



CONSULTANTS IN ENGINEERING,  
ENVIRONMENTAL SCIENCE &  
PLANNING

# CLAREMORRIS CLOSED LANDFILL REMEDIATION PROJECT

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## INVASIVE SPECIES MANAGEMENT PLAN

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Prepared for: Mayo County Council



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Mayo County Council

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## INVASIVE SPECIES MANAGEMENT PLAN

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**Abstract:** This document provides an Invasive Species Management Plan to provide guidance and strategies for the management of invasive plant species located at the Claremorris Closed Landfill.



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## 1. INTRODUCTION

Mayo County Council has commissioned Fehily Timoney & Company (FT) to prepare an Invasive Species Management Plan as part of the proposed remediation plan for Claremorris Closed Landfill. This plan has been prepared to comply with Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 to 2021 (not to cause the spread of non-native invasive plant species listed in schedule III), and to ensure non-native invasive plant species not listed in schedule III are not spread to adjacent land or Natura 2000 (European) sites. The report details a programme for the mapping and control of invasive species at the remediation site within the closed historic landfill site.

Japanese knotweed was treated on site with herbicide by contractors employed by Mayo County Council in September 2014 and 2015. The Japanese Knotweed Company (JKC) on behalf of Mayo County Council - Claremorris & Western District Energy Co-op carried out additional inspections in August 2018 and 2019, and Japanese knotweed was still persisting on site. A recent ecological walkover covering the habitat at the closed landfill was conducted in November 2021. This walkover identified Japanese knotweed, in addition to winter heliotrope and cherry laurel within the site boundary. Japanese knotweed is a high impact invasive species according to the National Biodiversity Data Centre, on a scale based on risk analysis according to Kelly et al., 2013.

This document provides background information on the non-native invasive species present and mapping of their location and extent within the footprint of the remediation site. It provides sources of information including policy and guidelines to which cognisance has been paid, and the means of managing and controlling the species from site safely using prevention, containment, treatment, monitoring, follow up treatment, record keeping and appropriate disposal.

### 1.1 Legislative Context

In Ireland, the spread and propagation of species listed in the Third Schedule of S.I. No. 477/2011 European Communities (Birds and Natural Habitats) Regulations 2011 to 2021 is an offence. Under Regulation 49 (2) - save in accordance with a licence granted under paragraph (7), any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in any place specified in relation to such plant in the third column of Part 1 of the Third Schedule, any plant which is included in Part 1 of the Third Schedule, shall be guilty of an offence. Under Regulation 50 it is an offence to transport a vector material listed in Part 3 of the Third Schedule except under licence (Regulation 50 is not yet in effect).

In October 2017, Ireland's 3rd National Biodiversity Action Plan (NPWS, 2017), for the period 2017-2021 was launched. This Plan sets out actions through which a range of government, civil and private sectors will undertake to achieve Ireland's 'Vision for Biodiversity' and follows on from the work of the first and second National Biodiversity Action Plans. Target 4.4 states that '*Harmful invasive alien species are controlled and there is reduced risk of introduction and/or spread of new species.*'



This is supported by seven actions, those relevant to this management plan are:

- 4.4.3. Continue and enhance measures for eradication, where feasible, control and containment of invasive species
- 4.4.4. Encourage horticultural nurseries to produce native species, varieties and landraces from appropriate native sources for public and private sector plantings. Public bodies will endeavour to plant native species in order to reduce importation of non-native species, varieties and landraces.
- 4.4.6. Publish legislation to address required provisions under the EU Regulation on invasive alien species (No. 1143/2014) and on responsibilities and powers regarding invasive alien species, giving IFI responsibility for aquatic invasive species.

The Draft Mayo County Development Plan includes an Invasive Species Policy, which aims to “support measures for the prevention and/or eradication of invasive species as appropriate within the county”. The plan also outlines an Invasive Species Objective, which ensures “that where the presence of invasive species is identified at the site of any proposed development or where the proposed activity has an elevated risk of resulting in the presence of these species, details of how these species will be appropriately managed and controlled will be required”.

## 1.2 Site Description

Claremorris closed landfill is located in the townland of Clare, Claremorris, Co. Mayo. The site is approximately 800m south-east of Claremorris town. The closed landfill capping area footprint is 3.8ha and is located within a larger application site consisting of open land which has an area of 5.6ha. The site is currently vacant and in an overgrown state. Neighbouring land uses include agricultural grassland, cutaway bogland, commercial forestry and residential properties located approximately 280m to the west of the site. An electrical substation is also located approximately 150m to the north of the site. The site is bound by the Dublin-Westport Railway line to the north, the Knock-Claremorris Bypass (N17) to the West, commercial forestry to the south and agricultural land (boggy ground) occupies the remaining land to the east of site.

The site operated as a landfill accepting municipal waste from 1982 to March 1996. The site was capped with boulder clay, but no remediation works have been completed.

Waste deposited at the site is understood to comprise of municipal and commercial wastes to depths of 6.5m below ground level (BGL). The interpreted landfill extent covers an area of 32,000 m<sup>2</sup> and initial calculations estimate an interred waste volume of approximately 168,000 – 297,623m<sup>3</sup> at the site.

