

METROLINK

Integrated Transport. Integrated Life.

A15.1

**MetroLink Invasive
Species Technical
Report – Glasnevin**

Contents

1.	Introduction.....	1
1.1	Background	1
1.2	Purpose of this Report	2
1.3	Legal context	3
1.4	Guidance Used	3
1.5	Site and Study Location.....	4
2.	Methodology.....	4
2.1	Invasive species considered.....	4
2.2	Desk based study	5
2.3	Field Survey.....	5
3.	Results	5
3.1	Desktop Results	5
3.2	Field Survey Findings	5
3.3	Limitations.....	8
4.	Discussion and Recommendations.....	8
4.1	Prevention of Further Spread of Japanese Knotweed.....	8
4.2	Measures to Control and Eradicate Japanese Knotweed	9
5.	References	10

Appendix A. Figures

Appendix B. Photographs

1. Introduction

1.1 Background

Jacobs have been appointed by the National Transport Authority (NTA) and Transport Infrastructure Ireland (TII) to provide engineering design services in support of a successful application for a Railway Order for the proposed Dublin Metrolink. MetroLink will provide a high speed, high capacity, high frequency, modern and efficient public transport service for commuters travelling in the Swords / Airport to City Centre corridor in Dublin.

A new station is to be constructed at Glasnevin (Whitworth Rd/ Cross Guns Bridge) and will become an interchange for the MetroLink and the Intercity Maynooth and Kildare rail lines. Upgrades to the current railway line at Glasnevin, including track lowering, will be needed to achieve the requirements of the Interchange Station.

As part of the works preliminary ground investigation (GI) works are required to provide additional information in respect of the soil and rock ground conditions, ground water levels and ground water conditions, and soil and water contamination assessment, to facilitate the Preliminary Design and Environmental Impact Assessment for the MetroLink project. Phase 4 of intrusive GI aims to gather information required for the design of the Interchange Station at Glasnevin and associated infrastructure works. Phase 4 will comprise both trackside (TS), within Irish Rail (IE) boundary fence, and non-trackside (NTS) works including cable percussion boreholes, windowless sampling boreholes, slit trenches, trial pits, retaining wall investigations, horizontal and inclined exploratory cores. **Figure 1** and **2** show all the proposed G.I locations.

