

CARMELITES, DELGANY, CO. WICKLOW, IRELAND
INVASIVE SPECIES SURVEY & MANAGEMENT PLAN



FINAL REPORT

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CARMELITES, DELGANY, CO. WICKLOW, IRELAND

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1. INTRODUCTION

Faith Wilson Ecological Consultant was appointed by Drumkilla Ltd. to prepare an Ecological Impact Assessment for a proposed Strategic Housing Development on lands previously owned by the Carmelites in Delgany, Co. Wicklow as shown in **Figure 1** below.



Figure 1. The proposed development lands in Delgany as outlined in red.

During the surveys conducted for same a number of invasive and non-native species were recorded which will require management and treatment to ensure that they do not spread. This report was therefore prepared on foot of same and records the subsequent treatment and management proposals implemented to date.

Guidance in preparing this report was taken from:

- Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA, 2010),
- Best Practice Management Guidelines for Japanese knotweed (Invasive Species Ireland, 2008),
- Best Practice Management Guidelines for Giant hogweed (Invasive Species Ireland, 2008),
- Best Practice Management Guidelines for Rhododendron and Cherry Laurel (Invasive Species Ireland, 2008),
- Managing Japanese knotweed on development sites - the knotweed code of practice (Environment Agency, September 2013), and other international best practice.

2. RELEVANT LEGISLATION

2.1 Invasive Species

Until recently there has been no legal framework for the control or eradication of non-native invasive species in the Republic of Ireland. The Birds and Habitats Regulations (2011) which were signed on 21st September 2011 by the Minister for Arts, Heritage and the Gaeltacht Jimmy Deenihan, included new legislation on invasive and non-native species in Sections 49 and 50. Sections 49 and 50 have not yet been legally implemented as they have implications for members of the pet and horticultural trades and consultation with these groups is ongoing.

The relevant text of these regulations are presented below for reference and those species, which are known to be present on the Carmelite Lands are highlighted in yellow.

2.2 Section 49. Prohibition on the introduction and dispersal of certain species.

Section 49 of the act states:

(1) Save in accordance with a licence granted under paragraph (7), any person who breeds, reproduces or releases or allows or causes to disperse or escape from confinement, any animal which—

(a) is not—

- (i) ordinarily resident in or is not a regular visitor to the State in a wild state, or
- (ii) of a kind that is domesticated or that is in the normal course the subject of human husbandry,

(b) is included in Part 2A of the Third Schedule in any place specified in relation to such animal in the third column of Part 2A of the Third Schedule, or
(c) is included in Part 2B of the Third Schedule in any place specified in relation to such animal in the third column of Part 2B of the Third Schedule,

shall be guilty of an offence.

(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.

(3) Subject to paragraph (4), 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.

(4) Where the defence provided by paragraph (3) involves an allegation that the commission of the offence was due to the act or default of another person, the person charged shall not, without leave of the court, be entitled to rely on the

defence unless, within a period ending 28 days before the hearing, he or she has served on the prosecutor a notice giving such information identifying or assisting in the identification of the other person as was then in his or her possession.

(5)

(a) In this Regulation, an animal or plant listed in the Third Schedule shall mean such an animal or plant or a hybrid of any such animal or plant or any breed, strain, sport, variety, cultivar or other infraspecific taxon of such plant or animal in relation to the entire State or, where limited for such an animal or plant, the particular areas set forth in the Third Schedule for each such animal or plant.

(b) For the avoidance of doubt, an animal or plant of a species to which the Third Schedule refers shall include specimens of such species under any scientific synonym, vernacular name or trade name by which it may be referred to.

(6) In this Regulation, “confinement” means a place in which an animal is secure from escaping and from which its eggs, larvae, young, any life stage or resting stage, or any part from which an adult of the animal could develop are secure from being dispersed or escaping.

(7)

(a) One or more persons may make an application for a licence, under this paragraph, for the purposes of complying with the requirements of paragraph (1) or (2).

(b) The Minister may seek from the applicant any information that he or she considers necessary for consideration of the application.

(c) The Minister may grant or refuse to grant, or revoke, such a licence, and shall give reasons for his or her decision and for any conditions imposed under subparagraph (f).

(d) In making a decision under subparagraph (c), the Minister shall take account of the requirements of the Habitats Directive and the Birds Directive and in particular the requirements of Article 22(b) of the Habitats Directive, and he or she shall take account of such advice or information as he or she considers appropriate in relation to any animal or plant to which the licence application relates.

(e) The Minister shall grant a licence under this paragraph only if he or she is satisfied that the grant of the licence will not pose a threat to the objectives of the Birds Directive or the Habitats Directive.

(f) A licence granted under this paragraph shall be subject to such conditions, restrictions, limitations or requirements as the Minister considers appropriate.

(g) Any conditions, restrictions, limitations or requirements to which a licence under this paragraph is subject shall be specified in the terms of the licence.

(h) Paragraphs (1) and (2) do not apply to anything done under and in accordance with the terms of a licence granted by the Minister under subparagraph (c).

(8) For the purposes of this Regulation, “the State” includes the territorial waters of the State and the exclusive economic zone of the State.

(9) For the avoidance of doubt, the Minister may develop threat response plans under Regulation 39 for the purposes of this Regulation and, generally, for the purposes of addressing the exclusion, eradication or control of species referred to in the Third Schedule and any other species that the Minister considers poses a threat to the habitats or species protected under these Regulations.

(10) Where the Minister considers that a species poses a threat to the objectives of the Birds and Habitats Directives, including the protection of European Sites, of habitats, and of species of flora and fauna, including birds, he or she may authorise the destruction by appropriate means including, where appropriate, by shooting, of any of the animals referred to in paragraph (1)(a), or listed in Part 2 of the Second Schedule.

(11) Where an animal that is of a species referred to in Part 2B of the Third Schedule, or that is a hybrid of such a species, is one of a herd that is being farmed for slaughter for commercial meat production, it shall not be an offence under this Regulation to transport the animal from one place of enclosure to another for farming purposes or to transport the animal for sale or for slaughter for commercial meat production.

(12) For the purposes of paragraph (11), “slaughter” does not include the killing of an animal during or following hunting.

2.3 Section 50. Prohibition on dealing in and keeping certain species

Section 50 of the act states:

(1) Save in accordance with a licence granted under paragraph (7), and subject to Regulation 74, a person shall be guilty of an offence if he or she has in his or her possession for sale, or for the purposes of breeding, reproduction or propagation, or offers or exposes for sale, transportation, distribution, introduction or release –

- (a) an animal or plant listed in Part 1 or Part 2 of the Third Schedule,
 - (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 Part 3 of the Third Schedule,
- in any place in the State specified in the third column of the Third Schedule in relation to such an animal, plant or vector material.

(2) Save in accordance with a licence granted under paragraph (7), a person shall be guilty of an offence if he or she imports or transports –

- (a) an animal or plant listed in Part 1 or Part 2 of the Third Schedule,
- (b) anything from which an animal or plant referred to in Part 2 of the Third Schedule can be reproduced or propagated, or

(c) a vector material listed in Part 3 of the Third Schedule, into or in or to any place in the State specified in relation to such an animal or plant or vector material in relation to that animal or plant or vector material in the third column of the Third Schedule.

