



# IRELAND'S INVASIVE ALIEN SPECIES SOIL AND STONE PATHWAY ACTION PLAN 2023 – 2027

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Actions to reduce the risk of introduction and spread of  
invasive alien species through movement of soil and stone



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Invasive alien species are animals, plants or pathogens that would not naturally occur in an area but are there because of human activity (deliberate or accidental). When introduced, they survive and thrive to the point of negatively impacting on wildlife and the environment, on the services nature provides, are costly to the economy and can even impact on our health and way of life.

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## Introduction

Once established in a new region, invasive alien species can quickly spread and become difficult, if not impossible, to control or eradicate. Their presence can result in detrimental impacts on wildlife, on the services nature provides, on our economy, our health and the way we live. However, the likelihood of establishment is largely governed by opportunities for initial introduction. As invasive alien species can be unintentionally transported in ‘habitat material’ such as soil and stone (including excavated/dredged spoil), action is needed to reduce the risk of introducing and spreading invasive alien species among habitats in Ireland by this pathway.<sup>1</sup>

The development of action plans to tackle priority pathways of unintentional introduction and spread of Invasive Alien Species of Union concern in Ireland is a requirement under the EU Invasive Alien Species Regulation<sup>2</sup>. This Pathway Action Plan<sup>3</sup> targeting the transport of invasive alien species in soil and spoil material is one of a series of plans intended to reduce the risk of introduction and spread of invasive alien species in Ireland.

*Ireland’s Invasive Alien Species Soil and Stone Pathway Action Plan 2023 – 2027* outlines the general policy approach to tackling this pathway and what actions government and those involved with excavation, transportation, recovery, reuse and disposal of habitat material in Ireland can undertake.

## Scope

The scope of this Soil and Stone Pathway Action Plan concerns activities related to excavation, transportation and disposal of possible invasive alien species vector material among terrestrial and freshwater/transitional aquatic environments. This includes soil and stone and excavated/dredged spoil but excludes raw, non-composted animal manures. It incorporates reuse, recovery and disposal activities related to soil, stone and excavated/dredged material.

The scope is not targeted at the *intentional*<sup>4</sup> excavation, movement and disposal activities of invasive alien species or the soil and stone (including excavated/dredged spoil) known to contain invasive species, but to focus on the movement of soil and stone in the course of normal activities (e.g. construction and demolition, farming, waterway maintenance etc.) whereby there is a risk of *inadvertently* also moving invasive alien species within those vector materials.

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<sup>1</sup> Pathways are the routes and mechanisms of the introduction and spread of invasive alien species.

<sup>2</sup> The official title of the EU Invasive Alien Species Regulation is: 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.

<sup>3</sup> The purpose of Pathway Action Plans (PAPs) is to prevent or minimize the risk posed by the pathways using measures such as raising public awareness and setting out actions to prevent unintentional introductions by minimizing the contamination of goods, commodities, vehicles, and equipment by invasive alien species, and ensuring appropriate border checks.

<sup>4</sup> The intentional movement and disposal of invasive alien species and their vector materials - such as known contaminated soil – is already regulated with provisions in place to address biosecurity risks.

Substrate used to enclose the root-systems of potted and/or ornamental plants is outside the scope of the Pathway Action Plan.

While the geographic scope of the plan is limited to Ireland, given the significant connectivity, close proximity and ease of access between cross border locations, aspects concerning Northern Ireland are referred to, as well as linkages with Great Britain and continental Europe.

This Pathway Action Plan is aimed at all those that engage in the excavation, transportation, reuse and disposal of soil and stone including excavated/dredged spoil that may harbour invasive alien species. These activities may be done by landowners for land management (i.e., landscaping), site maintenance or development works (i.e., construction, dredging, riparian management, road works etc), or farming purposes, as well as those that are commercially engaged with excavation, transportation, and disposal of these vector materials, along with governing bodies and agencies that regulate these activities.

## Description of the target pathway

### What is this pathway?

Plants, animals or pathogens can be unintentionally transported to new sites in habitat material such as soil and stone including excavated/dredged spoil. For example, soil that is excavated from a development site and transported for reuse at another site may contain whole or viable parts (seeds, rhizomes, plant fragments, eggs) of invasive alien species that could establish at the new site. Additionally, excavation activities in an area where invasive alien species are present could inadvertently result in the attachment of contaminated soil to excavation and transport machinery. If the machinery has not been properly checked, cleaned and dried, and/or disinfected before being used in other locations, the invasive alien species may survive transport on the equipment and be introduced into another location.

Excavation and transport equipment include any machinery or equipment that has been used for substrate extraction and transport that may retain even small amounts of substrate that could harbour invasive alien species. This equipment could include auger drill rigs, earth-moving vehicles such as bucket loaders, bulldozers, and scrapers, agricultural machinery, as well as vehicles and trailers used for the transportation of soil and stone. This includes all parts of equipment that is in contact with substrate, such as digging apparatus, tyres, tracks and undercarriage.

For excavation and transport equipment deployed for use within and/or adjacent to waterbodies, the 'Recreational Boating and Watercraft Pathway Action Plan' should also be consulted given the additional risks associated with aquatic invasive alien species. In particular, it has been shown that some aquatic invasive alien species do not need to be submerged in water during transport but can survive in damp conditions. Similarly, small plant propagules (i.e., stem or root-system fragments) of many invasive plants are capable of growing into new plants. These propagules can be readily transported in small amounts of habitat material to new locations due to their size and inconspicuous appearance.

