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Transport Infrastructure Ireland

TII Publications



The Management of Invasive Alien Plant Species on National Roads – Standard

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TII Publications



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1. Introduction

1.1 General

Invasive Alien Plant Species (IAPS) are species that are introduced intentionally or unintentionally that can threaten native biodiversity, human health and ecosystem services, and potentially damage infrastructure, agricultural practices and forestry. The economic costs of treating invasive alien species (IAS) in Europe have been estimated at approximately €12.5 billion a year, a figure that is rising with increased travel and trade (BiodivERsA, 2017).

This Standard (The Management of Invasive Alien Plant Species on National Roads - Standard) is based on an extensive literature review and analysis of best practice throughout Europe, and aims to provide the following:

- Details of the key IAPS management strategies that must be incorporated into the planning, construction practices and maintenance regimes of national roads
- The processes for managing IAPS on national roads in Ireland

There is increasing awareness and concern over the threats that IAPS pose to Ireland's indigenous biodiversity, and national legislation governing the control of these plant species has been subject to significant revision over the last number of years. Ireland also has international obligations under a number of conventions and various pieces of European legislation to address the increasing threat of IAPS.

As IAPS have the potential to significantly impact national biodiversity, obstruct signage and sightlines at junctions, and damage road infrastructure, Transport Infrastructure Ireland (TII) is outlining its requirements in this Standard for the management of the species most likely to be encountered on existing and proposed national roads.

The aim of this Standard is to provide the necessary requirements for personnel involved in national road planning, construction, operation and maintenance to effectively manage IAPS, and to ensure their activities do not contribute to the introduction and spread of these species. It is essential that this document is read in conjunction with the guidance provided in GE-ENV-01105 The Management of Invasive Alien Plant Species on National Roads – Technical Guidance.

1.2 Implementation

This Standard shall be used forthwith in the planning, design and construction of national road projects that:

- require approval under Section 51 of the Roads Act, 1993, as amended (proposed road development subject to Environmental Impact Assessment);
- require approval under Section 177AE of the Planning and Development Act, 2000, as amended (certain local authority development subject to Appropriate Assessment); or
- are subject to the procedure established under Section 179 of the Planning and Development Act, 2000, as amended, and Part 8 of the Planning and Development Regulations, 2001, as amended (known as the 'Part 8' procedure).

In relation to the:

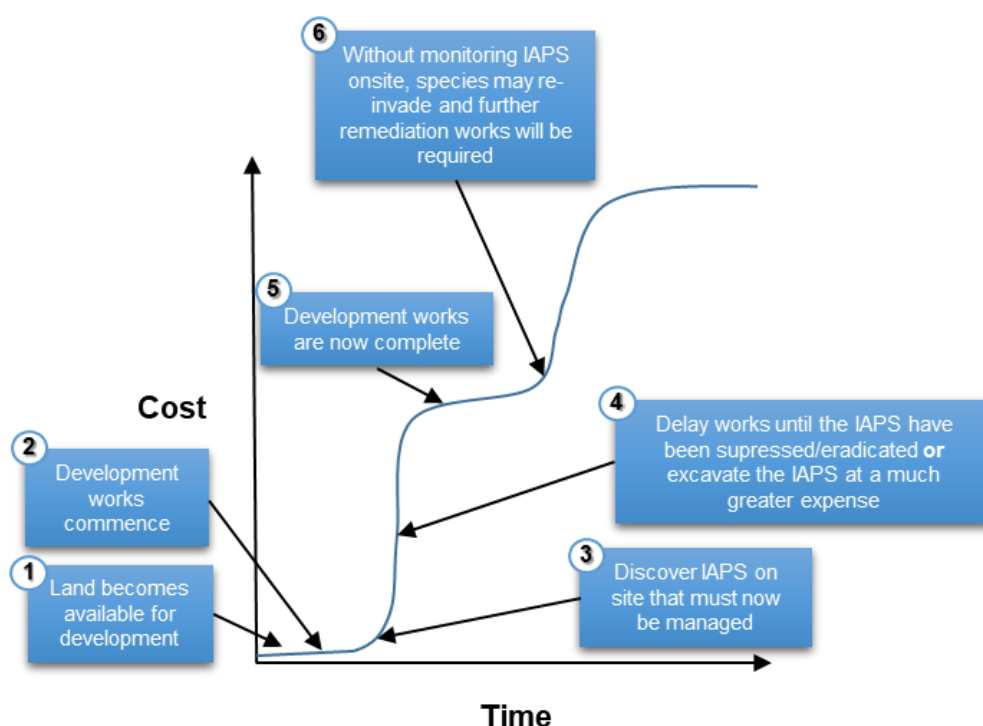
- the planning, design and construction of all other national road projects; and,
- the maintenance of national roads,

the contents of this Standard shall be:

- treated as advice and guidance, particularly, with regard to health and safety requirements and when using herbicides/pesticides;
- employed to the extent that is reasonably practicable; and,
- applied in a proportionate manner, having regard to the characteristics and location of the project/maintenance works and the type and characteristics of potential impacts.