(3) Save in accordance with a licence granted under paragraph (7), a person shall be guilty of an offence if he or she publishes or causes to be published by any means, including on the internet, any advertisement, catalogue, circular or price list likely to be understood as conveying that such person imports into the State, buys, sells, distributes or provides for the introduction or release, or intends to buy or sell or distribute or introduce or release, in any place in the State as specified in the third column of the Third Schedule, –

(a) an animal or plant listed in Part 1 or Part 2 of the Third Schedule,
(b) anything from which such an animal or plant can be reproduced or propagated, or

(c) a vector material listed in Part 3 of the Third Schedule.

(4) Subject to paragraph (5), it shall be a defence to a charge of committing an offence under paragraph (1), (2) or (3) to prove that the accused took all reasonable steps and exercised all due diligence to avoid committing the offence.

(5) Where the defence provided by paragraph (4) involves an allegation that the commission of the offence was due to the act or default of another person, the person charged shall not, without leave of the court, be entitled to rely on the defence unless, within a period ending 28 days before the hearing, he or she has served on the prosecutor a notice giving such information identifying or assisting in the identification of the other person as was then in his or her possession.

(6)

(a) This Regulation applies to an animal or plant listed in the Third Schedule.
(b) For the avoidance of doubt, an animal or plant listed or referred to in the Third Schedule shall apply to that animal or plant under any synonym or vernacular or trade name by which that animal or plant may be referred to.

(7)

(a) One or more persons may make an application for a licence, under this paragraph, for the purposes of complying with the requirements of paragraph (1), (2) or (3).

(b) The Minister may seek from the applicant any information that he or she considers necessary for consideration of the application.

(c) The Minister may grant or refuse to grant, or revoke, such a licence, and shall give reasons for his or her decision and for any conditions imposed under subparagraph (e).

(d) In making a decision under subparagraph (c), the Minister shall take account of the requirements of the Habitats Directive and the Birds Directive and in particular the requirements of Article 22(b) of the Habitats Directive, and he or she shall take account of such advice or information as he or she considers appropriate in relation to any species to which the licence application relates.

(e) A licence granted under subparagraph (c) shall be subject to such conditions, restrictions, limitations or requirements as the Minister considers appropriate.

(f) Any conditions, restrictions, limitations or requirements to which a licence under this subparagraph is subject shall be specified in the licence.

(g) Paragraph (1), (2) or (3) do not apply to anything done under and in

accordance with the terms of a licence granted by the Minister under subparagraph (c).

(8) For the purposes of this Regulation, “the State” includes the territorial waters of the State and the exclusive economic zone of the State.

(9) For the avoidance of doubt, the Minister may develop threat response plans under Regulation 39 for the purposes of this Regulation and, generally, for the purposes of addressing the exclusion, eradication or control of species referred to in the Third Schedule and any other species that the Minister considers poses a threat to the habitats or species protected under these Regulations.

(10) Where an animal that is of a species referred to in Part 2B of the Third Schedule, or that is a hybrid of such a species, is one of a herd that is being farmed for slaughter for commercial meat production, it shall not be an offence for a person to have such an animal in his or her possession for sale or transportation in the course of the business of farming such animals, including providing for their slaughter or, for the purposes of farming, to import or transport such an animal, and paragraph (3) shall not apply to the publication of any advertisement, catalogue, circular or price list regarding the purchase or sale of such an animal for slaughter for commercial meat production or to be farmed for that purpose.

(11) For the purposes of paragraph (10), “slaughter” does not include the killing of an animal during or following hunting.

*The plant and animal species to which the regulations apply are presented in Schedule Three. Part 1 details the plant species, while Part 3 outlines those animal or plant vector materials and are presented below. **Species present on the Carmelite lands are highlighted in yellow.***

Third Schedule: Part 1 Plants

Non-native species subject to restrictions under Regulations 49 and 50.

First column	Second column	Third column
Common name	Scientific name	Geographical application
American skunk-cabbage	<i>Lysichiton americanus</i>	Throughout the State
A red alga	<i>Grateloupia doryphora</i>	Throughout the State
Brazilian giant-rhubarb	<i>Gunnera manicata</i>	Throughout the State
Broad-leaved rush	<i>Juncus planifolius</i>	Throughout the State
Cape pondweed	<i>Aponogeton distachyos</i>	Throughout the State
Cord-grasses	<i>Spartina</i> (all species and hybrids)	Throughout the State
Curly waterweed	<i>Lagarosiphon major</i>	Throughout the State
Dwarf eel-grass	<i>Zostera japonica</i>	Throughout the State
Fanwort	<i>Cabomba caroliniana</i>	Throughout the State
Floating pennywort	<i>Hydrocotyle ranunculoides</i>	Throughout the State
Fringed water-lily	<i>Nymphoides peltata</i>	Throughout the State

First column	Second column	Third column
Common name	Scientific name	Geographical application
Giant hogweed	<i>Heracleum mantegazzianum</i>	Throughout the State
Giant knotweed	<i>Fallopia sachalinensis</i>	Throughout the State
Giant-rhubarb	<i>Gunnera tinctoria</i>	Throughout the State
Giant salvinia	<i>Salvinia molesta</i>	Throughout the State
Himalayan balsam	<i>Impatiens glandulifera</i>	Throughout the State
Himalayan knotweed	<i>Persicaria wallichii</i>	Throughout the State
Hottentot-fig	<i>Carpobrotus edulis</i>	Throughout the State
Japanese knotweed	<i>Fallopia japonica</i>	Throughout the State
Large-flowered waterweed	<i>Egeria densa</i>	Throughout the State
Mile-a-minute weed	<i>Persicaria perfoliata</i>	Throughout the State
New Zealand pigmyweed	<i>Crassula helmsii</i>	Throughout the State
Parrot's feather	<i>Myriophyllum aquaticum</i>	Throughout the State

First column	Second column	Third column
Common name	Scientific name	Geographical application
Rhododendron	<i>Rhododendron ponticum</i>	Throughout the State
Salmonberry	<i>Rubus spectabilis</i>	Throughout the State
Sea-buckthorn	<i>Hippophae rhamnoides</i>	Throughout the State
Spanish bluebell	<i>Hyacinthoides hispanica</i>	Throughout the State
Three-cornered leek	<i>Allium triquetrum</i>	Throughout the State
Wakame	<i>Undaria pinnatifida</i>	Throughout the State
Water chestnut	<i>Trapa natans</i>	Throughout the State
Water fern	<i>Azolla filiculoides</i>	Throughout the State
Water lettuce	<i>Pistia stratiotes</i>	Throughout the State
Water-primrose	<i>Ludwigia</i> (all species)	Throughout the State
Waterweeds	<i>Elodea</i> (all species)	Throughout the State
Wireweed	<i>Sargassum muticum</i>	Throughout the State

Part 3: Vector Materials

Vector material	Species referred to	Geographical application
Blue mussel (<i>Mytilus edulis</i>) seed for aquaculture taken from places (including places outside the State) where there are established populations of the slipper limpet (<i>Crepidula fornicata</i>) or from places within 50 km. of such places	Mussel (<i>Mytilus edulis</i>) Slipper limpet (<i>Crepidula fornicata</i>)	Throughout the State
Soil or spoil taken from places infested with Japanese knotweed (<i>Fallopia japonica</i>), giant knotweed (<i>Fallopia sachalinensis</i>) or their hybrid Bohemian knotweed (<i>Fallopia x bohemica</i>)	Japanese knotweed (<i>Fallopia japonica</i>) Giant knotweed (<i>Fallopia sachalinensis</i>) Bohemian knotweed (<i>Fallopia x bohemica</i>)	Throughout the State

Within the environs of the Carmelite lands a population of Japanese knotweed (*Fallopia japonica*), as listed under **Schedule Three - Part 1 of the Birds and Habitats Regulations 2011** was noted by the owners.