The western portion of the site (raised area) is inhabited by rough grassland and scrub. The eastern half of the site forms part of an area of harvested, drained peatland.

The site generally falls from south to north towards the railway and west to east towards the harvested and drained peatland. The KILBEG-MALONE (EPA code: 30K3711), a 1st order stream crosses the eastern portion of the site travelling in a southern direction. After flowing for 44km, this stream ultimately enters Lough Mask via the LISDUFF 30 (EPA code: 30L4313) and Robe River (EPA code: 30R0115).



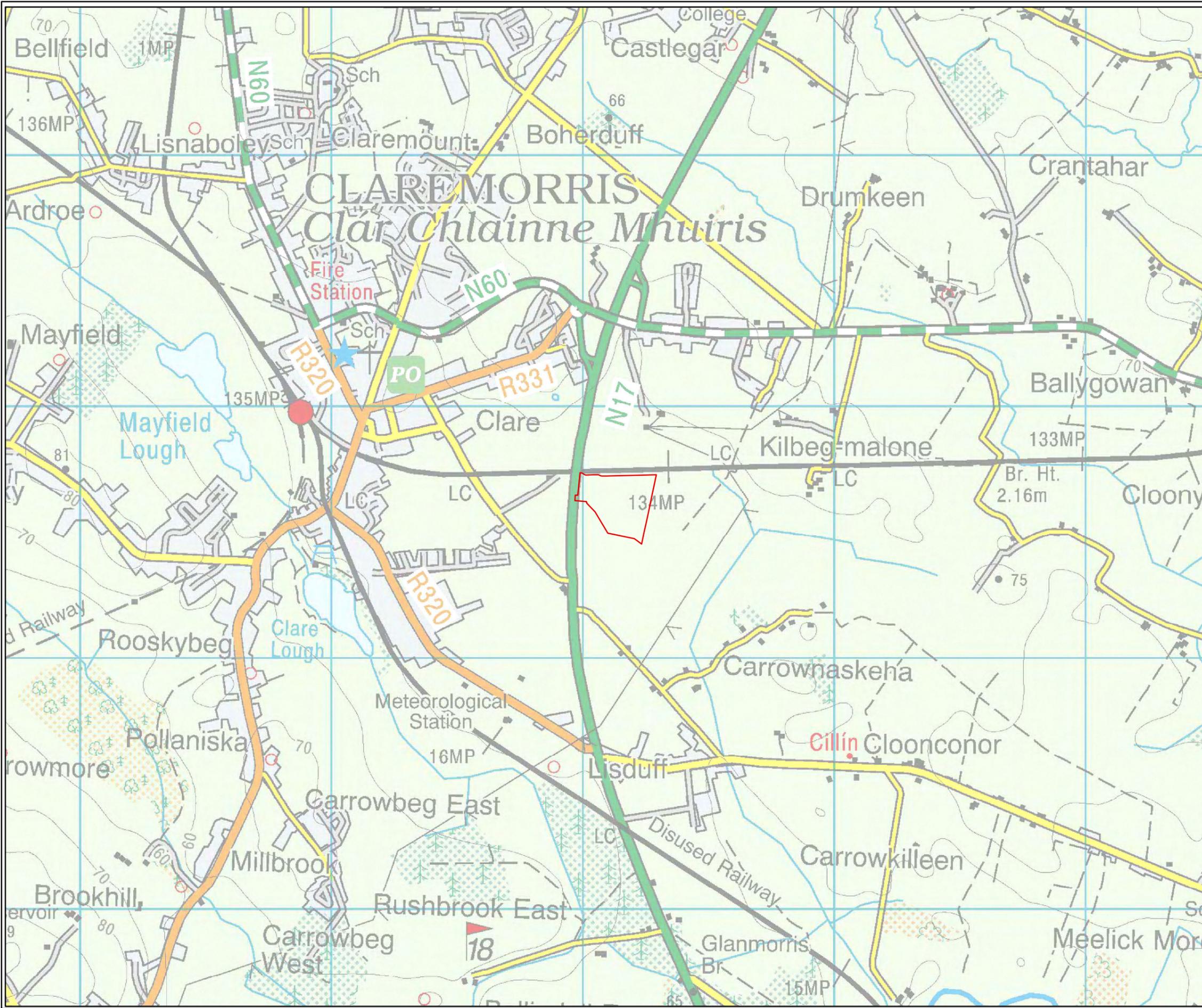
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The site currently:

- Has a shallow soil cap with an established grass and shrub cover.
- Is drained by a watercourse along the western and northern boundary of the site which ultimately discharge to the Kilbeg-Malone River.
- Is secured by stock proof fencing along the western boundary of the site.

The location of the site is shown in Figure 1.1.