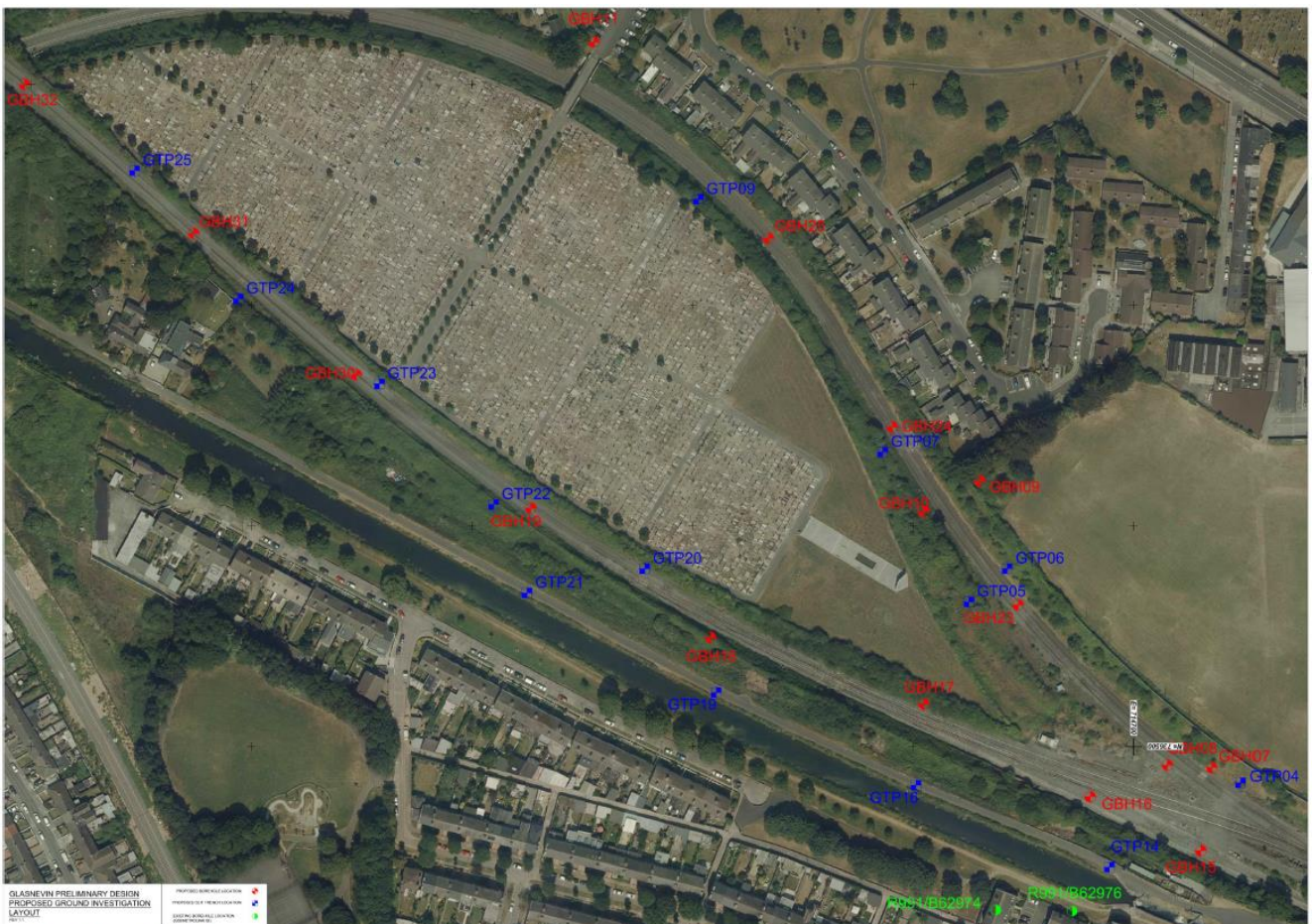


Figure 1: Proposed G.I locations at Glasnevin identified in blue and red.

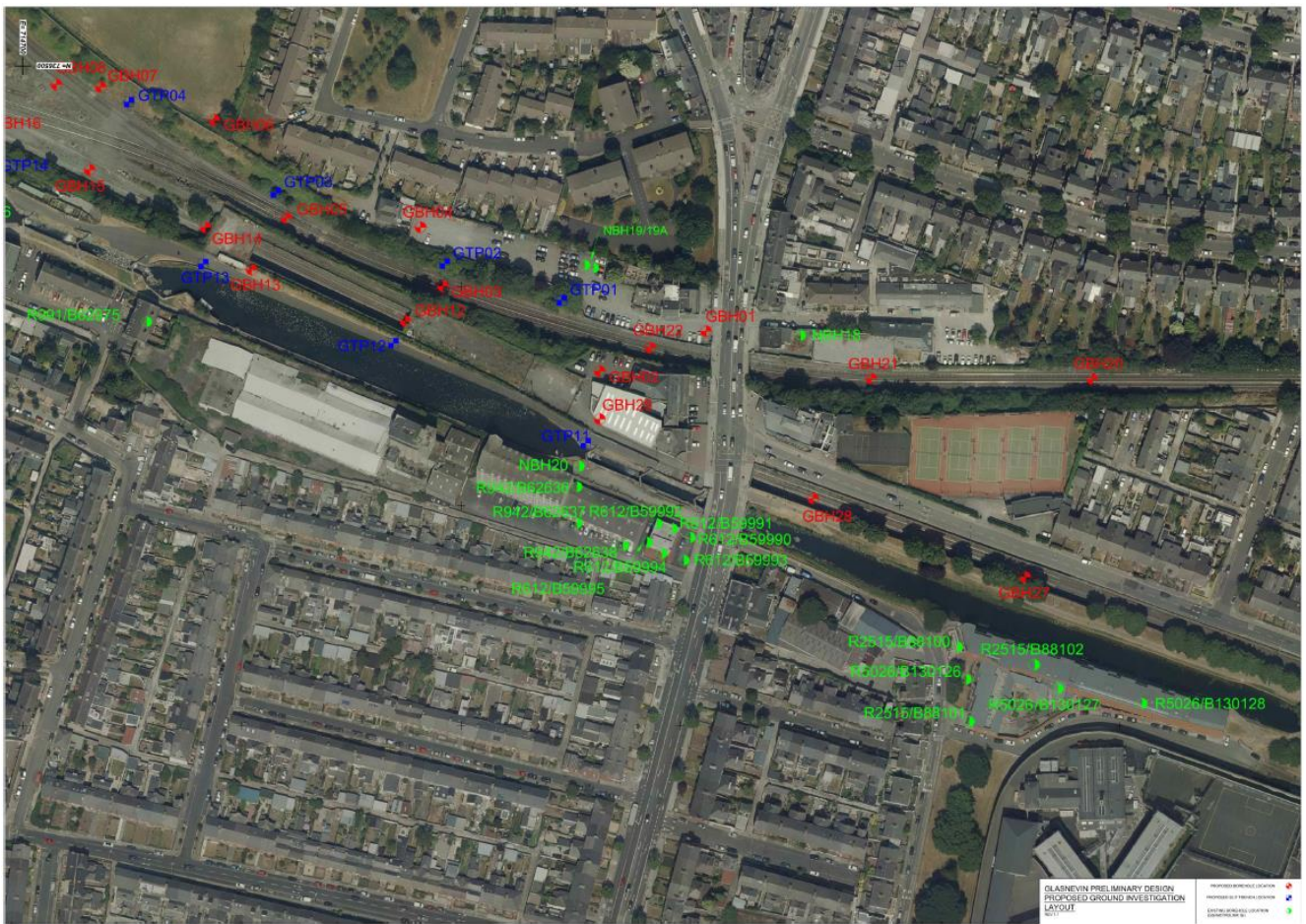


Figure 2: Proposed G.I locations at Glasnevin identified in blue and red.