### What is the scale of the activity related to this pathway in Ireland?

There is an abundance of scenarios that require soil and stone to be relocated but the quantities of habitat material moved within the State are largely unknown, as are the frequency of transport events and movement of machinery among different locations. Nevertheless, a considerable

number of mechanically propelled vehicles capable for use in excavation and transport activities are operated within Ireland: 75,863 agricultural tractors, 5,632 excavation machinery, 3,106 small dumpers and forklift trucks, 718 haulage-type tractors, 26 off-road dumpers, as well as numerous rigged-tipper and articulated trucks that could be used for the transport of soil and spoil.<sup>5</sup>

In general, it appears that relatively little import or export of waste soil occurs. In 2020, for example, 450 tonnes of uncontaminated waste soil and stone were exported from the State to Northern Ireland<sup>6</sup>. However, these records reflect the process of classifying soil and spoil as “soil and stone”, and further categorisation as a waste and/or a by-product. Accordingly, little information is available concerning actual habitat material. If soil or stone is classified as waste, then its collection, transport, handling and treatment (recovery or disposal) has to be in accordance with waste regulations. In 2020 for example, 8.2 million tonnes of construction and demolition-based waste were generated and collected in Ireland, with 84% of this being soil and stone waste.<sup>7</sup> The 2022 report further states that ‘in 2020, the EPA received by-product notifications for 3,217,523 tonnes of soil and stone material. Notifications for 155,200 tonnes were withdrawn. The EPA determined that 1,374,575 tonnes of the soil and stone notified were by-product and that 73,000 were waste. The estimated quantity of soil and stone material notified in 2020 for which no determination was made to date, amounted to 1,614,748 tonnes’.<sup>8</sup> The majority of uncontaminated waste soil and stone (i.e., substrate that does not contain other waste materials) along with dredging spoil, that enter the waste management network are sent to authorised soil recovery facilities. These facilities are generally worked-out quarries that are in the process of being restored or sites where the natural ground levels need to be raised.<sup>9</sup> Classification as a by-product result in the reuse of soil and stone without further intervention. In 2018, 907,000 tonnes of the soil and stone were classed as a by-product.

Since the 1960’s the number of invasive alien species in Ireland has steadily increased<sup>10</sup> with a variety of species now widespread in Ireland with continued risk of spread including terrestrial invasive alien species such as American skunk cabbage (*Lysichiton americanus*), Chilean rhubarb (*Gunnera tinctoria*), Giant hogweed (*Heracleum mantegazzianum*), Himalayan balsam (*Impatiens glandulifera*), New Zealand flatworm (*Arthurdendyus triangulatus*) and Japanese Knotweed (*Fallopia japonica*; synonyms *Reynoutria japonica* and *Polygonum cuspidatum*), as well as aquatic invasive alien species such as Zebra mussel (*Dreissena polymorpha*), Quagga mussel (*Dreissena rostriformis*

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<sup>5</sup> Irish Bulletin of Vehicle and Driver Statistics (2019). Available online:

<https://www.gov.ie/en/publication/Of943b-irish-bulletin-of-vehicle-and-driver-statistics-2019/>

<sup>6</sup> Waste Shipment Registers (2020). National Transfrontier Shipment Office. Available online:

<https://www.dublincity.ie/residential/environment/national-tfs-office/ntfso-waste-shipment-registers>

<sup>7</sup> Construction & Demolition Waste Statistics for Ireland (2022). Environmental Protection Agency. Latest reference year: 2020. Available online: [www.epa.ie/our-services/monitoring--assessment/waste/national-waste-statistics/construction--demolition](http://www.epa.ie/our-services/monitoring--assessment/waste/national-waste-statistics/construction--demolition)

<sup>8</sup> The EPA 2022 report further states ‘It is important to note that by-product notifications do not necessarily mean that any or all of the material was generated or indeed moved. Notifiers of by-product may not have proceeded with the activities related to the by-product notifications. However, if they did proceed, the materials would not have entered the waste management network or be included in the 2020 C&D waste statistics data presented here. Only material notified as by-product, determined to be waste, generated and moved as waste in 2020 is covered by the EPA’s 2020 C&D waste statistics.’

<sup>9</sup> Guidance on waste acceptance criteria at authorised soil recovery facilities (2020). Environmental Protection Agency. ISBN: 978-1-84095-880-5. Available online: <https://www.epa.ie/publications/compliance--enforcement/waste/guidance-on-waste-acceptance-criteria-at-authorised-soil-recovery-facilities.php>

<sup>10</sup> O’Flynn, C., Kelly, J., Lysaght, L. (2014). Ireland’s invasive and non-native species – trends in introductions. National Biodiversity Data Centre Series No. 2. Ireland.

*bugensis*), Craayfish plague (*Aphanomyces astaci*), Nuttall’s waterweed (*Elodea nuttallii*) and African curly waterweed (*Lagarosiphon major*). As more invasive alien species are poised to be introduced to Ireland from Great Britain and continental Europe<sup>11</sup>, good awareness and implementation of biosecurity measures by all relevant stakeholders are required.

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The term ‘biosecurity’ relates to measures taken to prevent the introduction and spread of living organisms.

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In the absence of implementing appropriate biosecurity measures, there is an increased potential for the inadvertent spread of viable invasive alien species from infested to un-infested sites. Accordingly, sensible steps should be taken to minimise, if not eliminate, opportunities for further invasive alien species spread. The general principles of the Check Clean Dry campaign for biosecurity can be used to reduce the introduction and spread of invasive alien species through soil and spoil. In addition, comprehensive biosecurity guidance developed by the United States Department of Agriculture (USDA) Forest Service<sup>12</sup> to control the spread of invasive alien species is especially pertinent. Overall, relatively straightforward yet effective steps can be taken to prevent introduction and spread of invasive alien species.

**MOVING SOIL AND STONE**

**BIOSECURITY STEPS TO TAKE**

**BEWARE OF ALIENS**

- Site risk assessment**  
Check for presence of invasive species and risk of introducing them prior to commencing works
- Managing risk**  
Put in place a plan for site biosecurity
- Check**  
Have visual inspection check-lists for machinery/equipment
- Clean**  
Removal of any heavy debris adhering to machinery with a brush or trowel prior to leaving a worksite, wash down if possible
- Responsible disposal**  
Dispose of soil and stone containing invasive species following regulations and best practice guidance
- Depot cleaning station**  
Use self-contained cleaning stations for incoming machinery or equipment at central depots
- Stay informed**  
Keep up to date with compliance and reporting procedures

<sup>11</sup> Davis, E., Caffrey, J.M., Dick, J.T.A., Coughlan, N.E., Britton, J.R., Ramsay, R., Tricarico E., Lucy, F.E. (2017) Horizon scanning for invasive alien species on the island of Ireland. Available online: [https://www.biodiversityireland.ie/wordpress/wp-content/uploads/Horizon-Scan-Report-Ireland\\_FINAL\\_2017.pdf](https://www.biodiversityireland.ie/wordpress/wp-content/uploads/Horizon-Scan-Report-Ireland_FINAL_2017.pdf)