**Legend**  
 Site Boundary

<b>TITLE:</b>	Site Location	
<b>PROJECT:</b>	Claremorris Historic Landfill	
<b>FIGURE NO:</b>	1.1	
<b>CLIENT:</b>	Mayo County Council	
<b>SCALE:</b>	1:15000	<b>REVISION:</b> 0
<b>DATE:</b>	06/05/2022	<b>PAGE SIZE:</b> A3







## 2. METHODOLOGY

### 2.1 Relevant Guidance

The methodology and guidance for this management plan has been devised in consideration of the following relevant guidance:

- NRA, (2010) Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads. Revision 1, December 2010. National Roads Authority.
- Property Care Association, (2018). Practical Management of Invasive Non-Native Weeds in Britain and Ireland. Packard Publishing Ltd.
- Kelly et al., (2008). Best Practice Management Guidelines Japanese Knotweed *Fallopia japonica*. Prepared for NIEA and NPWS as part of Invasive Species Ireland.
- Tu, (2009) Assessing and Managing Species within Protected Areas. Protected Area Quick Guide Series. Editor J., Ervin, Arlington, VA. The Nature Conservancy, 40 pp.
- Stokes et al., (2004). Invasive Species in Ireland. Unpublished report to Environment and Heritage Service and National Parks and Wildlife Service. Quercus, Queens University Belfast, Belfast.
- AM-SOP-009 Information and Guidance Document on Japanese Knotweed
- RAPID, 2018. Good Practice Management- Japanese Knotweed (*Fallopia japonica*).
- INNSA, 2017. Code of Practice – Managing Japanese Knotweed
- Irish Water, 2022. AM-SOP-009 Information and Guidance Document on Japanese Knotweed
- Irish Water, 2022. IW-AMT-GL-001 Irish Water Guidance on the Management of Giant Hogweed
- Irish Water, 2022. IW-AMT-GL-002 Irish Water Guidance on the Management of Himalayan Balsam
- Irish Water, 2022. IW-AMT-GL-007 Irish Water Guidance on Biosecurity for Aquatic Sampling Activities
- Irish Water, 2022. IW-OPM-SOP-10 Biosecurity Standard Operating Procedure for Aquatic Sampling

### 2.2 Desktop Study

A desktop study was carried out to identify existing records of invasive flora species at the remediation site within the Claremorris Closed Landfill and habitat suitability of the adjacent area for the invasive species. This study allows the surveyor to narrow down the source of the species introduction and its likelihood of spreading. The following open sources of information were consulted:

- Invasive Species Ireland website (Invasive Species Ireland, 2022)
- Invasive Alien Species in Ireland website (Invasives.ie, 2022)
- OSI Aerial photography and 1:50000 mapping
- National Parks and Wildlife Service (NPWS) web mapping (NPWS, 2022)
- National Biodiversity Data Centre (NBDC) web mapping (National Biodiversity Data Centre, 2022)
- Environmental Protection Agency (EPA) web mapping (EPA, 2022)
- Botanical Society of Britain and Ireland Mapping (BSBI, 2022).



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## 2.3 Mapping

The habitats at the Claremorris Closed Landfill were identified and classified, according to '*A Guide to Habitats in Ireland*' (Fossitt, 2000) during walkover survey undertaken by Fehily Timoney ecologist Kate Mahony in November 2021. During this survey, invasive non-native flora species were identified and mapped.



### 3. EXISTING ENVIRONMENT

#### 3.1 Desktop Records

Historical records of invasive species plants from the relevant national datasets were assessed through the National Biodiversity Data Centre (08/03/2022). No records of invasive species were available within the 2km grid square the remediation site is located (M37M). However, Japanese knotweed is present in the square according to BSBI (2022). Table 3-1 summarises the invasive flora recorded within the 10km (M37) grid square surrounding the closed landfill:

**Table 3-1: Invasive flora species within the M37 Grid Square**

Common Name	Scientific Name	Impact*	Year of Last record
Canadian Waterweed	<i>Elodea canadensis</i>	High	2006
Hybrid knotweed	<i>Fallopia japonica x sachalinensis =F. x bohemica</i>	High	2015
Japanese knotweed	<i>Fallopia japonica</i>	High	2016
Sycamore	<i>Acer pseudoplatanus</i>	Medium	2015