1.2 Purpose of this Report

This report outlines the findings of an invasive species survey, which has been completed to support ground investigation works for the proposed Metrolink project specifically around Glasnevin. The survey was undertaken to confirm previously recorded locations of Japanese knotweed (*Fallopia japonica*), identify any spread or occurrences of new stands of Japanese knotweed and record the presence of any other invasive species at/or in the vicinity of each proposed exploratory site and working area. Japanese knotweed is considered a high impact invasive species and established stands are extremely difficult to eradicate. The species can spread by the re-growth of cut plant fragments or root material and therefore the plants are highly susceptible to spread during construction works.

The survey and reporting have been carried out by an experienced Jacobs ecologist:

- Anthony Robb BSc MCIEM has undertaken multiple surveys for invasive species and has over five years' consultancy experience working in Ireland and the UK.

This report is to be read in full, with no excerpts to be representative of the findings. This report has been prepared exclusively for Jacob's client and no liability is accepted for any use or reliance on the report by third parties. This report has been prepared on the basis of the data made available at the time of writing. Where assumptions have been necessary, these are clearly outlined.

1.3 Legal context

The obligations of the European Commission (EC) and the European Union (EU) Member States with regard to invasive species are provided in EU Regulation No. 1143/2014 which entered into force on 1 January 2015. This Regulation is on the prevention and management of introduction and spread of invasive alien species. This European Regulation, which has direct effect in the Irish State, commits the EC to establish a list of invasive species of Union concern ('the Union list').

The Regulation obliges Member States (and/or relevant competent authorities) to – *inter alia*:

- submit requests to the EC for the inclusion of particular species on the Union list;
- establish a national list of invasive species of Member State concern;
- produce risk assessments on the current and potential range of invasive species;
- have in place fully functioning structures to prevent the unintentional introduction or spread of species of Union concern;
- have due regard to human health and the environment (especially non-target species and habitats) when applying management measures, and selecting methods to be used; and
- carry out restoration to assist recovery of ecosystems degraded by invasive species.

In Ireland, offences relating to the spread of invasive species are primarily regulated through the European Communities (Birds and Natural Habitats) Regulations 2011-2015 (hereafter 'the Regulations'); and particularly S.I. 477 of 2011. Regulation 49 (2) of the Regulations provides that:

"Save in accordance with a licence granted [by the Minister of Arts, Heritage, Regional, Rural and Gaeltacht affairs] any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow [throughout the state], any plant which is included in Part 1 of the Third Schedule, shall be guilty of an offence."

Regulation 49 (3) clarifies that a defence to a charge of an offence under 49 (2) is provided if all reasonable steps and due diligence is exercised.

Regulation 50 of the Regulations provides that:

"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;
- (b), can be reproduced or propagated, or
- (c) a vector material listed in Part 3 of the Third Schedule".

1.4 Guidance Used

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

- Irish Water. (2016). Information and Guidance Document on Japanese Knotweed Asset Strategy and Sustainability. Irish Water.
- Kelly, J., Maguire, C.M. and Cosgrove, P.J., Muir, R.A. (2015). Best Practice Management Guidelines Japanese knotweed *Fallopia japonica*. Prepared for NIEA and NPWS as part of Invasive Species Ireland.
- NRA (2010). Guidelines on management of noxious weeds and non-native invasive plant species on national roads. National Roads Authority.

- Stokes, K., O'Neill, K. & McDonald, R.A. (2004). Invasive species in Ireland. Unpublished report.
- O'Flynn, C., Kelly, J. and Lysaght, L. (2014). Ireland's invasive and non-native species –trends in introductions. National Biodiversity Data Centre Series No. 2. Ireland.

1.5 Site and Study Location

The survey area consists of lands within and immediately surrounding Glasnevin railway junction at grid ref: O 14823 36434. 51 G.I locations are proposed. The majority of these are located within the confines of Irish Rail lands along the railway and adjacent embankments. Several G.I locations are located along the Royal Canal, canal tow path and a number of surrounding car parks. The canal tow path is a popular walking/ cycling route used by the public. The extent of the survey area is shown in **Figure 3** below and proposed G.I locations shown in **Figure 1** and **2** above.