<sup>12</sup> Fleming, J. (2005). Vehicle Cleaning Technology for Controlling the Spread of Noxious Weeds and Invasive Species. United States Department of Agriculture (USDA) Forest Service. Available online: <https://www.fs.fed.us/eng/pubs/pdf/05511203.pdf>

## Policy and legal context

Efforts to prevent initial introduction and further spread of non-native species in Europe and Ireland, especially potentially damaging invasive alien species, has long been a feature of legislation and policy. The most relevant European policy instruments concerning invasive alien species transported by habitat material include the Bern Convention<sup>13</sup>, the Water Framework Directive<sup>14</sup>, and the EU Invasive Alien Species Regulation<sup>2</sup>. Relevant domestic legislative instruments include:

- Wildlife Act 1976 – updated to 1 August 2019<sup>15</sup>
- Wildlife (Amendment) Act, 2000<sup>16</sup>
- S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011<sup>17</sup>
- European Communities (Marine Strategy Framework) Regulations S.I. No. 249 of 2011<sup>18</sup>

National policy for invasive alien species includes actions under:

- Ireland's third *National Biodiversity Action Plan 2017-2021*<sup>19</sup> whereby Target 4.4 states that 'Harmful invasive alien species are controlled and there is reduced risk of introduction and/or spread of new species.' This is supported by 7 actions in the plan. A successive 4<sup>th</sup> National Biodiversity Action Plan<sup>20</sup> is in draft and as of March 2023, Outcome 2G states 'Invasive alien species (IAS) are controlled and managed on an all-island basis to reduce the harmful impact they have on biodiversity and measures are undertaken to tackle the introduction and spread of new IAS to the environment'. This outcome is supported by 8 actions.
- The *Biodiversity Climate Change Sectoral Adaptation Plan*<sup>21</sup> whereby Action 1.6 is to 'Establish and implement an all-island invasive species programme to monitor the spread of terrestrial, aquatic and marine invasive species in a changing climate and control invasive species where their spread is considered problematic'.
- The Water Framework Directive (WFD) (Directive 2000/60/EC) whereby in Ireland, invasive alien species are considered a significant pressure. 'The river basin public consultations on significant water management issues in 2015 identified [invasive alien species] as a significant issue for water management.' It has been further identified that 'invasive species are a significant pressure impacting 42 or 1.8% of the 1,460 At Risk water bodies. This total of 42 is made up of 7 river and 35 lake water bodies.'<sup>22</sup> These invasive alien species include aquatic and riparian invasive alien species that can be transported in habitat material.

Additional policy and legislation govern the classification, movement, and use of soil and spoil in Europe and Ireland. Primary European policy and legislative implements consist of the Waste

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<sup>13</sup> <https://www.coe.int/en/web/bern-convention>

<sup>14</sup> <https://water.europa.eu/freshwater/europe-freshwater/water-framework-directive>

<sup>15</sup> <https://revisedacts.lawreform.ie/eli/1976/act/39/revised/en/html>

<sup>16</sup> [www.irishstatutebook.ie/eli/2000/act/38/enacted/en/print.html](http://www.irishstatutebook.ie/eli/2000/act/38/enacted/en/print.html)

<sup>17</sup> <https://www.irishstatutebook.ie/eli/2011/si/477/made/en/print>

<sup>18</sup> <https://www.irishstatutebook.ie/eli/2011/si/249/made/en/print>

<sup>19</sup> [www.npws.ie/sites/default/files/publications/pdf/National%20Biodiversity%20Action%20Plan%20English.pdf](http://www.npws.ie/sites/default/files/publications/pdf/National%20Biodiversity%20Action%20Plan%20English.pdf)

<sup>20</sup> [www.gov.ie/en/consultation/1566c-public-consultation-on-irelands-4th-national-biodiversity-action-plan](http://www.gov.ie/en/consultation/1566c-public-consultation-on-irelands-4th-national-biodiversity-action-plan)

<sup>21</sup> [www.npws.ie/news/biodiversity-climate-change-sectoral-adaptation-plan](http://www.npws.ie/news/biodiversity-climate-change-sectoral-adaptation-plan)

<sup>22</sup> [www.catchments.ie/significant-pressures-invasive-species/](http://www.catchments.ie/significant-pressures-invasive-species/)



Framework Directive<sup>23</sup> and the Plant Health Regulation 2016/2031.<sup>24</sup> As a result of the Plant Health Regulation, transport of soil into EU territories from non-EU countries, other than Switzerland, is prohibited. Additionally, machinery used for agricultural or excavation purposes cannot be imported without a phytosanitary certificate declaring the machinery is clean and free from soil.<sup>25</sup>

Relevant domestic legislative instruments include:

- S.I No. 894/2004 European Communities (Control of Organisms Harmful to Plants and Plant Products) as amended
- S.I. No. 821/2007 - Waste Management (facility permit and registration) Regulations 2007
- S.I. No. 126/2011 - European Communities (Waste Directive) Regulations 2011.

National policy for soil and spoil includes actions under:

- Plant Health & Biosecurity Strategy 2020-2025<sup>26</sup>, whereby it is recommended to ‘Develop and maintain a risk register for Ireland and use this to identify gaps in surveillance, contingency plans, capacity and expertise.’ It is suggested that such a risk register could include ‘private and commercial imports of soil, seeds, plants and plant parts, timber and wood packaging material’.
- A Waste Action Plan for a Circular Economy - Ireland’s National Waste Policy 2020-2025<sup>27</sup>, whereby the Plan shifts focus away from waste disposal and looks instead to how we can preserve resources by creating a circular economy. This new national waste policy will inform and give direction to waste planning and management in Ireland over the coming years.

The OPW’s (June 2023) *Article 27 Management of Soil and Stone By-Products on Flood Relief Schemes Technical Note* provides further useful information on relevant European and Irish waste legislation including an overview of the relevant guidance.<sup>28</sup>

Guidance aimed at reducing the introduction and spread of damaging invasive alien species through the movement of habitat material have been promoted in the past. In 2014, the Property Care Association Code of Practice for the Management of Japanese Knotweed<sup>29</sup> was published (updated 2018) and has been highlighted as Best Practice Guidelines for Ireland.<sup>30</sup> The Invasive Non-Native Specialists Association (INNSA), an industry body for companies involved in controlling and

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<sup>23</sup> The official title of the Waste Framework Directive is: Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives.