\*Impact classified according to Invasives.ie, 2022

#### 3.2 Results of Field Survey

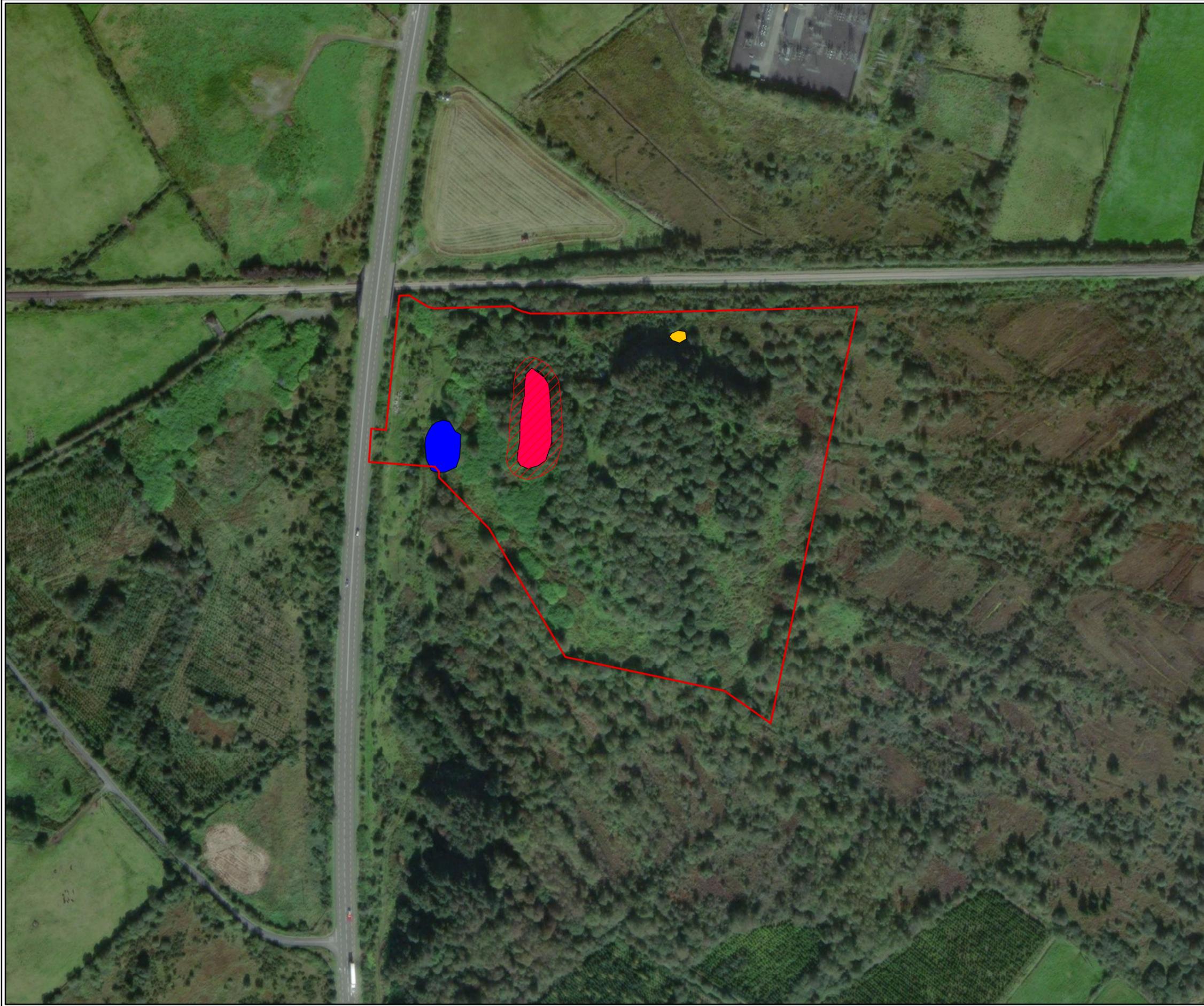
The following habitats were recorded on site include wet grassland (GS4), wet heath/cutover bog (HH3/PB4), conifer plantation (WD4), drainage ditched (FW4) and wet willow-alder-ash woodland (WN6).

During field surveys in November 2021, the following invasive species were recorded within the footprint of the remediation site:

- Japanese knotweed (*Fallopia japonica*)
- Winter heliotrope (*Petasites fragrans*)
- Cherry laurel (*Prunus laurocerasus*)

The extent of these species is detailed in Figure 3.1.





**Legend**

-  Site Boundary
-  Potential Rhizome Growth

**Invasive Species:**

-  Cherry Laurel
-  Japanese Knotweed
-  Winter Heliotrope

<b>TITLE:</b>	Invasive Species		
<b>PROJECT:</b>	Claremorris Historic Landfill		
<b>FIGURE NO:</b>	3.1		
<b>CLIENT:</b>	Mayo County Council		
<b>SCALE:</b>	1:2500	<b>REVISION:</b>	0
<b>DATE:</b>	06/05/2022	<b>PAGE SIZE:</b>	A3







## 4. INVASIVE SPECIES ACCOUNTS

The International Union for Conservation of Nature (IUCN) in their ‘IUCN Guidelines for the Prevention of Biodiversity Loss Caused by Alien Invasive Species’ 2000 report describes non-native invasive species (referred to as an invasive species) as:

*“an alien species which becomes established in natural or semi-natural ecosystems or habitat, is an agent of change, and threatens native biological diversity”.*

The three invasive species below were recorded within the remediation site. The species in bold are included in the Third Schedule, the remaining are identified in Kelly et al., (2008). *Risk analysis and prioritisation for invasive and non-native species in Ireland and Northern Ireland*. A report prepared for the Northern Ireland Environment Agency and National Parks and Wildlife Service as part of Invasive Species Ireland. Accounts of these species, summaries of their ecology, distribution, growth, and management periods are included below.

- Japanese knotweed (*Fallopia japonica*)
- Winter heliotrope (*Petasites fragrans*)
- Cherry laurel (*Prunus laurocerasus*)

### 4.1 Japanese knotweed (*Fallopia japonica*)

According to the Invasive Species Ireland Project who have carried out a risk assessment of Japanese Knotweed (*Fallopia japonica*), which is distributed throughout the island of Ireland, the species is “one of the highest risk (most unwanted) non-native invasive species in Ireland”. The species poses a risk to open and riparian areas where it spreads rapidly to form dense stands, excluding native vegetation and prohibiting regeneration. This process has been known to reduce diversity and alter semi-natural and locally important habitats for wildlife. Once stands become established, they are extremely persistent and difficult to remove. Japanese knotweed can grow through weaknesses in both tarmac and concrete. Population clusters must be completely removed, under appropriate licencing, before site works or specific projects within the site can commence (Kelly et al., 2008).

