the proposed works boundary.



Plate 5-18 *Rhododendron (Rhododendron ponticum)* plant recorded along Beach Road, adjacent to the proposed works boundary.



Plate 5-19 Himalayan Balsam (*Impatiens glandulifera*) plant recorded along the banks of the unmapped EPA watercourse that flows through Clifden Town centre, outside of the proposed works boundary to the east.



Plate 5-20 Butterfly Bush (*Buddleja davidii*) recorded to the northeast margin of Harbour Park, within the proposed works boundary.



Plate 5-21 A singular plant of Wall Cotoneaster (*Cotoneaster horizontalis*), a medium impact non-native invasive species of potential concern that is not listed on the Third Schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) recorded on Doonen Road, outside of the proposed works boundary to the south.



Plate 5-22 Montbretia (Crocsmia x crocosmiiflora) a low impact, non-native invasive species of potential concern that is not listed on the Third Schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) recorded to the northern margin of Harbour Park, within the proposed works boundary.

5.1.3 Fauna

5.1.3.1 Birds

An ecological walkover survey was carried out in November 2021, during the dedicated wintering bird season. No SCI species of any nearby SPA were recorded roosting or feeding within the proposed project site. However, several bird species were observed in Clifden Bay, including Mallard (*Anas platyrhynchos*), Black-headed gull (*Larus ridibundus*), Ringed plover (*Charadrius hiaticula*), Oystercatcher (*Haematopus ostralegus*), Redshank (*Tringa tetanus*) and Bar-tailed godwit (*Limosa lapponica*). The first three species are amber listed as per Birds of Conservation Concern in Ireland 2020-2026 (Gilbert et al. 2021), while the latter three species are red listed

Other bird species documented within the project boundary during the two multidisciplinary walkover surveys conducted in November 2021 and September 2023 include House sparrow (*Passer domesticus*), Robin (*Erithacus rubecula*), Blackbird (*Turdus merula*) and Rook (*Corvus frugilegus*). No evidence of bird species listed in the annexes of the Birds Directive were recorded within Clifden Town Centre, Harbour Park or along Beach Road.

5.1.3.2 Bats

No bats/ signs of bats, or bat roosts/ suitable bat roosting features were identified during the multidisciplinary walkover surveys carried out by MKO within the proposed works boundary.

5.1.3.3 Otter

No signs of Otters (*Lutra lutra*) including holts, couches, spraints, or prints were recorded during the targeted Otter (*Lutra lutra*) survey undertaken on the 20th of September 2023 along the artificially canalised section of an unmapped EPA watercourse that runs culverted under Main Street in Clifden Town Centre to the northeast parcel of the proposed works, and adjacent to the eastern margin of the proposed works site, along the accessible areas of the Owenglin River to the southern margin of the site, or Clifden Bay Estuary.

However, the Owenglin River, which flows to the southern margin of the site, outside of the proposed works boundary is designated as part of the Twelve Bens/Garraun Complex SAC. Otter is a listed QI species of the SAC; therefore, Otters are likely to occur in the wider area.

5.1.3.4 Other fauna

No evidence of any other protected species or habitat for any species was recorded within the project site. It is likely that fox and rat will occur in the general area.

5.1.4

Importance of Ecological Receptors

Table 5-1 lists all identified receptors and assigns them an ecological importance in accordance with the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009). This table also provides the rationale for this determination and identifies the habitats and species that are Key Ecological Receptors.

Table 5-1 Importance of Ecological Receptors

Habitats and Geographic Importance	KER Y/N	Rationale
Habitats - Local importance (<i>Higher Value</i>) Deterioration of water quality- Eroding/upland rivers (FW1)/ Depositing Lowland Rivers/ Estuary ➤ Unmapped EPA Watercourse ➤ Owenglin River ➤ Clifden Stream, a Tributary of Owenglin River ➤ Clifden Bay Estuary	Y	An artificially canalised section of an unmapped EPA watercourse runs culverted under Main Street in Clifden Town Centre to the northeast parcel of the proposed works site (Grid Reference: ITM 465910, 750682)). This artificially canalised watercourse continues to flow adjacent to the eastern margin of the proposed works site, in a southerly direction before discharging into the Owenglin River after approx 280m, which at this point is designated as part of the Twelve Bens/ Garraun Complex SAC. The Owenglin River continues to flow to the southern margin of the site, outside of the proposed works boundary in a westerly direction before discharging into Clifden Bay Estuary. Further, the Clifden Stream, a tributary of the Owenglin River flows culverted through the western margin of Harbour Park, flowing in a southerly direction before discharging into Clifden Bay Estuary As such, the construction phase of the proposed works may result in pollution to surface waters and groundwaters, adversely impacting the aquatic influenced QI habitats and species within the European Designated Sites and downstream waterbodies, via the deterioration of water quality. Further, these watercourses are classified as <i>Local Importance (Higher Value)</i> as they provide supporting habitat and commuting corridors for a variety of aquatic species. This aquatic feature also provides connectivity to Clifden Bay, which is likely to support a host of marine aquatic species. They are also connecting to sites which are of national and international importance. Therefore, water quality is included as a KER.
Habitats - Local Importance (<i>Lower Value</i>) ➤ Buildings and artificial surfaces (BL3) ➤ Dry meadows and grassy verges (GS2) ➤ Spoil and bare ground (ED2) ➤ Recolonising bare ground (ED3) ➤ Scrub (WS1)	N	These habitats are classified as <i>Local Importance (Lower Value)</i> as they have low biodiversity value, are overgrown with third schedule invasive species, and are common and widespread in the local and wider landscape and are therefore not included as KERs.
Fauna		

Birds - Local Importance (Higher Value)	Y	Taking a precautionary approach, the Scrub (WS1) habitat within Harbour Park may be used by the local bird population as supporting foraging and nesting habitat. As such, the loss of approx 0.421ha of Scrub (WS1) habitat to the eastern parcel of Harbour Park, may result in the loss of supporting habitat for local bird species. As such, Bird Species are included as a KER.
Bats – Local Importance (Lower Value)	N	The main habitats recorded within the boundary of the proposed works site are classified as Dry Meadows and Grassy Verges (GS2), Scrub (WS1), Recolonising Bare Ground (ED3), Spoil and Bare Ground (ED2), Eroding/upland rivers (FW1), and Depositing Lowland Rivers (FW2). As such, the proposed works site does not provide suitable linear commuting, foraging or roosting features for local bat species. Further, no signs of bats, and no suitable roosting features were recorded within the proposed works boundary during the multidisciplinary walkover surveys conducted by MKO. However, taking a precautionary approach, the habitats recorded to the margins of the proposed works site, outside of the proposed works boundary including Treelines (WL2) and Hedgerows (WL1) may be used by foraging and commuting bats, as they provide connectivity to the wider landscape. However, these habitats will be retained and protected during construction works and will not be subject to artificial lighting during the operational phase. As such, there is no potential for impact to local bat species during the construction or operational phases of the proposed works. Bats of Local importance (Lower value) are therefore not included as a KER.
Otters (<i>Lutra lutra</i>)- Local Importance (Higher Value)	Y	Taking an extremely precautionary approach, the unmapped EPA watercourse that flows through the northeastern boundary of the site, and adjacent, the Owenglin River, and Clifden Bay Estuary may provide ex-situ supporting foraging and breeding habitat for the aquatic QI Species Otter (<i>Lutra lutra</i>) associated with the Twelve Bens/ Garraun Complex SAC. As such, taking an extremely precautionary approach, a potential pathway for effect to this aquatic QI Species was identified in the form of ex-situ disturbance and displacement during the construction phase of the proposed works, in the absence of mitigation. Therefore, Otters are included as a KER.
Other fauna - Local Importance (Lower Value)	N	None of the habitats within the proposed project area provide significant habitat for any other protected faunal species and other fauna was classified as <i>Local Importance (Lower Value)</i>.

		It is likely that species such as fox and rat will occur within the project boundary, however, these are common and typical of urban and semi-urban settings. Therefore, non-volant mammals are not included as KERS .
Invasive Species		
Third Schedule Invasive Species: ➤ Giant rhubarb (<i>Gunnera tinctoria</i>) ➤ Japanese knotweed (<i>Fallopia japonica</i>) ➤ Rhododendron (<i>Rhododendron ponticum</i>) ➤ Himalayan Balsam (<i>Impatiens glandulifera</i>).	Y	Rhododendron (<i>Rhododendron ponticum</i>) and Himalayan Balsam (<i>Impatiens glandulifera</i>) are listed under Regulations 49 and 50 of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011). However, these plants will be avoided during the proposed works and as such, no management and control measures need to be prescribed for these third schedule, high impact species recorded outside the proposed works site. Giant rhubarb (<i>Gunnera tinctoria</i>) and Japanese knotweed (<i>Fallopia japonica</i>) are present within the proposed works boundary, within Harbour Park and Clifden Town, and as such will not be avoided during the proposed works. As such, the construction of the proposed works may result in the increased spread of these Invasive species throughout the site. As such, these third schedule invasive species have been subject to management and control in an Invasive Species Management Plan (ISMP) available in Appendix 1, and as such are included as KERS.
Non-third Schedule Invasive Species ➤ Butterfly Bush (<i>Buddleja davidii</i>) ➤ Wall Cotoneaster (<i>Cotoneaster horizontalis</i>) ➤ Montbretia (<i>Crocsmia x crocosmiiflora</i>)	N	Butterfly Bush (<i>Buddleja davidii</i>) and Wall Cotoneaster (<i>Cotoneaster horizontalis</i>), both medium impact non-native invasive species of potential concern, and Montbretia (<i>Crocsmia x crocosmiiflora</i>) a low impact non-native invasive species of potential concern, all of which are not listed on the Third Schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) were identified and recorded within the proposed works boundary. As such, these have not been subject to management and control in a specified Invasive Species Management Plan (ISMP) and are not included as KERS.
European Designated Sites		
The Twelve Bens/Garraun Complex SAC [002031]	Y	The proposed works site is located within the same groundwater body- Clifden Marbles [IE_WE_G_0013] as this SAC. As per EPA Map the majority of the site, including Clifden Town Centre, is located within an area of Moderate Groundwater Vulnerability, with smaller sections located within areas of Extreme Vulnerability and in areas with rock at or near the surface. Due to the proximity of the proposed works site to this SAC, the potential impacts to groundwater have been considered. An artificially canalised section of an unmapped EPA watercourse runs culverted under Main Street in Clifden Town Centre to the northeast parcel of the proposed works site. This watercourse continues to flow adjacent to

		the eastern margin of the proposed works site, in a southerly direction before discharging into the Owenglin River after approx 280m (from where the watercourse intersects the proposed works boundary (Grid Reference: ITM 465910, 750682)), which as this point is designated as part of the Twelve Bens/ Garraun Complex SAC. The Owenglin River flows in a westerly direction before discharging into the Clifden Bay Estuary. As such, taking a precautionary approach, there is potential hydrological connectivity via the proposed works site and this SAC. Therefore, the construction phase of the proposed works may result in pollution to surface waters and to groundwaters adversely impacting the groundwater and aquatic influenced QI habitats and species within the SAC, in the absence of mitigation. A dedicated Otter survey was conducted on the 20th of September 2023 by MKO, along the unmapped EPA watercourse, along the accessible sections of the Owenglin River and Clifden Bay Estuary. No signs of Otters were recorded along the surveyed sections of the watercourses. However, taking an extremely precautionary approach, the unmapped EPA watercourse that flows through the northeastern boundary of the site, and adjacent, and the Owenglin River may provide ex-situ supporting foraging, commuting and breeding habitat for the aquatic QI Species: Otters (<i>Lutra lutra</i>). As such, a potential pathway for effect to this aquatic QI Species was identified in the form of ex-situ disturbance and displacement during the construction phase of the proposed works, in the absence of mitigation. As such, the Twelve Bens/ Garraun Complex SAC is included as a KER of International Importance.
Slyne Head Peninsula SAC [002074]	Y	The proposed works site is located approx 2.5km northeast of this SAC. An artificially canalised unmapped EPA watercourse flows through the northeastern boundary of the proposed works site, in a southerly direction before discharging into the Owenglin River, which at this point is designated as part of the Twelve Bens/ Garraun Complex SAC. The Owenglin River flows in a westerly direction before discharging into the Clifden Bay Estuary. Further, the Clifden Stream, a tributary of the Owenglin River flows culverted through the western margin of Harbour Park, flowing in a southerly direction into Clifden Bay Estuary. Clifden Bay Estuary flows in a westerly direction discharging into the Slyne Head Peninsula SAC after approx 6.5km. As such, taking a precautionary approach, the construction phase of the proposed works may result in pollution to surface waters, adversely impacting the aquatic influenced QI habitats and species within the SAC, via the deterioration of water quality, in the absence of mitigation. As such, Slyne Head Peninsula SAC is included as a KER of International Importance.

West Connacht Coast SAC [002998]	Y	The proposed works site is located approx 4.7km east of this SAC. An artificially canalised unmapped EPA watercourse flows through the northeastern boundary of the proposed works site, in a southerly direction before discharging into the Owenglin River, which at this point is designated as part of the Twelve Bens/ Garraun Complex SAC. The Owenglin River flows in a westerly direction before discharging into the Clifden Bay Estuary. Further, the Clifden Stream, a tributary of the Owenglin River flows culverted through the western margin of Harbour Park, flowing in a southerly direction into Clifden Bay Estuary. Clifden Bay Estuary flows in a westerly direction, discharging into the West Connacht Coast SAC after approx 5.6km. As such, taking a precautionary approach, the construction phase of the proposed works may result in pollution to surface waters, adversely impacting this aquatic QI species: Common Bottlenose Dolphin (<i>Tursiops truncatus</i>) within the SAC, via the deterioration of water and habitat quality, in the absence of mitigation. As such, West Connacht Coast SAC is included as a KER of International Importance.
Slyne Head Islands SAC [000328]	Y	The proposed works site is located approx 7.9km northeast of this SAC. An artificially canalised unmapped EPA watercourse flows through the northeastern boundary of the proposed works site, in a southerly direction before discharging into the Owenglin River, which at this point is designated as part of the Twelve Bens/ Garraun Complex SAC. The Owenglin River flows in a westerly direction before discharging into the Clifden Bay Estuary. Further, the Clifden Stream, a tributary of the Owenglin River flows culverted through the western margin of Harbour Park, flowing in a southerly direction into Clifden Bay Estuary. Clifden Bay Estuary flows in a westerly direction discharging into the Slyne Head Islands SAC after approx 11.2km. As such, taking an extremely precautionary approach, the construction phase of the proposed works may result in pollution to surface waters, adversely impacting the aquatic QI species: Grey Seal (<i>Halichoerus grypus</i>) and habitat: Reefs within the SAC, via the deterioration of water and habitat quality, in the absence of mitigation. As such, Slyne Head Islands SAC is included as a KER of International Importance.
Nationally Designated Sites		
Slyne Head Peninsula pNHA [002074]	Y	The proposed works area is located approx 2.5km northeast of this pNHA. An artificially canalised unmapped EPA watercourse flows through the northeastern boundary of the proposed works site, in a southerly direction before discharging into the Owenglin River, which at this point is designated as part of the Twelve Bens/ Garraun Complex SAC. The Owenglin River flows in a westerly direction before discharging into

		the Clifden Bay Estuary. Further, the Clifden Stream, a tributary of the Owenglin River flows culverted through the western margin of Harbour Park, flowing in a southerly direction into Clifden Bay Estuary. Clifden Bay Estuary flows in a westerly direction discharging discharging into the Slyne Head Peninsula pNHA after approx 6.5km. As such, taking a precautionary approach, the construction phase of the proposed works may result in pollution to surface waters, adversely impacting this site, via the deterioration of water quality, in the absence of mitigation. As such, Slyne Head Peninsula pNHA is included as a KER of International Importance.
Slyne Head Islands pNHA [000328]	Y	The proposed works area is located approx.9km southeast of Slyne Head Islands pNHA. An artificially canalised unmapped EPA watercourse flows through the northeastern boundary of the proposed works site, in a southerly direction before discharging into the Owenglin River, which at this point is designated as part of the Twelve Bens/ Garraun Complex SAC. The Owenglin River flows in a westerly direction before discharging into the Clifden Bay Estuary. Further, the Clifden Stream, a tributary of the Owenglin River flows culverted through the western margin of Harbour Park, flowing in a southerly direction into Clifden Bay Estuary. Clifden Bay Estuary flows in a westerly direction discharging into the Slyne Head Islands pNHA after approx 11.2km. As such, taking a precautionary approach, the construction phase of the proposed works may result in pollution to surface waters, adversely impacting this site, via the deterioration of water quality, in the absence of mitigation. As such, Slyne Head Islands pNHA is included as a KER of International Importance.