The aim of this Standard is to provide the necessary requirements for personnel involved in national road planning, construction, operation and maintenance to effectively manage IAPS, to ensure their activities do not contribute to the introduction and spread of these species.

Scenario A: A common but inefficient approach



Scenario B: A more efficient approach

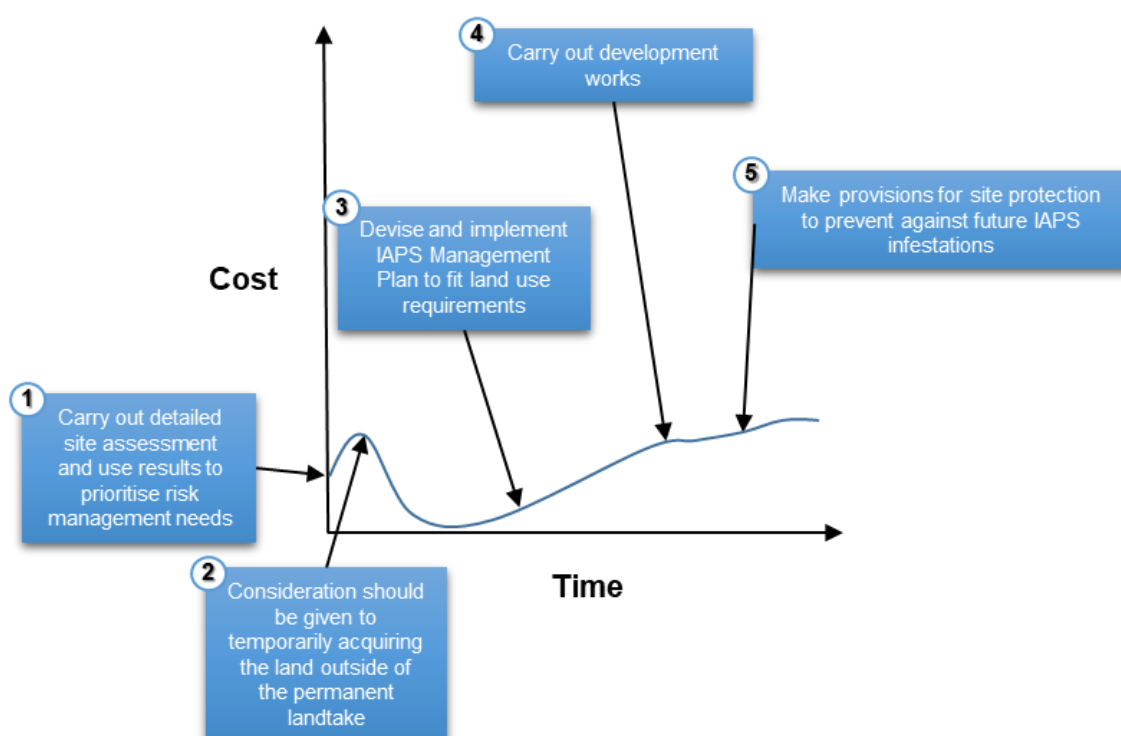


Figure 1 Inefficiencies in common approaches to invasive species management (***adapted from CIRIA, 2008***)

1.3 Planning

The early identification and management of IAPS can significantly reduce the resources required to minimise the spread of these species (refer to Figure 1).

Section 2 of this document outlines the systematic approach of IAPS management to be followed during the planning of any national road development works.

1.4 Construction

Areas identified as requiring specific IAPS treatment during the planning phase of any proposed national road development works should be demarcated and the designated control measures implemented at the earliest possible stage to reduce the risk of spread of IAPS by means of enabling or advance works.

During the construction of any road development or improvement works, raw materials (e.g. rock, topsoil, sands and gravel) may be imported from a range of locations. It is important that all such locations, (e.g. quarries, gravel pits, or other areas) are assessed for the presence of IAPS in advance of removing any material from such sites.

At sites where IAPS that reproduce solely using seeds are known to be present, priority should be given to reducing the risk of seed transfer by preventing the plants from flowering. In relation to all IAPS efforts should be made to reduce the risk of material transfer by instigating appropriate controls on the movement of machinery and soil/gravel/stones in the infected area, i.e. by implementing strict and appropriate biosecurity measures on site. Biosecurity essentially refers to the measures to be taken to prevent the introduction and spread of IAPS; refer to Section 2.3.3.

A systematic approach should be taken in the removal and control of IAPS, ensuring that the use of tracked machinery is limited in infested areas and vehicles and equipment are cleaned before moving between sites. This will minimize the risk of introducing or reintroducing contaminated soil/gravel/stones, seeds or plant fragments into areas that is already treated or developed.