#### 4.1.1 Species Ecology

Although Japanese knotweed plants flower, all flowers in Ireland and Britain are female, precluding the possibility of sexual reproduction. The means of spread is entirely through the movement of rhizomes or rhizome fragments in soil or cut stems. Japanese knotweed has an extraordinary ability to spread vegetatively from crown, stem and rhizome (underground root) if disturbed. Even tiny amounts of cut stem, crown or rhizome can produce a new plant.

Controlling the spread of the species is therefore dependent on preventing the spread of the stem, crown or rhizome. Japanese knotweed causes numerous impacts, both ecological and economic. It is capable of outcompeting native plants and blocking commuting corridors of native mammals, and damaging buildings, tarmacadam and concrete. In waterways, it can block and reduce water flow, increasing the risk of flooding. In winter, when it dies back, it can leave riverbanks bare and open to erosion.



Red/purple shoots appear early in spring, which in some cases have an asparagus-like appearance but, as the canes grow, the leaves unfurl, and the plant takes its more characteristic appearance. The mature canes are like bamboo, being hollow, and have a characteristic pattern of purple speckles.

The leaves are shield-shaped with pointed tips and a flat base, arranged in a zig-zag formation. The plant can grow to over 3m in height. Flowering occurs in late summer/autumn (End July – typically August) and consists of small creamy white flowers. During the winter the leaves die back and reveal orange/brown woody erect stems. Rhizomes are bright orange inside and can extend to a depth of 3m and a width of 7m around the visible growth above ground.



Source: “Expansion of Japanese Knotweed” by U.S Fish and Wildlife Service – Northeast Region is licensed with CC PDM 1.0 (<https://www.flickr.com/photos/43322816@N08/5951588772>)

**Plate 4-1: Characteristic Features of Japanese Knotweed**

4.1.2 Timeframe

Japanese Knotweed shoots typically appear between March and April. During this time energy stores from the root system are used to facilitate initial growth. The summer growth period commences in May and lasts until July, typical growth occurs during this time. Flowering begins in August and lasts until October. During this time the pale flowers can be seen.

Figure 4-1 indicates the suitable period which glyphosate herbicide is used to remove Japanese Knotweed. It is suitable to use glyphosate herbicide on knotweed between the months of May and October, with August, September and October being the preferred months of use.

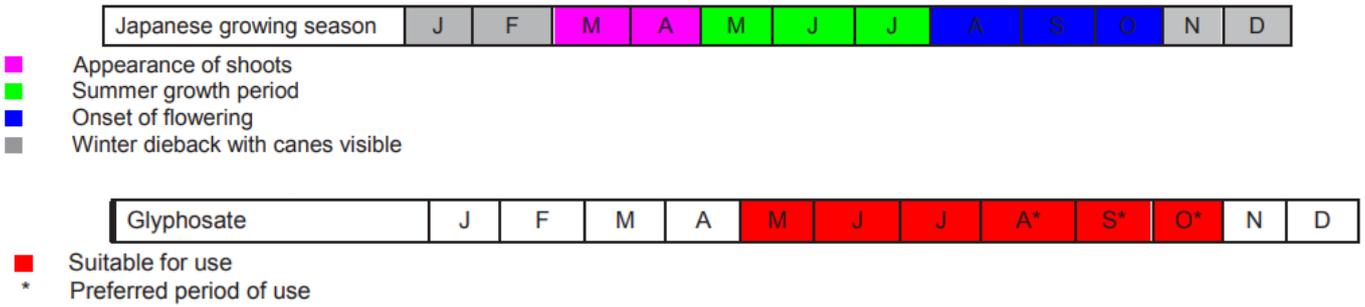


Figure 4-1: Japanese Knotweed Growth season summary (Kelly, et al., 2008).

## 4.2 Cherry Laurel (*Prunus laurocerus*)

### 4.2.1 Species Ecology

Cherry laurel is an evergreen shrub that forms dense thickets of either a single stem or multiple stems (especially if it has been trimmed). It has thick 5-15cm long oblong-ovate leaves; glossy green on surface and pale underneath. Leaves are arranged alternately on short leaf stalks and leaf edges are toothed with pointed tips. Small white fragrant flowers are held in clusters (racemes) and flowers are comprised of five petals and many yellow stamens. The clustered fruits are purple/black and cherry like.



Source: "Cherry Laurel" by edenpictures is licensed CC BY 2.0 (<https://www.flickr.com/photos/10485077@N06/49845235411>)

Plate 4-2: Characteristic Features of Cherry Laurel



#### 4.2.2 Timeframe

Cherry laurel can be cut down at any time of year; the herbicide glyphosate can also be applied throughout the year, however May to October inclusive is a sub-optimal period. Of principle concern when cutting and/or moving vegetation or surrounding soil is the movement of viable seeds. As such the optimal time for cutting is outside the flowering and fruiting period.