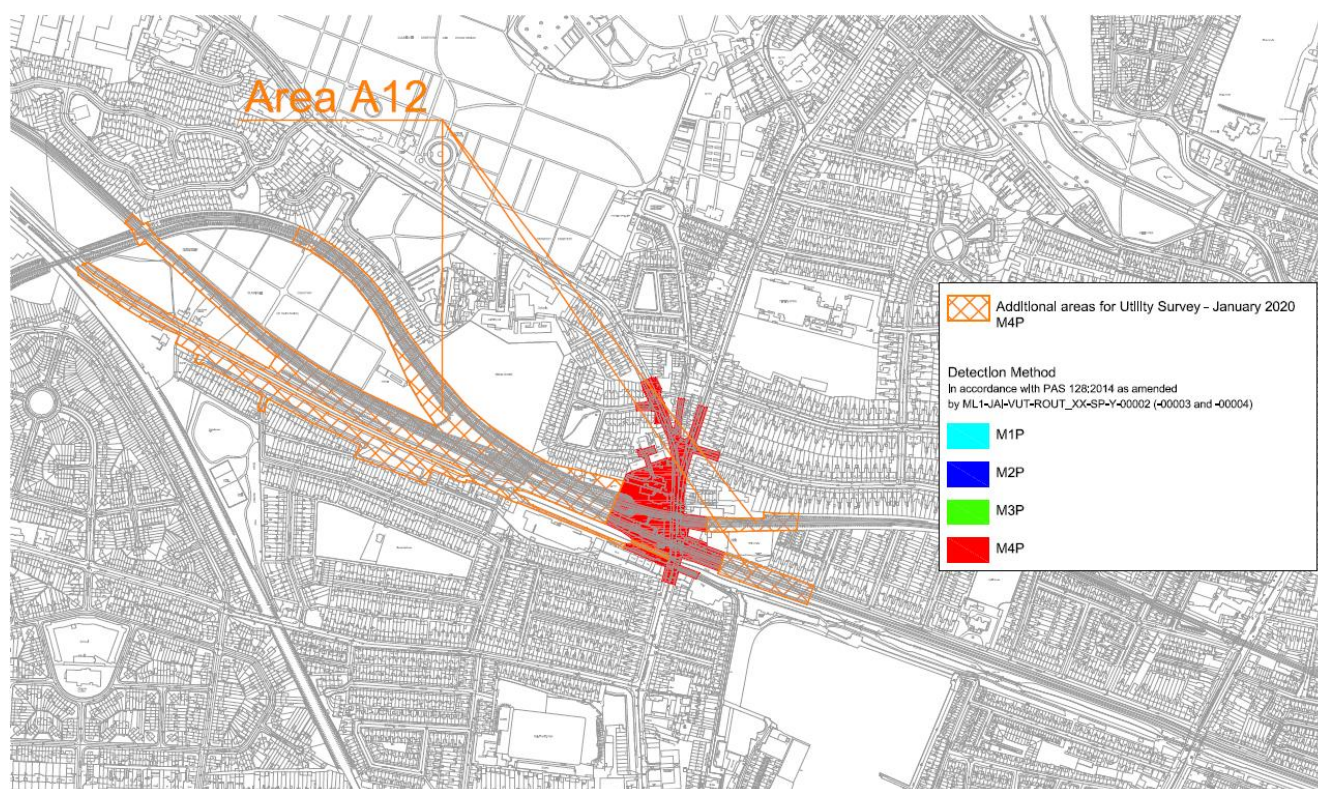


Figure 3: Approximate extent of survey area identified by orange hatching.

2. Methodology

2.1 Invasive species considered

The survey was conducted to identify those species listed in Part 1 of the Third Schedule of S.I No. 477 of 2011, European Communities (Birds and Natural Habitats) Regulations 2011 with specific emphasis on Japanese knotweed; this species having previously recorded in the survey area. Other invasive species and/or noxious weeds including those identified in the NRA guidelines (NRA, 2010), listed on the IAS (Invasive Alien Species) Regulations¹ or listed on the biodiversity invasive species trend list (O'Flynn *et al.*, 2014) were also noted where present.

¹ http://ec.europa.eu/environment/nature/invasivealien/list/index_en.htm (accessed March 2020)

2.2 Desk based study

A desk study was undertaken to gather information on previous records of invasive species at and around the Glasnevin site. The following sources were used:

- aerial imagery (Google Maps);
- areas of previously identified infestations of Japanese knotweed on and around the railway at Glasnevin rail junction provided by Irish Rail/TII; and
- invasive species records from the national biodiversity data centre (NBDC) online at <http://www.biodiversityireland.ie/>.

2.3 Field Survey

The field survey was carried out on 19 March 2020 during dry, clear weather by a Jacobs ecologist accompanied by two Irish Rail safety lookouts as required for work on active rail lines. The survey was undertaken during the sub-optimal survey period (optimal survey period is May to September). The survey involved walking the entire survey area to locate each exploratory location and covering an area of at least 7m around each point. An area proposed for the site compound was also surveyed for invasive species presence. Data on invasive species was collected digitally using a tablet computer equipped with the ArcCollector software tool enabled through ArcGIS. This software allows for data and mapped features to be uploaded directly from the field and for the mapping of approximate areas of stands of invasive species where encountered. GPS located digital photos were also taken where permissible and safe to do so.

The area of IAS extent is approximate and based on a visual assessment by the surveyor. IAS were identified to species level. The locations of recorded IAS were mapped using ArcGIS 10.5.1 onto licenced ESRI aerial photographic maps.

3. Results

3.1 Desktop Results

Searches on the National Biodiversity Data Centre (NBDC) website returned records for Japanese knotweed in the immediate vicinity of Royal canal and the tow path adjacent the railway. There were no records of Himalayan balsam (*Impatiens glandulifera*), giant hogweed (*Heracleum mantegazzianum*) within 1km of the site boundary, however records exist for both species within 5km of the site.