2.4 Non-native Species Which Threaten Biodiversity

Several other non-native invasive species have been recorded within the site. These include:

- Snowberry bush (*Symphoricarpos albus*),
- Winter heliotrope (*Petasites fragrans*),
- Cherry laurel (*Prunus laurocerasus*),
- Montbretia (*Crocoshmia x crocosmiiflora*),
- Old man's beard (*Clematis vitalba*), and
- Buddleia bush (*Buddleia davidii*).

Each of these species (with the exception of snowberry bush) are listed in the 'NRA Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads' and information on the control and eradication of some is presented on the Invasive Species Ireland website, but there are no legal requirements to eradicate or control these.

3. OBJECTIVE

The objective of the detailed invasive species survey was:

- to identify the locations of invasive species within the site boundary of the Carmelite lands,
- to ensure that any invasive species were not inadvertently spread and that due cognisance was taken of same during the project development and planning,
- to provide recommendations on how to eradicate/treat any populations present.

4. METHODOLOGY

4.1 General Methods

Faith Wilson first attended the site in the company of staff from the development company on 20th August 2019 who were aware of the plants presence on the site.

The locations of Japanese knotweed were accurately documented by staff from the development company and an exclusion zone extending in a 7m radius from the populations was clearly marked out with stakes.

Further surveys of invasive species and noxious weeds were conducted during subsequent walkover surveys of the site.

4.2 Desk study

Records of invasive species from the general area were sought from the National Biodiversity Data Centre who maintains records of invasive species in a national database.

5. SURVEY RESULTS

5.1 Invasive Species

Japanese knotweed (*Fallopia japonica*) was the only invasive species (of those species listed under sections 49 and 50 of the Birds and Habitats Regulations (2011)) encountered on the site.

There is a known population of three cornered leek (*Allium triquetrum*) on lands to the north of the site boundary at Richview House.

5.1.1 Japanese knotweed

Japanese knotweed (*Fallopia japonica*) was currently recorded in two locations on the site (one population in total). This was in the northern field outside the walled enclosure of the monastery along an old overgrown field boundary and a small plant was recorded within the field at the edge of this small compound as indicated below on **Figure 5.1** and the following plates.

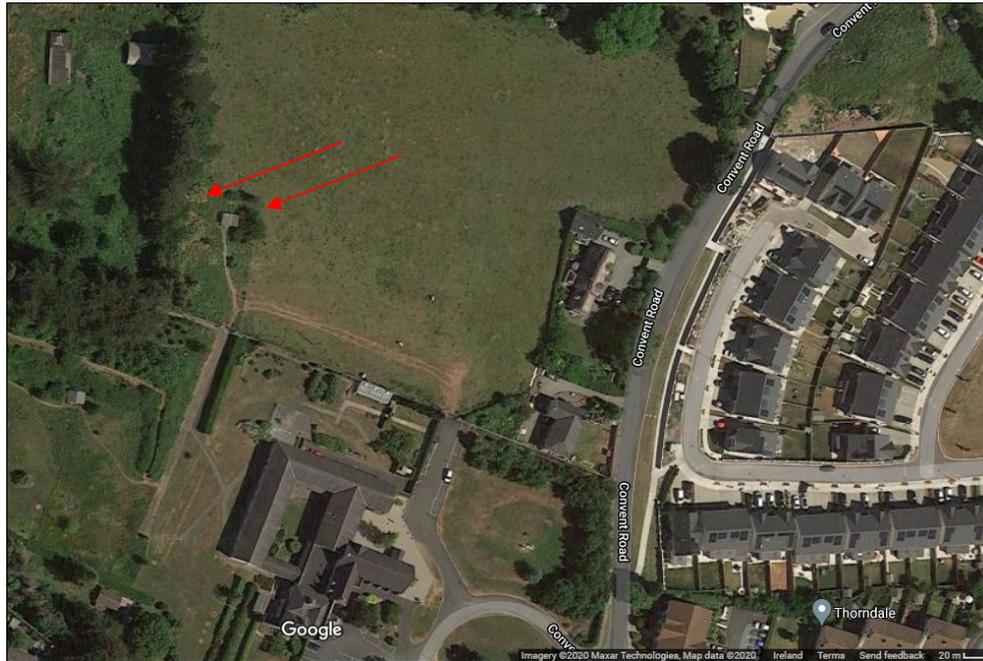


Figure 5.1. Extent of Japanese knotweed at the Carmelites - 2019.

A review of Google Earth Imagery was conducted and imagery from July 2013 shows more clearly the former extent of Japanese knotweed in this area prior to treatment as can be seen on **Figure 5.2** below.

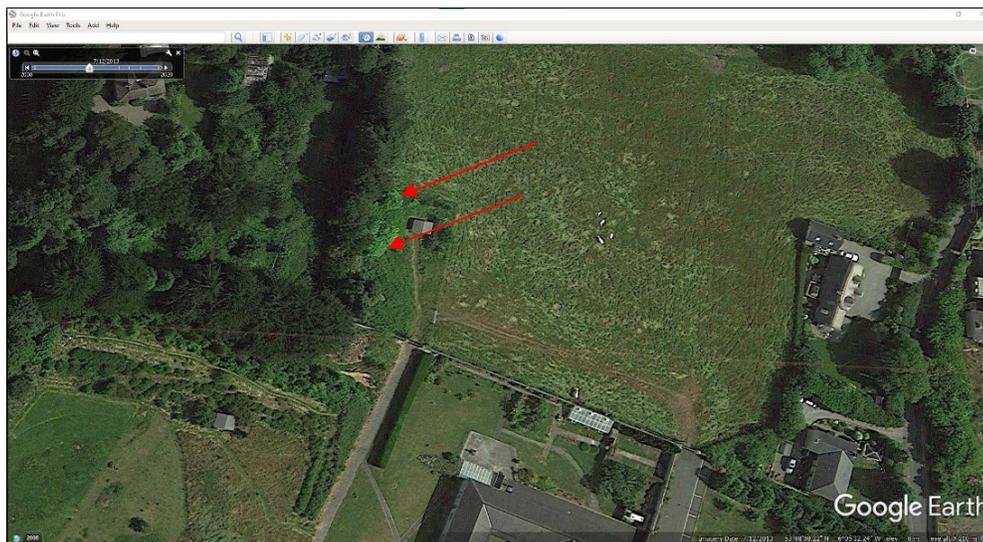


Figure 5.2 Google Earth imagery dated 12th July 2013.



Plate 1. Japanese knotweed within the field boundary - August 2019.



Plate 2. Dead stems of previously treated Japanese knotweed- August 2019.



Plate 3. Japanese knotweed within the field just beyond the fence- August 2019.

5.1.2 Three Cornered Leek

Three cornered leek is found on the adjoining site (Richview House) as illustrated below on **Figure 5.3** but has not been recorded within the Carmelite grounds.