<sup>24</sup> The official title of the EU Plant Health Regulation is: Regulation (EU) No 2031/2016 of the European Parliament of the Council of 26 October 2016 on protective measures against pests of plants.

<sup>25</sup> Commission Implementing Directive 2019/523 (Amendment to Plant Health Legislation). Available online: <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32019R2072>

<sup>26</sup> Plant Health & Biosecurity Strategy 2020-2025. Department of Agriculture, Food and the Marine. Available online: <https://www.gov.ie/en/publication/b737e-dont-risk-it/#plant-health-bio-security-strategy-2020-2025>

<sup>27</sup> A Waste Action Plan for a Circular Economy - Ireland’s National Waste Policy 2020-2025. Department of Communications, Climate Action and Environment. Available online:

<https://www.gov.ie/pdf/?file=https://assets.gov.ie/86647/dcf554a4-0fb7-4d9c-9714-0b1fbc7dbc1a.pdf#page=null>

<sup>28</sup> To be published on [www.gov.ie/opw](http://www.gov.ie/opw).

<sup>29</sup> Code of Practice for the Management of Japanese Knotweed (2018). Property Care Association, UK. Available online: [https://www.property-care.org/wp-content/uploads/2018/05/PCA-COP-Control-of-Knotweed-24pp\\_04.05.18-WEB.pdf](https://www.property-care.org/wp-content/uploads/2018/05/PCA-COP-Control-of-Knotweed-24pp_04.05.18-WEB.pdf)

<sup>30</sup> <http://invasivespeciesireland.com/species-accounts/established/terrestrial/japanese-knotweed>



eradicating invasive non-native species in the UK, also provide their members with a similar Code of Practice for Managing Japanese Knotweed<sup>31</sup>. Best Practice Guidelines have also been developed for the management of several Invasive Alien Species of Union concern, i.e. Chilean rhubarb<sup>32</sup>, Giant Hogweed<sup>33</sup>, and Himalayan balsam.<sup>34</sup> Furthermore, from circa 2010 onwards, Inland Fisheries Ireland developed and led a biosecurity campaign with recreational water users.<sup>35</sup> Since 2018, the Department of Housing, Local Government and Heritage have been promoting the Check Clean Dry public awareness campaign aimed at improving biosecurity amongst water users. The Check Clean Dry campaign<sup>36</sup> is adopted across Ireland, Northern Ireland, Great Britain, the Isle of Man and Channel Island governments, thus providing a readily recognisable and consistent biosecurity messaging across those areas. The principles of the Check Clean Dry campaign can be used to better prevent the introduction and further spread of invasive alien species by habitat material and not just for aquatic environments.

## Aim and objectives

The aim of this Soil and Stone Pathway Action Plan is to reduce the risk of invasive alien species being introduced to Ireland and spread from one location to another within Ireland through the movement of habitat material in the form of soil and stone and excavated/dredged spoil. Successful implementation of the Pathway Action Plan actions will support application of regulation and policy, and ultimately reduce the environmental and socioeconomic impacts of invasive alien species.

The **objectives** to meet the aim of the Pathway Action Plan are:

- A. Communicate invasive alien species issues amongst key stakeholder groups, including relating to how good biosecurity actions incorporated into day-to-day activities reduce the risk of introduction and spread of invasive alien species. [ACTIONS 2, 3, 4]
- B. Good practice guidance information is available to enable key sectors to address their risk and take appropriate prevention and response measures. [ACTIONS 1, 3, 4]
- C. Review and adapt the existing regulatory framework, where necessary, to incorporate measures to reduce the inadvertent risk of introduction and spread of invasive alien species by the relevant stakeholder groups. [ACTION 2]
- D. Improved surveillance and availability of distribution data of invasive alien species with guidance to support decision making on when and to whom to report the detection of the priority concern list of invasive alien species. [ACTION 5,6]
- E. Identify and close the gaps in knowledge that are required to support development of the key actions and enable their implementation. [ACTION 7]

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<sup>31</sup> Code of Practice for Managing Japanese Knotweed (2017). Invasive Non-Native Specialists Association, UK. Available online: <https://www.innsa.org/wp-content/uploads/2019/06/INNSA-Code-of-Practice.pdf>

<sup>32</sup> <http://invasivespeciesireland.com/wp-content/uploads/2020/07/Annex-C1-Gunnera-tinctoria-Management-Measures-1.pdf>

<sup>33</sup> <https://invasivespeciesireland.com/wp-content/uploads/2012/01/Giant-Hogweed-BPM.pdf>

<sup>34</sup> <https://invasivespeciesireland.com/wp-content/uploads/2012/01/Himalayan-Balsam-BPM.pdf>

<sup>35</sup> <https://www.fisheriesireland.ie/what-we-do/education-and-outreach/safeguarding-and-governance/biosecurity>

<sup>36</sup> <https://invasives.ie/biosecurity/check-clean-dry/>

## Identification of key stakeholders

Achieving the aim of this Soil and Stone Pathway Action Plan is dependent on close cooperation between the Department of Housing, Local Government and Heritage and other government agencies along with the key stakeholders to reduce the risk of further introduction and spread of invasive alien species to Ireland. The key stakeholders including representative bodies identified for this Soil and Stone Pathway Action Plan are:

- Association of Landscape Contractors of Ireland
- Builders
- Construction Industry Federation (CIF)
- Chartered Institute of Ecology and Environmental Management (CIEEM)
- Department of Agriculture, Food and the Marine (Horticulture & Plant Health Division)
- Department of Communications, Climate Action and Environment
- Digger/excavation drivers
- Engineers Ireland
- Environmental Protection Agency (EPA)
- Farmers
- Waste hauliers (especially of soil and stone and dredged/excavated spoil)
- Irish Farmers' Association (IFA)
- Irish Mining and Quarry Association (IMQS)
- Landscapers
- Local Authorities
- Mandatory register of competent builders (via Construction Industry Registration of Ireland (CIRI))
- National Parks and Wildlife Service (NPWS)
- National Waste Collection Permit Office (NWCPO)
- Office of Public Works (OPW)
- Transport Infrastructure Ireland (TII)
- Waste Management Companies dealing with soil/spoil including recovery/reuse.