The management strategy for IAPS presented in Section 2.2 provides the template for strategic management, which should commence with an assessment of the detailed distribution of all IAPS within the lands in question.

Control of IAPS on national road schemes during the construction phase requires adherence to an appropriate and effective soil management plan (refer to Section 5.5 of GE-ENV-01102 *A Guide to Landscape Treatments for National Road Schemes in Ireland* (TII)).

Section 2 outlines the systematic approach of IAPS management to be followed during the construction phase of any national road development works.

1.5 Maintenance

Roadsides are important dispersal corridors for many plants, including IAPS. Those responsible for the maintenance regimes of roadsides must be cognisant of the risks of liability associated with the spreading of IAPS (refer to GE-ENV-01105, *The Management of Invasive Plant Species on National Roads – Technical Guidance*). Road verges are regularly mown for traffic-safety reasons. Hedge cutting and strimming pose a significant risk by facilitating the spread of IAPS along road verges. Local authorities and maintenance contractors must remain vigilant in their management of road verges to prevent the establishment and spread of IAPS and to protect native biodiversity.

TII, in collaboration with the Kildare National Roads Office (NRO), have produced signage to deter hedge cutters from cutting in areas contaminated by Japanese knotweed (Figure 2) and where the management of Japanese knotweed is currently being undertaken. This signage can be adapted to warn of other IAPS along roadsides, as appropriate. A flier has also been produced to warn those engaging in roadside management to refrain from carrying out any hedge cutting or strimming activities in areas contaminated by Japanese knotweed (Figure 3).

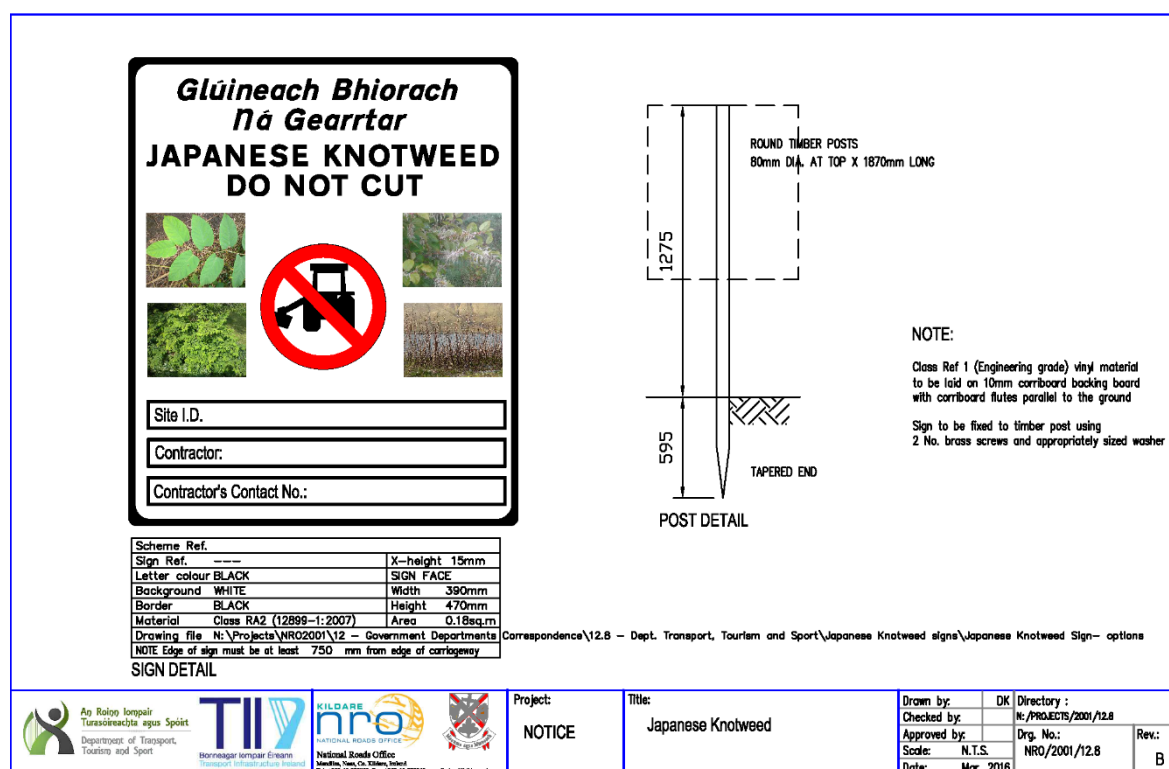


Figure 2 Design specification for signage to deter any hedge cutting or strimming activity in areas contaminated by Japanese knotweed



Figure 3 Flier to deter any hedge cutting or strimming activity in areas contaminated by Japanese knotweed

Suitably qualified personnel (refer to Appendix A) must be employed when undertaking IAPS management during maintenance activities.