6. ECOLOGICAL IMPACT ASSESSMENT

6.1 Do Nothing Impact

The main habitats recorded within the boundary of the proposed works site are classified as **Dry Meadows and Grassy Verges (GS2)**, **Scrub (WS1)**, **Recolonising Bare Ground (ED3)**, **Spoil and Bare Ground (ED2)**, **Eroding/upland rivers (FW1)**, and **Depositing Lowland Rivers (FW2)**. Habitats recorded to the margins of the proposed works site, outside of the proposed works boundary include **Treelines (WL2)** and **Hedgerows (WL1)**.

If the proposed project were not to go ahead, there would be no change to Clifden Town Centre or Beach Road. However, it is likely that Harbour Park would become overgrown further with Invasive Species or would be subject to alternative development proposals.

6.2 Impacts during Construction

6.2.1 Habitat Loss

6.2.1.1 Habitats of Local Importance (Lower Value)

Habitats of *Local Importance (Lower Value)* lost to the footprint of the proposed works include **Dry meadows and grassy verges (GS2)**, **Spoil and bare ground (ED2)**, **Recolonising bare ground (ED3)**, **Scrub (WS1)**, and **Buildings and artificial surfaces (BL3)**.

The effect is assessed as a permanent not-significant negative impact on a receptor of *Local Importance (Lower Value)*. Loss of these habitats to the footprint of the proposal is not considered to be significant at any geographic scale. These habitats are common and widespread in the locality, are overgrown with third schedule invasive species (particularly in Harbour Park) and have a low biodiversity value. The loss of these habitats is considered not significant and therefore no mitigation is required.

6.2.1.2 Habitats of Local Importance (Higher Value)

The proposed project will not result in the loss of any habitat classified as *Local Importance (Higher Value)*. It will, however, result in the loss of the two alder trees within Harbour Park. The effect is considered non-significant.

Further, following the implementation of the proposed landscape plan as detailed fully in **Section 2.3** of this report, there will an increase in tree cover throughout the site, as summarised below:

6.2.1.2.1 Mitigation Measures

It is proposed to plant an additional 90 street trees throughout Clifden Town Centre, some of which will comprise the vegetation of the proposed rain garden planting. Species to be planted include Common Alder (*Alnus glutinosa*), Strawberry tree (*Arbutus unedo*), Downy birch (*Betula pubescens*), Crab Apple (*Malus sylvestris*), Wild cherry (*Prunus avium*), Sessile oak (*Quercus petraea*), Rowan (*Sorbus aucuparia*), Wild service tree (*Sorbus torminalis*).

It is proposed to plant an additional 121 native trees throughout Harbour Park, including parkland trees, woodland planting, ornamental planting, and hedgerow planting. It is proposed to retain two tree species along the eastern boundary of Harbour Park. Native parkland tree species to be planted include Common Alder (*Alnus glutinosa*), Strawberry tree (*Arbutus unedo*), Downy birch (*Betula pubescens*), Crab Apple (*Malus sylvestris*), Wild cherry (*Prunus avium*), Sessile oak (*Quercus petraea*), Rowan

(*Sorbus aucuparia*), Wild service tree (*Sorbus torminalis*). Native hedgerow and woodland species to be planted include Blackthorn (*Prunus spinosa*), Common Hawthorn (*Crataegus monogyna*), Common hazel (*Corylus avellana*), Common holly (*Ilex aquifolium*), and Wild privet (*Ligustrum vulgare*). Native shrub species to be planted include European Spindle (*Euonymus europaeus*), Tutsan (*Hypericum androsaemum*), Common Juniper (*Juniperus communis*), Bog Myrtle (*Myrica gale*), Grey Willow (*Salix cinerea*), Purple Willow (*Salix purpurea*), Osier Willow (*Salix viminalis*), European Blueberry (*Vaccinium myrtillus*), and Guelder Rose (*Viburnum opulus*).

6.2.1.2.2 Residual impacts

No significant residual impacts on habitats are anticipated at any scale.

6.2.2 Impacts on Fauna During the Construction Phase

The effects on faunal species that have been identified as Key Ecological Receptors to facilitate construction are described in the following sections.

6.2.2.1 Birds

Table 6-1 Impacts to Birds during the Construction Phase

Description of Effect	Habitat Loss/Degradation The Scrub (WS1) habitat within Harbour Park may be used by local populations of common foraging and nesting birds. As such, the loss of approx 0.421ha of Scrub (WS1) habitat to the eastern parcel of Harbour Park, may result in the loss of supporting habitat for local bird species. The site of the proposed works does not provide significant supporting habitat and has no potential for disturbance for SCI species for Connemara Bog Complex SPA due to the development site being buffered from the SPAs by existing buildings, tree line and hedgerow habitats.
	Disturbance The loss of approx 0.421ha of Scrub (WS1) habitat to the eastern parcel of Harbour Park, has the potential to result in disturbance to birds and potentially to cause mortality to juvenile birds in the nest.
Assessment of Significance prior to mitigation	Habitat Loss/Degradation The potential loss of nesting and foraging habitat for common bird species would be considered significant at a local geographical scale .
	Disturbance Mortality/disturbance to the local bird population as a result of vegetation clearance in the nesting season would be considered significant at the local geographic scale .
Mitigation	Habitat Loss/Degradation It is proposed to plant an additional 90 street trees throughout Clifden Town Centre, some of which will comprise the vegetation of the proposed rain garden planting. Species to be planted include Common Alder (<i>Alnus glutinosa</i>), Strawberry tree (<i>Arbutus unedo</i>), Downy birch (<i>Betula pubescens</i>), Crab Apple (<i>Malus sylvestris</i>), Wild cherry (<i>Prunus avium</i>), Sessile oak (<i>Quercus petraea</i>), Rowan (<i>Sorbus aucuparia</i>), Wild service tree (<i>Sorbus torminalis</i>).

	- Ornamental species to be planted in the Rain Garden proposed throughout Clifden Town Centre include the following native shrubs, Tutsan (<i>Hypericum androsaemum</i>), Common Juniper (<i>Juniperus communis</i>), Bog Myrtle (<i>Myrica gale</i>), and Bilberry (<i>Vaccinium myrtillus</i>). - It is proposed to plant an additional 121 native trees throughout Harbour Park, including parkland trees, woodland planting, ornamental planting, and hedgerow planting. It is proposed to retain two tree species along the eastern boundary of Harbour Park. Native parkland tree species to be planted include Common Alder (<i>Alnus glutinosa</i>), Strawberry tree (<i>Arbutus unedo</i>), Downy birch (<i>Betula pubescens</i>), Crab Apple (<i>Malus sylvestris</i>), Wild cherry (<i>Prunus avium</i>), Sessile oak (<i>Quercus petraea</i>), Rowan (<i>Sorbus aucuparia</i>), Wild service tree (<i>Sorbus torminalis</i>). Native hedgerow and woodland species to be planted include Blackthorn (<i>Prunus spinosa</i>), Common Hawthorn (<i>Crataegus monogyna</i>), Common hazel (<i>Corylus avellana</i>), Common holly (<i>Ilex aquifolium</i>), and Wild privet (<i>Ligustrum vulgare</i>). Native shrub species to be planted include European Spindle (<i>Euonymus europaeus</i>), Tutsan (<i>Hypericum androsaemum</i>), Common Juniper (<i>Juniperus communis</i>), Bog Myrtle (<i>Myrica gale</i>), Grey Willow (<i>Salix cinerea</i>), Purple Willow (<i>Salix purpurea</i>), Osier Willow (<i>Salix viminalis</i>), European Blueberry (<i>Vaccinium myrtillus</i>), and Guelder Rose (<i>Viburnum opulus</i>).
	Disturbance Where possible, all cutting of trees, scrub and tall vegetation will be undertaken outside the bird nesting season which runs from the 1st of March to the 31st of August, in accordance with the Wildlife Act 1976-2019. Any cutting of vegetation that may be required outside the season described above will be supervised by a suitably qualified ecologist to ensure that no birds' nests are present. Should nesting birds be encountered, the trees will be left until nesting activity has concluded.
Residual Effect following Mitigation	Habitat Loss – No significant effect
	Disturbance – No significant effect.
Potential for Cumulative Effect	Habitat Loss The proposed works will not result in any significant effect in regard to habitat loss for birds. It therefore cannot contribute to any cumulative effect in this regard.
	Disturbance The proposed works will not result in any significant effect in regard to disturbance to birds. It therefore cannot contribute to any cumulative effect in this regard.

6.2.2.2 Otters

Table 6-2 Impacts to Otters during the construction Phase

Description of Effect	A dedicated Otter survey was conducted on the 20th of September 2023 by MKO, along the unmapped EPA watercourse, the accessible sections of the Owenglin River and Clifden Bay Estuary. No signs of Otters were recorded along the surveyed sections of the watercourses. Although no signs of Otters were recorded during the Otter survey conducted, it is likely that Otters occur within the wider study area. As such, taking a precautionary approach, the unmapped watercourse that flows through the northeastern boundary of Clifden Town, and the Owenglin River which flows to the southern margin of the proposed works area, may provide ex-situ supporting foraging, commuting and breeding habitat for the aquatic QI Species: Otters (<i>Lutra lutra</i>) associated with the Twelve Bens/ Garraun Complex SAC.
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	As such, taking an extremely precautionary approach, a potential pathway for effect to this aquatic QI Species was identified in the form of ex-situ disturbance and displacement during the construction phase of the proposed works.
Assessment of Significance prior to mitigation	In the absence of best practice design and mitigation the potential for disturbance and displacement related impacts to Otters is considered to be significant at an International Scale as Otters are a QI Species of the Twelve Bens/ Garraun Complex SAC.
Mitigation	The following mitigation measures to limit noise and vibration disturbance during the construction phase of the proposed works is set out in the Construction and Environmental Management Plan (CEMP) prepared by MKO, submitted as part of this application: ➤ Construction equipment for use outdoors shall comply with the European Communities Regulations– Noise Emission by Equipment for Use Outdoors – SI 241 - 2006. ➤ Diesel generators will be enclosed in sound proofed containers to minimise the potential for noise impacts. ➤ Plant and machinery with low inherent potential for generation of noise and/or vibration will be selected. All construction plant and equipment to be used on-site will be modern equipment and will comply with the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations; ➤ Plant with the potential of generating noise or vibration will be placed as far away from sensitive properties as permitted by site constraints. ➤ Regular maintenance of plant will be carried out in order to minimise noise emissions. Particular attention will be paid to the lubrication of bearings and the integrity of silencers; ➤ All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the works; ➤ Compressors will be of the “sound reduced” models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers; ➤ Machines which are used intermittently will be shut down during those periods when they are not in use; ➤ Training will be provided by the Site Management to drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation. ➤ It is recommended that drivers of heavy goods vehicles (HGVs) associated with the works extend due care and courtesy to other road users. Excessive use of and unnecessary engine revving will be avoided. ➤ The proposed construction working hours will be 08:00 – 18:00 Monday to Friday. Construction will not take place at the site on Sundays or Public Holidays.
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant effects in the form of ex situ disturbance or displacement are predicted.
Potential for Cumulative Effect	The proposed works will not result in any significant effects in the form of disturbance or displacement. It therefore cannot contribute to any significant cumulative effect in this regard.

6.2.3

Spread of Invasive Species During the Construction Phase

For full details on invasive species within the proposed development boundary, an Invasive Species Management Plan (ISMP) has been prepared and is available in **Appendix 1** of this report.

Table 6-3 Impacts on Invasive Species During the Construction Phase

Description of Effect	Four invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011) were recorded during the surveys undertaken. The most extensive areas of Invasive Species recorded were in Harbour Park. Giant rhubarb (<i>Gunnera tinctoria</i>) was recorded throughout Harbour Park and in the lands adjacent, and throughout Clifden Town. Further, Japanese knotweed (<i>Fallopia japonica</i>) was also recorded in the south-east of Harbour Park within the proposed works area. As such, the ISMP deals with the control and management of Giant rhubarb and Japanese Knotweed. Rhododendron (<i>Rhododendron ponticum</i>) and Himalayan Balsam (<i>Impatiens glandulifera</i>) were recorded outside of the proposed works area. Invasive species not listed on the Third Schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) recorded within the works boundary, and in the lands adjacent include Butterfly Bush (<i>Buddleja davidii</i>), Wall Cotoneaster (<i>Cotoneaster horizontalis</i>), and Montbretia (<i>Crocsmia x crocosmiiflora</i>).
Assessment of Significance prior to mitigation	The proposed works area, particularly Harbour Park contains large infestations of Giant rhubarb, and Japanese Knotweed listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011). As well as other invasive species not listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011). The ISMP deals with the control and management of Giant rhubarb and Japanese Knotweed. As such, additional growth and spread of invasive species within the site, and to surrounding areas is likely during the construction works as a result of soil excavation, by faunal dispersion via birds or via water dispersion if seeds enter nearby watercourses. In the absence of best practice design and mitigation the further spread and growth of third schedule invasive species is considered to be significant at local scale.
Mitigation	Mitigation measures are outlined in the CEMP submitted as part of this application, and the control measures outlined in the ISMP available in Appendix 1 of this report
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant effects displacement is predicted.
Potential for Cumulative Effect	The proposed works will not result in any significant effects. It therefore cannot contribute to any significant cumulative effect in this regard.

6.2.4

Deterioration of Water Quality During the Construction Phase

Table 6-4 Impacts on Water Quality During the Construction Phase

Description of Effect	The construction phase of the development will involve earth moving and levelling operations which create the potential for pollution in various forms, i.e., the generation of suspended solids and the potential for spillage of fuels associated with the refuelling of excavation machinery. An artificially canalised section of an unmapped EPA watercourse runs culverted under Main Street in Clifden Town Centre to the northeast parcel of the proposed works site (Grid Reference: ITM 465910, 750682)). This artificially canalised watercourse continues to flow adjacent to the eastern margin of the proposed works site, in a southerly direction before discharging into the Owenglin River after approx 280m, which at this point is designated as part of the Twelve Bens/ Garraun Complex SAC. The Owenglin River continues to flow to the southern margin of the site, outside of the proposed works boundary in a westerly direction before discharging into Clifden Bay Estuary. Further, the Clifden Stream, a tributary of the Owenglin River flows culverted through the western margin of Harbour Park, flowing in a southerly direction before discharging into Clifden Bay Estuary. Therefore, taking a precautionary approach, the construction phase of the proposed works may result in pollution to surface waters and to groundwaters through pollutants including hydrocarbons, fuel and cement, and silt laden runoff into nearby watercourses, adversely impacting aquatic QI Species and Habitats associated with nearby SACs.
Assessment of Significance prior to mitigation	In the absence of best practice design and mitigation the potential impact on water quality is considered to be significant at an International Scale given that there is direct surface water connection via the proposed works site and the Twelve Bens/ Garraun Complex SAC.
Mitigation	The mitigation measures outlined to protect water quality during construction have been outlined fully in the CEMP submitted as part of this application, and are summarised below: The mitigation measures described below ensure that the proposed works does not prevent or obstruct any of the Qualifying Interests (QIs) from reaching favourable conservation status as per Article 1 of the EU Habitats Directive, ensuring that the proposed works does not adversely affect the integrity of any Designated European sites or biodiversity. Protecting Water Quality Prior to the commencement of any construction activities, the necessary mitigation measures will be put in place to ensure that no silt laden water runoff generated at the site will flow to nearby watercourses thus ensuring the protection of surface water during the works. This will involve confirming the location of all existing services and delineating between drainage systems. Surface waters will be managed to ensure the prevention of run off from areas where excavation occur does not result in silt laden water entering the existing storm water network. Stockpiled material will be located away from any drains or watercourses, covered with polyethylene sheet and if deemed necessary will be surrounded by silt fencing where there is a risk of run-off during prolonged periods of rainfall. Particular emphasis will also be placed on hazardous materials entering the surface water management system as well as spill or leaks of fuel oils. Section 4.2 provides an Emergency Response Plan for dealing with spillages which may result in adverse environmental effects. Prevention Pollution Control Measures The following measures will be put in place to prevent the transportation of silt laden water or pollutants from entering any of the wider environments including watercourses/drains near the site:

Details of control measures which will be implemented at the site, if required, are included in the Plates below.