### 4.3 Winter Heliotrope (*Petasites fragrans*)

#### 4.3.1 Species Ecology

Winter heliotrope (*Petasites fragrans*) is an invasive plant species, native to North Africa and the Mediterranean. It often forms dense carpets of kidney-shaped leaves, 20-50cm wide, and is not often confused with other species. Heliotrope prefers damp areas and embankments, both within waste ground areas and cultivated land. It can often be found along roadways and drains.

These deciduous plants produce large roundish leaves up to 30cm in diameter. These are downy underneath. Its pale pink flowers have a distinctive sweet smell and flower in December and January. Foliage forms a dense carpet with a height of approximately 30cm. Its rhizomatous root system allows vegetative spreading. Plate 4-4 displays some characteristic features of winter heliotrope. The winter heliotrope plants in Ireland are all clone males, originating from a single male, through fragmentation. These male plants are unable to produce seed and thus rely on root systems and fragmentation to spread. The species is thought to be widespread, but under recorded, in Ireland. Thought to have been introduced in the 1800s, first reported in pre-1866 records, it's believed that the species was originally either planted as winter ground cover or as a foodplant for bees (Reynolds, 2002)



Source: "*Petasites fragrans* (Winter Heliotrope)" by Hugh Knott is licensed with CC BY-ND 2.0 (<https://www.flickr.com/photos/148695759@N02/34108451431>)

**Plate 4-3: Characteristic Features of Winter Heliotrope**



#### 4.3.2 Timeframe

It can be dug up any time of the year when soil is suitably dry.





## 5. PROPOSED MEASURES FOR MANAGEMENT OF INVASIVE SPECIES

### 5.1 Recommended Measures

While it is extremely important and more efficient to contain invasive species at the point of infestation, care shall also be taken to ensure the management plan (Section 6) shall also be adhered to ensure that the species is not spread outside the works area.

Invasive Species Ireland (ISI) notes that invasive non-native species are the second greatest threat (after habitat destruction) to worldwide biodiversity. Invasive species negatively impact Ireland's native species; changing habitats and ultimately threatening ecosystems which impacts on biodiversity as well as economics as they are costly to eradicate.

Through prevention, early detection, rapid response, eradication and control measures, we can reduce the risk of their introduction, establishment, spread and impact (Invasives.ie, 2022)

#### 5.1.1 Prevention of spread within the works footprint

Prevention of the spread of invasive species will be achieved by:

- The full implementation of the invasive species management plan (Section 6) in conjunction with a competent and experienced Invasive Species Specialist Contractor.
- Supervision of control measures and treatment works by an appropriately qualified ecologist or invasive species specialist.
- Raising awareness to site workers via toolbox talks given by a suitably qualified person as part of site introduction; informing workers what to look out for and what procedure to follow if they observe an invasive species.
- Where invasive species have been physically removed and soil disturbed, this soil will be seeded or replanted (including 5cm deep mulch) with native plant species. This will prevent erosion and the easy colonisation of bare soil by invasive species in the area.
- Unwanted material originating from the site will immediately be transported off site by an appropriately licensed waste contractor and disposed of properly at a suitably licenced facility, in accordance with the (NRA, 2010) guidelines, i.e. where cut, pulled or mown non-native invasive plant material arises, its disposal will not lead to a risk of further spread of the plants. Care will be taken near watercourses as water is a fast medium for the dispersal of plant fragments and seeds. Material that contains rhizomes, flower heads or seeds will be disposed of either by composting or burial at a depth of 2m, or disposal to licensed landfill in the case of non-native invasive species. All disposals will be carried out in accordance with the Waste Management Acts.
- Signs will warn people working within the site that there is invasive species contamination.
- Ensure appropriate biosecurity measure are in place, these will include the Check Clean Dry method, along with those outlined below:
  - Remove the build-up of soil on equipment
  - Keep equipment clean
  - Do not move fouled equipment from one site to another,



- Footwear and clothing of operatives working near invasive species should be checked for seeds, fruits, knotweed rhizomes or other viable material before exiting the site
  - All vehicles exiting the site will be examined to prevent the transport of rhizomes, seeds and other plant material.
  - Soil, rhizomes and other material cleaned down in the excavation area will be buried in the burial cell.
- Follow instructions provided for containment of invasive species (Section 5.2).

## 5.2 Containment

The three most common ways a site can become infected are:

1. Importation of infected soil.
2. Contamination on vehicles and equipment.
3. Illegal dumping.

Containment of invasive species at Claremorris Closed Landfill will be achieved by:

- A licensed invasive species contractor shall be engaged to remove invasives prior to remediation works.
- No contaminated soil (contamination from non-native species) or vegetation shall be removed from site unless proper biosecurity (Refer to Section 5.1.1. above) is observed and removal by an appropriately licensed waste contractor to a suitably licenced facility.
- New sightings of the invasive plant species identified within the site (refer to Section 3.2) shall be relayed to the contractor for invasive species control. These areas shall follow the same protocol as the current infected areas.
- It is possible, particularly in the first year of control, that new plants will sprout following the initial removal/treatment, either because shade suppression will be reduced or due to soil disturbance. As such, several additional visits will likely be required. Three visits, May/June, July/August and September/October should be sufficient to catch all regrowth, although, a cautionary approach is advisable.
- Plants that germinate after September/October are very unlikely to have sufficient time to complete their life cycle and produce seeds.