This list is not exhaustive and other key stakeholders may be identified through the process of implementation and review of the pathway Action Plan.

## Key Actions

The key actions are divided into six sections:

- Good practice
- Policy
- Raising awareness
- Surveillance
- Reporting
- Knowledge gaps

For each section an aim, outcome and actions are set. For each of the actions, a timeframe and a responsible lead and partners are assigned where possible. Key stakeholders may also be listed where relevant.

### GOOD PRACTICE

**Aim:** guidance is developed to support good practices in the priority risk sectors of soil and stone movement, on dredging, on construction and earthworks, and on landscaping. This includes reuse, recovery and disposal activities.

*Outcome:* Each sector will have access to core guidelines to inform best practice to assess risk and implement biosecurity actions on movement of soil and stone and associated vehicles and machinery. Implementation will aid in compliance with soil and stone and dredged/spoil waste and by-product policy and in reducing the risk of causing an offence under Regulation 49 of S.I. 477/2011<sup>37</sup> by introducing or causing or allowing dispersal of invasive alien species.

#### Action 1 – Developing guidelines for good practice

The Soil and Stone Pathway Action Plan Working Group will coordinate development of a core biosecurity measures guidance document. This can act as a basis for development of sectoral guidance documents tailored to policy and authorisation requirements by individual sectors.

<b>Lead</b>	INVAS Biosecurity, National Biodiversity Data Centre, Waterways Ireland
<b>Partners</b>	Soil and Stone Pathway Action Plan Working Group, Leave No Trace, Chartered Institute of Ecology and Environmental Management (CIEEM)
<b>Key stakeholders</b>	Waste hauliers, landscapers, farmers/agriculture, construction & demolition, dredging, forestry, Council planning unit and procurement.
<b>Timeline</b>	Q4 2023 – Q2 2024

### POLICY

**Aim:** sufficient regulatory provisions are in place to reduce the risk of inadvertent introduction and spread of invasive alien species by activities relating to the movement of invasive alien species soil and stone and dredged/spoil material.

*Outcome:* Improved provisions in the waste, recovery and by-product regulatory framework to reduce the risk of the introduction and spread of invasive alien species through those activities.

#### Action 2 - Adapting the regulatory framework

To reduce the risk of the spread of invasive alien species by off-site movement of soil and stone, dredged/spoil material and associated vectors (machinery, vehicles etc.),

<sup>37</sup> [www.irishstatutebook.ie/eli/2011/si/477/made/en/print](http://www.irishstatutebook.ie/eli/2011/si/477/made/en/print)

the Soil and Stone PAP Working Group will review the need for amendments to existing waste legislation to enable authorities to adapt the existing waste authorisation framework to improve or introduce standards and checks on biosecurity measures. This may include:

- a. Adding conditions to facility permits and collection permits - with checks for sign-off - that the material is invasive alien species free before going for recovery or recycling.
- b. Introducing a more efficient authorization process for onsite waste disposal options for known invasive alien species contaminated material in line with recommendations from appropriate experts.

Implementation of Action 2a is dependent on a need to first set out what control standards are to be applied and what checks put in place. This Knowledge Gap is covered in Action 7b.

Recommendations on amendments to waste legislation will be for the consideration of the Department of Environment, Climate and Communications.

<b>Lead</b>	Soil and Stone Pathway Action Plan Working Group
<b>2a Relevant public body</b>	Regional Waste Management Planning Offices, National Waste Collection Permit Office
<b>2b Relevant public body</b>	Department of Environment, Climate and Communications
<b>Timeline</b>	Unknown. Amendments to regulations – if needed, may take a long time to enact and so a definitive timeframe cannot be given.
<b>Partners</b>	Regional Waste Management Planning Offices, Waste Enforcement Regional Lead Authorities, National Waste Collection Permit Office, Dept. Environment, Climate and Communications and, the Environmental Protection Agency.
<b>Key stakeholders</b>	Local authorities, waste receiving facilities, waste hauliers, invasive alien species site contractors and site developers, Chartered Institute of Ecology and Environmental Management (CIEEM).

### Action 3 – Environmental Protection Agency update of waste and by-product guidance documents

The **Environmental Protection Agency (EPA)** will provide further clarity regarding the appropriate management and prevention of invasive alien species at construction and demolition development sites, authorised soil recovery facilities, and other appropriate use locations. This will be achieved through:

- a. Updating the [‘Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects’](#)
- b. Updating [‘Guidance on waste acceptance criteria at authorised soil recovery facilities’](#)
- c. Inclusion of appropriate measures, controls and guidance for invasive alien species in:
  - i. National By-Product Criteria;
  - ii. Single Case by-product notifications,
  - iii. National End-of-Waste-Criteria; and
  - iv. Single case End-of-Waste decisions.

The by-production notification system requires the further use of the soil and stone to be lawful (Regulation 27(1)(d)) and relies on regulation of the development at the use location by the planning authority. The by-product system can link to the Biosecurity Guidelines being drafted for use by the planning authority.

The National Parks and Wildlife Service, supported by the Soil and Stone Invasive Alien Species Pathway Action Plan Working Group, will assist the EPA in updating these guidance documents. Development of a core biosecurity measures guidance document under Action 1 will inform updates to these two EPA guidance documents.

<b>Lead</b>	Environmental Protection Agency
<b>Partners</b>	National Parks and Wildlife Service, Soil and Stone Pathway Action Plan Working Group
<b>Key stakeholders</b>	Construction and Demolition, Soil recovery facility operators
<b>Timeline</b>	Start Q3 2024 – End Q4 2024

## RAISING AWARENESS

**Aim:** biosecurity campaigns are developed and disseminated targeting key sectors at risk of inadvertently introducing and spreading invasive alien species through their day-to-day activities but whose reach is outside of the soil and stone and dredged/spoil material regulatory framework.

*Outcome:* Raised awareness on the actions that can be taken to reduce the risk of introduction and spread of invasive alien species by key sectoral high-risk activities that fall outside the regulatory framework.

