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# **Invasive Species Management Plan**

## Proposed Residential Development at Far Finisklin, Co. Sligo

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## Executive Summary

Two patches of Japanese Knotweed have been identified to the south of Rathellen House in Far Finisklin, Sligo. The applicant (Sligo County Council) has submitted a planning application for a residential development at the site, which will involve works within the footprint of both Japanese Knotweed patches. It is an offence under the *EC (Birds and Natural Habitats) Regulations 2011* to cause the spread of Japanese Knotweed, including soil / spoil that may contain its rhizomes. To ensure compliance with this legislation, NM Ecology Ltd has developed a plan for the management of knotweed prior to, during and after construction works.

The management plan includes details of its distribution within the site, an outline of the development proposals, and the legal restrictions that apply to the plant. The management strategy includes the following measures:

1. Pre-construction herbicide treatment and monitoring
2. Biosecurity measures for the construction phase
3. Excavation of knotweed-contaminated soils for off-site treatment
4. Monitoring the site and spot-treating any re-growth

The measures outlined in this plan will avoid or minimise the spread of restricted invasive plant species during the construction of the development. This will ensure compliance with relevant legislation, the protection of new structures, and minimal disruption of the proposed construction works.

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## 1 Introduction

### 1.1 Background to the report

Sligo County Council has submitted a planning application for a residential development in the grounds of Rathellen House in Far Finisklin, Sligo. As part of an ecological assessment of the site, two patches of Japanese Knotweed (a legally-restricted invasive plant species) were recorded to the south of Rathellen House. In response, NM Ecology Ltd was engaged to develop an Invasive Species Management Plan for the project.

This plan outlines the measures that will be implemented to avoid or minimise the spread of Japanese Knotweed prior to, during and following the proposed works, and to ensure compliance with the law. It is based on current best practise in the treatment of Japanese knotweed, and has been adapted to the development proposals and schedule.

### 1.2 Legislative background

Japanese Knotweed *Fallopia japonica* is listed as restricted non-native plant species on the third schedule of the *European Communities (Birds and Natural Habitats) Regulations 2011* (SI 477/2011, as amended). Relevant extracts from the regulations are reproduced below.

49(2) *Save in accordance with a licence granted [by the Department of Housing, Local Government and Heritage], any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in any place [a restricted non-native plant], shall be guilty of an offence.*

49(3) *... it shall be a defence to a charge of committing an offence under paragraph (1) or (2) to prove that the accused took all reasonable steps and exercised all due diligence to avoid committing the offence.*

50(1) *Save in accordance with a licence, a person shall be guilty of an offence if he or she [...] offers or exposes for sale, transportation, distribution, or release—*

(a) *[any restricted non-native animal or plant species],*

(b) *anything from which an animal or plant referred to in subparagraph (a) can be reproduced or propagated, or*

(c) *a vector material listed in the Third Schedule, [which includes] soil or spoil taken from places infested with Japanese Knotweed (Fallopia japonica)*

In summary, it is an offence under regulations 49(2) and 50(1) to spread Japanese Knotweed, or to distribute any plant material or soil containing its rhizomes / roots. An offence may be avoided if a licence is obtained from the Department of Housing, Local Government and Heritage, and if reasonable steps and due diligence are put in place. In recognition of these regulations, this management plan outlines the reasonable steps and due diligence that will be implemented by the contractor to ensure compliance with the legislation.

### 1.3 Characteristics of Japanese Knotweed

Japanese knotweed is a herbaceous perennial plant that grows to heights of 2 - 3m. In summer it produces dense bushes of bamboo-like stems, with large shield-shaped leaves and strings of small white flowers. In winter the herbaceous material dies back, leaving standing dead canes.

As plants mature, rhizomes (underground creeping stems) spread laterally into the surrounding earth, usually within 2.5 m of the above-ground stems, and occasionally up to 4 m. Root growth underneath the plant typically extends 1.5 m below ground level, but for mature plants it can occasionally extend up to 3.2 m (Fennell et al. 2018)<sup>1</sup>.



**Fig 1. Mature Japanese Knotweed stems in flower**

Japanese Knotweed is spread exclusively by fragmentation of its rhizomes, roots and stems. The rhizomes and roots are relatively fragile and can easily be spread during groundworks, and new plants can grow from rhizome fragments weighing less than one gram. Although the plant produces large numbers of flowers in the late summer period, its seeds are not viable in Ireland, so it does not spread by seed dispersal.