Correspondence from Irish Rail/TII provided additional records of Japanese knotweed on and around the railway at Glasnevin rail junction from a previous survey. The locations where Japanese knotweed was previously recorded are shown on **Figure 1, Appendix A and Photographs A1 – A4, Appendix B**. It is not known whether these invasive species stands were subject to any treatment however photographs provided by Irish Rail would suggest that treatment had occurred (**Photographs A1 – A4, Appendix B**).

3.2 Field Survey Findings

Habitats within the survey area comprised areas of hardstanding, buildings, scrub, amenity grassland and semi-natural grassland surrounded by screening vegetation. Boundary screening vegetation comprised trees and shrubs including yew (*Taxus baccata*) birch (*Betula pendula*), ash (*Fraxinus excelsior*), willow (*Salix spp.*) and conifer sp. Other ornamental species were also noted mostly from dumped cuttings likely from nearby housing and Glasnevin cemetery.

Japanese knotweed, which is one of the invasive species subject to restrictions, was recorded within the survey area at eleven locations by Jacobs ecologist. Ten stands of Japanese knotweed were in approximately the same location

previously identified by a previous Irish Rail survey. Although photos from Irish Rail appear to suggest that some of the Japanese knotweed stands underwent treatment, at the time of surveying there was no evidence to suggest these stands were currently undergoing treatment (e.g. treatment signage) however as the survey was outside of the optimal survey period visible signs of treatment i.e. withered leaves was unidentifiable. An additional two stands were located during the survey. One small stand approximately 1m x 1m north of the rail junction on the embankment and a second stand approximately 7m x 5m associated with the spread of a previously identified infestation (30m x 5m) at the south east boundary of Glasnevin cemetery behind a retaining wall. All photographs from the survey will be made available and two examples of Japanese knotweed recorded during the survey are provided in **Appendix B (Photographs A5 – A6)**.

Japanese knotweed was recorded within 7m from two proposed G.I locations (GBH 14 and GTP19). An area proposed for the site compound was also heavily infested with Japanese knotweed and had been partially covered with stockpiled ballast stone. No other invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations (S.I. 477 of 2011) were recorded within or adjacent to any proposed G.I locations.

All locations where Japanese knotweed was recorded are shown on **Figure 1, Appendix A**. Further information on the infested areas are provided in **Table 3.1** and **3.2** below.

Table 3.1: Invasive species survey results. Stands within 7m of GI location highlighted in red.

Exploratory Hole No.	Location	Eastings	Northings	Invasive Species Survey Result*
GBH01	Car park	715011.776	736379.431	No IAS recorded.
GBH02	Car park	714963.288	736361.254	No IAS recorded.
GBH03	On track	714891.688	736399.892	No IAS recorded.
GBH04	Car park	714881.498	736426.717	No IAS recorded.
GBH05	On track	714820.264	736430.979	No IAS recorded.
GBH06	In field	714787.458	736475.393	No IAS recorded (however view restricted).
GBH07	Beside track	714735.508	736490.615	No IAS recorded.
GBH08	Beside track	714715.339	736491.649	No IAS recorded.
GBH09	In vegetation	714630.364	736620.411	No IAS recorded.
GBH10	Beside track (in vegetation)	714604.775	736606.527	No IAS recorded.
GBH11	Car park	714455.36	736819.1	No IAS recorded.
GBH12	On track	714874.554	736384.088	No IAS recorded.
GBH13	Canal toe-path	714804.394	736407.438	No IAS recorded.
GBH14	In vegetation	714783.375	736426.694	Within 7m of a Japanese knotweed stand.
GBH15	On track	714730.57	736452.87	No IAS recorded.
GBH16	On track	714680.377	736477.391	No IAS recorded.
GBH17	Beside track	714604.933	736519.388	No IAS recorded.
GBH18	Beside track (in vegetation)	714508.242	736549.448	No IAS recorded.
GBH19	On track	714426.745	736608.184	No IAS recorded.
GBH20	On track	715187.367	736357.662	No IAS recorded.
GBH21	On track	715087.019	736357.955	No IAS recorded.
GBH22	On track	714986.415	736371.986	No IAS recorded.
GBH23	On track	714647.733	736564.29	No IAS recorded.
GBH24	On track	714590.571	736644.917	No IAS recorded.
GBH25	On track	714534.457	736730.235	No IAS recorded.