In all situations, a risk assessment shall be undertaken to identify the hazards at the particular site and to facilitate planning of the IAPS control and Temporary Traffic Management design, in accordance with the HSA Guidelines for Working on Roads *Guidelines for Works on Roads* (Health and Safety Authority, 2009) and the Temporary Traffic Management Design Guidance (Department of Transport). All signing, lighting and guarding at the works must be supervised by a competent person (refer to Appendix A).

Section 2 outlines the systematic approach of IAPS management to be followed during the maintenance regimes of any national roads where IAPS have been identified.

2. Invasive Alien Plant Species Management and Control

Any planning, development or maintenance works on national roads must take into account the risks associated with IAPS infestations. An assessment of the presence and status of IAPS must be undertaken to guide the selection of control measures and the appropriate risk management requirements. The control of IAPS shall be undertaken in four distinct phases (Figure 4), as follows:

- Phase 1: Undertake a detailed site assessment and risk assessment
- Phase 2: Create a detailed IAPS Management Plan
- Phase 3: Implement biosecurity and the appropriate control methods
- Phase 4: Undertake post control monitoring

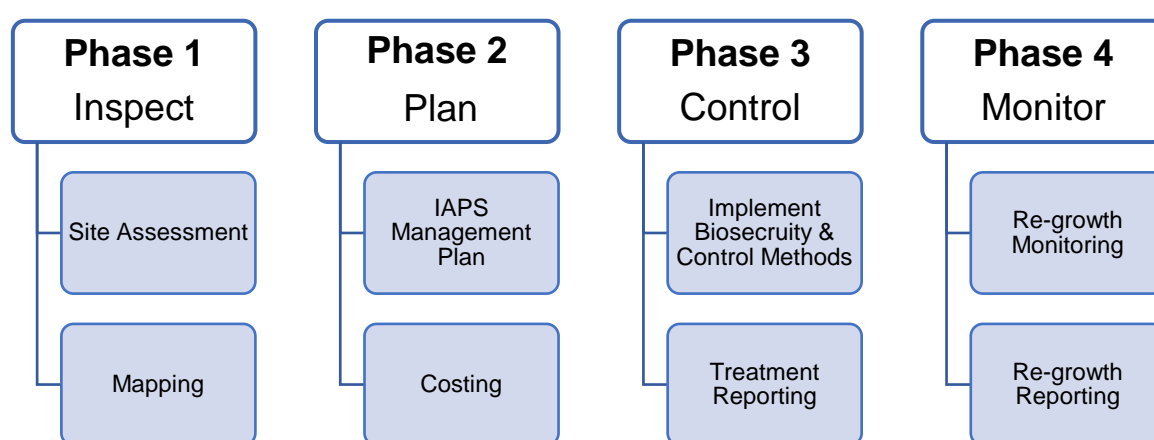


Figure 4 Infographic outlining the different phases associated with any IAPS management process

This protocol shall be applied to any IAPS within all ecosystems. The information gathered will act as a source of information for IAPS inventories, planning, analysis, monitoring, treatment, reporting and resource allocation.

2.1 Phase 1: Invasive Alien Plant Species Site Inspection

The risk that IAPS pose to a site should be determined on a site-by-site basis. A suitably qualified ecologist or horticulturalist (refer to Appendix A), capable of identifying the relevant IAPS and protected or rare habitats and species that could be affected through the management of IAPS, must be appointed to carry out a site assessment for the presence of IAPS. This person shall also provide advice on the control options, timing of treatments and related matters. The assessment will further take account of the presence and location of any planting or landscaping on the section of road in question, as well as any sensitive ecological receptors (e.g. watercourses, species-rich grassland, designated conservation areas) that may be in the immediate vicinity. Consideration will also need to be given to whether there is potential bird nesting habitat in the vicinity where control is being undertaken during the bird nesting season (1st March to 31st August).

2.1.1 Assessment for the Presence of Invasive Alien Plant Species

During habitat mapping, the perimeter of each IAPS infestation shall be surveyed using a recognised topographical survey technique by a suitably qualified person (refer to Appendix A).

Where the accuracy of the survey would not be adversely affected (e.g. along a straight), the interval spacing may be increased. The survey points shall be accurate to 25mm in the horizontal. The survey shall utilise the Irish Transverse Mercator (ITM) coordinate system. A Geographic Information System (GIS) provides a valuable tool for the informed management of IAPS and in order to facilitate consistency and information sharing in GIS, all IAPS infestations will be mapped and stored as polygons. Each individual IAPS infestation shall be represented by a closed 3D polygon. A suitably qualified GIS technician (refer to Appendix A) shall record instances of IAPS as 3D polygon strings, thereby identifying the extent of the IAPS stands. Unique IDs will follow the format CC-RR-NNNN, where C represents the two letter county code, R represents the two-digit national road number, 01 to 99, and NNNN represents a four-digit number between 0001 and 9999. It is the Contractor's responsibility to maintain the uniqueness of the Site IDs and ensure that there are no duplicates, and that the IDs remain with one site. The survey observations must be recorded as per the schema set out in Table 1.