Site setup:

- Any areas where it is proposed to carry out works will be secured with fencing and markers. No construction access will be permitted outside the fenced area.
- Access routes will be clearly marked. Access during construction to any working area will be restricted to land within the outlined works areas.
- Traffic diversions and sections of roadways/footpaths may be required to be used during the course of the construction phase.

Pollution Prevention:

- Any requirement for temporary fills or stockpiles will be damped down or covered with polyethylene sheeting as required to avoid sediment release associated with heavy rainfall.
- Excavated spoil will be stockpiled and contained entirely within the confines of the proposed works areas and a minimum of 50m from nearby watercourses. Silt fencing will also be utilised around these stockpiles, if necessary.
- In the event of encountering groundwaters during excavation, the excavation will be de-watered using a pump equipped with a silt bag on the outlet, if necessary, to capture any silty material prior to subsequent natural percolation to ground. The discharge area around the silt bags will have a layer of embedded silt fencing installed.
- All diesel or petrol pumps required onsite will be operated within bunded units.
- Ground disturbance will be kept to a minimum and water from excavations will be filtered. Silt fences will be installed at the site if deemed necessary. Exposed surfaces will be re-vegetated as soon as possible following construction.
- Earthworks and excavations will not be carried out during periods of heavy rainfall.

Cement Based Products Control Measures

Cement based products will be required over the course of the works. Due to the nature of the proposed works, significant volumes of cement are not anticipated to be required. Where cement is required, this will be delivered to the work areas by concrete trucks. The complete washing out of concrete trucks will not be permitted at the works area. Suppliers will be directed back to their own facility to complete the washout process. The following mitigation measures are proposed to avoid release of cement leachate from the works area:

- No batching of wet-cement products will occur on site.
- Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place. Where possible pre-cast elements for concrete works will be used.
- No washing out of any plant used in concrete transport or concreting operations will be allowed.
- No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed.
- Use weather forecasting to plan dry days for pouring concrete.
- Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event.

Refuelling, Fuel and Hazardous Materials Storage

The following measures are proposed to avoid release of hydrocarbons at the site:

	➤ Minimal refuelling or maintenance of construction vehicles or plant will take place on site. Off-site refuelling will occur at a controlled fuelling station. ➤ On-site refuelling will take place by direct refuelling from the delivery truck or from fuel stored within a bunded fuel tank. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations. ➤ Storage/refuelling will be located in and carried out in a designated area of the works area, located a suitable distance from excavation works. This area will be underlain by concrete hard standing or another impermeable surface, and tanks will be inspected for leaks regularly. Spill kits will be supplied at these stations and staff will be trained in their use and in spill control. Drainage from these areas will be diverted for collection and not discharged into waterbodies without treatment and other best management practices. ➤ Fuels, lubricants, and hydraulic fluids for equipment used, will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment. ➤ Vehicles will never be left unattended during refuelling. Only dedicated trained and competent personnel will carry out refuelling operations and plant refuelling procedures shall be detailed in the contractor's method statements. ➤ All site plant will be inspected at the beginning of each day prior to use. Defective plant shall not be used until the defect is satisfactorily fixed. All major repair and maintenance operations will take place off site. ➤ Spill control measures as outlined in Section 3.2 below will be adhered to. Dust Control Construction dust can be generated from many on-site activities such as excavation and backfilling. The extent of dust generation will depend on the type of activity undertaken, the location, the nature of the dust, i.e., soil, sand, etc and the weather. In addition, dust dispersion is influenced by external factors such as wind speed and direction and/or, periods of dry weather. Construction traffic movements also have the potential to generate dust as they travel along the approach road. The measures below will also prevent construction debris arising on the public road network. Proposed means to control dust include: ➤ Any site roads with the potential to give rise to dust will be regularly watered, as required, during dry and/or windy conditions. ➤ The designated public roads outside the site and along the main transport routes to the site will be regularly inspected by Site Management for cleanliness and cleaned as necessary. ➤ Material handling systems and material storage areas will be designed and laid out to minimise exposure to wind. ➤ Water misting or bowsers will operate on-site if required to mitigate dust in dry weather conditions. ➤ The transport of soils or other material, which has significant potential to generate dust, will be undertaken in tarpaulin-covered vehicles where necessary. ➤ All construction related traffic will have speed restrictions on un-surfaced roads to 15 kph. ➤ Daily inspection of construction sites to examine dust measures and their effectiveness.
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant effects are predicted.
Potential for Cumulative Effect	The proposed works will not result in any significant effects to water quality. It therefore cannot contribute to any significant cumulative effect in this regard.

6.3 Impacts During the Operational Phase

6.3.1 Impacts on Habitats

There will be no additional habitats loss associated with the operational phase of the proposed project. No direct or indirect impacts on adjacent habitats are considered likely as a result of the operational phase of the proposed project. The proposal therefore will not have a significant negative impact at any geographic scale and no mitigation is required.

6.3.2 Impacts on Fauna

The operational phase of the proposed works will be confined to the footprint of the project boundary. Local faunal species are likely to be habituated to anthropogenic activity in the area, given the development's close proximity to busy roads and residential housing. Given the absence of significant faunal species occurring within the proposal footprint, no significant direct or indirect impacts on fauna are considered likely as a result of the operational phase of the proposed works and no mitigation is required.

6.3.3 Impacts on Water Quality During the Operational Phase

The proposed works will result in the generation of additional surface water. However, due to the project design, described fully in **Section 2.2**, there is no potential for deterioration of water quality during the operational phase of the proposed works.

6.4 Impacts on Designated Sites

6.4.1 Impacts on European Sites

The EPA Guidance 2022 states:

“A biodiversity section of an EIAR, should not repeat the detailed assessment of potential effects on European sites contained in a Natura Impact Statement” but should “incorporate their key findings as available and appropriate”.

This section provides a summary of the key assessment findings with regard to Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

6.4.2 Impacts on European Designated Sites

Potential indirect impacts on European Designated sites (SACs and SPAs) are assessed within a separate Natura Impact Statement.

The potential for likely significant effects on the following European Sites in the absence of any mitigation, individually or cumulatively with other plans or projects, was identified in the NIS:

- The Twelve Bens/Garraun Complex SAC [002031]
- Slyne Head Peninsula SAC [002074]
- West Connacht Coast SAC [002998]
- Slyne Head Islands SAC [000328]

The NIS identified a potential pathway for impact on the Twelve Bens/Garraun Complex SAC, Slyne Head Peninsula SAC, West Connacht Coast SAC, and Slyne Head Islands SAC in the form of deterioration of water quality resulting from hydrological connectivity via the proposed works area, and these SACs.

An artificially canalised section of an unmapped EPA watercourse runs culverted under Main Street in Clifden Town Centre to the northeast parcel of the proposed works site (Grid Reference: ITM 465910, 750682)). This artificially canalised watercourse continues to flow adjacent to the eastern margin of the proposed works site, in a southerly direction before discharging into the Owenglin River after approx 280m, which at this point is designated as part of the Twelve Bens/ Garraun Complex SAC. The Owenglin River continues to flow to the southern margin of the site, outside of the proposed works boundary in a westerly direction before discharging into Clifden Bay Estuary. Further, the Clifden Stream, a tributary of the Owenglin River flows culverted through the western margin of Harbour Park, flowing in a southerly direction before discharging into Clifden Bay Estuary.

Therefore, the construction phase of the proposed works may result in pollution to surface and groundwaters, adversely impacting the aquatic or groundwater influenced QI/ SCI habitats and species within these SACs.

The proposed works will not contribute to any effect on the hydrological regime in the area or to any water pollution effects.

The NIS objectively concluded that that the proposed project, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site

The NIS states:

“This NIS has provided an assessment of all potential direct or indirect adverse effects on European Sites.

Where the potential for any adverse effect on any European Site has been identified, the pathway by which any such effect may occur has been robustly blocked through the use of avoidance, appropriate design and mitigation measures as set out within this report and its appendices. The measures ensure that the construction phase of the proposed works does not adversely affect the integrity of European sites.

Therefore, it can be objectively concluded that the Proposed Works, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site”.

6.4.3

Impacts on Nationally Designated Sites

Impacts on nationally designated sites including NHAs and pNHAs are considered in this section of the report. Where such sites are also designated as SACs or SPAs (European Sites) they have been assessed and considered under that designation. Where there are pathways for effect on Nationally designated sites that are not also designated as European Sites, a full ecological impact assessment is provided below.

Taking a precautionary approach, a potential pathway for indirect effects on Slyne Head Peninsula pNHA [002074] and Slyne Head Islands pNHA [000328] was identified in the form of deterioration of water quality resulting from potential hydrological connectivity via surface water, as described fully in **Table 4. 1.**

However, there is no potential for significant indirect effects on these pNHAs based on mitigation measures as outlined in the Construction and Environmental Management Plan (CEMP) submitted as part of this application, which are in place to protect these nationally designated sites from pollution arising from construction activities.

No potential pathways for impact on any pNHA have been identified, following the implementation of mitigation and best practice as described above.

No significant effects on nationally designated sites are anticipated.

7.

CUMULATIVE IMPACT ASSESSMENT

7.1

Other Projects

Assessment material for this in-combination impact assessment was compiled on the relevant developments within the vicinity of the Proposed Development and was verified on the 21/08/2024. The material was gathered through a search of relevant online Planning Registers, reviews of relevant documents, planning application details and planning drawings, and served to identify past and future projects, their activities, and their environmental impacts. All relevant projects were considered in relation to the potential for in-combination effects. All relevant data was reviewed (e.g., individual EISs/EIARs, layouts, drawings etc.) for all relevant projects where available. The projects considered include those listed below. These consisted mainly of small-scale domestic developments and upgrades.

- Planning reference 191101: Permission to (1) construct three detached holiday cottages on a revised site boundary (2) install pedestrian walkway from hotel to holiday cottages, (3) proposed connection to the public sewer as well as all ancillary site works. Gross floor space of proposed works: 111.00 sqm (x3).
- Planning reference 201174: Permission for a) demolition of an existing house, b) the construction on the new 2 storey house, c) new wastewater treatment system d) alterations to the existing site entrance and driveway and e) all associated site works. Gross floor space of proposed works: 233 sqm
- Planning reference 212264: Permission for a residential development which will consist of 28 no. two-storey detached residential units (7 no. 4-bed units, 18 no. 3-bed units, and 3 no. 2-bed units) (4572 sqm total finished floorspace), 56 no. car parking spaces, 4 no. bike racks and all other associated site development works and services, including an internal road and footpath network; ancillary surface water and foul drainage and connections; and appropriate landscaping and boundary treatments, required to facilitate the development
- Planning reference 181484: Permission for the construction of a new playing pitch and all associated site works and services.
- Planning reference 201722: Permission to construct a dwelling house with new site entrance and wastewater treatment system. Gross floor space of proposed works: 367 sqm
- Planning reference 201182: Permission for 1] a new vehicular & pedestrian entrance/exit from / to the R341, 2] New internal access road and parking, 3] a new running/walking track within the site, 4] formation of new landscaped training paddocks and all ancillary site works and services. This application is accompanied by a Natura Impact Statement.
- Planning reference 19246: Permission for 1) a four-megawatt solar farm with battery storage units 2) new perimeter security fencing and access within the site 3) upgrade existing access road and 4) works to facilitate the electricity connection from the solar farm to ESB substation as well as all ancillary site works. This planning application is accompanied by an NIS as required by article 239 of the Planning & Development Regulations 2001 (as amended). Gross floor space of proposed works: 201 sqm
- Planning reference 20942: Permission for development which consists of 270sqm, 3-bedroom single storey house and studio and for the installation of a new wastewater treatment system, associated percolation area and associated site works. Gross floor space of proposed works; 270sqm
- Planning reference 19980: Permission for construction of one and half storey dwelling house (184m²) with attached single storey carport (43m²), new separate single storey garage/gym (64m²), and new effluent treatment system with polishing filter area, new access road, and all ancillary services and landscaping works. Gross floor space of proposed works: 290 sqm (House - 184 sqm, Carport - 43 sqm, Garage - 63 sqm)
- Planning reference 211205: Permission for development consisting of a single storey extension to the west of the school comprising 578sqm of class room facilities for Special Education Needs, a glazed link connecting the school to existing vehicle access to the school as well as access from the school to the school yard, and existing ball courts and sports hall, minor

alterations to the existing GP hall to provide new fire escape door sets and associated site works including the building contractor's temporary access to the works from the North of the site. Gross floor space of proposed works 578 sqm.

- Planning Ref: 191184: Permission for the alterations, extension of the existing dwelling to provide a four bedroom dwelling, comprising a new single storey extension to the West and South East, new porch to North, demolition of existing roof and dormer floor, internal walls and some external walls, alteration of existing walls for new roof, new ground floor internal layout, removal of existing septic tank, replacement with new waste water treatment system and percolation area, along with improvements to existing site entrance, access road and all associated site works, new garage (gross floor space garage 41 sqm/extensions 171 sqm). Previous Planning Ref: 14/548.
- Planning Reference: 221198: for development consisting of modifications to the ground floor layout and shop facade and will include for: (a) single-storey extension to front of the existing store to provide a DRS facility to allow customers to return plastic beverage bottles to a reverse vending machine in store, (b) the removal of the existing entrance/exit pod, (c) the removal of the existing trolley bay, (d) proposed free-standing trolley bay. (e) proposed alteration works to store elevation. (f) alteration works to car park area. (g) all ancillary works required to complete to the required Building Regulations standards. Gross floor space of proposed works: 1579.06sqm.
- Planning Ref: 2460018: for the development consisting of the demolition of non-protected existing buildings and glazed porch and construction of an extension to and refurbishment of existing Protected Structure to create a 40-bed Residential Care Centre with gross floor area of 4,337m² on a site of 1.46Ha, consisting of: (1) two-storey courtyard building, rectangular in plan, containing 38 single bedrooms with ensuite and one twin room with ensuite, along with support accommodation: sitting and activity rooms, day spaces, sanitary accommodation, pantries, stores, stairs and lifts, roof top plant and roof mounted solar photovoltaic panels; (2) two-storey support wing containing production kitchen, staff changing, family accommodation, stair and lift, plant rooms, screened roof plant areas, and roof mounted solar photovoltaic panels; (3) two-storey glazed links containing corridors, entrance lobby, and reception; (4) reconfiguration of the Protected Structure to provide administrative areas, staff changing, resident support areas, and Day Hospital containing day room, reflection room, hairdressing, physiotherapy areas, clinic rooms, and associated support areas; (5) external works in the form of improved existing site entrances, new landscaped gardens, screened plant areas, electrical substation, liquefied petroleum gas tanks, 37 car parking spaces, bicycle parking, new internal roads and paths, new foul and surface water drainage installations, including SUDS measures, and flood mitigation measures incorporating the diversion of existing culvert to new watercourse with flood retention basins. The application includes a Natura Impact Statement (NIS). Gross floor space of proposed works: 3200 sqm. Gross floor space of any demolition: 149 sqm.
- Planning Ref: 211205: development consists of a single storey extension to the west of the school comprising 578sqm of class room facilities for Special Education Needs, a glazed link connecting the school to existing vehicle access to the school as well as access from the school to the school yard, and existing ball courts and sports hall, minor alterations to the existing GP hall to provide new fire escape door sets and associated site works including the building contractor's temporary access to the works from the North of the site. Gross floor space of proposed works 578 sqm.
- Planning Ref: 181484: Permission or the construction of a new playing pitch and all associated site works and services.
- Planning Ref: 161627: Permission for the construction of a new harbour side public amenity park for the town of Clifden incorporating the following : (1) a new off road public park (2) the demolition of part of the existing ball alley structure (3) the demolition of the roadside wall of the ball alley to within 0.9metres of existing ground level and retaining the remainder as a roadside wall (4) two new bocchia/bowling courts (5) two new hand ball/ball wall courts (6) new out-door gym and recreation equipment (7) a new skate park (8) new public pathways and associated public lighting, viewing areas (9) a new teen zone recreational area (10) a new extension of existing playground (11) filling and draining of existing lands to create raised

open parkland (12) the provision of new amenity woodland and associated walkway. And all associated landscaping and site development works to facilitate the above (gross floor space ball alley 260sqm) (Previous Planning Ref. No. 12/146.).