### Action 4 – Development of sectoral biosecurity awareness campaigns

Representative groups, advisory bodies or authorities as appropriate should develop a biosecurity awareness campaign for their members/sectors. In particular, the following sectors will be targeted:

- Farmers
- Landscapers
- Digger/excavation drivers
- Builders.

Possible routes of elevating awareness may be through adding an invasive alien species and biosecurity module to existing training systems such as:

- SOLAS Safe Pass or other appropriate courses
- Toolbox talks on construction sites
- Leave No Trace courses
- Green Cert agricultural course

These campaigns will likely build from the guidance produced in Action 1.

<b>Coordinating support</b>	National Biodiversity Data Centre, INVAS Biosecurity, Leave No Trace
<b>Lead</b>	Sector representative body led or competent authority as appropriate
<b>Leads may include</b>	Teagasc, Construction Industry Federation, Irish Farmers Association, the Association of Landscape Contractors (ALCI)
<b>Key stakeholders</b>	Farmers, Landscapers, Digger/excavation drivers, Mandatory register of competent builders (via Construction Industry Registration of Ireland (CIRI))
<b>Timeline</b>	Q3 2024 – Q4 2027. Once commenced, this will be an ongoing action.

## SURVEILLANCE

**Aim:** improved knowledge and availability of up-to-date distribution data on invasive alien species is publicly available to enable assessment of risk of spread from activities on or near an infested site.

*Outcome:* reduced risk of the spread of invasive alien species from a site due to availability of up-to-date distribution data on invasive alien species thus informing identification of risks.

### Action 5 – Local Authority survey of invasive alien species

Each Local Authority undertakes periodic surveys for invasive alien species within its region making the distribution data easily accessible to its staff, contractors etc. This should build on the existing distribution data available<sup>38</sup> and may be supplemented by staff incidental sighting reports that are/can be verified.

The Local Authority will also provide a copy to the National Biodiversity Data Centre for central collation and publishing in Ireland. In doing so, the distribution data can then be readily accessed by all from the Biodiversity Maps portal (<https://maps.biodiversityireland.ie>) along with verified records of invasive species from other sources.

<b>Lead</b>	Each of Ireland's Local Authorities
<b>Timeline</b>	Ongoing action

## REPORTING

**Aim:** when an invasive alien species is detected on site, a reporting hierarchy is available to guide reporting on the presence of the species.

*Outcome:* timely reporting and communication on the presence of invasive alien species to aid risk assessment of site activities and informed decision making on risk management.

### Action 6 – Reporting the presence of invasive alien species

While the presence of an invasive alien species at a site may not be obvious (plant has died back; eggs or seed are in the soil; microscopic pathogens), as standard practice, a minimum level of biosecurity measures should be implemented on-site to reduce the risk of introduction and spread of invasive alien species within and from a site. However, good practice includes a site survey for invasive alien species and a reporting protocol to be followed should they be detected. The intensity of survey and urgency in reporting should be dictated by the risk at the site, the activity and the species detected.

A general reporting hierarchy for communication on a list of priority invasive alien species will be published on [www.invasives.ie](http://www.invasives.ie). The list will be dynamic, and periodically reviewed and updated.

<b>Lead</b>	National Biodiversity Data Centre supported by the Chartered Institute of Ecology and Environmental Management (CIEEM)
<b>Partners</b>	Soil and Stone Pathway Action Plan Working Group
<b>Timeline</b>	Q4 2024

<sup>38</sup> For example from: the Botanical Society of the British Isles BSBI maps <https://bsbi.org/maps> and the National Biodiversity Data Centre's Biodiversity Maps: <https://maps.biodiversityireland.ie>

## KNOWLEDGE GAPS

**Aim:** gaps in knowledge or methods critical to development and implementation of Actions 1-6 are identified and actions put in place to close those gaps, where possible.

*Outcome:* Successful implementation of Actions 1- 6 is more likely due to closure of knowledge gaps.

### Action 7 – Close knowledge gaps that are vital to support development and implementation of Actions 1-6

Knowledge gaps identified by the Soil and Stone Invasive Alien Species Pathway Action Plan Working Group include:

- a. What, if any, of the priority invasive alien plant species and parts thereof can be composted?
- b. Implementation of permit authorisations need to be assessable and enforceable. Explore methods for aiding inspection of declared invasive alien species free soil and stones and dredged/spoil material. Consider sample size and frequency, list of invasive alien species for detection, holding procedures etc.

To enable delivery of Action 7, a funding stream to address the identified knowledge gaps needs to be sourced.

<b>6a Lead</b>	National Botanic Gardens
<b>6b Lead</b>	To be determined – funding dependant
<b>Partners</b>	Soil and Stone Pathway Action Plan Working Group
<b>Timeline</b>	Q4 2023 – Q4 2025



## Recommendations

Through the Soil and Stone Pathway Action Plan Working Group discussions, it became evident that additional measures to support tackling the threat of introduction and spread of invasive alien species through the unintentional movement of soil and stone fell outside the scope of this Pathway Action plan. Therefore, the Working Group make the following recommendations:

- A. There is a need for clarification on the streams of movement and disposal of invasive alien species and soil and stone *known* to be contaminated with invasive alien species. This includes clarification on any checks and authorisations needed. While actions on the intentional movement of invasive alien species, and soil and stone known to contain invasive alien species, are outside the scope of this pathway action plan, a recommendation is made herein that this information be made more accessible and be presented in a format with ease of readability - such as a quick reference flow chart. This should also cover the movement options of invasive alien species free soil and stone.
- B. That government departments devise and implement their own internal policy procedures in relation to the unintentional spread of invasive alien species through earthworks in terrestrial and aquatic ecosystems. This may include developing a Standard Operating Procedure (SOP) to implement policy through actions.
- C. A working group on invasive alien species for public authorities is established to share knowledge and address information gaps, and to enhance awareness with key stakeholder groups.
- D. To develop a grant aid scheme aimed at providing training to community groups in relation to soil and spoil management and invasive alien species.
- E. All whom act on invasive alien species in Ireland (e.g awareness raising, implementing biosecurity measures, undertaking control, developing policy, research etc) log that work on the *Actions on Invasives*<sup>39</sup>portal. This will give recognition to their efforts, contribute to a better understanding of all the actions taken across Ireland and, facilitate co-ordination of actions taken to address invasive species across Ireland.