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<sup>1</sup> Fennell et al. (2018), *Japanese knotweed (Fallopia japonica): an analysis of capacity to cause structural damage (compared to other plants) and typical rhizome extension*. PeerJ 6:e5246; DOI 10.7717/peerj.5246

As a result of its highly-invasive characteristics and vigorous growth, Japanese Knotweed is recognised as a significant constraint on construction sites. It can easily be spread by the movement of earth, gravel or rocks, or by snagging on construction vehicles. Its rhizomes extend laterally underground, so even works several metres from the stems can disturb its rhizomes. New seedlings are vigorous, and can cause superficial / cosmetic damage to some built surfaces (e.g. shallow tarmac, permeable paving) or exploit gaps between concrete surfaces. However, although there had previously been a widespread belief that it posed a structural threat to solid concrete or other major structures, recent research has shown that this is not the case (Fennel et al., 2018).

The standard approach to control Japanese knotweed is to treat it with a systemic herbicide, applied either as a spray to the foliage, or injected into the stem. Systemic herbicides are the most effective option in this regard, because they are carried through the vascular system of the plant and can infiltrate parts of the rhizome. This typically takes a number of years: 1 – 2 years for immature plants, 2 – 3 years for semi-mature plants, and 3 or more years for mature plants. However, it is rarely possible to kill the entire rhizome network using herbicide, and the rhizomes can remain dormant underground even when no above-ground stems are visible. Therefore, to fully eradicate the plant it is usually necessary to excavate the knotweed and dispose of it by deep burial, landfill or incineration.

## **2 Distribution of Japanese Knotweed within the development site**

The site was surveyed by Nick Marchant of NM Ecology Ltd on 1<sup>st</sup> June 2021 as part of a multi-disciplinary ecological assessment. Two patches of Japanese knotweed *Fallopia japonica* were found to the south of Rathellen House. Their locations are shown in Figure 2, and they are described as follows:

- JK1 – Relatively small patch (5 m x 5 m) of semi-mature plants, located at the base of a wall. Some surface vegetation was scraped off this area in recent months, and moved to a small stockpile 5 m away.
- JK2 – Larger patch (10 m x 10 m) of mature plants at the base of a wall.



Figure 2. Japanese knotweed patches to the south of Rathellen House

### 3 Development Proposals

The proposed development will involve the demolition of some derelict outbuildings, and the clearance of much of the remainder of the site. An existing structure (known as Rathellen House) and an associated outbuilding will be renovated and converted into 6 no. residential units. 57 no. new residential units will be constructed in the remainder of the site, comprising a mixture of 2 – 5 bedroom houses and 1 - 2 bedroom duplex apartments. In total, this will comprise 63 no. residential units.

The primary access point will be from Sea Road, and it will lead to paved internal roads and on-street parking spaces. A cycle path will run along the western and northern sides of the

Site. Part of Sea Road will be re-aligned to accommodate public transport. Existing mature trees in the north of the Site will be retained and incorporated into a large area of public open space. New residences will have private gardens.

Works in the vicinity of JK1 will include the clearance of vegetation, renovation / alterations to Rathellen House, renovation / rebuilding of outbuildings, and replacement of the adjacent wall. Works in the vicinity of JK2 will include the clearance of vegetation, demolition of outbuildings and construction of new dwellings.

## 4 Management Strategy

### 4.1 Review of treatment options for Japanese Knotweed

Some general guidance on the preferred treatment options is outlined in the *Knotweed Code of Practice*<sup>2</sup>, which was published by the Environment Agency of the United Kingdom. Some excerpts are reproduced below:

- *“Unless an area of Japanese knotweed is likely to have a direct impact on the development, you should control it in its original location with herbicide over a suitable period of time, usually two - five years.*
- *If in-situ treatment is not possible, soil containing Japanese knotweed may be buried on the site to ensure that you completely kill it. In this case, you must bury material at least 5m deep, or at 2m if enclosed in a root barrier membrane*
- *Where local conditions mean you cannot use burial as an option, it may be possible to create a Japanese knotweed bund. The purpose of the bund is to move the Japanese knotweed to an area of the site that is not used. This gives time for herbicide treatment that would not be possible where the Japanese knotweed was originally located.*
- *Sometimes, due to shortage of time and location, off-site disposal (by incineration or landfill) is the only reliable option, but it should be treated as a last resort.”*

In-situ herbicide treatment will not be feasible at this site because extensive construction work will be required in the vicinity of both patches, and herbicide treatment is unlikely to achieve full eradication. Deep burial or bunding is not feasible due to a lack of suitable locations. Therefore, the only remaining option is off-site disposal. Detailed management measures are provided in Section 5.