- Planning Ref: 2460815: Permission for the demolition of an existing modern extension to the rear of the dwelling, comprising of a dining & sun room, the construction of a new extension, comprising of an open-plan kitchen-dining-living space and new pantry, the making of a new opening between the existing hall and proposed extension, incorporating full height glazing to east and west façade and a low pitch zinc roof with central rooflight, external works include relocating the soil vent pipe which connects to the existing septic tank and allowance for new soakpit to take water run-off from the new extension and sundry other minor works. Gross floor space of proposed works: 67.53 sqm. Gross floor space of any demolition: 31.49 sqm.
-

7.2

Plans

The following plans have been reviewed and taken into consideration as part of this assessment:

- > Galway County Development Plan 2022 - 2028
- > Clifden Local Area Plan 2018 – 2024
- > Ireland's 4th National Biodiversity Action Plan 2023-2030
- > Northern and Western Regional Assembly – Regional Spatial and Economic Strategy 2020 - 2032

The review focused on policies and objectives that relate to Natura 2000 sites and natural heritage. Policies and objectives relating to sustainable land use were also reviewed.

Table 7-1 Review of Relevant Plans and Policies

Land Use and Spatial Plans	Key Policies/Issues/Objectives Directly Related to European Sites in The Zone of Influence	Assessment of Potential Impact on European Sites
Galway County Council Development Plan 2022- 2028		
Objective NHB 1 Natural Heritage and Biodiversity of Designated Sites, Habitats and Species Protect and where possible enhance the natural heritage sites designated under EU Legislation and National Legislation (Habitats Directive, Birds Directive, European Communities (Birds and Natural Habitats) Regulations 2011 and Wildlife Acts) and extend to any additions or alterations to sites that may occur during the lifetime of this plan. Protect and, where possible, enhance the plant and animal species and their habitats that have been identified under European legislation (Habitats and Birds Directive) and protected under national Legislation (European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011), Wildlife Acts 1976-2010 and the Flora Protection Order (SI 94 of 1999). Support the protection, conservation and enhancement of natural heritage and biodiversity, including the protection of the integrity of European sites, that form part of the Natura 2000 network, the protection of Natural Heritage Areas, proposed Natural Heritage Areas, Ramsar Sites, Nature Reserves, Wild Fowl Sanctuaries (and other designated sites including any future designations) and the promotion of the development of a green/ ecological network. Objective NHB 2 European Sites and Appropriate Assessment To implement Article 6 of the Habitats Directive and to ensure that Appropriate Assessment is carried out in relation to works, plans and projects likely to impact on European sites (SACs and SPAs), whether directly or indirectly or in combination with any other plan(s) or project(s). All assessments must be in compliance with the European Communities (Birds and Natural Habitats) Regulations 2011. All such projects and plans will also be required to comply with statutory Environmental Impact Assessment requirements where relevant. Objective NHB3 Protection of European Sites No plans, programmes, or projects etc. giving rise to significant cumulative, direct, indirect or secondary impacts on European sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this Plan (either individually or in combination with other plans, programmes, etc. or projects.*		The plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the Natura 2000 network and other natural heritage interests. No potential for cumulative impacts when considered in conjunction with the current proposal were identified. There will be no impact on designated sites or biodiversity as a result of the proposed works. Best practice measures as described in the CEMP, and the project design as described in Section 2.2 will be implemented to avoid effects on Biodiversity. There will be no adverse effects on KERs identified in Section 5.1.4 of this report as a result of the proposed works.
Clifden Local Area Plan (LAP) 2018-2024		
<u>Natural Heritage and Biodiversity Policies:</u> Policy NH 1 – Natural Heritage, Landscape and Environment		The plan was comprehensively reviewed, with particular reference to Policies and Objectives that

Land Use and Spatial Plans	Key Policies/Issues/Objectives Directly Related to European Sites in The Zone of Influence	Assessment of Potential Impact on European Sites
It is the policy of Galway County Council, to support the conservation and enhancement of natural heritage and biodiversity, including the protection of the integrity of European Sites , the protection of Natural Heritage Areas and proposed Natural Heritage Areas and the promotion of the development of a green/ecological network within the plan area, in order to support ecological functioning and connectivity, create opportunities in suitable locations for active and passive recreation and to structure and provide visual relief from the built environment. The protection of natural heritage and biodiversity, including European Sites, will be implemented in accordance with relevant EU environmental directives and applicable national legislation, policies, plans and guidelines, including the following (and any updated/superseding documents): EU Directives, including the Habitats Directive (92/43/EEC), the Birds Directive (2009/147/EC codified version of Directive), the Environmental Impact Assessment Directive (2011/92/EU, as amended by (2014/52/EU), the Water Framework Directive (2000/60/EC) and the Strategic Environmental Assessment Directive (2001/42/EC); the Environmental Liability Directive 2004/35/EC; National legislation, including the Wildlife Act 1976, the European Communities (Environmental Impact Assessment) Regulations 1989 (SI No. 349 of 1989) (as amended), the Wildlife (Amendment) Act 2000, the European Union (Water Policy) Regulations 2003 (as amended), the Planning and Development (Amendment) Act 2010 and the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) and the Regulation of the European Parliament and of the Council on the Prevention and Management of the Introduction and Spread of Invasive Non-Native Species [2013/0307 (COD)] (adopted by European Council coming into effect January 2015) National policy guidelines, including the Landscape and Landscape Assessment Draft Guidelines 2000, the Environmental Impact Assessment Sub-Threshold Development Guidelines 2003, Strategic Environmental Assessment Guidelines 2004, and the Appropriate Assessment Guidelines 2010. <u>Objective NH 1 – European Sites</u> Protect European sites that form part of the European Sites network (including Special Protection Areas and Special Areas of Conservation) in accordance with the requirements in the EU Habitats Directive (92/43/EEC), EU Birds Directive (2009/147/EC), the Planning and Development (Amendment) Act 2010, the European Communities (Birds and Natural Habitats) Regulations 2011 (SI No. 477 of 2011) (and any subsequent amendments or updated legislation) and having due regard to the guidance in the Appropriate Assessment Guidelines 2010 (and any updated/superseding guidance). A plan or project (e.g., proposed development) within the plan area will only be authorised after the competent authority (Galway County Council) has ascertained, based on scientific evidence and 62 62 a Habitats Directive Assessment where necessary, that: The plan or project will not give rise to significant adverse direct, indirect or secondary impacts on the integrity of any European Sites (either individually or in combination with other plans or projects); or	relate to the Natura 2000 network and other natural heritage interests. No potential for cumulative impacts when considered in conjunction with the current proposal were identified. There will be no impact on designated sites or biodiversity as a result of the proposed works. Best practice measures as described in the CEMP, and the project design as described in Section 2.2 will be implemented to avoid effects on Biodiversity. There will be no adverse effects on KERs identified in Section 5.1.4 of this report as a result of the proposed works.	

Land Use and Spatial Plans	Key Policies/Issues/Objectives Directly Related to European Sites in The Zone of Influence	Assessment of Potential Impact on European Sites
	The plan or project will adversely affect the integrity of any European Sites site (that does not host a priority natural habitat type and/or a priority species) but there are no alternative solutions, and the plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of European Sites; or The plan or project will adversely affect the integrity of any European Sites site (that hosts a priority natural habitat type and/or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons of overriding public interest, restricted to reasons of human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of European Sites. <u>Objective NH 2 – Protected Habitats and Species</u> Support the protection of protected habitats and species listed in the annexes to the EU Habitats Directive 1992 (92/43/EEC) and the Birds Directive (2009/147/EC) and regularly occurring-migratory birds and their habitats, species protected under the Wildlife Acts and the Flora Protection Order. This includes the protection of the barn owl, otters, salmon, brook lamprey, bats and their roosts and the maintenance of woodland, hedgerows, tree lines, waterways and ecological networks and corridors which serve as feeding areas, flight paths and community routes for bats. <u>Objective NH 3 – Natural Heritage Areas and Proposed Natural Heritage Areas</u> Protect Natural Heritage Areas and proposed Natural Heritage Areas in accordance with the requirements of the Wildlife Act 1976, the Wildlife (Amendment) Act 2000 and the Planning and Development Act 2000 (as amended). Where a proposed development within the plan area may give rise to likely significant effects on any Natural Heritage Area or proposed Natural Heritage Area an Ecological Impact Assessment or an Environmental Impact Assessment, as appropriate, may be required. <u>Objective NH 4 – Impact Assessments</u> Ensure full compliance with the requirements of the EU Habitats Directive (92/43/EEC), SEA Directive (2001/42/EC) and EIA Directives including 2011/92/EU & 2014/52/EU and associated legislation/regulations, including the associated European Communities (Birds and Natural Habitats) Regulations 2011 (SI No. 477 of 2011), European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004-2011, Planning and Development (Strategic Environmental Assessment) Regulations 2004-2011 and the European Communities (Environmental Impact Assessment) Regulations 1989-2011 & European Union (Environmental Impact Assessment) Planning and Regulations 2014 (or any updated/superseding legislation).	

Land Use and Spatial Plans	Key Policies/Issues/Objectives Directly Related to European Sites in The Zone of Influence	Assessment of Potential Impact on European Sites
<u>Objective NH 5 – Biodiversity & Ecological Networks</u> Support the protection of biodiversity and ecological connectivity within the plan area including woodlands, trees, hedgerows, roadside verge vegetation, rivers, streams, natural springs, wetlands, stonewalls, fens, geological and geo-morphological systems, other landscape features and associated wildlife, where these form part of the 63 63 ecological networks. Seek to retain and incorporate these natural features into developments, in order to avoid ecological fragmentation and maintain ecological corridors or stepping stones in the context of Article 10 of the Habitats Directive: b) Protect and enhance the water quality and ecology of the Owenglin River & Shoreline, in the plan area and their function of as ecological corridors, by maintaining the existing banks and channel and ensuring that new developments are generally set back at least 10m as measured from the near riverbank (this distance may be increased and decreased on a site-by-site basis, as appropriate). d) Seek to prevent inappropriate shoreline development which would negatively impact on the ecological quality and biodiversity of the coastal waters. Objective NH 6 – Water Resources Protect all water resources in the plan area, including sea waters, rivers, streams, springs, wetlands, surface waters and groundwater quality, in accordance with the requirements and guidance in the EU Water Framework Directive 2000 (2000/60/EC), the European Union (Water Policy) Regulations 2003 (as amended), the National River Basin Management Plan and other relevant EU Directives, including associated national legislation and policy guidance (including any superseding versions of same). <u>Objective NH 11 – Control of Invasive and Alien Species</u> Seek to prevent the spread of invasive and alien invasive species and require a landscaping plan to be produced for developments near water bodies and ensure that such plans do not include invasive species. <u>Control of Invasive Species Development Management Guideline</u> <u>DM Guideline NH 1</u> – Control of Invasive Species & Bio-Security Measures Ensure larger developments include the relevant documentation with their planning application to demonstrate the bio-security measures proposed to ensure that invasive species will not be introduced and/or spread within the development site.		
Northern and Western Regional Assembly - Regional Spatial and Economic Strategy 2020-2032		
Regional Policy Objectives		The plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the Natura 2000 network and other natural heritage interests. No potential for cumulative impacts

Land Use and Spatial Plans	Key Policies/Issues/Objectives Directly Related to European Sites in The Zone of Influence	Assessment of Potential Impact on European Sites
79. Encourage the prioritization of Site Specific Conservation Objectives for all sites of Conservation Value, designated in EU Directive (i.e. SACs, SPAs) to integrate with the development objectives of this strategy. 80. Ensure efficient and sustainable use of all our natural resources, including inland waterways, peatlands, and forests in a manner which ensures a healthy society a clean environment and there is no net contribution to biodiversity loss arising from development supported in this strategy. 81. Conserve and protect designated areas and natural heritage areas. Conserve and protect European sites and their integrity. 83. Ensure that all plans, projects and activities requiring consent arising from the RSES are subject to the relevant environmental assessment requirements including SEA, EIA and AA as appropriate.		when considered in conjunction with the current proposal were identified. There will be no impact on designated sites or biodiversity as a result of the proposed works. Best practice measures as described in the CEMP, and the project design as described in Section 2.2 will be implemented to avoid effects on Biodiversity. There will be no adverse effects on KERs identified in Section 5.1.4 of this report as a result of the proposed works.
Ireland's 4th National Biodiversity Action Plan 2023-2030		
Objective 1: Adopt a Whole-of Government, Whole of-Society Approach to Biodiversity. Proposed actions include capacity and resource reviews across Government; determining responsibilities for the expanding biodiversity agenda providing support for communities, citizen scientists and business; and mechanisms for the governance and review of this National Biodiversity Action Plan. Objective 2: Meet Urgent Conservation and Restoration Needs. Supporting actions will build on existing conservation measures. Efforts to tackle Invasive Alien Species will be elevated. The protected area network will be expanded to include the Marine Protected Areas. The ambition of the EU Biodiversity Strategy will be considered as part of an evolving work programme across Government. Objective 3: Secure Nature's Contribution to People. Actions highlight the relationship between nature and people in Ireland. These include recognising the tangible and intangible values of biodiversity, promoting nature's importance to our culture and heritage, and recognising how biodiversity supports our society and our economy. Objective 4: Enhance the Evidence Base for Action on Biodiversity. This objective focuses on biodiversity research needs, as well as the development and strengthening of long-term monitoring programmes that will underpin and strengthen future decision-making. Action will also focus on collaboration to advance ecosystem accounting that will contribute towards natural capital accounts.		The plan was comprehensively reviewed, with particular reference to Policies and Objectives that relate to the Natura 2000 network and other natural heritage interests. No potential for cumulative impacts when considered in conjunction with the current proposal were identified. There will be no impact on designated sites or biodiversity as a result of the proposed works. Best practice measures as described in the CEMP, and the project design as described in Section 2.2 will be implemented to avoid effects on Biodiversity. There will be no adverse effects on KERs identified in Section 5.1.4 of this report as a result of the proposed works.

Land Use and Spatial Plans	Key Policies/Issues/Objectives Directly Related to European Sites in The Zone of Influence	Assessment of Potential Impact on European Sites
Objective 5: Strengthen Ireland's Contribution to International Biodiversity Initiatives. Collaboration with other countries and across the island of Ireland will play a key role in the realisation of this Objective. Ireland will strengthen its contribution to international biodiversity initiatives and international governance processes, such as the United Nations Convention on Biological Diversity		

7.3.1

Conclusion of Cumulative Assessment

In the review of the projects that was undertaken, no connection, that could potentially result in additional or cumulative impacts was identified. Neither was any potential for different (new) impacts resulting from the combination of the various projects and plans in association with the proposed works.

Taking into consideration the reported residual impacts from other plans and projects in the area and the predicted impacts with the current proposal, no residual cumulative impacts have been identified.



8.

CONCLUSION

A comprehensive assessment of the potential significant effects on biodiversity has been undertaken. Mitigation has been prescribed where necessary and the residual effects have been assessed. Following the implementation of best practice and mitigation, there will be no significant impacts on biodiversity.

The potential residual impacts on ecological receptors will not be significant and no potential for the proposed works to contribute to any cumulative impacts on biodiversity when considered in-combination with other plans and projects was identified.

In conclusion, provided that the proposed works are constructed and operated in accordance with the design described within this application, there will be no significant effects on biodiversity at any geographic scale.

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APPENDIX 1

INVASIVE SPECIES MANAGEMENT PLAN (ISMP).