GBH27	On track	715157.329	736267.604	No IAS recorded.
GBH28	On track	715060.628	736303.324	No IAS recorded.
GBH29	Car park	714963.277	736339.473	No IAS recorded.
GBH30	On track	714347.599	736668.524	No IAS recorded.
GBH31	On track	714273.747	736732.522	No IAS recorded.
GBH32	On track	714197.134	736799.841	No IAS recorded.
GTP01	Beside track (in vegetation)	714945.878	736393.474	No IAS recorded.
GTP02	Beside track (in vegetation)	714892.537	736410.173	No IAS recorded (however view restricted).
GTP03	Beside track (in vegetation)	714815.481	736442.488	No IAS recorded.
GTP04	Beside track (in vegetation)	714748.512	736483.696	No IAS recorded.
GTP05	In vegetation	714673.735	736511.491	No IAS recorded.
GTP06	Beside track (in vegetation)	714642.763	736580.73	No IAS recorded.
GTP07	Beside track (in vegetation)	714586.256	736633.597	No IAS recorded.
GTP09	Beside track (in vegetation)	714502.615	736747.956	No IAS recorded.
GTP11	Canal toe-path	714956.785	736328.539	No IAS recorded.
GTP12	Canal toe-path	714869.115	736374.046	No IAS recorded.
GTP13	Canal toe-path	714782.356	736410.036	No IAS recorded.
GTP14	Canal toe-path	714689.065	736445.505	No IAS recorded.
GTP16	Canal toe-path	714601.338	736482.615	No IAS recorded.
GTP19	Canal toe-path	714510.84	736524.637	Within 7m of a Japanese knotweed stand.
GTP20	Beside track	714478.343	736580.708	No IAS recorded.
GTP21	Canal toe-path	714424.932	736569.69	No IAS recorded.
GTP22	Beside track (in vegetation)	714409.786	736609.788	No IAS recorded.
GTP23	Beside track (in vegetation)	714358.039	736664.436	No IAS recorded.
GTP24	Beside track (in vegetation)	714293.993	736702.915	No IAS recorded.
GTP25	On track	714247.03	736760.916	No IAS recorded.

Table 3.2: Information on Invasive Species Recorded; Location Species and Extent.

Easting	Northing	Species	Notes	Located within 7m from a G.I point
314981	236334	Japanese knotweed	Approximately 5 x 5m stand on east side of railway compound.	No
314863	236405	Japanese knotweed	Approximately 5 x 1m stand on east side of railway compound.	No
314841	236408	Japanese knotweed	A large stand (20 x 5m) situated on south embankment of the access ramp to railway junction.	Yes – GBH14
314831	236422	Japanese knotweed	A large stand (40 x 5m) situated on north embankment of the access ramp to railway junction.	No
314752	236475	Japanese knotweed	A large stand (50 x 20m) situated at the V area between the two railway lines.	Yes – located at the proposed site compound
314701	236480	Japanese knotweed	Approximately 37 x 5m stand on south east side of Glasnevin cemetery retaining wall.	No

314689	236469	Japanese knotweed	Approximately 20 x 5m stand behind retaining wall south of railway line.	No
314703	236446	Japanese knotweed	A large stand (45 x 15m) situated along the north side of tow path.	No
314642	236474	Japanese knotweed	A large stand (10 x 20m) situated along the north side of tow path.	No
314585	236503	Japanese knotweed	A large stand (30 x 20m) situated along the north side of tow path.	Yes – GTP19
314830	236449	Japanese knotweed	Approximately 1 x 1m stand within vegetation on embankment north of the railway.	No

3.3 Limitations

The following are considered limitations to the survey:

1. The survey was undertaken outside of optimal season for invasive species surveys. However, some specimens of invasive plants species, particularly stands Japanese knotweed, are still identifiable at this time of the year particularly the larger invasive species which take longer to die back.
2. All vegetated railway embankments at and around Glasnevin rail junction were topped with mechanical mower and were of a short sward during the survey. Several GI locations were located along the embankments. Visual identification of standing dead knotweed plants is one of the main methods of identification outside of the optimal survey period. Although the vegetation clearance wouldn't restrict visibility for a large dense stand of Japanese knotweed where the previous year's debris would still be seen there is a possibility that small establishing individual plants would not be visible as a result of the vegetation clearance.
3. All proposed GI points were surveyed with the exception of two (GBH06 and GTP02) where view was restricted however these were partially observed from a distance and there were no obvious signs of invasive species.

4. Discussion and Recommendations

The survey confirmed that one listed species, Japanese knotweed was present within the survey area at eleven locations. Several large infestations were recorded. Two proposed GI locations are located within 7m of a recorded stand of Japanese knotweed.

It is recommended to microsite GBH14 and GTP19 to locations outside the 7m exclusion zone. The proposed site compound is partially within an area heavily infested with Japanese knotweed. If the site is not relocated there is a high risk of potential contamination of vehicles and plant, and spread of this invasive species. **Section 4.1** provides recommendations for site hygiene and measures to prevent the spread of Japanese knotweed during GI works.

4.1 Prevention of Further Spread of Japanese Knotweed

Japanese knotweed is considered a high impact invasive species. Established stands of this species are extremely difficult to eradicate.