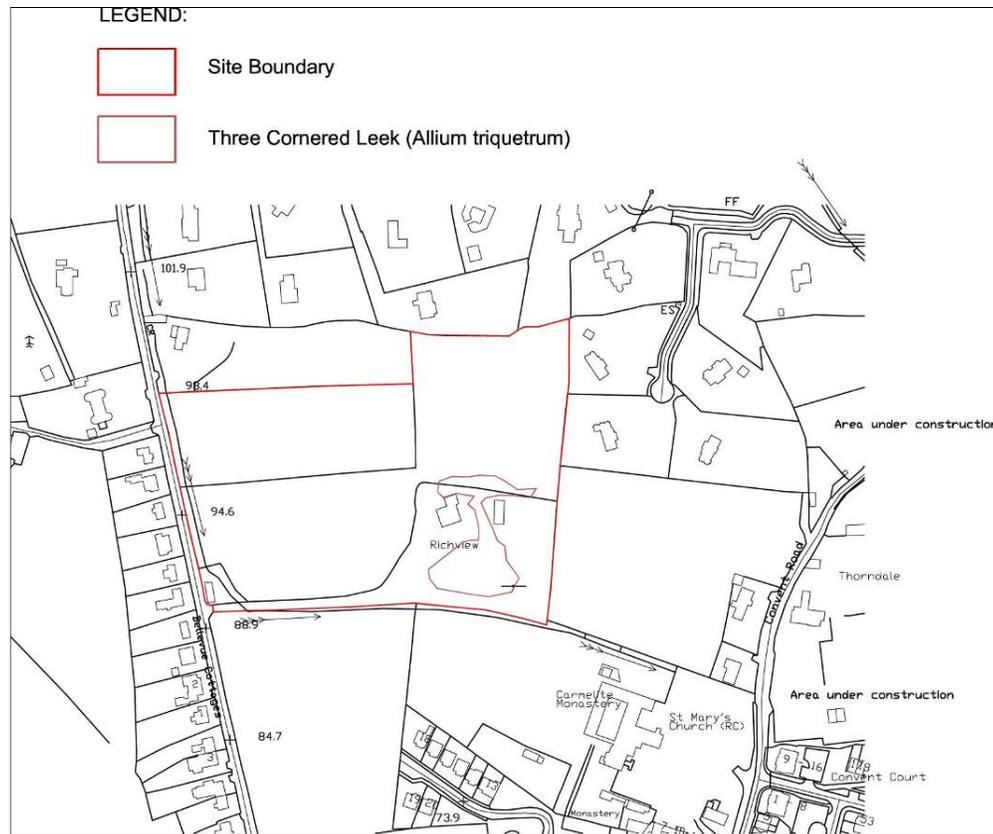


Figure 5.3. The indicative extent of three cornered leek in the adjoining gardens at Richview House.

5.2 Non-native species

Other species recorded from within the site boundaries which are also listed in the NRA guidelines include:

- Butterfly bush (*Buddleia davidii*)
- Cherry laurel (*Prunus laurocerasus*)
- Snowberry bush (*Symphoricarpos albus*)
- Winter heliotrope (*Petasites fragrans*)
- Montbretia (*Crocsmia x crocosmiflora*)
- Old man's beard (*Clematis vitalba*)

Butterfly bush is rare within the site and its presence is not of high concern as it does not threaten any habitats of conservation interest. It does have a biodiversity value for foraging insects – notably butterflies, bees and bumblebees.

Cherry laurel was introduced to many old demesne woodlands and is present in a number of locations beneath mature trees and along field boundaries as shown on **Figure 5.4** below.



Figure 5.4. Cherry laurel within the property.

Similarly some small stands of Montbretia are found below the treeline of Monterey Cypress along the boundary with Richview House as shown on **Figure 5.5** below.



Figure 5.5. Montbretia within the property.

A small area of old man's beard was recorded on the field boundary adjoining the cottage known as 'Alba' on Convent Road as shown on **Figure 5.6** below.

Winter heliotrope was recorded on the earthen bank below the stonewall, which forms the western boundary of the site adjoining the road to Bellevue Hill and adjoining Convent Road, as shown on **Figure 5.7** below.



Figure 5.7. Winter heliotrope within the property.



Plate 5. Winter heliotrope.

Snowberry bush was introduced to many old gardens where it was used as an understorey species and hedging plant. It is present along the field boundary with Richview House as shown on **Figure 5.8** below.



Figure 5.8. Snowberry bush within the property.

6. MANAGEMENT RECOMMENDATIONS

The control guidance outlined below for Japanese knotweed and the other invasive species present follows current best practice as described in:

- 'Managing Japanese knotweed on development sites - the knotweed code of practice' (Environment Agency, July 2013),
- 'Best Practice Management Guidelines for Japanese knotweed by Invasive Species Ireland',
- 'Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads',
- 'Best Practice Management Guidelines for Rhododendron and Cherry Laurel by Invasive Species Ireland'

6.1 Japanese Knotweed (*Fallopia japonica*)

The location where the Japanese knotweed is found within the lands are to be retained as open space and are not planned for building development so the risk of inadvertent spreading of this species and contaminated soils can be avoided. In line with best practice a dedicated programme to control and eradicate this species was begun by the nuns and had achieved a good level of control of the original stand when surveyed in August 2019.

Best practice guidance for the control and management of Japanese knotweed is provided by the Environment Agency who recommend that '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'.

The recommended methodology for the control of Japanese knotweed involves the use of herbicide. It is essential that a competent and qualified person carries out the herbicide treatment. They must carefully follow the instructions on the herbicide label.

The most effective time to apply glyphosate is from July to September (or before cold weather causes leaves to discolour and fall). Spring treatment is acceptable, but less effective. Triclopyr, picloram and 2, 4-D amine can be used throughout the growing season. One should avoid the flowering period to protect bees and other pollinating insects.

The majority of herbicides are not effective during the winter dormant stage because they require living foliage to take up the active ingredient.

Glyphosate is a non-selective herbicide and therefore kills most plants, including grass. One can use it, with care, around mature trees and shrubs and using certain formulations near water. 2, 4-D amine is selective and can be used selectively (using certain formulations) near watercourses and without harming grass.

Further detailed information is provided in the *Environment Agency* document – see pages 12 – 18.



Plate 6. Treatment of Japanese knotweed by the nuns had commenced prior to 2019 with good success.

A site specific management plan for the treatment of Japanese knotweed within the site has been completed by Drumkilla (2020) and is presented in **Appendix 1**.

Treatment to Date:

In line with best practice a dedicated programme to control and eradicate this species was begun by the nuns and is continuing to be implemented on the site.

A 'Japanese Knotweed Management Plan', which was prepared by Drumkilla Ltd. in June 2020 continues the treatment of Japanese Knotweed on site as outlined below.

An exclusion zone was set out using stakes to clearly define the potential extent of Japanese knotweed on site. Treatment of the Japanese knotweed using herbicide was then commenced by operatives working on behalf of the developer.

The following is a record maintained by the developer of the treatment of Japanese knotweed at the Carmelite site in Delgany:

- 22/8/2019, 23/08/2019 and 28/08/2019 - setting out of 7meter zone around the affected area, carefully cutting back some small trees and briars to gain access to main stems, herbicide applied by drilling main stems and injecting over a period of weeks, small plants were sprayed.
- 2/9/2019, 9/9/2019, 16/9/2019, 23/9/2019 - herbicide applied by drilling main stems and injecting over a period of weeks, small plants were sprayed.
- Note! the small trees and briars that were removed were kept on site within the 7 meter zone. The tools used were cleaned down within the 7 meter zone and bagged before taken from site.