Invasive Species Management Plan

Clifden Town Centre Public
Realm Enhancement
Project





DOCUMENT DETAILS

Client: **Galway County Council**

Project Title: **Clifden Town Centre Public Realm Enhancement Project**

Project Number: **210327**

Document Title: **Invasive Species Management Plan**

Document File Name: **ISMP F1- 210327- 24.10.2024**

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Table of Contents

1.	INTRODUCTION.....	1
1.1	Statement of Authority.....	1
1.2	General Introduction.....	1
1.3	Objectives.....	2
1.4	Proposed Works	2
1.5	Background	3
1.5.1	Legislative Framework.....	3
1.5.2	Guidance Documents	3
2.	METHODOLOGY	5
2.1	Desk Based Assessment	5
2.1.1	Desk Study Results.....	5
2.1.1.1	Ecology of Giant Rhubarb.....	6
2.1.1.2	Ecology of Japanese Knotweed.....	6
2.2	Field Survey	9
3.	RESULTS	10
3.1	Third Schedule invasive Species.....	10
3.2	Other Non-native Invasive Species	10
4.	PROPOSED INVASIVE SPECIES MANAGEMENT	27
4.1	Site Set up and Associated Measures	27
4.2	Management of Giant Rhubarb (<i>Gunnera tinctoria</i>).....	28
4.2.1	Treatment of Giant rhubarb in Harbour Park	28
4.2.1.1	Chemical Treatment Options.....	28
4.2.2	Treatment of Giant rhubarb in Clifden Town.....	29
4.2.2.2	Disposal Options for Treated Plant Materials	29
4.3	Management of Japanese Knotweed (<i>Fallopia japonica</i>).....	31
4.3.1	Treatment of Japanese knotweed in Harbour Park.....	31
4.3.1.1	Manual/ Mechanical Removal	31
4.3.1.2	Chemical Treatment Options.....	31
4.3.1.3	Disposal Options for Treated Plant Material:.....	32
4.4	Post Treatment Monitoring.....	34
	BIBLIOGRAPHY.....	35

TABLE OF PLATES

<i>Plate 3-1 Large stands of Giant rhubarb (Gunnera tinctoria) to the eastern margin of Harbour Park, within the proposed works boundary.....</i>	<i>21</i>
<i>Plate 3-2 Giant rhubarb (Gunnera tinctoria) growing on wall along Beach Road/Seaview, within the proposed works boundary.....</i>	<i>21</i>
<i>Plate 3-3 Large, well-established area of Giant rhubarb (Gunnera tinctoria) the southern margin of Harbour Park, within the proposed works boundary.....</i>	<i>22</i>
<i>Plate 3-4 Large individual stands of Giant rhubarb (Gunnera tinctoria) along the unmapped EPA watercourse that flows through Clifden town, outside of the proposed works boundary to the east.</i>	<i>22</i>
<i>Plate 3-5 Japanese Knotweed (Fallopia japonica) stand recorded to the southeast margin of Harbour Park, within the proposed works boundary.....</i>	<i>23</i>
<i>Plate 3-6 Japanese Knotweed (Fallopia japonica) area recorded to the eastern margin of Harbour Park, outside of the proposed works area in the lands adjacent.....</i>	<i>23</i>

Plate 3-7 Rhododendron (<i>Rhododendron ponticum</i>) plant recorded along Beach Road, within the proposed works boundary.....	24
Plate 3-8 Himalayan Balsam (<i>Impatiens glandulifera</i>) plant recorded along the banks of the unmapped EPA watercourse that flows through Clifden Town centre, outside of the proposed works boundary to the east.....	24
Plate 3-9 A large, well-established area of Butterfly Bush (<i>Buddleja davidii</i>) recorded the unmapped EPA watercourse that flows through Clifden Town, outside of the proposed works boundary to the east.	25
Plate 3-10 Butterfly Bush (<i>Buddleja davidii</i>) recorded to the northeast margin of Harbour Park, within the proposed works boundary.....	25
Plate 3-11 A singular plant of Wall Cotoneaster (<i>Cotoneaster horizontalis</i>), a medium impact non-native invasive species of potential concern that is not listed on the Third Schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) recorded on Doonen Road, outside of the proposed works boundary to the south.....	26
Plate 3-12 Montbretia (<i>Crocasmia x crocosmiiflora</i>) a low impact, non-native invasive species of potential concern that is not listed on the Third Schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) recorded to the northern margin of Harbour Park, within the proposed works boundary.	26

TABLE OF FIGURES

Figure 1-1 Site Location.....	4
Figure 2-1 European Designated Sites Within the Likely Zone of Influence.....	7
Figure 2-2 Location of the Twelve Bens/Garraun Complex SAC in relation to the proposed works site.	8
Figure 3-1 Invasive Species- Giant Rhubarb (<i>Gunnera tinctoria</i>) Extent.....	12
Figure 3-2 Invasive species- Japanese knotweed (<i>Fallopia japonica</i>) Extent.....	13
Figure 3-3 Invasive Species- Rhododendron (<i>Rhododendron ponticum</i>) Extent.....	14
Figure 3-4 Invasive species- Himalayan Balsam (<i>Impatiens glandulifera</i>) Extent.....	15
Figure 3-5 Invasive Species- Butterfly Bush (<i>Buddleja davidii</i>) Extent.....	16
Figure 3-6 Invasive Species- Wall Cotoneaster (<i>Cotoneaster horizontalis</i>) Extent.....	17
Figure 3-7 Invasive Species- Montbretia (<i>Crocasmia x crocosmiiflora</i>) Extent.....	18
Figure 3-8 Overview of Invasive Species Within the Proposed Works Boundary, and Lands Adjacent to the Proposed Works Boundary.....	19
Figure 3-9 Overview of Invasive Species Recorded Within Harbour Park.....	20

TABLE OF TABLES

Table 4-1 Chemical Treatment Options for Gunnera.....	28
Table 4-2 Mechanical/Manual Treatment Options for Giant Rhubarb.....	29
Table 4-3 Chemical Control Options for Japanese Knotweed.....	31

1. INTRODUCTION

1.1 Statement of Authority

An initial Invasive Species Survey was undertaken by Inga Reich (Honours degree in Biology, Ph.D. in Applied Ecology) on the 26th of November 2021. A follow up Invasive Species Survey was undertaken on the 20th of September 2023 by Rachel Minogue (BSc., Env) and Timothy O’Ceallaigh (BSc., Env) of MKO. This report has been prepared by Rachel Minogue (BSc., Env). RM is an ecologist with MKO with relevant academic qualifications in Environmental Science. This report has been reviewed by Colin Murphy (B.Sc., MSc). Colin is an experienced project ecologist with over 3 years’ professional consultancy experience.

1.2 General Introduction

MKO were commissioned to undertake a targeted invasive species survey on behalf of Galway County Council (GCC) of the area proposed to be enhanced under the Clifden Town Centre Public Realm Enhancement Project in Clifden, Co. Galway (ITM Grid Ref. of approximate centre: X465879, Y750621). The extent of the proposed public enhancement works extends to three sites in Clifden, including the Town Centre, Harbour Park, and Beach Road. To the south of the proposed works area is the Clifden Bay, and the Owenglin River which is designated as part of the Twelve Bens/ Garraun Complex SAC. To the east and north of the proposed works site is existing public buildings and residential dwellings. To the west of the site is large open areas of bog/ woodland/ scrub habitats.

The site can be accessed from the north and east via the **N59**, and from the west via the **L1104** Sky Road.

The location of the proposed works site is shown on **Figure 1.1** below.

This document has been prepared with reference to current legislation and best practice guidelines in the identification, treatment, and management of invasive alien species listed on the ‘Third Schedule’ of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) and of invasive alien species of potential concern which are not listed on the Third Schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011).

During the invasive species surveys that were undertaken by MKO in 2021 and 2023, four invasive species listed under the ‘Third Schedule’ of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) were recorded. Giant rhubarb (*Gunnera tinctoria*) and Japanese knotweed (*Fallopia japonica*) were recorded within the proposed works boundary. Rhododendron (*Rhododendron ponticum*) and Himalayan Balsam (*Impatiens glandulifera*) were recorded within the lands adjacent, outside of the proposed works boundary. Other non-native invasive species, not listed on the Third Schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) recorded include Butterfly Bush (*Buddleja davidii*), Wall Cotoneaster (*Cotoneaster horizontalis*), and Montbretia (*Crocsmia x crocosmiiflora*).

1.3

Objectives

The objectives of this report are summarised below:

- Undertake targeted surveys for invasive species within and adjacent to the proposed site boundary as shown in **Figure 1.1**.
- Record locations of third schedule invasive species, if present, and other relevant details using a hand-held GPS (Global Positioning Satellite) device.
- Produce maps of any invasive species records.
- Report on findings of field surveys; and
- Provide general best practice guideline measures and a specific management plan for the treatment of invasive species listed on the 'Third Schedule' of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011)).

1.4

Proposed Works

Galway County Council are seeking approval from An Bord Pleanála for the proposed development of a public realm scheme in Clifden, Co. Galway.

- i. Alterations works to the Clifden Town Centre area on Seaview Road, Main Street, Market Street, Market Hill, Bridgewell Lane, Bridge Street, and Hulk Street comprising:
 - a. The reconfiguration and resurfacing of roads and realignment of parking spaces including removal of 58 no. on-street parking spaces leaving a total of 155 no. on street parking spaces,
 - b. The widening and realignment of existing footpath areas, including the provision of new soft and hard landscaping,
 - c. The installation of new and upgraded public lighting throughout the town,
 - d. Relocation of The Beacon Statue
- ii. Alterations to and resurfacing of Beach Road Quay public realm comprising:
 - a. The provision of pedestrian and seating areas on the quay side of Beach Road quay, including the installation of 6 no. seating areas, and ancillary paving and landscaping,
 - b. Remedial works to the quay wall (NIAH reg no. 30325017), including the resetting of dislodged stones, the removal of vegetation, and remedial masonry works,
 - c. The replacement of existing railings along the quay wall,
 - d. The installation of public lighting along the roadside,
- iii. Redevelopment of the Harbour Park area south of Beach Road and to the west of Clifden town centre.
 - a. The demolition of the existing playground on site, and the construction of a new park including multi-age playground areas, including the provision of:
 - i. Cycle Parking,
 - ii. Timber Play Furniture,
 - iii. Picnic benches and seating areas,
 - iv. An Amphitheatre Performance Spaces,
 - v. Climbing Wall
 - vi. Pump track,
 - vii. Running Track,
 - viii. Car Park,
 - ix. Sports pitch,
 - x. Resurfacing, paving and hard & soft landscaping of the park area,
- iv. All other associated and ancillary works

1.5 Background

1.5.1 Legislative Framework

Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) include legislative measures to deal with the dispersal and introduction of invasive alien species:

Regulation 49

‘a person shall be guilty of an offence if they: plant; disperse; allow or cause to disperse; spread or cause to grow the plant in the Republic of Ireland’.

Regulation 50

‘An offence to or intend to; import; buy; sell; breed; reproduce or propagate; offer or expose for sale; advertise; publish a price list; transport; and distribute any plant species or vector material listed in the Third Schedule’.

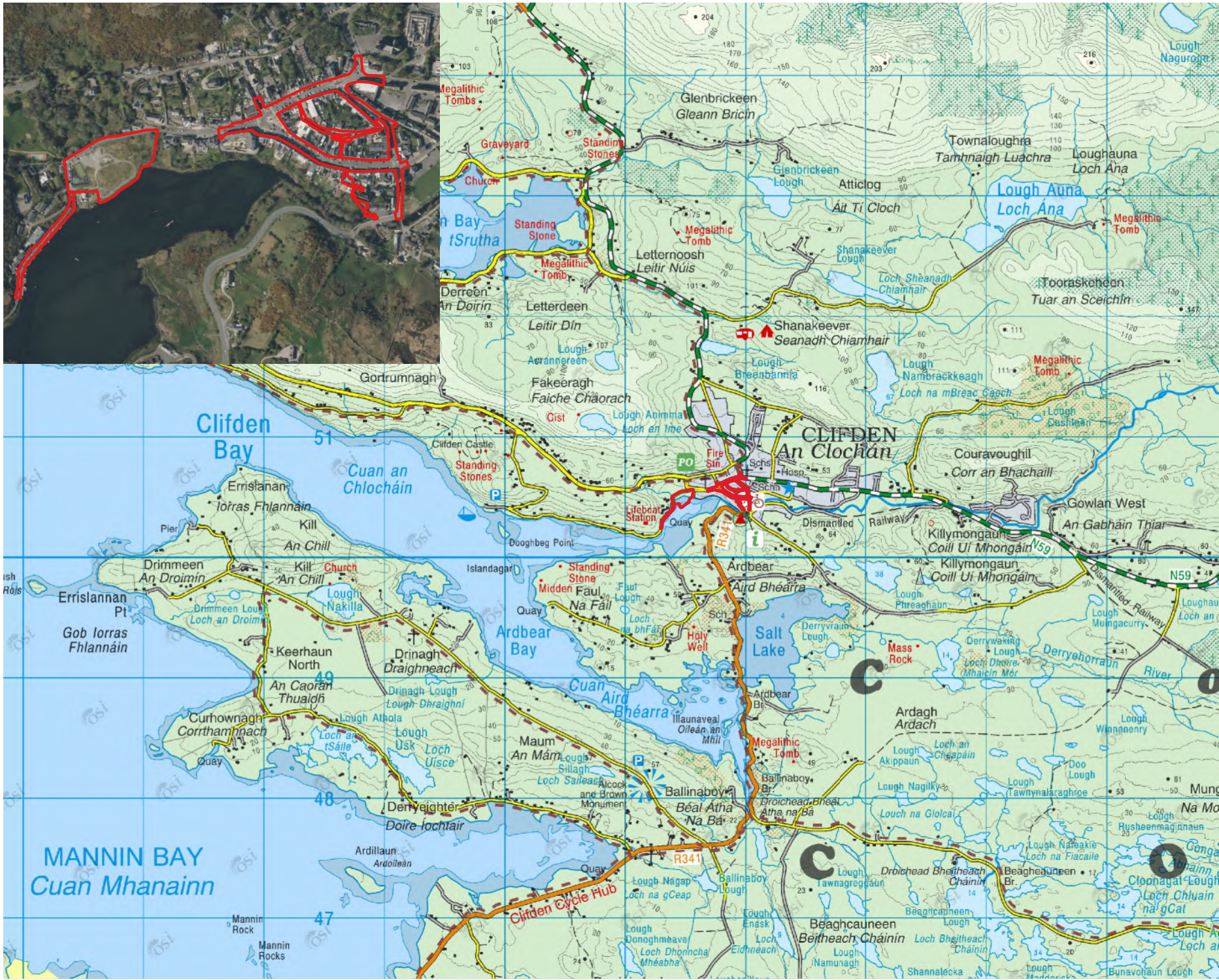
Non-native species subject to restrictions under Regulations 49 and 50 are included in the ‘Third Schedule’ of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011). Invasive species included in this list include Japanese knotweed, Himalayan knotweed, Bohemian knotweed, giant knotweed, giant hogweed, giant rhubarb, Himalayan balsam, and rhododendron. Vector materials which aid in the spread of these species include soil or spoil taken from places infested with Japanese knotweed (*Fallopia japonica*), giant knotweed (*Fallopia sachalinensis*) or their hybrid Bohemian knotweed (*Fallopia x bohemica*). Two vector materials are referred to in the regulations (Third Schedule Part 3), one is blue mussel seed and the second is:

“Soil or spoil taken from places infested with Japanese knotweed, Giant knotweed, or their hybrid Bohemian knotweed”.

1.5.2 Guidance Documents

The following guidance documents and literature sources were consulted during the preparation of this report:

- Irish Water (2016) Information and Guidance Document on Japanese Knotweed Asset Strategy and Sustainability. Irish Water.
- TII (2020) The Management of Invasive Alien Plant Species on National Roads – Technical Guidance
- NRA (2010). Guidelines on management of noxious weeds and non-native invasive plant species on national roads. National Roads Authority.
- Crushell, P., Foss, P., Hurley, C. & O’Loughlin, B. (2011). County Kerry Invasive Species Survey 2011 - Pilot Mapping Study of the River Lee Catchment, Tralee. Report prepared for Kerry County Council and The Heritage Council.
- Stokes et al. (2004). Stokes, K., O’Neill, K. & McDonald, R.A. (2004) Invasive species in Ireland. Unpublished report.
- Ireland’s 3rd National Biodiversity Action Plan (2017), National Action Biodiversity Plan 2017-2021.
- Department of Environment (2013). An Invasive Alien Species Strategy for Northern Ireland. www.doeni.gov.uk/topics/biodiversity/invasive-non-native-species-inns
- People and Nature - The Galway County Biodiversity Project
<https://biodiversity.galwaycommunityheritage.org/content/invasive-species/gunnera>



Map Legend

Site boundary



Drawing Title

Site Location

Project Title

Clifden Town Public Realm Enhancement

Drawn By

RM

Project No.

210327

Scale

1:41,034

Checked By

CM

Drawing No.

Figure 1.1

Date

16/08/2024



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2. METHODOLOGY

2.1 Desk Based Assessment

Initially the most up to date GIS spatial datasets for European designated sites and water catchments were downloaded from the NPWS website (www.npws.ie) and the EPA website (www.epa.ie) on the 19/09/2023. The datasets were utilized to identify European Sites which could feasibly be affected by the proposed development.

All European Sites that could potentially be affected were identified using a source-pathway - receptor model. To provide context for the assessment, European Sites surrounding the works site are shown in **Figure 2.1 below**. The location of the proposed works in relation to the Twelve Bens/ Garraun Complex SAC is shown in **Figure 2.2**. Sites that were further away from the proposed works were also considered.