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<sup>2</sup> UK Environment Agency (2013) *The Knotweed Code of Practice: Managing Japanese Knotweed on development sites*, Version 3. The code of practice was formally withdrawn by the Environment Agency in 2016 because the agency no longer provides best practice guidance, but the methods of the code of practice are still considered valid.

## 4.2 Management objectives

Based on the treatment options discussed above, the objectives of this management plan are to:

1. Carry out herbicide treatment until the commencement of construction
2. Prevent the accidental spread of Japanese Knotweed during construction works
3. Excavate knotweed-contaminated soils from the working area and send them off-site for treatment at a licensed facility.
4. Monitor the site and control any re-growth

## 5 Details of management measures

The measures outlined below will be required to deal with invasive species prior to, during and after construction works. Many of these measures require specialist skills, so the contractor will employ a suitably qualified ecologist or invasive-species specialist to assist with the interpretation and implementation of the management measures outlined in this document. The specialist will visit the site periodically during construction works, and will supervise certain tasks, but will not have a permanent presence on site. Therefore, the implementation of this management plan is ultimately the responsibility of the contractor's site manager.

### 5.1 Pre-construction herbicide treatment and monitoring

To prevent further spread or establishment of the existing knotweed stands, they will be treated with herbicide until the commencement of construction. Herbicide will be applied in September of each year. The status of the infestation and the effectiveness of herbicide treatment will be monitored on an annual basis during the growing season (May to September, inclusive). This will include a count and description of above-ground knotweed stems, and the excavation of sections of crown and rhizome to assess viability.

### 5.2 Isolating the infested areas and implementing bio-security measures

There is a risk that Japanese knotweed may accidentally be spread during construction. This may occur if there is any excavation within a few metres of a stand, if vehicles drive through a stand, or if materials are temporarily stored there. To prevent accidental spread, the contractor will take precautions prior to and during works. These precautions are referred to as 'bio-security measures' and will include fencing of existing stands, restrictions on the removal of any materials, and measures to clean any vehicles that work within them.

#### 5.2.1 Exclusion zones

Exclusion zones will be established around the patches of Japanese knotweed and marked with a temporary construction fence (e.g. Heras-style fencing), which will be fixed in position for the duration of works. The exclusion zones will be placed at a four-metre radius from all

above-ground knotweed stems, in order to cover the likely extent of underground rhizomes. Signs will be attached to the fences to inform construction personnel that the areas contain live knotweed, and of the restrictions to work in these areas. In order to avoid or minimise the spread of invasive species from the infested areas, the following bio-security measures must be implemented:

- All unnecessary work within the exclusion zones will be avoided. The contractor's compound will not be placed within them, nor will any construction materials or vehicles be stored within them
- No soil, vegetation, rubbish or any other material will be removed from the exclusion zones, other than for the transfer of knotweed contaminated material outlined in Section 5.3
- No vehicles will drive through the exclusion zones unless strictly required, because Japanese Knotweed fragments could become attached to vehicles (e.g. in tyre treads) and spread to other parts of the construction site, or outside the site. Any vehicles involved in the excavation of knotweed-contaminated soils will be cleaned of invasive plant material before leaving the exclusion zones (see Section 5.2.3)
- The exclusion zones will remain in place until the measures outlined in Section 5.3 have been completed and signed off by the ecologist / invasive species specialist

#### 5.2.2 Toolbox talk

Relevant construction personnel will be given a 'toolbox talk' by the project ecologist / invasive species specialist regarding the procedures for working in the exclusion zone. This will include the following items:

- Introduction to Japanese knotweed and its implications for construction projects.
- Outline of its legal status and the implications of spreading it
- How to identify it, including both above-ground stems / leaves and underground rhizomes / roots
- The extent of the infested areas
- Discussion of procedures and restrictions for work in exclusion zones, as outlined in this management plan
- Demonstration of the procedures for entering and leaving the exclusion zones, and for cleaning vehicles, equipment and footwear.