Plate 7. A 7m exclusion zone surrounding the dead stems and areas of extant growth was marked out on the ground using stakes.

The stand was revisited by Faith Wilson on 28th August 2020 and the regrowth of Japanese knotweed was examined. Although much reduced some rhizome crowns were continuing to sprout with a number of stems of active growth.

Treatments resumed on the 9th September 2020 by the team working on behalf of the developer with further treatment on the 16th September 2020 and 25th September 2020.

The team from the developer will continue to monitor the situation and will recommence treatment during 2021 and 2022 as required to kill off the species.



Plate 8. Japanese knotweed treatment (September 2020).

The development of the site will be done in several Phases as shown below on **Figure 6.1**. The Japanese Knotweed is located lands proposed for development in Phase 4, i.e. the final phase of the project which is programmed to commence in 2024.

If there is any evidence of growth of Japanese Knotweed by then, the developer is proposing to adopt the protocol for the buried cell solution so to effect the most secure remedy to any potential latent problems with knotweed. There is 3130m²

of designed open space / green area which will adequately accommodate the 176m³ of potentially contaminated earth from the knotweed zone.

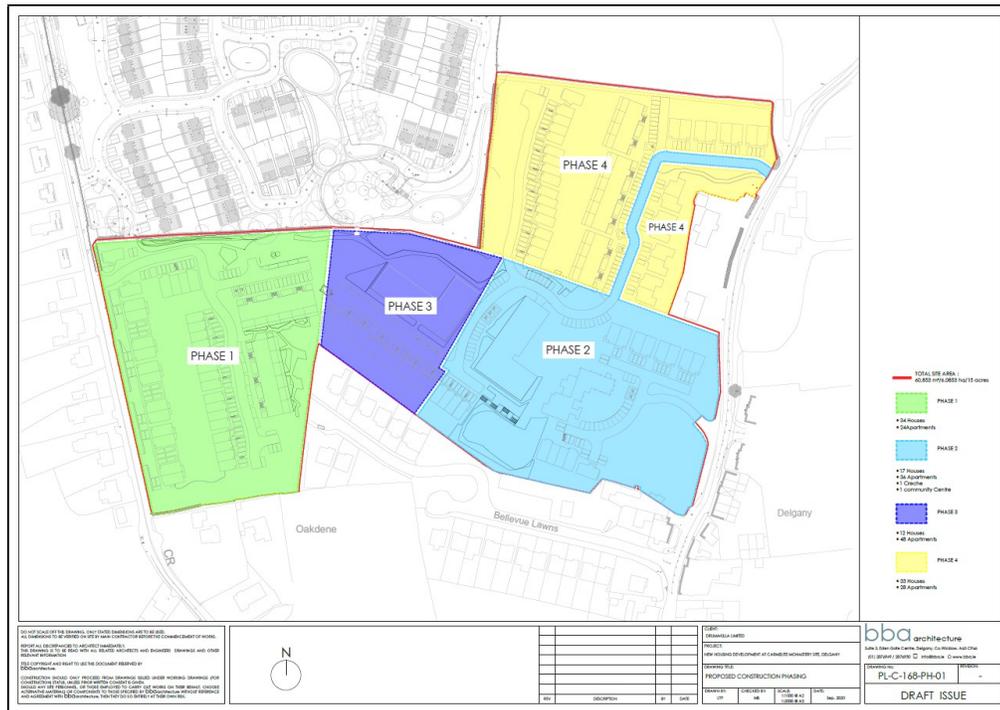


Figure 6.1. Proposed phasing of works on site.

6.2 Cherry laurel (*Prunus laurocerasus*)

Cherry laurel is only an issue as an invasive species when it threatens the diversity of native woodlands or other habitats of conservation value as it tends to form dense thickets and outcompetes native vegetation. It is an unpalatable species and is likely to be toxic to mammals and invertebrates due to the presence of cyanide in the leaves, stem and bark of the plant.

Eradication/management of cherry laurel

Cut and remove stems by hand or chainsaw, cutting as close to the ground as possible to remove above ground growth. Chip or remove the cut material from the area to allow for effective follow-up work and prevent regrowth. Chipped material can provide good weed barrier around ornamental garden areas.

The removal of above ground growth will not prevent regrowth as *Cherry laurel* will regrow from cut stems and stumps. There are four recommended methods to achieve successful management after the initial cut and removal:

1. Digging the stumps out. The effectiveness of this technique is increased by removing all viable roots. This can be done manually or with a tractor and plough. To avoid regrowth, stumps should be turned upside down and soil should be brushed off roots.
2. Direct stump treatment by painting or spot spraying freshly cut low stumps with a herbicide immediately after been cut. Glyphosate (20% solution), triclopyr (8% solution) or ammonium sulphate (40% solution)

are known to be effective during suitable weather conditions i.e. dry weather. The herbicide concentrations used and timings of applications vary according to which chemical is used. Use of a vegetable dye is recommended to mark treated stumps and all stumps should be targeted. A handheld applicator will help avoid spray drift onto surrounding non-target species. Always read the label and follow the manufacturer's guidelines when using herbicides.

3. A variation on the stump treatment method is stem injection, using a 'drill and drop' methodology, whereby, if the main stem is cut and is large enough for a hole to be drilled into it, the hole can be used to facilitate the targeted application of glyphosate (25% solution).
4. Stump regrowth and seedlings can be effectively killed by spraying regrowth with a suitable herbicide, usually glyphosate. Best practice spraying protocols should be carefully followed. General broadcast spraying is not as effective as stump spot treatment and has the potential to impact on surrounding non-target species. The leaves are thick and waxy. For herbicide treatment to be effective **each individual leaf needs be thoroughly wetted with herbicide to kill the plant.**

Cutting	J	F	M	A	M	J	J	A	S	O	N	D
Glyphosate	J	F	M	A	M	J	J	A	S	O	N	D
Triclopyr*	J*	F*	M*	A*	M*	J*	J*	A*	S*	O*	N*	D*
Ammonium sulphate	J	F	M	A	M	J	J	A	S	O	N	D

■ Optimum treatment time.
■ Suboptimum treatment time but can be effective. In the case of glyphosate based herbicides consider higher concentrations 25-100% during this time period.
 * Suitable for treatment any time after cutting and appearance of new growth.

6.3 Butterfly Bush (*Buddleia davidii*)

This species is only sparsely located on the site where it provides nectaring for many species of insects including moths and butterflies. Some consideration could be given to controlling it if populations on the site increase.

The NRA guidelines outline the following:

'As buddleia is a plant that favours disturbed sites, physical grubbing of plants can provide ideal conditions for the germination of seeds. Care needs to be taken to ensure revegetation of controlled areas is undertaken swiftly. The branches of buddleia are capable of rooting as cuttings, so care should also be taken to ensure material is disposed of in a manner to avoid this risk.

The species can be controlled by physical means as follows; 'Management methods such as digging it out are applicable only to minor infestations at the initial stage of invasion. Hand-picking of young plants is feasible but should be undertaken with care to avoid soil disturbance which can give rise to a flush of new seedling. Grubbing of mature stands as a sole attempt at control is not recommended for the same reason. After uprooting, it is essential to plant the ground in order to prevent a flush of new seedling growth. When it is cut, Buddleia grows back from the stump very vigorously. Mowing of young plants does not provide control as they re-sprout with vigour. Where removal of

mature plants is not feasible in the short term, the flower heads should be cut off in June before seed set’.