### 5.2.1 Japanese Knotweed (*Fallopia japonica*)

One method of treatment is proposed for Japanese knotweed on site. Additionally, the following site hygiene measures will be implemented during the proposed works:

- Japanese Knotweed root systems can extend up to 7m in a lateral direction (but usually only up to 5 m), and 2m deep from the over ground parent plant. This buffer zone and infested area will be fenced off prior to and during works where possible to avoid spreading seeds or plant fragments around or off-site.
- Erection of adequate site hygiene signage in relation to the management of non-native invasive material as appropriate and to inform contractors of the risk.
- All staff shall be made aware of nature of threat via toolbox talks as part of site inductions.
- Ensure all site users are aware of measures to be taken and alert them to the presence of the Invasive Species Management Plan.
- Site works will only be allowed within exclusion zones following the removal of Japanese knotweed and contaminated soil.
- All machinery vehicles, equipment, footwear and clothing operating within area of infestation to be thoroughly checked and cleaned in appropriately contained area prior to leaving the area to protect against further spreading of Japanese knotweed.
- Avoid if possible using machinery with tracks in infested areas.
- No stockpiling of contaminated soil will occur on-site.
- For soil imported to the site for infilling of embankments, the contractor will gain documentation from suppliers stating that it is free from invasive species.

#### *Excavation*

Japanese knotweed will be buried at a minimum depth of 2m and fully encapsulated with a root barrier membrane cell. The burial cell will be within the site boundary, centrally located within the proposed capping area. This will be a root barrier specifically designed for Japanese knotweed, designed to remain intact for at least 50 years (as per guidelines). A buffer layer of sand will be placed above and below, it will be infilled to 2m with inert fill or topsoil. This method meets the requirements of the UK Environment Agency, (2019).

The proposed location for Japanese Knotweed Burial is shown in a drawing accompanying this planning application (Drawing Reference: P21-287-0100-0014)

### 5.2.2 Winter Heliotrope (*Petasites fragrans*)

Generally, site-wide control measures for this species are not required; however, areas of bare soil should be re-vegetated as soon as possible to reduce the amount of suitable habitat for these species. Additionally, donkeys should be excluded from this area, due to evidence of spread of this particular species via donkeys on site.



Source: Fehily Timoney

### Plate 5-1: Potential Spread of Winter Heliotrope by Donkeys at Claremorris Closed Landfill

#### *Physical control*

Excavation of winter heliotrope can be completed at any time of year when soils are suitably dry. All plant material, particularly the rhizomes, should be excavated and processed appropriately. Regular follow-up treatment should be completed to combat re-sprouting (NRA, 2010).

Contaminated plant matter, soils and other materials and buried on-site at a minimum depth of 2m or removed off-site to an appropriately licensed facility. This will be carried out in accordance with the NRA (2010) guidelines (refer to Section 5.1.1).

#### 5.2.3 Cherry Laurel (*Prunus laurocerus*)

One option for the treatment of cherry laurel has been proposed and may be used to eradicate cherry laurel where it will be disturbed by construction and to avoid the spread of the species. The following general recommendations will be adhered to as part of the plan:

- Construction works will only be allowed within exclusion zones once the species has been fully eradicated.
- No treatment measures are to take place in these areas without supervision and agreement by appointed cherry laurel eradication specialist.
- The cherry laurel plant contains cyanide and as per good practice will only be handled with gloves. This plant will be disposed of via an appropriately licensed waste facility.
- Equipment, clothing and footwear will be checked following treatment operations or work in the vicinity of the species and cleared of fruits/seeds as necessary.



*Cut to stump and dig out stump; bury*

This method involves cutting the main stem of the plant near ground level and digging out the stump and any visible roots. This option is not usually practical in areas where there are other invasive plants present as the disturbed soil can allow for the setting of seeds or the spread of rhizomes of adjacent species (ISI, 2008).





## 6. MANAGEMENT PLAN

The management of any invasive species is achieved by the assessment and mapping of the invasive species, containment once found, continual monitoring and record keeping as well as the safe disposal of invasive species material. It is recommended that surveys be carried out periodically at the site to monitor the extent of invasive flora and the success of the control and management measures. These can be carried out by FT, or a contractor specialised in invasive flora treatment. Monitoring should continue during the remediation works and as part of the post remediation monitoring to make sure successful control has been achieved. All invasive species which occur within the area utilised by people and machinery during the proposed remediation works will be controlled/removed from the works area before commencement of works.

### 6.1 Containment

For the efficient use of resources namely, financial, and physical effort, it is important to prevent the further spread of invasive species. Containment will be achieved using measure outlined in Section 5 and those presented below:

- Landholder to be informed of location of the invasive species and the management plan.
- Ensure anyone treating the infestation is a suitably qualified trained professional who follows the management plan.
- The site will be re-surveyed prior to treatment/remediation works to confirm the findings of the original survey.

### 6.2 Schedule

Periodic re-surveying for all invasive species will be required, to ensure that treatment measures were effective, and to trigger further treatment if necessary. Refer to Table 6-1.

Please note that the schedule may require amendment following any given site visit.