The catchment mapping was used to establish or discount potential hydrological connectivity between the site of the proposed development and any European Sites. The hydrological catchments are also shown in **Figure 2.1**.

In relation to Special Protection Areas, in the absence of any specific European or Irish guidance in relation to such sites, the Scottish Natural Heritage (SNH) Guidance, 'Assessing Connectivity with Special Protection Areas (SPA)' (2016) was consulted. This document provides guidance in relation to the identification of connectivity between proposed development and Special Protection Areas. The guidance takes into consideration the distances species may travel beyond the boundary of their SPAs and provides information on dispersal and foraging ranges of bird species which are frequently encountered when considering plans and projects.

2.1.1 Desk Study Results

All European Designated Sites and hydrological sub catchments surrounding the development site identified **are shown on Figure 2.1**. In addition, the potential for hydrological connectivity with European Sites and the proposed works were also considered in this initial assessment.

The regional road- R341 within the proposed works boundary extends into the boundary of the Twelve Bens/ Garraun Complex SAC to the south, crossing over the Owenglin River which at this point is designated as part of this SAC. Further, the West Connacht Coast SAC is located approx 4.8km west of Harbour Park and Beach Road, and Slyne Head Peninsula SAC is located approx 5.1km southwest of Harbour Park and Beach Road, both located downstream of the proposed works site, **as shown on Figure 2.1**. The location of the proposed works in relation to the Twelve Bens/ Garraun Complex SAC is shown in **Figure 2.2**

The proposed works area has potential hydrological connectivity via an unmapped EPA watercourse that flows through Clifden Town to the eastern parcel of the site, into the Owenglin River which at this point is designated as part of the SAC. Further, a tributary of the Owenglin River flows through the western boundary of Harbour Park, into Clifden Bay, which has downstream hydrological connectivity with the West Connacht Coast SAC and Slyne Head Peninsula SAC. As such, the proposed works may indirectly impact the aquatic QI habitats and species for which the above European Designated Sites are designated for via the deterioration of water and habitat quality, in the absence of mitigation.

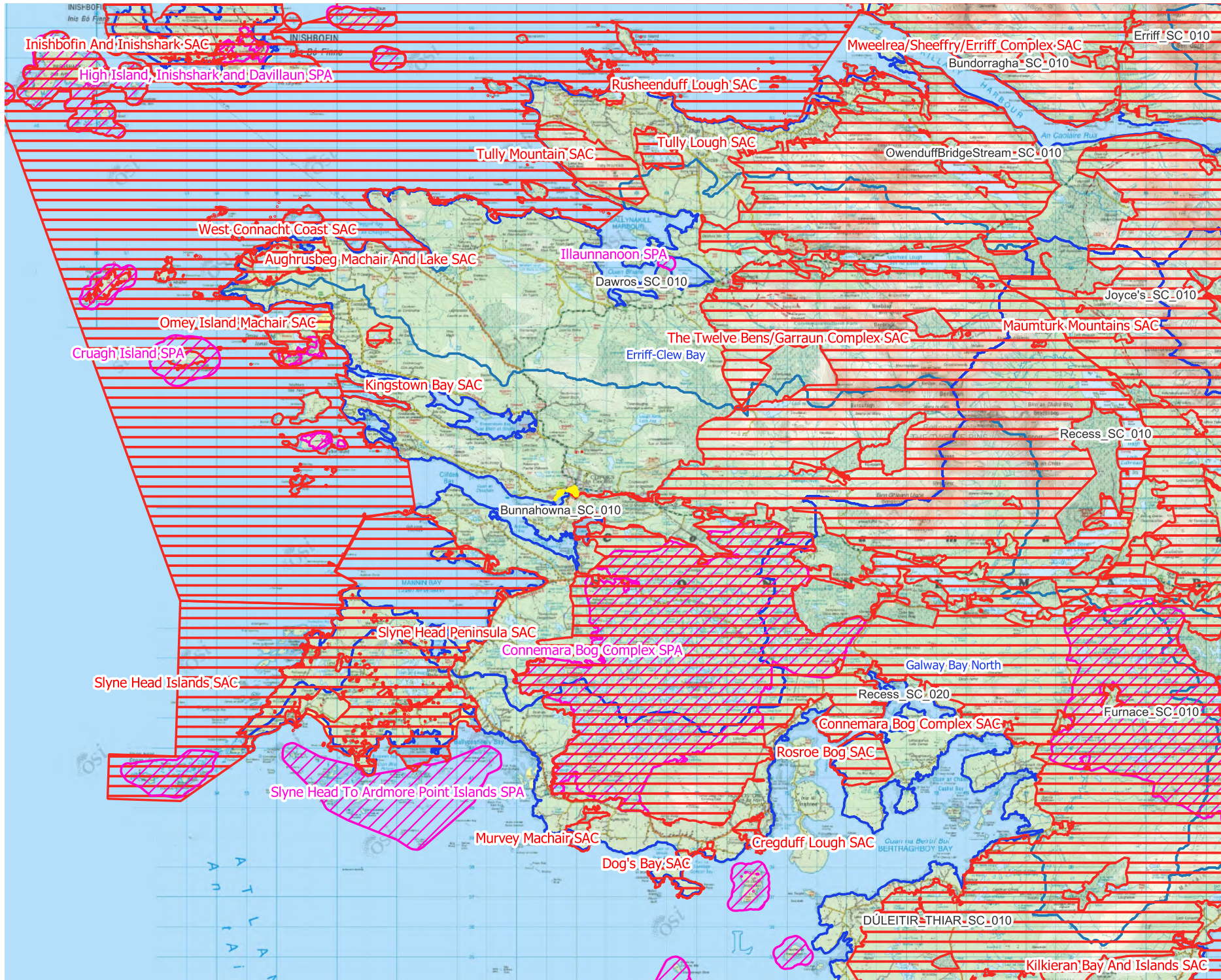
2.1.1.1 Ecology of Giant Rhubarb

Giant rhubarb (*Gunnera tinctoria*) is a perennial plant native to South America but is now frequently found in a variety of habitats in Connemara and other parts of Ireland, particularly the West. It can grow up to 2m high and its large leaves form dense thickets that can outcompete native plants, block drains or impede visibility and access. The rhizomes (sub-terranean stems) of mature plants can be up to 2m long and commonly grow above ground. Each plant can have up to five flowers, which are cone-like and produce orange-red fruit that mature in late summer to early autumn. Each flower head can produce more than 250,000 seeds per year and the plant is easily spread via the movement of infested soil that contains seeds or even fragments of plant material. Seeds may also be dispersed through birds, wind, or watercourses.

Gunnera begins its growth in early spring, with leaves emerging from its apical buds in March/ April, completing its growth by August/ September. Subsequently, the leaves and inflorescence emerge, dying off in October, before the new growth cycle commences.

2.1.1.2 Ecology of Japanese Knotweed

Japanese knotweed (*Fallopia japonica*) is a tall, vigorous, ornamental plant that escaped cultivation in the late nineteenth century and has since become an aggressive invader in both rural and urban environments. The plant can grow up to 3m high and its root system can extend up to 3m into the ground and 7m laterally from the parent plant. The reason this plant is such a threat is due to the nature of its regeneration. Cut fresh stems can produce fresh shoots and roots from nodes when immersed in soil or water. Very small fragments (0.7g) of fresh knotweed shoot and root material have the potential to start a whole new plant.



Map Legend

- Site Location
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- EPA Hydrological Catchments
- EPA Hydrological Subcatchments

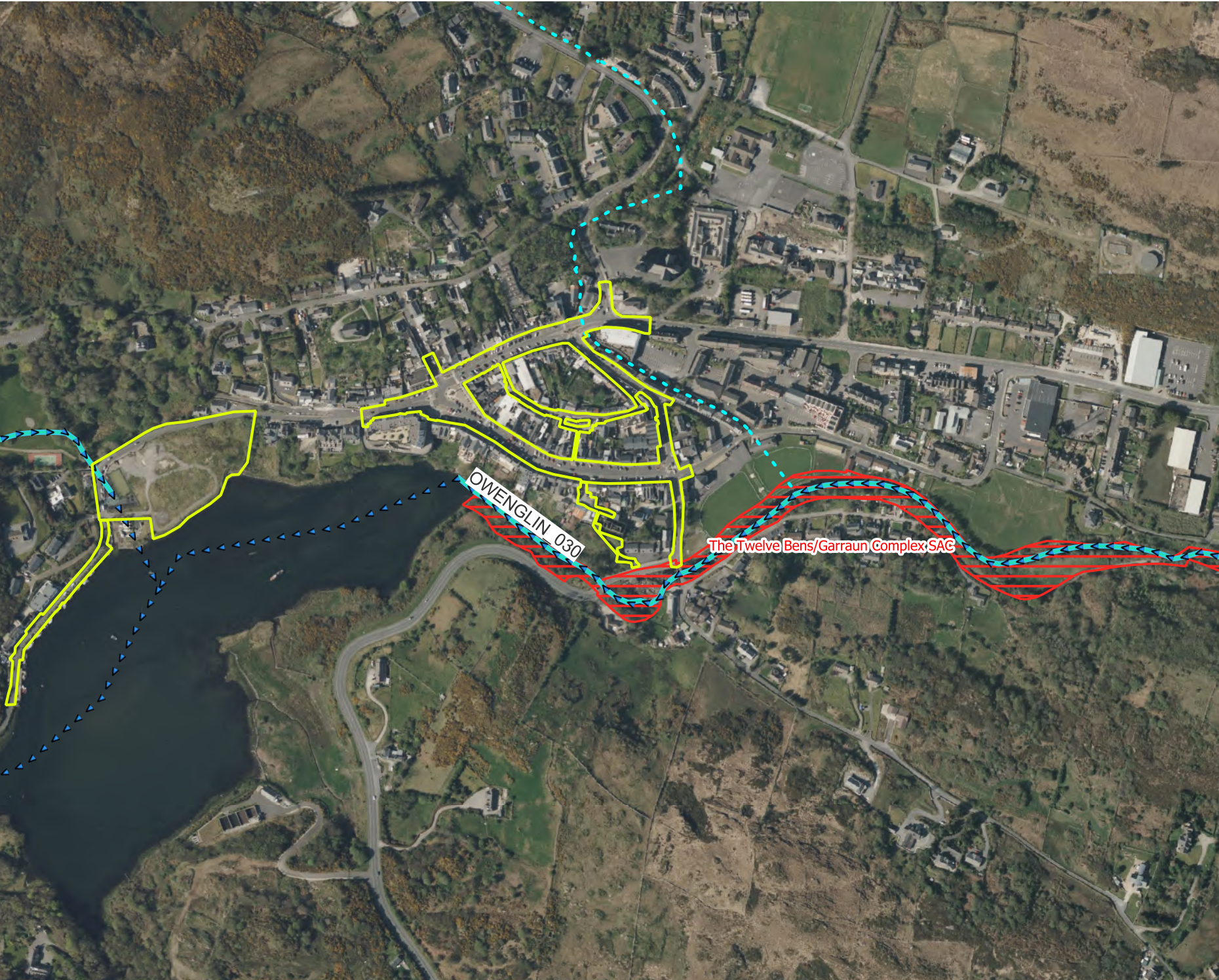


Drawing Title
European Designated Sites
Within the Likely Zone of Influence

Project Title
Clifden Town Public Realm
Enhancement

Drawn By RM	Checked By CM
Project No. 210327	Drawing No. Figure 2.1
Scale 1:164,841	Date 16/08/2024

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Map Legend

- Site Location
- The Twelve Bens/ Garraun Complex SAC
- River Flow Direction
- EPA Mapped River Waterbodies
- Unmapped EPA Watercourse



Drawing Title
Location of the Twelve Bens/ Garraun Complex SAC in Relation to the Proposed Works Site

Project Title
Clifden Town Public Realm Enhancement

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Project No. 210327	Drawing No. Figure 2-2
Scale 1:5,464.544	Date 16/08/2024



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Field Survey

An initial Invasive Species Survey was undertaken by Inga Reich (Honours degree in Biology, Ph.D. in Applied Ecology) on the 26th of November 2021. A follow up Invasive Species Survey was undertaken on the 20th of September 2023 by Rachel Minogue (BSc, Env) and Timothy O’Ceallaigh (BSc, Env) of MKO in line with NRA (2009) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes).

The site area was walked and systematically surveyed for the presence of invasive species (listed under the ‘Third Schedule’ of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011)) with an emphasis on Japanese knotweed (*Fallopia japonica*), Himalayan knotweed (*Persicaria wallichii*), Himalayan balsam (*Impatiens glandulifera*), Giant hogweed (*Heracleum mantegazzianum*), Giant rhubarb (*Gunnera tinctoria*), Rhododendron (*Rhododendron ponticum*) and Salmonberry (*Rubus spectabilis*). The location of specimens was mapped using a handheld GPS device and photographs were taken from the site.

Despite the initial survey having been undertaken outside the optimal season for surveying of invasive species in 2021, the additional invasive species survey carried out in 2023 was conducted within the optimal season for surveying invasive species. As such, it is considered that a comprehensive assessment of invasive species within the works area has been achieved. A precautionary approach has been adopted with regard to the management of areas with the potential to support invasive species.

3.

RESULTS

3.1

Third Schedule Invasive Species

Four invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011) were recorded during the surveys undertaken (**Figure 3.8**). The most extensive areas of Invasive Species recorded were in Harbour Park (**Figure 3.9**).

Giant rhubarb (*Gunnera tinctoria*) (**Plates 3-1 to 3-4**) was recorded within the proposed works boundary, throughout Harbour Park and in the lands adjacent, and throughout Clifden Town, with extensive areas recorded within the vicinity of the unmapped EPA watercourse that flows to the eastern margin of Clifden Town. Large, well established, mature patches, with sustainable strands were recorded in the north-east corner, along the southern edge of the site, and to the southwest margin of Harbour Park. Single plants, that are young, and immature were also recorded throughout Harbour Park, **as shown on Figure 3.1**. Due to the extent of the infestation, only large areas of growth and distinctive single plants were marked on **Figure 3.1**, but it should be assumed that the soil within the majority of the site is infested with seeds. Further, large singular plants of *Gunnera* were recorded along the unmapped EPA watercourse that flows through Clifden town, to the eastern margin of the proposed works area. Further, singular plants were recorded along the tributary of the Owenglin River that flows through the western margin of Harbour Park. Single plants of this species were found in other parts throughout Clifden town, including one larger patch east of the fire station. However, the latter is located outside the proposed works area.

One large, well-established area of Japanese knotweed (*Fallopia japonica*) consisting of several plants located less than 7m from each other was also recorded in the south-east of Harbour Park within the proposed works boundary, **as shown on Figure 3.2**, and further a large, well-established area was identified in the lands adjacent, to the southeast of Harbour Park (**Plates 3.5 & 3.6**). Further, a single plant was recorded from private premises at the corner of Church Hill and Sky Road.

Rhododendron (*Rhododendron ponticum*) plants were recorded from private premises adjacent to the proposed works area, along Church Hill and Sky Road, and a singular Rhododendron plant was recorded along Beach Road (**Plate 3.7**), **as shown on Figure 3.3**.

Himalayan Balsam (*Impatiens glandulifera*) plants were recorded along the banks of the unmapped EPA watercourse that flows through Clifden Town centre, outside of the proposed works boundary to the east (**Plate 3.8**), **as shown on Figure 3.4**.

3.2

Other Non-native Invasive Species

Butterfly Bush (*Buddleja davidii*) a medium impact non-native invasive species of potential concern that is not listed on the Third Schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) was identified and recorded throughout the proposed works boundary (**Plates 3.9 to 3.10**), **as shown on Figure 3.5**. A large, well-established area of Butterfly Bush was recorded to the northeast margin of Harbour Park, along the unmapped EPA watercourse that flows through Clifden Town, and to the southern margin of the proposed works area, near Bridewell Brewery. Further, singular plants of this species were recorded within Harbour Park, and throughout Clifden Town.

A singular plant of Wall Cotoneaster (*Cotoneaster horizontalis*), a medium impact non-native invasive species of potential concern that is not listed on the Third Schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) was recorded on Doonen Road, outside of the proposed works boundary to the south (**Plate 3.11**), **as shown on Figure 3.6**.