Chemical control can also be used; ‘Recommended practice for the application of herbicides requires cutting back of plants to a basal stump during active growth (late spring to early summer) which is then treated (brushed on) immediately with a systemic weed killer mix (Starr et al, 2003).

Foliar application of Triclopyr or Glyphosate may be adequate for limited infestations of younger plants, but should be followed up at 6 monthly intervals.

At this point it must be restressed that all Plant Protection Products must be used in accordance with the product label and with Good Plant Protection Practice as prescribed in the European Communities (Authorization, Placing on the Market, Use and Control of Plant Protection Products) Regulations, 2003 (S.I. No. 83 of 2003).

Again, it should be noted that it is an offence to use Plant Protection Products in a manner other than that specified on the label. The methods just outlined are not in accordance with the product label and so it will be necessary to discuss the use of such methods with the Pesticides Control Service with a view to seeking approval under the derogation procedures provided under the Plant Protection Regulations’.

 Physical Control		
Method	Season	Follow-up
Grubbing	Any time of year when the soil is suitably dry. Small plants can be pulled by hand. Large stems cut and roots grubbed out.	Regular follow-up to deal with re-growth or seedlings which can result from exposure of soil.
 Chemical Control		
Chemical	Season	Follow-up
Systemic weed-killer mix (Starr et al 2003)	During active growth in late spring or summer.	Brushed on to cut back stumps.
Triclopyr or Glyphosate	During active growth in summer of limited infestations of young plants	Foliar spray. Requires follow-up at 6 monthly intervals.
<p>All Plant Protection Products should be used in accordance with the product label and with Good Plant Protection Practice as prescribed in the European Communities (Authorization, Placing on the Market, Use and Control of Plant Protection Products) Regulations, 2003 (S.I. No. 83 of 2003). It is an offence to use Plant Protection Products in a manner other than that specified on the label.</p>		

6.4 Winter heliotrope (*Petasites fragrans*)

This species is common across the site at the base of field boundaries. The NRA Guidelines recommend the following:

‘Due to the extensive rhizome network, physical removal of winter heliotrope is really only practical on a limited scale. Where mechanical means can be employed, it should be possible to deal with larger infestations but due to the potential for regeneration from fragments of roots, it may be best to tackle its control using a combination of excavation with follow-up treatment by herbicides. As with other plants with the potential to spread from small root fragments, disposal of material should be undertaken with due caution to prevent accidental spread of the plant. Other means of disposal include burial of material at a depth of at least 2m, incineration or disposal to licensed landfill. There is no evidence that the material would withstand composting though this approach would probably only be suitable for limited infestations.

An application of a Glyphosate-based herbicide after flowering in February to March is recommended by Cornwall Nature Reserves (2008), though the Royal Horticultural Society (2008b) recommends spraying in midsummer or later but before the foliage begins to die back’.

 Physical Control		
Method	Season	Follow-up
Excavation	Any time of year when the soil is suitably dry.	Regular follow-up to deal with re-sprouting.
 Chemical Control		
Chemical	Season	Follow-up
Glyphosate	After flowering in February to March, or in mid to late summer.	Foliar spray, wiper applicator or spot treatment
<small>All Plant Protection Products should be used in accordance with the product label and with Good Plant Protection Practice as prescribed in the European Communities (Authorization, Placing on the Market, Use and Control of Plant Protection Products) Regulations, 2003 (S.I. No. 83 of 2003). It is an offence to use Plant Protection Products in a manner other than that specified on the label.</small>		

6.5 Montbretia (*Crocsmia x crocosmiiflora*)

Montbretia is easily recognised when in flower by the distinct shape and colour of the flower head with relatively short stems and orange flowers. When not in flower, Montbretia is more difficult to identify. Look for rusty brown dead leaves and remains of previous years flowering heads.

The NRA guidelines recommend the following methods for control/eradication:

Physical Control

Physical control of Montbretia is difficult as the corms break up from their chains very readily and can result in ready re-infestation or further spread. Where infestations are limited in extent, the entire stand can be excavated and buried at a depth of at least 2m, incinerated or disposed of to licensed landfill. The corms are very hardy and are not suitable for composting. Due to the potential for re-infestation from corms, regular follow-up will be required over a period of at least 2 years to deal with any re-growth.

Chemical Control

Control can be achieved using Glyphosate or Metsulfuron. For both products, 20ml of penetrant is recommended. Application can be by either foliar spray or weed wiper during the growing season.

 Physical Control		
Method	Season	Follow-up
Excavation	Any time of year when the soil is suitably dry.	Regular follow-up to deal with missed corms re-sprouting.

 Chemical Control		
Chemical	Season	Follow-up
Glyphosate	During active growth in late spring or summer.	Foliar spray, wiper applicator or spot treatment.
Metsulfuron	During active growth in late spring or summer.	Foliar spray, wiper applicator or spot treatment.

6.6 Snowberry Bush (*Symphoricarpos albus*)

This species was recorded within field boundaries in the site. It is an issue in woodlands as it outcompetes native flora and suppresses natural regeneration thereby reducing functionality within woodlands.

Its main method of spread is by means of its vigorous suckering habit; it does not appear to propagate much by seed. It can be spread from garden waste containing plant fragments. Therefore any prunings should be destroyed by incineration, or thorough shredding into small fragments. Do not discard into the countryside.

It may be eradicated by spraying with a strong Glyphosate-based herbicide, which must be applied when the plant is in full leaf. Several applications may be required.

6.7 Old man's beard (*Clematis vitalba*)

Plants can be cut by hand at any time of year when the soil is suitably dry. Small plants can be pulled by hand. Large stems can be cut and the roots grubbed out. Regular follow-up is required to deal with re-growth or seedlings.

Weedkiller such as Glyphosate can be applied during active growth in late spring or summer. It is best applied as a foliar spray, wiper applicator or spot treatment. For large vines cut at base and apply to cut surface. May require follow-up for 2-3 years.

7. MONITORING

It is recommended that an annual survey of the property is conducted to monitor the spread and abundance of invasive and non-native species across the site and to determine how control eradication measures are being implemented and if additional/variable control methods should be applied.

8. BIBLIOGRAPHY

Environment Agency, (July, 2013). Managing Japanese knotweed on development sites - the knotweed code of practice.

Invasive Species Ireland (2008). Best Practice Management Guidelines for Japanese knotweed.

Invasive Species Ireland (2008). Best Practice Management Guidelines for Rhododendron and Cherry Laurel.

NRA, (2010). Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads.

9. APPENDIX 1. Japanese Knotweed Management Plan (Drumkilla 2020).

Drumakilla Ltd Abbeylands Arklow Co
Wicklow 5th June 2020

Japanese Knotweed Management Plan

Author - Drumakilla Ltd

Version	Written By	Checked By
V1 - Drumakilla Ltd Ref Nr DL-1-5/6/2020	Drumakilla Ltd and based on Site Assessment Survey	

1 SITE PARTICULARS

On the 23rd of October 2018 a site assessment/survey was undertaken at the Carmelite Lands Convent Road Delgany for the purpose of assessing the presence of invasive plant species which could constitute potential constraints to any development/construction works which might take place.