Where necessary, the ecologist will supervise any work within the exclusion zones, in order to assist with the implementation of the management plan. In particular, this applies to Section 5.3 of this document.

#### 5.2.3 Cleaning of contaminated vehicles and clothing

Invasive species can easily be snagged in construction vehicles (particularly in tracks), providing a high risk that they can be spread to other parts of the construction site.

Therefore, any vehicles or personnel that need to work within the excavation zones will be thoroughly cleaned before being used in any other construction works, as outlined below:

- After completing excavation works, all plant material and soil will be removed from the vehicles using shovels and brushes. Special attention will be paid to tracks and joints. All material will be removed, even if it does not look like Japanese Knotweed
- All removed plant fragments and soils will be returned to the exclusion zones
- When vehicles have been cleaned, they can leave the exclusion zones and be re-used for other construction work
- Any personnel working within the exclusion zones will check their shoes, clothes and equipment for invasive species material when leaving the site. All removed plant fragments and soils will be returned to the exclusion zones.

### **5.3 Excavation and off-site disposal**

At the start of the construction work, prior to site clearance, all knotweed-contaminated soils within the site boundary will be excavated and sent off-site for treatment. As this will involve the movement of Japanese knotweed and soils containing its rhizomes, a licence must be obtained from the National Parks and Wildlife Service for this process, as per Regulation 49(2) of the *European Communities (Birds and Natural Habitats) Regulations 2011* (as amended). This management plan will be submitted in support of the licence application.

A specialist waste contractor will organise the haulage of the knotweed-contaminated material to the treatment centre (usually an incinerator in Ireland or the Netherlands), and will submit their own method statement as part of the licence application. However, procedures for the construction contractor are outlined below:

- The removal of Japanese knotweed will be the first stage of construction works, in order to minimise the risk that any material is spread
- A clean 'haul route' will be developed between the site entrance and the exclusion zones
- Knotweed-contaminated soils will be excavated and placed directly into skips or trucks located just outside the exclusion zones. The knotweed-contaminated soils will not be set-down or stored elsewhere on the site
- Skips and trucks will not be over-filled; the surface of the excavated material will be at least 30cm below the top of the skip / truck
- All excavation work will be supervised by an ecologist or invasive species specialist, who will attempt to track the extent of all rhizomes extending from the main plants, in order to ensure that all live material is removed
- When all excavated material has been removed, the 'haul route' will also be cleared. All plant material and soils along the haul route should be transferred to the skips and sent for off-site treatment

#### **5.4 Post-construction monitoring and herbicide treatment.**

Although the measures outlined in this report should eradicate or remove the vast majority knotweed from the site, it is not always possible to fully remove all traces of knotweed from a site. Tiny fragments of knotweed may accidentally be overlooked during excavation works, or knotweed may accidentally be re-introduced to the site from third-party lands. To manage this risk, it is best practice to implement a programme of monitoring and spot-treatment after the completion of works.

Monitoring will commence in the year following the completion of construction, and will continue for at least three years after the completion of construction works. This will ensure that any new growth of knotweed is identified early and can be treated with herbicide before it becomes established. This is standard practice on any knotweed control project, and is the most cost-effective method to manage regrowth.

Annual monitoring should be carried out in June / July each year, in order to identify any regrowth of Japanese knotweed within the survey area. Monitoring should be carried out for a minimum of three years post-construction. If no growth is detected for at least two consecutive years, then the knotweed can be considered eradicated, and annual monitoring / treatment will no longer be required.

## **6 Conclusion**

In recognition of their obligations under the *EC (Birds and Natural Habitats) Regulations*, Sligo County Council has commissioned NM Ecology Ltd to prepare this management plan on their behalf. The management plan includes pre-construction herbicide treatment and monitoring, 'bio-security' measures for the construction phase, the excavation and off-site disposal of knotweed-contaminated soils, and post-construction monitoring. These approaches are consistent with best practice and are regularly undertaken at construction projects around Ireland.

Subject to the successful implementation of these measures, the contractor would not be in contravention of Regulation 49(2) of the *EC (Birds and Natural Habitats) Regulations*. Even if some material was accidentally spread within the site, the contractor would have demonstrated that they "*took all reasonable steps and exercised all due diligence to avoid committing the offence*", as outlined in Regulation 49(3).