## Pathway Action Plan management

The National Parks and Wildlife Service will coordinate development of the Soil and Stone Pathway Action Plan and monitoring of implementation of the Pathway Action Plan actions.

The Working Group will assess progress of implementation of the Pathway Action Plan on an annual basis. An interim and final review will compile and assess quantitative data of outcomes and include discussion of strengths and weaknesses of the current provisions as well as suggestions for improvement. The interim and final review will include feedback from those identified with implementation of the Soil and Stone Pathway Action Plan actions.

### Time schedule

- Draft Soil and Stone Pathway Action Plan issued for public consultation Q2 2023
- Final Soil and Stone Pathway Action Plan Q2 2023
- Interim review of Soil and Stone Pathway Action Plan actions/outcomes Q2 2025
- Final Review of Soil and Stone Pathway Action Plan in Q3 of 2027

It is envisaged that a follow-up or refreshed Soil and Stone Invasive Alien Species Pathway Action Plan will be issued for the period 2028 to 2032.

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<sup>39</sup> <https://actionsoninvasives.biodiversityireland.ie/>

## Summary note

The success of achieving the aim and objectives of the Invasive Alien Species Soil and Stone Pathway Action Plan is dependent on a collaborative and partnership approach that will include individuals, contractors, key stakeholder representative groups, non-governmental organisations, and government. Successful implementation will go a long way in protecting our habitats, wildlife and our communities. It is anticipated that through education and awareness, individuals and organisations involved in excavation, transportation and disposal of invasive alien species habitat material will form part of the solution in tackling Invasive alien species within Ireland through vigilance, responsible spread-prevention behaviours, and the timely reporting alert level species.

## Appendix I – Working Group Members

The following organisations are represented on the Soil and Stone Pathway Action Plan Working Group:

- Atlantic Technological University Sligo (ATU Sligo)
- Construction Industry Federation
- Chartered Institute of Ecology and Environmental Management (CIEEM)
- Composting and Anaerobic Digestion Association of Ireland CLG (Cré)
- Envva
- Environmental Protection Agency
- Integrated Materials Solutions
- INVAS Biosecurity
- National Biodiversity Data Centre
- National Parks and Wildlife Service
- National Waste Collection Permit Office
- Office of Public Works
- Teagasc
- Transport Infrastructure Ireland
- Waste Enforcement Regional Lead Authorities
- Waterways Ireland

Other organisations liaised with during the drafting of the Pathway Action plan include:

- Association of Landscape Contractors of Ireland
- Department of Environment, Climate and Communications
- Leave No Trace
- Local Government Management Agency
- Office of the Planning Regulator

## Appendix II – Priority concern list of invasive alien species

Table 1. Priority concern list of invasive alien species for the Invasive Alien Species Soil and Stone Pathway Action Plan

Scientific name	English name	IAS Union concern	Third Schedule	High Impact	Life stage most concern for vector spread	Known distribution in Ireland	Alert species
<b>Terrestrial plants</b>							
<i>Ailanthus altissima</i>	Tree of heaven	x			Seeds	Rare - two sites where planted in Ireland	Yes
<i>Allium triquetrum</i>	Three-cornered leek		x		Seeds	Widespread	No
<i>Carpobrotus edulis</i>	Hottentot fig		x		Seeds	Localised on east and south coastal cliffs	No
<i>Fallopia japonica</i>	Japanese knotweed		x	x	Plant fragment including rhizome	Widespread	No
<i>Fallopia sachalinensis</i>	Giant knotweed		x	x	Plant fragment including rhizome	Scattered and localised	No
<i>Fallopia x bohemica</i>	Bohemian knotweed		x	x	Plant fragment including rhizome	Scattered and localised	No
<i>Gunnera manicata</i>	Brazilian giant rhubarb		x	x	Seeds and rhizome	Scattered and localised	No
<i>Gunnera tinctoria</i>	Giant Chilean rhubarb	x	x	x	Seeds and rhizome	Widespread - abundant on west coast	No
<i>Heracleum mantegazzianum</i>	Giant hogweed	x	x	x	Seeds	Widespread	No
<i>Hippophae rhamnoides</i>	Sea-buckthorn		x		Seeds	Widespread & Locally abundant on coastal sites	No
<i>Hyacinthoides hispanica</i>	Spanish bluebell		x		Seeds	Widespread	No
<i>Impatiens glandulifera</i>	Himalayan balsam	x	x	x	Seeds	Widespread	No
<i>Juncus planifolius</i>	Broad-leaved rush		x		Seeds	Only found in Co. Galway	No
<i>Koenigia polystachya</i>	Himalayan knotweed	x	x		Plant fragment including rhizome	Widespread and localised	No
<i>Lysichiton americanus</i>	American skunk cabbage	x	x		Seeds and root fragment	Widespread and localised	Yes
<i>Prunus Lauorocerus</i>	Cherry laurel		x		Seeds	Widespread	No
<i>Rhododendron ponticum</i>	Rhododendron		x	x	Seeds	Widespread	No
<i>Rubus spectabilis</i>	Salmonberry		x		Seeds and some plant fragments	Sparse in Ireland. Widespread in Northern Ireland	No
<b>Terrestrial invertebrates</b>							
<i>Arthurdendyus triangulatus</i>	New Zealand flatworm	x		x	All life stages- flatworms and eggs	Widespread	No
<b>Freshwater plants</b>							
<i>Elodea nuttallii</i>	Nuttall's waterweed	x	x	x	Plant fragment	Widespread	Yes
<i>Crassula helmsii</i>	New Zealand pigmyweed		x	x	Plant fragment	Localised	Yes
<i>Elodea canadensis</i>	Canadian waterweed		x		Plant fragment	Widespread	No
<i>Hydrocotyle ranunculoides</i>	Floating pennywort	x	x	x	Plant fragment	One pond site in Ireland (under control). Localised in two counties in Northern Ireland	Yes
<i>Lagarosiphon major</i>	Curly waterweed	x	x	x	Plant fragment	Widespread but mostly confined to artificial waterbodies except for Lough Corrib	Yes
<i>Myriophyllum aquaticum</i>	Parrot's feather	x	x	x	Plant fragment	Localised	Yes
<i>Nymphoides peltata</i>	Fringed water-lily		x	x	Seed and plant fragment	Localised	Yes
<b>Freshwater and Marine</b>							
<i>Spartina (All species and hybrids)</i>	Cord-grasses		x	x			No
<i>Corbicula fluminea</i>	Asian river clam		x	x	All life-stages - larvae, juveniles, adults	Localised - in Shannon River Basin. Few other sites in Ireland	Yes
<i>Dreissena polymorpha</i>	Zebra mussel		x	x	All life-stages - larvae, juveniles, adults	Widespread - except very south and east	No
<i>Dreissena rostriformis bugensis</i>	Quagga mussel		x	x	All life-stages - larvae, juveniles, adults	Localised - Shannon River Basin	Yes
<i>Eriocheir sinensis</i>	Chinese mitten crab	x	x	x	All life-stages - larvae, juveniles, adults	Rare - localised to Waterford harbour but may travel upstream	Yes
<i>Hemimysis anomala</i>	Bloody-red shrimp		x	x	All life-stages	Localised - Shannon River Basin	Yes