All areas of the 6.203 ha of this site were surveyed for non-native invasive plants, 1 stand of Japanese Knotweed was identified at the western boundary and is marked on the map contained within this document. This stand is referred to as JK1 for the purposes of this report.

The information that has been supplied to date suggests that these lands are for development at some point in the future. The stand of Japanese Knotweed JK1 measures 250m² of above ground growth, and the size of the crown material and the extent of the stand suggests that this stand of Japanese Knotweed several years old. It is likely to have arrived on site when works constructing the small timber cabin developed in this area by the nuns were underway.

1.1 Description of the Site

The Site consists of c 6.08 ha located between Convent Road (L1027) and Bellevue Hill Road (L103) consisting of the former Carmelite Monastery lands, Delgany, Co. Wicklow. GPS Co-Ordinates N53.1357' W-6.0926'.

The site is bounded by public roads to the east and west, and by residential properties to the south and north. The site slopes from west to east and aside from the Monastic buildings and out houses the land is mostly agricultural with some garden area. The lands are covered in native grasses, weeds, scrub and trees, and being partially grazed by livestock. The lands are being considered for a future mixed use commercial and residential development.

Brief description of the proposed development:

Strategic Housing Development at former Carmelite Monastery lands, Delgany, Co. Wicklow consisting of 233 residential units, with a creche and community facility located in the protected structure (house and church); access from Bellevue Hill via permitted development P.A ref. 151307, new access from Convent Road, parking, landscaping and all ancillary works. The strategic housing to consist of 136 apartments and 97 houses ranging from two for four storeys. Connections are proposed to Richview estate to the north and Bellevue Lawns to the south.

1.2 Site Management

The site is not operational yet however the infested Japanese Knotweed areas have been clearly marked out with stakes and are mostly enclosed within a fenced area accessed by a farmyard gate.

All efforts will be carried out to ensure no invasive plants are re-planted back onto the site. Native tree and plant species will be given high priority in the landscape design. During the landscape design process, the landscape architect will work with the invasive plant specialist to plan a course of action to take into account the monitoring and treatment of any Japanese Knotweed that may regrow in the following growing season after excavation works.

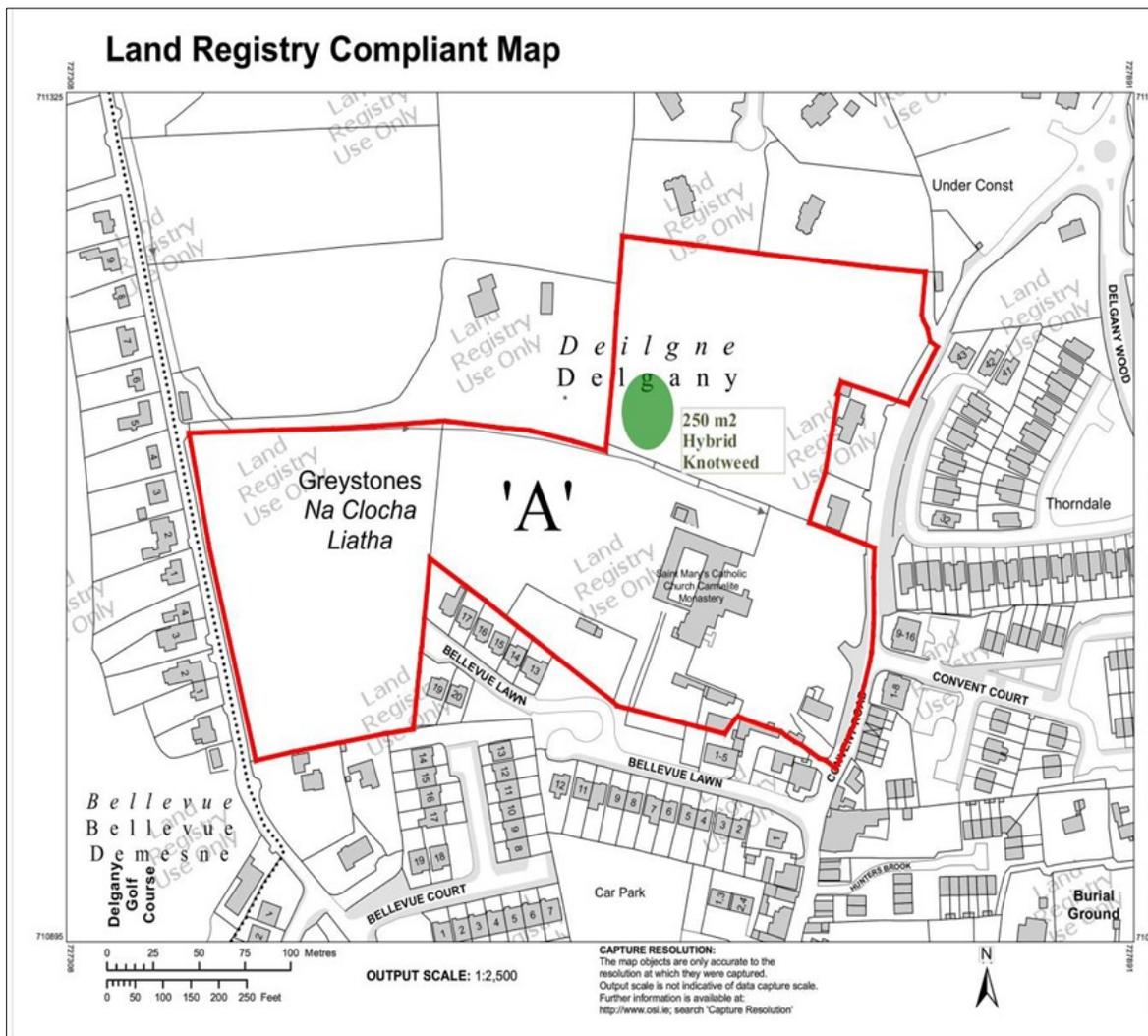
1.3 Eradication Methodology

Where the use of herbicides are proposed, they will be applied strictly in accordance with the manufactures recommendations, by a registered professional pesticides user and fully in compliance with the European Communities (Sustainable Use of Pesticides) Regulations, 2012

Under no circumstances should any invasive alien plant species be cut or dug out without the advice, direction and supervision of a certified surveyor of invasive plants. Most plant species have extensive root / rhizome systems which spread well beyond the footprint of the above ground plant, approximately 7 meters laterally and can regenerate themselves form very small fragments of root or stem. To prevent the uncontrolled spread of invasive alien plant species strict bio-security measures and protocols should always be adhered to under the direction of a certified surveyor of invasive plants.

1.4 Location of Knotweed

One area of Japanese knotweed is located within the site. This infestation is growing among other vegetation. The map below shows the approximate location of Japanese knotweed within the site.



An existing stream / waterways runs from west to east along the boundary of the site – this is at some distance from the stand and does not act as a potential vector for Japanese knotweed material from the site.

Approximate calculations of total Knotweed impacted soil: 250m² 176m³ (60 tons)

Average height of plants: 2m

2 MANAGEMENT PLAN

This Management Plan and appendices and revisions of this plan shall be kept for future site owners.

Several alternative approaches were considered for the eradication/control of Japanese Knotweed on this site. Following Best Practice assessment of site conditions and development design to determine a site-specific method of eradication best suited to the site, and following discussions with the project manager the (Cell Burial on-site) method was chosen as the long term solution.