Montbretia (*Crocsmia x crocosmiiflora*) a low impact, non-native invasive species of potential concern that is not listed on the Third Schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) was recorded throughout Clifden, in Harbour Park, along Beach Road and in the Town Centre (**Plates 3.12**), **as shown on Figure 3.7**.



Map Legend

- Site boundary 
- Giant Rhubarb Plant 
- Giant Rhubarb Areas 



Drawing Title
Location and Extent of Giant rhubarb (*Gunnera tinctoria*) in Clifden

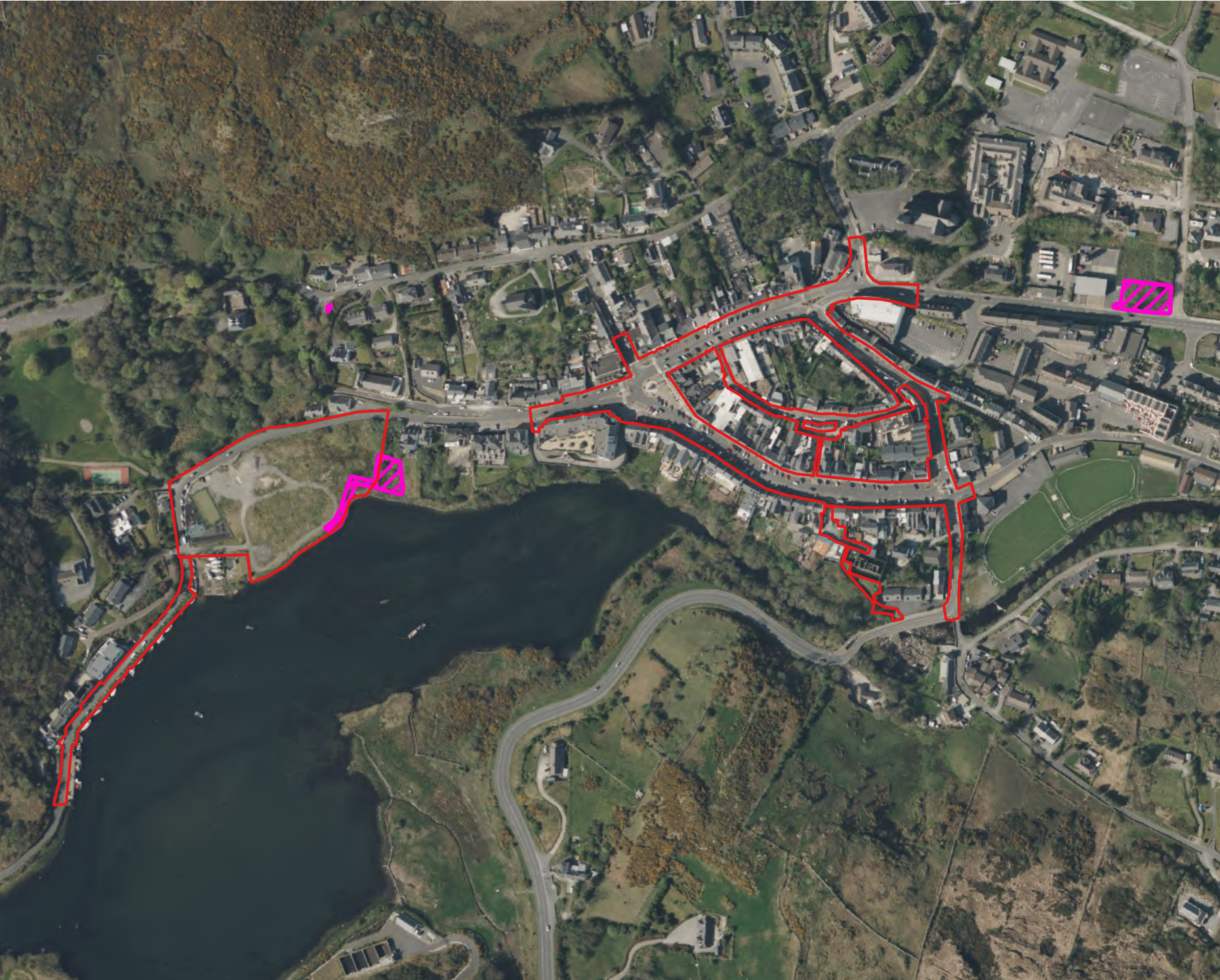
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Project No. 210327	Drawing No. Figure 3-1
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Map Legend

- Site boundary
- ▨ Japanese Knotweed



Drawing Title
Location and Extent of Japanese Knotweed
(Fallopia japonica) in Clifden

Project Title
Clifden Town Public Realm
Enhancement

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Project No. 210327	Drawing No. Figure 3-2
Scale 1:4,077.727	Date 16/08/2024



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Map Legend

 Rhododendron

 Site boundary



Drawing Title
Location and Extent of Rhododendron
(Rhododendron ponticum) in Clifden

Project Title
Clifden Town Public Realm
Enhancement

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Project No. 210327	Drawing No. Figure 3-3
Scale 1:3,195.006	Date 16.08.2024

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Map Legend

- Site boundary
- Himalayan Balsam



Drawing Title
Location and Extent of Himalayan Balsam
(Impatiens glandulifera) in Clifden

Project Title
Clifden Town Public Realm
Enhancement

Drawn By	Checked By
RM	CM
Project No. 210327	Drawing No. Figure 3-4
Scale 1:3,495.38	Date 16/08/2024

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Map Legend

- Site boundary
- Butterfly Bush Area
- Butterfly Bush Plant



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Drawing Title
Location and Extent of Butterfly Bush
(Buddleja davidii) in Clifden

Project Title
Clifden Town Public Realm
Enhancement

Drawn By RM	Checked By CM
Project No. 210327	Drawing No. Figure 3-5
Scale 1:3,195.006	Date 16.08.2024

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Map Legend

- Site boundary
- Wall Cotoneaster



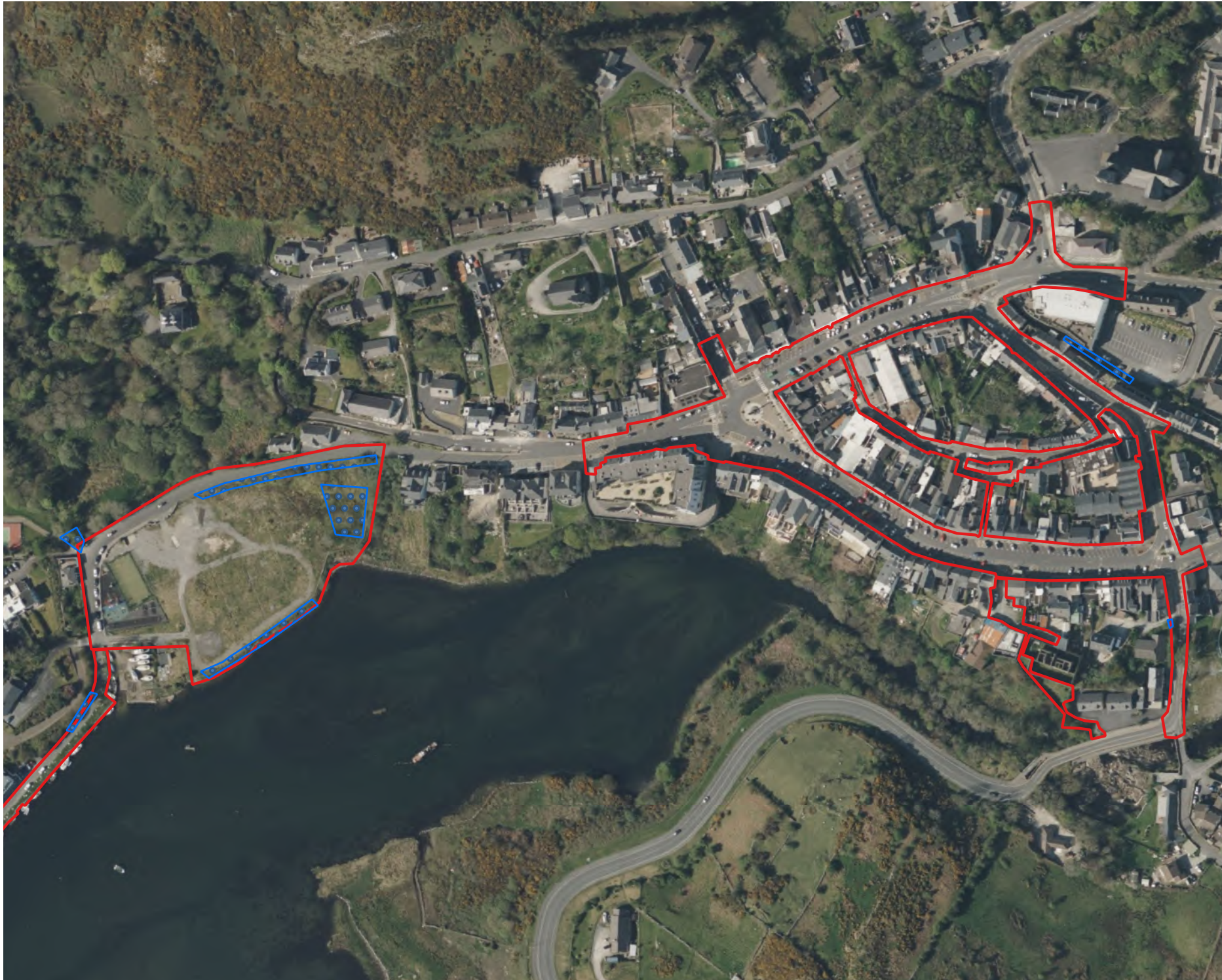
Drawing Title
Location and Extent of Wall Cotoneaster
(Cotoneaster horizontalis) in Clifden

Project Title
Clifden Town Public Realm
Enhancement

Drawn By	Checked By
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Project No. 210327	Drawing No. Figure 3-6
Scale 1:3,195.006	Date 16.08.2024



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Map Legend

- Site boundary
- Montbresia



Drawing Title
Location and Extent of Montbretia (Crocsmia x crocosmiiflora) in Clifden

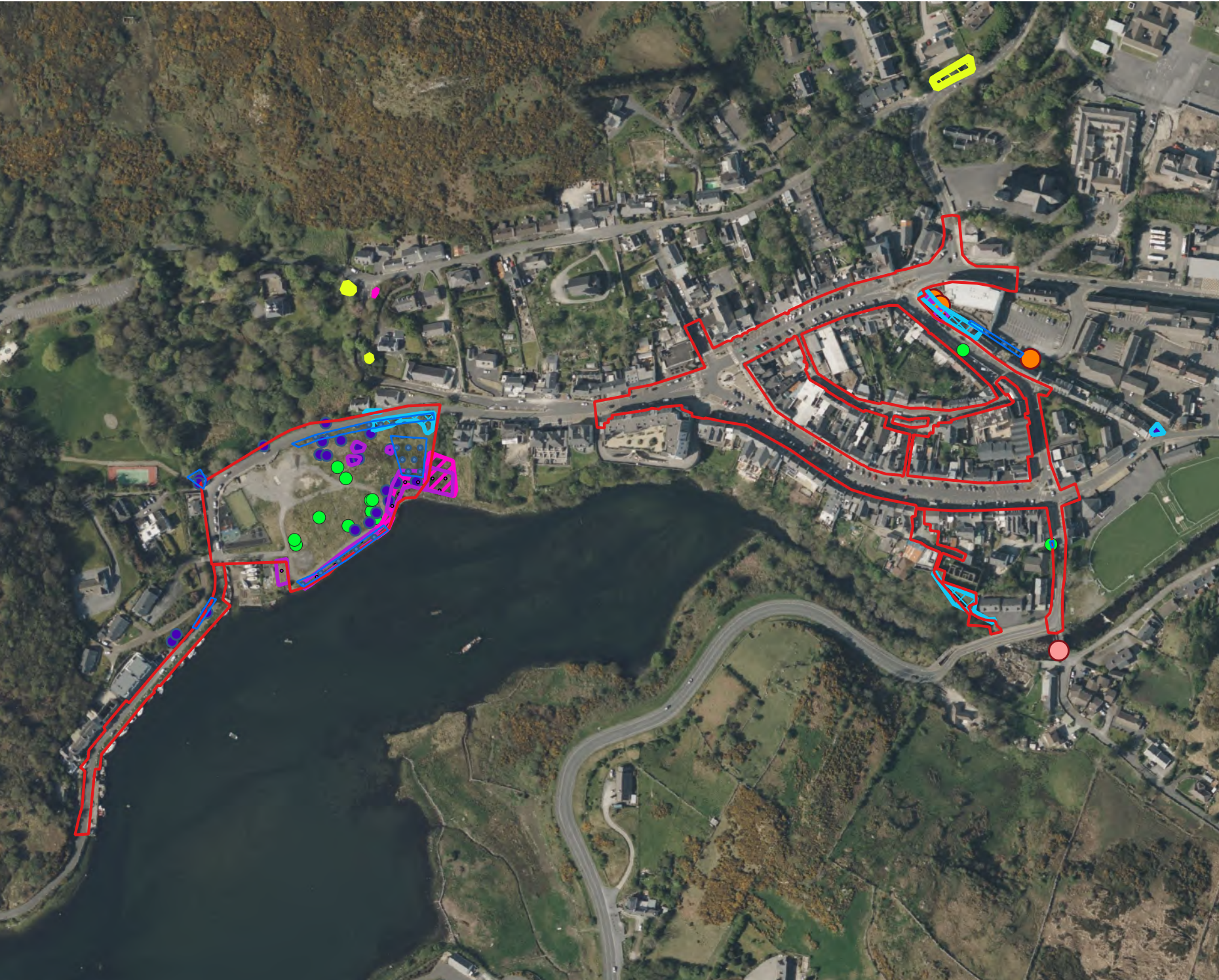
Project Title
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Drawn By RM	Checked By CM
Project No. 210327	Drawing No. Figure 3-7
Scale 1:2,909.151	Date 16.08.2024



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Map Legend

- Site Location
- Butterfly Bush
- Butterfly Bush Plant
- Giant Rhubard
- Giant Rhubard Plant
- Himalayan Balsam
- Japanese Knotweed
- Montbresia
- Rhododendron
- Wall Cottoncreeper

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Drawing Title

Overview of Invasive Species Recorded Within the Proposed Works Boundary, and in the Lands Adjacent

Project Title

Clifden Town Public Realm Enhancement

Drawn By	Checked By
RM	CM
Project No.	Drawing No.
210327	Figure 3.8
Scale	Date
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Map Legend

- Site Location
- Butterfly Bush
- Butterfly Bush Plant
- Giant Rhubarb
- Giant Rhubarb Plant
- Japanese Knotweed
- Montbresia
- Rhododendron



Drawing Title
Overview of Invasive Species Recorded
Within Harbour Park, and Adjacent Lands.

Project Title
Clifden Town Public Realm
Enhancement

Drawn By	Checked By
RM	CM
Project No. 210327	Drawing No. Figure 3.9
Scale 1:1,014.024	Date 16.08.2024



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Plate 3-1 Large stands of Giant rhubarb (*Gunnera tinctoria*) to the eastern margin of Harbour Park, within the proposed works boundary.



Plate 3-2 Giant rhubarb (*Gunnera tinctoria*) growing on wall along Beach Road/Seaview, within the proposed works boundary.



Plate 3-3 Large, well-established area of Giant rhubarb (*Gunnera tinctoria*) the southern margin of Harbour Park, within the proposed works boundary.



Plate 3-4 Large individual stands of Giant rhubarb (*Gunnera tinctoria*) along the unmapped EPA watercourse that flows through Clifden town, outside of the proposed works boundary to the east.



Plate 3-5 Japanese Knotweed (*Fallopia japonica*) stand recorded to the southeast margin of Harbour Park, within the proposed works boundary.



Plate 3-6 Japanese Knotweed (*Fallopia japonica*) area recorded to the eastern margin of Harbour Park, outside of the proposed works area in the lands adjacent.



Plate 3-7 *Rhododendron (Rhododendron ponticum)* plant recorded along Beach Road, within the proposed works boundary.



Plate 3-8 Himalayan Balsam (*Impatiens glandulifera*) plant recorded along the banks of the unmapped EPA watercourse that flows through Clifden Town centre, outside of the proposed works boundary to the east.



Plate 3-9 A large, well-established area of Butterfly Bush (*Buddleja davidii*) recorded the unmapped EPA watercourse that flows through Clifden Town, outside of the proposed works boundary to the east.



Plate 3-10 Butterfly Bush (*Buddleja davidii*) recorded to the northeast margin of Harbour Park, within the proposed works boundary.