Table 1 GIS schema of observations to be recorded for every IAPS infestation surveyed as part of the planning, development or maintenance activities on any national road

Column Name	Data Type	Information
Name_Con	Text	Name of Contractor
Surveyor	Text	Surveyor's name
Surv_Date	Date	Date of survey
County	Text	County
Road	Text	Road
SiteID	Text	CC-RR-NNNN
Species	Text (Picklist)	Pick list of IAPS recorded as part of Survey
XSection	Text (Picklist)	Verge or Median
X_Fence	Text (Yes/No Response)	Does the extent of the infestation cross the fenceline?
Notes	Text	Any additional notes/comments/observations about this specific site?
Photos	Image	Record/associate photos with specific site
Site_Risk	Text (Yes/No Response)	Is the site within or proximate to the following: areas for the abstraction of drinking water; surface watercourses, transport routes (such as railway lines); areas with sealed or very permeable surfaces; groundwater vulnerable areas; karst areas,

Column Name	Data Type	Information
		areas used by the general public or defined vulnerable groups; and, European sites?

All GIS survey data are to be reported to the client and to TII in an Environmental Systems Research Institute (Esri) or equivalent GIS file compliant polygon dataset of IAPS recorded. In order to improve the national database on the distribution of invasive species, records should also be submitted to the National Biodiversity Data Centre (NBDC) website at <http://records.biodiversityireland.ie/> (refer to Appendix B - Submitting Invasive Species Records to the National Invasive Species Database).

2.2 Phase 2: IAPS Management Planning and Costing

At the planning phase of any development project or development works on national roads, all infestations of IAPS shall be noted as requiring specific treatment because, if left unattended, they have the potential to cause significant problems in the future. Appropriate control measures shall be prescribed within the Environmental Impact Assessment Report (EIAR) or other environmental report and should detail the following:

- The area requiring treatment
- The type of treatment required
- An assessment of the risk of re-infestation from surrounding land
- Costings of appropriate control strategies

The specific management requirements to control the future spread of IAPS shall be addressed within the mitigation section of the EIAR or other environmental report, which will subsequently be reflected in the contractual documents and the Environmental Operating Plan (EOP) for the scheme.

Many sites may have multiple IAPS requiring different management treatments over different timeframes. A Management Plan for IAPS shall be drawn up detailing the biosecurity, control and management measures being undertaken at the site (refer to Appendix C). This is particularly important if Japanese or other knotweed species are present. The clerk of works is responsible for ensuring effective communication of the issues to all sub-contractors as well as ensuring compliance with relevant guidelines and legislation as well as the management of IAPS onsite. The Management Plan shall set out a clear programme for eradicating, controlling and/or containing these IAPS, including but not limited to the following:

- A full topographical survey (as outlined in Section 2.1.1)
- An implementation schedule
- Records of treatments undertaken (refer to Section 2.3)
- Records of re-growth of IAPS (refer to Section 2.4.1)
- Locations where contaminated or potentially contaminated materials are disposed of

The outline Management Plan checklist presented in Appendix C is for reference purposes only and should be amended according to the specific needs of the site and the proposed work programme.

2.3 Phase 3: Invasive Alien Plant Species Control Methods

The decision to use a particular type of treatment in the control of specific IAPS shall be made on a case-by-case basis by the Ecologist or Horticulturalist, in consultation with the Registered Pesticide Advisor and Registered Professional User as appropriate (refer to Appendix A). Control of IAPS can be divided into either physical or chemical methods. Whilst there should generally be a preference for physical control methods, chemical control may, in some instances, be more appropriate. In other instances, a combination of treatment by herbicide and physical methods may be most appropriate. Control options for specific IAPS are presented in the Technical Guidance document.

2.3.1 Chemical Methods of Invasive Alien Plant Species Control

Chemical treatment involves the application of pesticides/herbicides, either by targeted spraying or direct application to the individual plant by injection, weed-wiping or other method. As outlined in Appendix A, professional users of pesticides must be registered pursuant to Regulation 4 of the Sustainable Use of Pesticides Regulations, and must have the appropriate training (with associated certificates) required to perform the necessary treatment to suitably manage the targeted IAPS. Chemical treatments must always be used in compliance with the product label.

In general, the application of herbicides and pesticides should not be undertaken in the following conditions:

- Windy weather where there is a risk of spray drift occurring
- During or preceding rainfall which can result in the chemical being washed off
- During periods of particularly cold weather which can reduce the plant's ability to uptake the chemical

When chemicals are being used, it is important to refer to the Official Register of PPPs in Ireland (www.pcs.agriculture.gov.ie). This website specifies the list of approved products, the crops/situations for which they are approved and information on the national register of professional users (**Note:** A professional user is any person who applies/sprays professional use herbicide/pesticide products, regardless of quantity or method of application).