Japanese knotweed can spread by the re-growth of cut plant fragments or root material. If a plant is broken up or disturbed during site clearance or other earthworks, it can readily re-grow in new areas where material is transported to. The following measures will be implemented to prevent the further spread of Japanese knotweed within the site and/or to adjacent lands:

- if avoidance of stands of Japanese knotweed is not possible then options 1 – 4 detailed in **Section 4.2** must be investigated and site-specific management plan developed including details of management of soils contaminated with Japanese knotweed should be produced in advance of the works and followed accordingly;
- a buffer of at least 7m will be applied to all stands of Japanese knotweed and this area will be clearly demarcated by fencing to avoid any disturbance and to exclude access by plant and machinery. Signs will be erected on fencing to inform site personnel of any risks posed;
- prior to any works taking place, a toolbox talk will be given to all relevant site personnel to ensure they are aware of the location of the stands of Japanese knotweed, the impacts of this species and associated risks;
- if works or vegetation clearance is required within the fenced or densely vegetated areas that could not be accessed during the survey, then access should be made for an ecologist to survey these areas. If a full survey is not possible, for example due to very dense vegetation, then an ecologist should be present to provide a watching brief, identify any invasive species as vegetation is being removed, and provide advice if any are found during vegetation clearance works;
- all vehicles accessing and leaving the site are to be cleaned using brushes/shovels and then using a pressure washer at designated wash points to ensure they are free from invasive species;
- designated haul routes located on Irish Rail lands will be clearly marked up to ensure no contamination occurs. Excavated infested soils will be transported along these designated routes; and,
- any foreign material that is to be imported onto the site should be declared free of invasive species material before entering the site.

If this cannot be achieved, then actions will be required to control/eradicate Japanese knotweed from the working area and ensure the spread of invasive species is prevented.

4.2 Measures to Control and Eradicate Japanese Knotweed

Prior to control/eradication measures being undertaken the exact extent of the Japanese knotweed stands will be established through initial trial holes and trench testing to locate rhizome extent. This will be undertaken by an invasive species specialist.

Option 1: Stockpile and Treatment

Soils infested with Japanese knotweed can be excavated to a depth of at least c. 5m (or to a depth where no Japanese Knotweed root systems are visible) and stockpiled at a non-environmentally sensitive area of open space, on lands within the ownership of the applicant. If this requires transportation (e.g. using a dumper truck or digger) then this must be along a designated single haul route protected by root barrier membrane. The area for Japanese knotweed removal shall be determined by an invasive species specialist following the results of a series of test pits examining the underground rhizome system.

A heavy-duty root barrier will be laid out at the stockpile area and all infested material will be placed on top of it, creating a low flat-topped berm. A buffer around the edges of the root barrier, where no material will be placed, will be provided for in order to avoid spillage of contaminated material onto unprotected soils.

This stockpile area will be fenced off and sign-posted. It will then be treated using a herbicide either by stem injection or foliar application for a period of at least three years. If regrowth is observed, then additional treatment will be conducted.

Option 2: Chemical Control- Herbicide Application

A systemic herbicide (e.g. Picloram) and/or a bioactive formulation (i.e. glyphosate) may be sprayed on foliage during dry weather or injected directly into the stems of Japanese knotweed plants identified within the proposed development site. The length of treatment may vary depending on the type of herbicide used, i.e. highly persistent herbicides may eradicate a plant within one to two years, whereas non-persistent herbicides (such as glyphosate)

may take between three and five years to ensure the successful eradication of the plants. Annual spot-checks will be conducted in May-June to identify and retreat any re-growth. Such a treatment can take up to five years to completely eradicate growth; therefore, further treatment may be required beyond the three years. This will be determined by the results of the monitoring.

Option 3: Excavation and Burial on Site

Infested soils of Japanese knotweed may be: excavated to a depth of at least c. 5m (or to a depth where no Japanese Knotweed root systems are visible) and then buried at a designated area within the proposed development site boundary at a minimum depth of 5m. If this requires transportation (e.g. using a dumper truck or digger) then this must be along a designated single haul route protected by root barrier membrane. Buried infested soils will be covered with a root barrier membrane layer before infilling it completely to c. 5m deep with inert fill or topsoil.

It is recommended that material is immediately buried after excavation; however, if this is not possible material shall be stored in a designated area and clearly fenced off and sign-posted. A fence that can clearly be seen shall mark out the area of infestation. Signs shall warn people working there that there is Japanese Knotweed contamination.

It is essential that the burial site is accurately mapped and that the location of the burial site is recorded to prevent any potential future disturbance and in turn re-infestation.

Option 4: Excavation and Disposal off Site

Infested soils of Japanese knotweed may be: excavated to a depth of at least c. 5m (or to a depth where no Japanese Knotweed root systems are visible); and, disposed of offsite at a licenced landfill as hazardous material, under licence by National Parks and Wildlife Service. Precautions are required for the handling and transport of materials.

All excavation works within the exclusion zone will be supervised by an invasive species specialist.

5. References

Irish Water (2016). Information and Guidance Document on Japanese Knotweed Asset Strategy and Sustainability. Irish Water.

Kelly, J., Maguire, C.M. and Cosgrove, P.J., Muir, R.A. (2015). Best Practice Management Guidelines Japanese knotweed *Fallopia japonica*. Prepared for NIEA and NPWS as part of Invasive Species Ireland.

NRA (2010). Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (Revision 1, National Roads Authority, December 2010). National Roads Authority: Ireland.