This will utilize the burial of soil potentially contaminated with Japanese Knotweed in an enclosed dedicated cell encapsulated with a Japanese knotweed barrier membrane. Given that there is adequate space within the boundary of the property it is proposed that the excavated knotweed will be buried on-site, encapsulated within specialist root barrier membranes. The planned site layout has been designed and reviewed to ensure that adequate space has been allocated to accommodate this cell. Ground testing has been undertaken to establish that the required depths of 6 metres (i.e. that the top of the burial cell should not be less than 2m below the finished site ground level) can be achieved to make this option viable.

In the intervening period prior to construction the Japanese knotweed present on site will be treated with herbicide following Best Practice Guidelines while and any guidance on the Herbicide label.

3 ERADICATION&CONTROL

The eradication/control program will be in 3 stages

- Herbicide Application (Carried out between 2019 -2020 and onward as required)
- Monitoring (Carried out during the growing season of 2019/20/21/22)
- Excavation and associated works on the Knotweed plants is estimated to take 3-4days however infested soil will be excavated and stockpiled to be stored on site.

Containment Measures & Awareness

Containment measures will be implemented on site to ensure:

- Isolation of the Japanese knotweed on site by fencing to avoid disturbance during treatment.
- Procedures to ensure that imported materials are free from Japanese knotweed (BS: 3882, 2007/15)

- Identification of designated haul routes through site to avoid contamination.

All areas affected by Japanese knotweed will be fenced and isolated from activities on site to avoid potential for spread. An area extending in a radius of at least 7m from the above ground stems will be clearly marked out as per the Environment Agency Code of Practice to ensure that any underground parts are also isolated.

All topsoil and materials brought onto site will be checked prior to accepting in line with the Environment Agency Code of Practice.

No new materials will be stored adjacent to Japanese knotweed isolated areas.

No movement of Japanese knotweed contaminated material will be conducted within the site – the area where the Japanese knotweed is present is the last area to be developed during construction (Phase 4) which allows ongoing treatment of the stand to continue in the intervening period.

A toolbox talk will be given by the site manager to all operatives and contractors working on site highlighting the impacts of Japanese Knotweed and clearly identifying the delineated area.

Posters highlighting the key features of the plant will be displayed in all communal areas (see Environment Agency Code of Practice Appendices /-IV}).

Excavation

All Knotweed infested soil will be stockpiled on a ground membrane and stored on site and hauled to the burial location on site. Excavators / Loading machines will not be allowed track/wheel over infested soils.

Excavation pits when backfilling should be backfilled in layers of 20 cm. Each layer should be compacted sufficiently with machine.

Monitoring will be agreed with the site foreman who will be overseeing the eradication/control of Japanese knotweed on site.

Management plan will be reviewed on a regular basis and in any case every 6 months from commencement of works to site completion.

Replacement vegetation. All Knotweed areas that are left open after construction works have finished should be planted with hardy native shrubs which will help shade out any residual plant pieces that may have been overlooked.

4 HISTORY OF TREATMENT TO DATE

All Knotweed on site is being treated using the injection and spray methods.

Setting out of a 7m radius exclusion zone around the Knotweed plants was conducted in 2019 prior to treatment.

The area of Knotweed was then exposed by carefully cutting back and removing the clusters of briars outside the infected area. All carefully removed briars and any other debris arising was retained within the fenced off area. Tools were then fully cleaned before leaving the infected zone.

Herbicide was then applied by drilling the main stems and injecting herbicide, spraying small plants etc. over a period of weeks in August and September 2019, with continuous monitoring,

Follow up site surveys are to be carried out between May & October of each growing season. If any Knotweed regrowth is recorded, they will be left un-disturbed and allowed to grow to maximum leaf area before application of herbicide.

Controls Recommended

Methods	Stand reference	Yes	No
Dig & Burial Method			X
Off Site Disposal			X
Dig & Cell Burial on site		X	
Raised Bund Method			X
Foliar Spray		X	
Weed Wiping		X	
Stem Injection		X	
Root Barriers		X	
Geotextile Membrane		X	
Sifting on site		X	
Cane Removal		X	

Note: Environmental & Sustainability issues to be factored into all management, treatment & control methods.

Description of Site Substrate	Description of Desirable Vegetation
Monastery with agricultural lands	Mature trees and native flora

Degree Of Infestation	Yes	No
Low – (Sparse Presence of Plants) = 1% > 5% Cover		
Moderate – (Scattered Presence of Plants) = 5% > 25% Cover	X	
High – (Dense Presence of Plants) = 25% > 45% Cover		
Extreme – (Concentrated Presence of Plants = 45% & Greater		

Growth Stage - record as appropriate	Yes	No
Crown Only Visible	X	
Small Shoots	X	
1-1.5 meter high	X	
1.5 – 2.5 meter high	X	
In Flower	X	
Dead Cane	X	
Distressed Plant	X	
Stunted Growth	X	
Bonzai Growth	X	
Mature Healthy Stand	X	
Accumulation of dead cane		X
Signs of rhizome network spreading		X

Water courses on or adjacent to site

Mark as appropriate	Comment
Rivers	X
Streams	X
Open Drain	X
Dry Ditch	X
Hard Landscape Drainage	X
Other	

Is site on or adjacent to special area of conservation or interest		No
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Essential temporary bio-security measures required	Yes	No
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Fencing of stands	X	
No Grass Cutting in area of Infestation	X	
No Strimming in area of Infestation	X	
No Parking or Driving in area of Infestation	X	
Do Not Cut, Flail or disturb soils in area of Infestation	X	
Inform all personnel with access to site of JK Precautions	X	
Liase with all adjacent neighbours and inform of JK	X	
Erect signage to highlight presence of JK	X	

It is advised not to treat –remove or disturb any Japanese Knotweed infestation without a site specific management plan, which will include a risk assessment, method statement and a COSHH analysis

Actions & Resources	Yes	No
Ecologist report required	X	
Horticulturist report required		X
Fisheries Board to be Notified		X
Local Council to be Notified	X	

EPA to be Notified		X
National Parks & Wildlife Services to be Notified		X

Note: Should removal of soils off site be the preferred option of treatment of the Hybrid Knotweed infestation present on this site, a licence will have to be applied for from the National Parks & Wildlife Services.

Legislation:

Currently Regulations 49 and 50 of the European Communities (Birds and Natural Habitats) Regulations 2011 make it an offence to

- Plant, disperse, allow dispersal or cause the spread of Japanese knotweed.
- Keep the plant in possession for purpose of sale, breeding, reproduction, propagation, distribution, introduction or release.
- Keep anything from which the plant can be reproduced or propagated from without a granted licence.
- Keep any vector material, in this case soil or spoil taken from Japanese knotweed, for the purposes of breeding, distribution, introduction or release

And is punishable by fines of up to €500,000 or imprisonment for up to three years.

Regulation (EU) No. 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species (2014) OJ L 317/35

Wildlife Acts, 1976 to 2012, as amended

Regulation (EC) No. 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC (hereinafter referred to as the ‘Plant Products Regulation’);

European Communities (Plant Protection Products) Regulations, 2012 (S.I. No. 159 of 2012);

Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides (‘Sustainable Use of Pesticides Directive’)

European Communities (Sustainable Use of Pesticides) Regulations, 2012, (S.I. No 155 of 2012) Waste Management Acts, 1996 to 2013 and related legislation.