2.3.2 Physical Methods of Invasive Alien Plant Species Control and Disposal of Material

Physical methods of IAPS control include cutting, digging or excavating, hoeing and pulling by hand. Where cut, pulled or mown IAPS material arises, its disposal shall not lead to a risk of further spread or pose a risk of poisoning livestock. Particular care shall be taken near watercourses as water is an effective conduit for the dispersal of plant fragments and seeds. Material that contains flower heads or seeds shall be disposed of either by composting (if appropriate), burial at a depth of no less than 2m, by incineration (having regard to relevant legislation, including the Waste Management Act, 1996–2011, the Waste Management (Prohibition of Waste Disposal by Burning) Regulations, 2009, and relevant local authority byelaws), or disposal to licensed landfill. **Note:** Composting should only be employed as a method of control if it poses no biosecurity risks to the environment. **It is essential that the methods used comply with the law and that all necessary licences, permits, consents and permissions are in place.**

It should be noted that particular care is required in relation to the disposal of Japanese and other knotweed species. Where burial is being used to dispose of these species, a non-persistent herbicide shall be applied to the infestation prior to excavation. The material shall then be excavated and subsequently buried to a minimum depth of 5m. The waste shall be covered with a proprietary root barrier membrane layer and infilled with a minimum 5m depth of uncontaminated soil.

Any geotextile membranes used for burial must be undamaged, sealed securely, have a manufacturer's guarantee that it will remain intact for at least 50 years, and be UV resistant.

Where burial to a depth of 5m is not possible, the infestation shall be treated with a non-persistent herbicide prior to excavation, excavated and then completely encapsulated in a proprietary root barrier membrane cell. The upper surface of the cell shall be buried to a depth of at least 2m with uncontaminated soil.

It is essential that the methods used comply with the law and that all necessary licences, permits, consents, permissions, and other documentation are in place.

2.3.3 Biosecurity Measures

Areas infested with IAPS must be clearly identified and the specific sites of infestation isolated with fencing or warning tape. 'Biosecure zone' signs must be erected at each contaminated site to alert workers that IAPS are present and to avoid entering or interfering with these sites. Likewise, any stockpiles of soil that are or could be contaminated with IAPS must be clearly marked. Designated and clearly marked cleaning and/or disinfection stations should be strategically placed within the work site for use by staff, vehicles and machinery. Where it is necessary to work in contaminated areas, every effort should be made not to use vehicles with caterpillar tracks.

All vehicles and equipment that have been used in IAPS control operations must be thoroughly pressure-washed in a designated wash-down area each time they leave the works site and once work in that area has been completed. This also includes footwear, personal protective equipment (PPE), tools, and other light equipment. It is important to remove soil that may contain seeds or plant fragments, which otherwise could be transported along the road corridor as works are being undertaken. Vehicles leaving contaminated area(s) should either be confined to marked haulage routes protected by root barrier membranes, or be pressure-washed before leaving the area. Only vehicles that are deemed to be biosecure (i.e. sealed so that no soil can escape) shall be used to transport contaminated soil and all must be thoroughly pressure-washed in the designated wash-down area before exiting the infested area.

2.4 Invasive Alien Plant Species Treatment Monitoring

Those responsible for the treatment of IAPS must document the methods of treatment employed, as per the outline IAPS Management Plan presented in Appendix C. This documentation must be completed every time a treatment operation is performed. All herbicide treatment monitoring observations must be recorded as per the schema set out in Table 2. In circumstances where designated conservation areas (including Natura 2000 sites, Natural Heritage Areas, proposed Natural Heritage Areas, Nature Reserves and National Parks) adjoin the roadside, local authorities are advised to consult with the local NPWS Ranger in advance of undertaking any controls in such areas.

Following control of large areas of IAPS, subsequent disturbance of the soil may give rise to a flush of seedling germination or revitalised rhizome growth. To avoid this, bare soil should be mulched (covered with a natural or synthetic barrier, such as wood chip, straw, geo-textile, or other appropriate material) and planted at the earliest opportunity with appropriate native replacement vegetation to stabilize the soil and deter subsequent re-invasion.

Table 2 Treatment monitoring information that must be recorded every time any treatment of IAPS is performed

Column Name	Data Type	Information
SiteID	Text	Provide ID for site recorded as part of full topographical survey
Company	Text	Name of company applying treatment
TreatedBy	Text	Name of individual applying treatment
TreatDate	Date	Date and time of treatment
Weather	Text	Description of weather conditions
TreatMeth	Text	State the method of treatment used
Herbicide	Text	State the name of herbicide used
Pesticide Control Service (PCS)	Text	Provide PCS Number
Cal_Rate	Text	Provide calibration rate per hectare
Conc_Used	Text	State the total concentration of herbicide used
Water_Vol	Text	State the water volume used per hectare
Nozzle	Text	State the nozzle type used
Cal_SUD	Text (Yes/No Response)	Was the calibration used in compliance with the Sustainable Use Directive
Qual&Reg	Text (Yes/No Response)	Did a qualified and registered adviser carry out the treatment?
Prof_User	Text	Name of qualified and registered professional user
Notes	Text	Any notes re treatment

All treatment data must be submitted to the Client and to TII in an Esri or equivalent GIS file compliant point dataset of IAPS recorded.