O'Flynn, C., Kelly, J. and Lysaght, L. (2014). Ireland's invasive and non-native species –trends in introductions. National Biodiversity Data Centre Series No. 2. Ireland

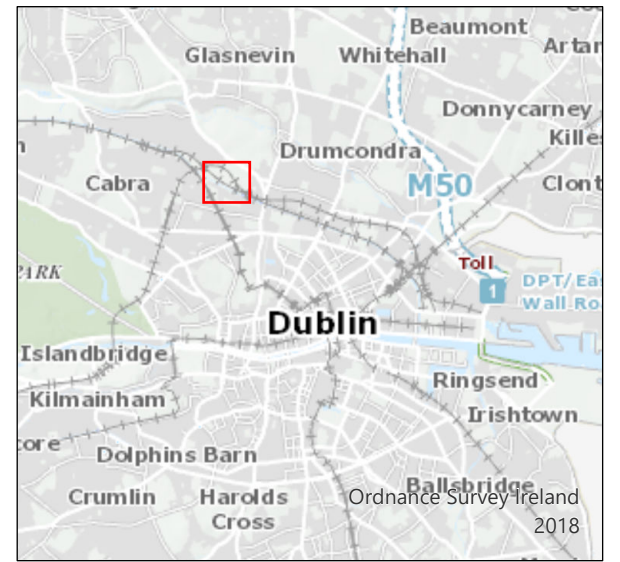
Stokes, K., O'Neill, K. & McDonald, R.A. (2004). Invasive species in Ireland. Unpublished report.

Appendix A. Figures



Legend

- Newly identified Japanese knotweed (Jacobs)
- Previously identified Japanese knotweed (Irish Rail)
- Proposed Borehole Location
- Proposed Trial Pit Slit Trench Location
- Existing Borehole (GSI Metrolink GI)
- 7m Exclusion Buffer
- Proposed Site Compound Location



XX	27/03/2020	DRAFT	PB	XX	XX	XX
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	App'r'd

JACOBS
IDOM

Client
TII
Bonnagar Iompair Éireann
Transport Infrastructure Ireland

Project
METROLINK

Drawing Title
**Invasive Species Survey Results
Sheet 1 of 2**

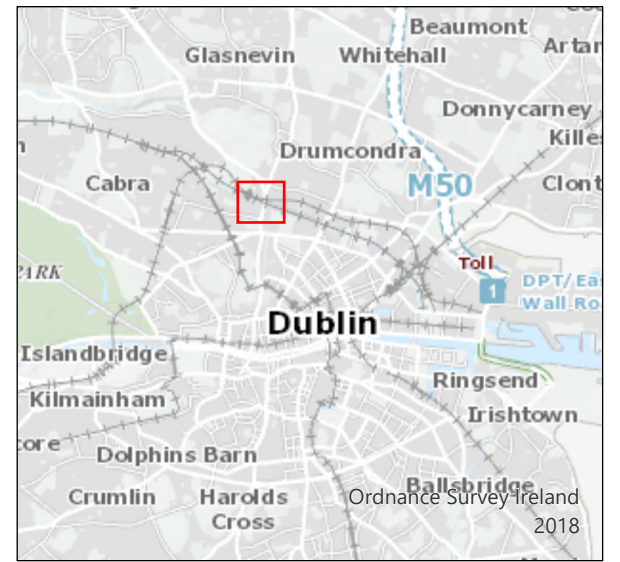
Drawing Status	DRAFT	
Scale @ A3	1:2,000	DO NOT SCALE
Jacobs No.	32108600	
Client No.		
Drawing No.	XXX	Rev XX

This drawing is not to be used in whole or in part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.



Legend

- Newly identified Japanese knotweed (Jacobs)
- Previously identified Japanese knotweed (Irish Rail)
- Proposed Borehole Location
- Proposed Trial Pit Slit Trench Location
- Existing Borehole (GSI Metrolink GI)
- 7m Exclusion Buffer
- Proposed Site Compound Location



XX	27/03/2020	DRAFT	PB	XX	XX	XX
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd



Drawing Title
**Invasive Species Survey Results
Sheet 2 of 2**

Drawing Status	DRAFT				
Scale @ A3	1:2,000	DO NOT SCALE			
Jacobs No.	32108600				
Client No.					
Drawing No.	XXX				Rev XX

This drawing is not to be used in whole or in part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

Appendix B. Photographs



Photograph A1: Japanese knotweed recorded behind retaining wall south of the railway track during previous Irish Rail surveys



Photograph A2: Japanese knotweed recorded behind retaining wall at the boundary with Glasnevin cemetery during previous Irish Rail surveys



Photograph A3: Japanese knotweed recorded at the V in Glasnevin rail junction during previous Irish Rail surveys (proposed compound location)



Photograph A4: Japanese knotweed recorded along the canal tow path during previous Irish Rail surveys



Photograph A5: Japanese knotweed recorded along the access ramp at Glasnevin rail junction during Jacobs invasive species surveys



Photograph A5: Japanese knotweed recorded south of the access ramp during Jacobs invasive species surveys