Plate 3-11 A singular plant of Wall Cotoneaster (*Cotoneaster horizontalis*), a medium impact non-native invasive species of potential concern that is not listed on the Third Schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) recorded on Doonen Road, outside of the proposed works boundary to the south.



Plate 3-12 Montbretia (*Crocsmia x crocosmiiflora*) a low impact, non-native invasive species of potential concern that is not listed on the Third Schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) recorded to the northern margin of Harbour Park, within the proposed works boundary.

4.

PROPOSED INVASIVE SPECIES MANAGEMENT

The focus of this report is the management and control of Giant rhubarb (*Gunnera tinctoria*) and Japanese knotweed (*Fallopia japonica*) within Harbour Park and Clifden Town, both of which are present within the proposed works boundary. Although Rhododendron (*Rhododendron ponticum*) and Himalayan Balsam (*Impatiens glandulifera*) are also listed under Regulations 49 and 50 of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011), these plants will be avoided during the proposed works and as such, no management and control measures need to be prescribed for these third schedule, high impact species.

4.1

Site Set up and Associated Measures

- Prior to the commencement of any works, a pre-commencement survey for invasive species including Japanese knotweed, and Giant Rhubarb will be undertaken by a fully qualified ecologist to determine the locations and extent of the species within the development site and to determine whether there have been any changes in the extent of the infestation since the undertaking of surveys in 2023.
- The locations and extent of invasive species within the site will be clearly marked out using temporary fencing to ensure they are not disturbed. An exclusion zone surrounding each stand will also be identified and this will inform the extent of the area to be treated as potentially contaminated. The exclusion zone will extend where works are proposed, to a distance of at least 7m from the identified stands.
- The entire fenced off area will be treated as potentially contaminated and strict biosecurity measures will be put in place to avoid the potential for spread of invasive species outside the fenced area.
- Exclusion zones will be large enough to accommodate any potentially contaminated material that is excavated to facilitate the construction works within the zones.
- As a precautionary measure, machinery will be thoroughly cleaned down before entering the site to prevent potential spread of invasive species from elsewhere.
- Clean machinery will enter the exclusion zones. No machinery will leave the exclusion zones without having been thoroughly cleaned down to ensure that it is not transporting contaminated material outside the potentially contaminated area.
- The machine will track out of the cell over plywood or other suitable material in order to protect the machine from potential contamination while exiting the contaminated cell area.
- Material used for tracking machinery out of the cell e.g. plywood will be thoroughly cleaned down under supervision of the invasive alien plant species (IAPS) specialist prior to removal off site.
- Personnel working within any exclusion zone will thoroughly clean/brush down their tools/boots/clothing etc. To ensure that they do not transport any contaminated material outside the site.
- Tool box talks will be held with all members of the construction team responsible for carrying out measures detailed in this management plan. This will detail locations of infested material and how to carry out work on site in a biosecure way.
- The appointed contractor that will carry out the works within the exclusion zones for Invasive Species on site will include the measures outlined in this management plan into their own method statements.
- The site manager/contractor will appoint an environmental manager to ensure all measures in this invasive species management plan are undertaken correctly and to record all associated actions and outcomes.
- The work will be undertaken under the supervision of an invasive alien species specialist who will oversee the project on behalf of the client

4.2

Management of Giant Rhubarb (*Gunnera tinctoria*)

With all management and control options described below for *Gunnera* (chemical and mechanical) the treated/ dead plant material must be disposed of carefully, as described fully in **Section 4.1.4.2**. Further, a strict biosecurity plan, as described in **Section 4.1** and Post Treatment Monitoring as described in **Section 4.4** must be adhered to for all treatment options described to ensure all plant vegetation and seeds are carefully removed and disposed of, and to prevent further spread of *Gunnera* in Clifden, Co. Galway.

4.2.1

Treatment of Giant rhubarb in Harbour Park

Giant rhubarb (*Gunnera tinctoria*) is abundant in Harbour Park, with large infestation of areas of well established, mature, sustainable stands recorded in the north-east corner, along the southern edge of the site, and to the southwest margin of the park and in the lands adjacent. Single plants, that are young, and immature were also recorded throughout the park. Due to the large infestation of this third schedule, high impact invasive, it cannot be guaranteed that the entire site is not contaminated with seeds and thus all soil within the site should be treated as contaminated and all the biosecurity measures set out in **Section 4.1** should be adhered to during the development of this site.

Recommended Approach: A program of annual treatment with herbicides, as listed in **Table 4.1** below should be applied at the end of the growing season in August-September when it is the most effective. The soil and dead plants can then either be kept on site and moved to one area of the site and treatment can continue until no more plant growth occurs, described fully below in **Section 4.2.2.2**. Post- treatment monitoring, as described below in **Section 4.4** is important to monitor re-growth and to determine if re-treatment is required, via spring/ summer monitoring,

4.2.1.1

Chemical Treatment Options

Table 4-1 Chemical Treatment Options for *Gunnera*

Foliar spraying	
>	This method can be used to target individual plants or to treat an entire area of dense growth.
>	Leaves should be sprayed on both sides using a knapsack sprayer and a glyphosate-based formula which is approved for use near water in autumn, using the recommended concentration (5l/ha glyphosate).
>	To reduce the impact to non-target vegetation, an inert blue dye can be added to the glyphosate herbicide to readily identify plants that have been treated.
>	Post treatment monitoring and re-treatment as deemed necessary by spring/summer monitoring is required.
Cut-and-paint technique	
>	This method is recommended for sensitive areas, e.g., around water. (The site is adjacent to an existing SAC, the Twelve Bens/ Garraun Complex SAC (including the Owenglin River) and Clifden Bay.)
>	Leaf stalks and inflorescences should be cut close to the base of the plant and the stumps should be painted with a 25% solution of glyphosate (with added inert blue dye) straightaway, in August/ September.
>	This can be applied using a brush or sponge.
>	The leaves can be composted or allowed to rot down on site, while the inflorescences must be disposed of carefully, in sealed bags or via burial (>1m deep).
>	Post treatment monitoring and re-treatment as deemed necessary by spring/summer monitoring is required.
Herbicide injection (Cut and Inject)	
>	This method is labour-intensive but effects on the neighbouring environment are minimised.
>	Leaves and inflorescence are removed.

- A drill is used to make small wells in the rhizome which are injected with herbicide (with added inert blue dye) in August/ September. Several wells should be made along the rhizome as translocation can be slow and the herbicide may only penetrate small sections of the rhizome.
- To gain access into the site the leaf stalks can be cut and disposed of as in the cut-and-paint method described above.
- Post treatment monitoring and re-treatment as deemed necessary by spring/summer monitoring is required.

4.2.2 Treatment of Giant rhubarb in Clifden Town

The single plants, that are young, and immature identified within other parts of Clifden can be removed by grubbing or spraying. If grubbing is used, this should be carried out before the plant flowers in June, if the plants are to be sprayed, this needs to be carried out in late August or early September following the methodology outlined in **Table 4.1** below. The dead plant material can then either be kept on site, or removed to an off-site licensed facility, both of which options are described below in **Section 4.1.4.2** Post-treatment monitoring, as described below in **Section 4.4** is important to monitor re-growth and to determine if re-treatment is required, via spring/ summer monitoring,

4.2.2.1.1 Manual/ Mechanical Removal of plant material and soil

In areas with extensive, well- established, mature, dense strands of Gunnera, mechanical removal/ excavation/grubbing can be difficult, costly, and ineffective, as this species can rapidly spread from small fragments. However, for immature and young strands, it can be an effective option once all the rhizome is completely removed.

Table 4-2 Mechanical/ Manual Treatment Options for Giant Rhubarb

Mechanical Control using excavators/ digging machines
➤ This method can be effective in controlling young immature plants whose rhizomes grow on or close to the soil surface, spreading horizontally. ➤ This is done by manually pulling young, immature plants out of the soil. ➤ The cut leaves can be left in-situ to naturally decompose. However, any rhizomes inflorescences removed, must be disposed of carefully in sealed bags or via burial over 1m deep. ➤ Post treatment monitoring and re-treatment as deemed necessary by spring/summer monitoring is required.
Manual Control via handing pulling or digging
➤ This method can be effective in controlling slightly larger plants whose rhizomes grow on or close to the soil surface, spreading horizontally. ➤ This method uses excavator and/or digging machines/ equipment to dig plants out of the soil. ➤ The cut leaves can be left in-situ to naturally decompose. However, any rhizomes inflorescences removed, must be disposed of carefully in sealed bags or via burial over 1m deep. ➤ Post treatment monitoring and re-treatment as deemed necessary by spring/summer monitoring is required.

4.2.2.2 Disposal Options for Treated Plant Materials

4.2.2.2.1 Herbicide Treatment and Keeping of Soil and Plant Material on Site.

The soil and dead plants can then be moved to one area of the site and treatment can continue until no more plant growth occurs. Suitable locations to hold and treat dead plant matter and soils should be on the site of an existing infestation to minimise the spread of material. This area would be in abeyance until the plant is eradicated (which may take 3-4 years), and so would form a later phase of works. Due

to the likelihood that the soil might contain seeds of the plant and the potential of re-growth of giant rhubarb, further applications of herbicide may be necessary throughout the site for a number of years.

4.2.2.2.2 **Herbicide Treatment and Removal of Plant Material and Soil off Site**

Plant material and soil can be taken off site to a licensed facility. This option can be very expensive and great care must be taken when transferring contaminated material. An NPWS licence application would require the following information:

- Methods of removal
- Method of transportation
- Treatment of the species
- Proposed bio-security measures
- Invasive Species Management Plan
- Timeframe of works
- Evidence that proposed landfill facility will accept the species.

Given the ground conditions of the site, and extent of infestation of Gunnera, offsite disposal of treated plant material is the recommended option at this stage. However, the final disposal method will be determined by the ecological clerk of work following the pre commencement invasive species survey.

4.3 Management of Japanese Knotweed (*Fallopia japonica*)

With all management and control options described below for Japanese Knotweed (chemical and mechanical) the treated/ dead plant material must be disposed of carefully, as described fully in **Section 4.3.1.3**. Further, a strict biosecurity plan, as described in **Section 4.1** and Post Treatment Monitoring as described in **Section 4.4** must be adhered to for all treatment options described (mechanical and chemical) to ensure all plant vegetation and seeds are carefully removed and disposed of, and to prevent further spread of *Gunnera* in Clifden, Co. Galway.

4.3.1 Treatment of Japanese knotweed in Harbour Park

One large, well-established, mature area of Japanese knotweed (*Fallopia japonica*) consisting of several plants located less than 7m from each other was recorded in the south-east of Harbour Park, and further a large, well-established area was identified in the lands adjacent, to the southeast of Harbour Park. Further, a single plant was recorded from private premises at the corner of Church Hill and Sky Road.

4.3.1.1 Manual/ Mechanical Removal

Mechanical removal/ excavation as described above in **Table 4.2** for Japanese knotweed contaminated soils is not suitable for Harbour Park, as this species was recorded in close proximity to a large body of water, Clifden Bay. If excavation is necessary, a 7m buffer zone from the last viable plant is required to ensure all plant vegetation and rhizome material is completely removed.

4.3.1.2 Chemical Treatment Options

Recommended Approach: Chemical control is the preferred treatment option for Japanese Knotweed, using an approved glyphosate-based herbicide, that is safe/ approved to use near water. The chemical treatment of Japanese Knotweed needs to be applied when the plants are most viable for the application. This period falls between August and October. An annual treatment programme is recommended, which will ensure that the infestations are controlled and systematically treated to provide the best results. Due to the nature of Japanese Knotweed being a seasonally effected plant, which will die back over winter, we would suggest a period of 3-4 years is provisioned to provide the best long-term results. As the area infested with Japanese knotweed is relatively small, it would be easiest to fence off the stands plus a 7m buffer around them, and herbicide treat in-situ. This area could then be developed as part of a later phase of works and should be programmed accordingly.

The dead plant material can then either be kept on site either by deep burial, burial in a knotweed cell or removed to an off-site licensed facility, all of which are described below in **Section 4.2.3.3**. Post-treatment monitoring is important to monitor re-growth and to determine if re-treatment is required, via spring/ summer monitoring,

Table 4-3 Chemical Control Options for Japanese Knotweed

Foliar spraying	
>	This method can be used to target individual plants or to treat an entire area of dense growth.
>	Leaves should be sprayed on both sides using a knapsack sprayer and a glyphosate-based formula which is approved for use near water in autumn, using the recommended concentration (51/ha glyphosate) using knapsacks fitted with low pressure drift beta nozzles.
>	Post treatment monitoring and re-treatment as deemed necessary by annual spring/summer monitoring in June/ July is required.
Herbicide injection (Cut and Inject)	

- The preferred treatment method is the stem injection.
- Stem injection will involve injecting a concentrate of glyphosate herbicide into each cane of the weed using specialist equipment specifically designed in the treatment of Japanese Knotweed.
- The weed will absorb the glyphosate into the rhizome (root crown) with a faster absorbency rate than foliar spraying, providing a quicker resolution to the knotweed problem and less risk to the surrounding environment.
- The use of stem injection is more effective than traditional methods as the injection is specific to the plant and has no effect on the surrounding vegetation.
- It is also safe to use in and around water.
- Post treatment monitoring and re-treatment as deemed necessary by annual spring/summer monitoring in June/July is required.

4.3.1.3 Disposal Options for Treated Plant Material:

4.3.1.3.1 On-site deep burial

Burial must be to a depth of at least 5m measured from finished ground level to the top of the buried infested soil. Volumes will be estimated on a worst-case scenario basis to inform the size of the burial area required, i.e., 7m lateral root growth from the last visible above ground evidence of the plant and a root depth of 3m. It is advisable to apply non-persistent herbicide to the growing plants, at least once, in advance of excavation to prevent the potential regrowth of infested material prior to burial. Only glyphosate formulations should be used for treatment as other persistent herbicides will not be allowed for burial under various waste regulations. The treated material should be left a sufficient amount of time to allow the herbicide to take effect on the plant prior to excavation and burial. Following placement, the top of the infested soil should be capped with a proprietary root barrier membrane system.

4.3.1.3.2 Burial in a knotweed cell

This option involves the construction of an underground containment cell, sized to permanently store all infested soil. The cell is formed using a proprietary root barrier membrane system which securely holds the soil. The cell must then be covered by a minimum of 2m of soil or inert material, which protects the integrity of the root barrier membrane from plant roots and burrowing animals.

Careful consideration must be given to the location of any containment cell, to ensure that it is positioned in a location which is stable, which will not be at risk of disturbance from future development, and where long-term soil subsidence is deemed acceptable. It is also recommended that such a cell should be located as close as possible to the original infestations, reducing the distance that viable rhizome material needs to be transported, and thus minimising bio-security risks. As a cell becomes a permanent feature on a site, its location needs to be mapped, shown on all drawings, and included on the legal maps pertaining to the property. Various root barrier membranes are available which can prevent Japanese knotweed penetrating. These membranes need to be specially laid under expert supervision in order to be effective, protecting the surrounding soil. Volumes will be estimated on a worst-case scenario basis to inform the size of the cell required, i.e., 7m lateral root growth from the last visible above ground evidence of the plant and a root depth of 3m.

4.3.1.3.3 Offsite disposal

If Japanese knotweed cannot be dealt with effectively on site, it must be disposed of at a suitably licensed waste management site. The licensed waste manager must be informed that the material is Japanese knotweed. This option can be very expensive and great care must be taken when transferring contaminated material. An NPWS licence application would require the following information:

- Methods of removal
- Method of transportation
- Treatment of the species
- Proposed bio-security measures

- > Invasive Species Management Plan
- > Timeframe of works
- > Evidence that proposed landfill facility will accept the species.

Given the ground conditions of the site, and extent of infestation of Japanese Knotweed, offsite disposal of treated plant material is the recommended option at this stage. However, the final disposal method will be determined by the ecological clerk of work following the pre commencement invasive species survey.

4.4

Post Treatment Monitoring

Ongoing monitoring will be required for all Third Schedule Invasive Species and non-native Invasive Species of potential concern recorded with suitable follow-up management in order to control new growth or re-establishment within the infested areas.

Following the initial treatment and completion of the development, the treated areas will be re-surveyed annually and if necessary, re-treated until no growth is recorded for two consecutive years. If invasive plants are found to be re-establishing, they shall be treated as per the measures outlined in **Section 4.1** and **Section 4.2** of this report.

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