2.4.1 Invasive Alien Plant Species Regrowth Monitoring

In many cases, it is not possible to control an established stand of IAPS with a single herbicide treatment (e.g. Japanese knotweed). Therefore, repeated treatments over successive years is necessary. Where physical methods are used to control IAPS, the treated area will also need to be monitored over a number of years for regrowth. A site may be considered remediated after two consecutive growing seasons with no sign of regrowth from all of the previously identified stands. However, there is always the possibility of further regrowth occurring, either through re-infestation of the site from off-site, or the reactivation of dormant rhizomes due to disturbance of soils.

It is important that any regrowth of treated IAPS on a site is accurately mapped and detailed reports prepared and submitted to the Client and to TII. Monitoring must be conducted for a number of years post-treatment in order to determine the level of control success that the treatment(s) has achieved. The regrowth monitoring survey observations must be recorded as per the schema presented in Table 3.

Table 3 Site inspection regrowth monitoring data that must be recorded in subsequent growing seasons post- treatment

Column Name	Data Type	Information
SiteID	Text	Read Only field, displaying ID for site recorded as part of full topographical survey stage
Company	Text	Name of company undertaking inspection
InspectBy	Text	Name of individual undertaking inspection
Ins_Date	Date	Date and time of survey
Regrowth	Text (Yes/No Response)	Is there any evidence of regrowth?
%Regrowth	Number	Whole number as a percentage of overall site, indicating estimate of regrowth
Comments	Text	Comments regarding regrowth (e.g. is regrowth coming from untreated adjacent lands outside of the site)
NewStands	Text (Yes/No Response)	Are there any new infestations evident adjacent/outside original site?
NewStdCom	Text	Comments re new infestation: where it is relative to site, how abundant
Notes	Text	Any notes re treatment?

All IAPS regrowth monitoring data shall be reported to the Client and to TII in an Esri or equivalent GIS file compliant point dataset of IAPS recorded.

3. Glossary of Acronyms

A list of acronyms referred to in this Standard is provided in Table 4.

Table 4 **Glossary of acronyms**

Acronym	Definition
CIEEM	Chartered Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research and Information Association
CPO	Compulsory Purchase Order
DAFM	Department of Agriculture, Food and the Marine
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EOP	Environmental Operating Plan
Esri	Environmental Systems Research Institute
GIS	Geographic Information System
IAPS	Invasive Alien Plant Species
IAS	Invasive Alien Species
IEMA	Institute of Environmental Management and Assessment
IOSH	Institution of Occupational Safety and Health
MS	Member States
NBDC	National Biodiversity Data Centre
NPWS	National Parks and Wildlife Service
NRO	National Roads Office
PCS	Pesticide Control Service
PPE	Personal Protective Equipment
PPPs	Plant Protection Products

Acronym	Definition
PRCD	Pesticide Registration and Controls Divisions
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
SCD	Standard Construction Detail
SLG CSCS	Signing, Lighting and Guarding at Roadworks Construction Skills Certification Course
TII	Transport Infrastructure Ireland

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Appendix A:

Key Personnel Required for the
Management of Invasive Alien
Plant Species

The key personnel required for the management of Invasive Alien Plant Species (IAPS) include:

- **Health and Safety Manager:** Must be competent to carry out the duties of the Contractor in compliance with Safety Health and Welfare at Work Act 2005 and Safety Health and Welfare at Work (Construction) Regulations 2013. Minimum of three years' relevant post-qualification experience and be a member (graduate member or higher) of a relevant professional body, such as the Institution of Occupational Safety and Health (IOSH).
- **Competent Person:** The assessment, design, installation, maintenance and removal of Temporary Traffic Management shall comply with the *Guidelines for Working on Roads* (Health and Safety Authority, 2009), the *Temporary Traffic Management Design Guidance* (Department of Transport) and the *Temporary Traffic Management Operations Guidance* (Department of Transport). A competent person must have training, experience and knowledge commensurate with the size or hazards (or both) of the TTM tasks to be undertaken. Training, experience and knowledge competency requirements for the TTM Designer, the Temporary Traffic Operations Supervisor and the TTM Operative are set out in the *Temporary Traffic Management Design Guidance* and *Temporary Traffic Management Operations Guidance* documents respectively. Where TTM Works must take place on Level 3 roads the competent person must also have an accredited TTM Level 3 qualification.
- **Registered Professional User:** A professional user of pesticides listed on the register established by the Minister for Agriculture, Food and the Marine pursuant to Regulation 4 of the European Communities (Sustainable Use of Pesticides) Regulations, 2012. The user must have the appropriate training (with associated certificates) necessary to perform the methodology to manage IAPS. Such training might include: training equal or equivalent to the following City and Guilds NPTC Pesticide Training Ireland courses: PA1 – Safe Handling and Application of Pesticides; PA6A – Hand Held Applicator (Knapsack Sprayer); PA6AW – Hand Held Near Water; and, PA6INJ Pesticide Injection.
- **Ecologist or Horticulturalist:** An ecologist or horticulturalist capable, *inter alia*, of identifying the relevant IAPS; and protected or rare habitats and species that could be affected through the management of IAPS. They will also provide advice on the options and timing for IAPS control and management programmes, and recommend and supervise best biosecurity practice. An ecologist must have a degree (Higher Education and Training Awards Council (HETAC)/National Framework of Qualifications (NFQ) Level 7 or equivalent or higher) in biological science or environmental science, or equivalent subject; three years' relevant post-qualification experience; and be a member (graduate member or higher) of a relevant professional body, such as the Chartered Institute of Ecology and Environmental Management (CIEEM) or Institute of Environmental Management and Assessment (IEMA). A horticulturalist must have a degree (Higher Education and Training Awards Council (HETAC)/National Framework of Qualifications (NFQ) Level 7 or equivalent or higher) in horticulture, or equivalent subject; and, three years' relevant post-qualification experience.
- **Geographical Information Systems** In order to fulfil the Geographical Information System (GIS) reporting requirements, a competent person capable of providing geographical information on IAPS infestations and associated treatment methods in a defined format, is required.

- **Land Surveyor:** A competent person capable of surveying with Global Positioning System (GPS), or equivalent, IAPS and other features relevant to the management of same, to a high degree of accuracy and providing the information in an appropriate format.

In addition to having the previously mentioned Key Personnel, it is advised that anyone involved in the chemical control of IAPS have access to the advice of a Registered Pesticide Advisor on the register established by the Minister for Agriculture, Food and the Marine pursuant to Regulation 4 of the European Communities (Sustainable Use of Pesticides) Regulations, 2012. As per Article 3(3) of the Sustainable Use of Pesticides Directive (Directive 2009/128/EC), 'advisor' means any person who has acquired adequate knowledge and advises on pest management and the safe use of pesticides, in the context of a professional capacity or commercial service, including private self-employed and public advisory services, commercial agents, food producers and retailers, where applicable.

Appendix B:

Submitting Invasive Alien Species
Records to the National Invasive
Species Database

The national invasive species database is held by the National Biodiversity Data Centre (NBDC) and is intended to provide centralised up-to-date information on the distribution of Invasive Alien Species (IAS) in Ireland.

Maps of the distribution of IAS in Ireland are publicly available through the NBDC's web GIS system. As a tool for the recording of new and the spread of established IAS in Ireland, it is important that the database accurately reflects the current distribution of IAS in Ireland. For that reason, it is important that all observations of IAS within Ireland be submitted to the database, regardless of how widespread the species may be.

To submit a record of an IAS to the national database, you need to record the name of the species, the date on which you observed it, the location of the species and a grid reference. This should be submitted along with your name and the name of the person who identified the species (if different) directly to the NBDC. Further detail on how to submit records to the national database is available at: <http://records.biodiversityireland.ie/>

Appendix C:

Invasive Alien Plant Species Site Assessment and Outline Management Plan

The management and control of Invasive Alien Plant Species (IAPS) should be undertaken in four distinct phases, as follows:

- Phase 1: Inspect
- Phase 2: Plan
- Phase 3: Control
- Phase 4: Monitor

The information gathered using this protocol will allow those engaged in IAPS control and management to:

- Record/identify IAPS infestations
- Plan the management and control of IAPS
- Implement control methods and track treatments
- Monitor re-growth of IAPS infestations

Phase 1	<ul style="list-style-type: none"> – Site assessment – Mapping 	<ul style="list-style-type: none"> – Description of site – Habitat mapping – Presence of IAPS – Sensitive receptors – Proximity to designated sites – Topographical survey
Phase 2	<ul style="list-style-type: none"> – IAPS Management Plan – Costing 	<ul style="list-style-type: none"> – Site management objectives – Treatment required – Risk of re-infestation – Costings of appropriate control strategies – Acquisition of land/Compulsory Purchase Order (CPO) if necessary
Phase 3	<ul style="list-style-type: none"> – Implement control methods – Treatment reporting 	<ul style="list-style-type: none"> – IAPS control (chemical, physical or a combination of both) – Biosecurity measures – Documentation of method of treatment
Phase 4	<ul style="list-style-type: none"> – Re-growth monitoring – Re-growth reporting 	<ul style="list-style-type: none"> – Survey re-growth – Report on re-growth – Make provisions for site protection to prevent future IAPS infestations



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