**Table 6-1: Schedule for Management of Invasive Species**

Time	Details of measures
<p><b>Pre remediation (Isolation of Invasives)</b></p>	<ul style="list-style-type: none"> <li>• A pre-treatment survey (to reconfirm the findings of the ISMP) will be undertaken during the growing season to mark out the extent of invasive species within site prior to any works commencing.</li> <li>• Treatment/ control of invasive species will be undertaken using the methods proposed in Section 5.</li> <li>• Invasive species to be retained on-site (notably Japanese knotweed) will be buried at a minimum depth of 2m from the top of buried material and fully encapsulated with a root barrier membrane cell.</li> <li>• Infested/ cleared areas will be demarcated and appropriately signed to prevent access to unauthorised personnel.</li> <li>• Any disposal of plant matter and soil off-site, should be completed through an appropriately licenced contractor and waste facility.</li> </ul>
<p><b>During remediation (General Clearance and Minor Profiling, Burial Cell Construction, Invasive Burial, Capping Works)</b></p>	<ul style="list-style-type: none"> <li>• Following treatment, site to be monitored for signs of regrowth/ spread to new areas.</li> <li>• Toolbox talks shall be given to all personnel accessing the site, informing them of the locations of the invasive species and instructing them not to enter these areas (unless they are licensed invasive species contractors or ecologists).</li> <li>• A clean down area within the excavation area will be identified and a suitable membrane will protect the soil from further infestation. Soil and plant material gathered in the clean down area shall be buried in the burial cell.</li> <li>• Designated curtailment areas will be demarcated for the transport of Japanese knotweed from infested areas to the burial cell.</li> <li>• Machinery to be used in the control of Japanese knotweed will be itemised, and only those machinery will be used for excavation.</li> <li>• The build-up of soil on equipment will be removed and fouled equipment will not be moved between sites, or between the curtailment area/clean down area and the rest of the landfill.</li> <li>• Footwear and clothing of operatives working near invasive species should be checked for rhizomes, seeds, fruits, or other viable material before exiting the site. Boot brushes will also be utilised.</li> <li>• All vehicles exiting the site will be examined to prevent the transport of seeds.</li> <li>• If re-growth of invasive species is discovered, further treatment/control will be completed using the treatment methods in Section 5.</li> <li>• Site to be monitored during remediation works for signs of regrowth of all invasive species, Invasive plant material to be buried in suitable location with appropriate depth (2m above buried material) available within the site. The burial cell will be within the site boundary, centrally located within the proposed capping area.</li> <li>• The burial cell will be signposted and demarcated to prevent accidental uncovering.</li> </ul>



## 6.3 Mapping, Evaluating and Record Keeping

During the pre-remediation and remediation phase the following will take place before control measures:

- Check that the area of infestation is still cordoned off and a warning/information sign is still in place
- Photographs of the area(s) of invasive species infestation
- Map the extent via recording GPS coordinates and measure the length and width of infestation (including above and below ground rhizome growth) and plot on map
- Evaluate the status/condition of the infestation
- Make sure the above steps are recorded.

At the end of each site visit the recorded data should be compared with the findings of this report. Preparation of a short report on the progress of treatment following treatment works, and any subsequent monitoring.

## 6.4 Appropriate Disposal

### 6.4.1 Storage

As described in Section 5, all cut and excavated plant matter will be stored securely in line with the relevant treatment methodology.

### 6.4.2 Disposal

#### 6.4.2.1 *Burial*

Burial of plant matter and possible contaminated soil is to be completed as per the species-specific conditions discussed in Section 5.

#### 6.4.2.2 *Licensed Disposal*

Disposal of plant matter and soil off-site if required, will be completed through an appropriately licenced haulier and waste facility.





## 7. DISCUSSION

There is a legal obligation not to spread plants listed on the third schedule of Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 to 2021; the relevant species Claremorris Closed Landfill, and therefore those of principal concern, is Japanese knotweed (*Fallopia japonica*). Additionally, of concern for the invasive species management plan are winter heliotrope and cherry laurel, which are present within the site boundary. Liaison with landholders of adjacent lands may be necessary to effectively control invasive species in the area and to prevent re-infestation.

It is recommended that a competent and experienced invasive species management contractor is appointed to treat and control invasive species. A dedicated invasive species survey is recommended to be undertaken by the appointed contractor to re-confirm the findings of the previous survey and to identify any new areas/species of infestation.

It is recommended that infested and cleared areas, as well as the burial cell, will be appropriately demarcated and signed to prevent access to unauthorised personnel. Additionally, appropriate biosecurity to prevent spread of invasive species is recommended., as stated in Section 5 for each species, and Section 5.1.1. for general biosecurity measures.





## 8. CONCLUSION

This Invasive Species Management Plan (ISMP) has been prescribed for Claremorris Closed Landfill and its proposed remediation, to comply with Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 to 2021 (not to cause the spread of non-native invasive plant species listed in schedule III), and to ensure non-native invasive plant species not listed in schedule III are not spread to adjacent land or Natura 2000 (European) sites. The report details a programme for the mapping and control of invasive species at the remediation site within the unauthorized landfill site.

The plan will prevent the spread of identified non-native invasive species within and from the site and reduce the potential risk for the introduction and/or spread of new invasive species within the site pre, during and post remediation.





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