The listing of these species as priority concern species is due to them being regulated, at risk of invasive impact and, the potential for their introduction or spread through the movement of soil and stone activities.

The listing of these as priority concern species may change if the threat status of listed or unlisted species changes. An up-dated version of the species list will be maintained on the National Biodiversity Data Centre's invasive species website: <https://invasives.ie/biosecurity/pathway-action-plans/>

Some of the species listed in this section plus many more are regulated under European and domestic regulations for prohibition on introduction, keeping and dispersal. For more information and to view the lists of regulated species visit: <https://invasives.ie/about/irelands-invasive-species/>.

## Reporting sightings of invasive alien species

Report suspected sightings of invasive alien species to the National Biodiversity Data Centre through the *Biodiversity Data Capture* app (available on ios and android) or through the online recording form: <https://records.biodiversityireland.ie/record/invasives>. For alert tagged species, the suspected or verified occurrence of the species should be reported without delay. Provide a photograph, if possible, to aid verification of the species identity.

## Appendix III – Biosecurity awareness resources

Under Action 1 of this Soil and Stone Pathway Action Plan, a core biosecurity measures guidance document that will act as a basis for sectoral guidance documents will be developed. In the meantime, information on biosecurity actions to reduce the risk of introducing and spread invasive alien species is widely available. For instance, see: [Biosecurity & prevention - Invasives.ie](https://www.biodiversityireland.ie/biosecurity-prevention-invasives) for some basic principles and campaign messaging.

### European Commission *Beware of Aliens* awareness initiative

The DG ENVIRONMENT of the European Commission launched in 2022 an initiative to raise awareness on Invasive Alien Species amongst stakeholders and citizens, which entailed workshops in several EU countries and consensus on key messages. A package of information material was produced covering 5 ways that Invasive Alien Species are introduced and spread. The 5 ways are through: aquatic ornamentals, aquatic recreation, forests, pets, and soil transport.

For information on these campaigns including posters, animations and other resources for raising awareness about IAS go to: <http://tinyurl.com/bewareofaliens>. Please download them for use to inform and educate people about biological invasions. A manual is included to guide you in communicating about this important issue. Thank you for playing a part in increasing understanding of Invasive Alien Species!

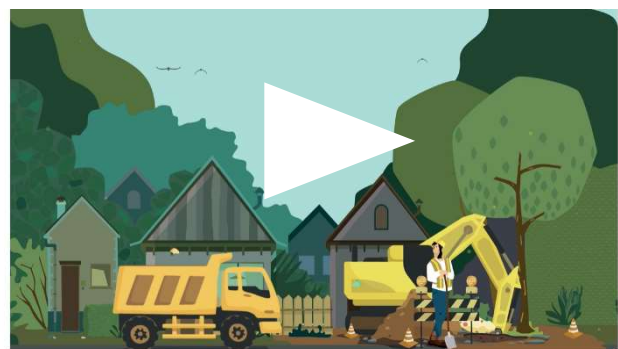
### Beware of Aliens - Soil Transport awareness campaign

You know what happens when soil is transported? Every little creature that lives in the soil - from plant seeds & roots to tiny animals - hitchhikes along and becomes part of the new environment. No big deal, you would say. But some plants, animals & microbes are invasive alien species. They overgrow or infest their new environment. The healthy ecosystem disappears. Buildings, roads, rivers, wildlife and crops are impacted. This comes at a huge cost to nature and to society.

Have you checked the soil you are about to move? Did you clean the soil from your boots, machinery & trucks in between jobs? The environment, your neighbours and your fellow taxpayers thank you!

A short video on how Soil Transport can cause spread of invasive alien species and actions to take to reduce that risk is available from:

<https://vimeo.com/743470577/a8f4922370>




Soil transport - beware of aliens

#BewareOfAliens



# MOVING SOIL AND STONE

## BIOSECURITY STEPS TO TAKE



**Site risk assessment**  
Determine presence/absence of invasive species prior to commencing works

**Managing risk**  
Put in place plan for site biosecurity

**Check**  
Have visual inspection check-lists for machinery/equipment

**Clean**  
Removal of any heavy debris adhering to machinery with a brush or trowel prior to leaving a worksite, wash down if possible

**Responsible disposal**  
Dispose of soil and stone containing invasive species following regulations and best practice guidance

**Depot cleaning station**  
Use self-contained cleaning stations for incoming machinery or equipment at central depots

**Stay informed**  
Keep up to date with compliance and reporting procedures

**Invasives.ie**  
Invasive Alien Species in Ireland

For information on **Ireland's Invasive Alien Species Soil and Stone Pathway Action Plan 2023 – 2027** contact:

**National Parks and Wildlife Service**

Biodiversity Policy, 90 North King Street, Dublin 7, Ireland

E-mail: [biodiversitypolicy@npws.gov.ie](mailto:biodiversitypolicy@npws.gov.ie)

Phone: +353 (0)1 8883200

Or

**National Biodiversity Data Centre**

Carriganore, Waterford, Ireland

E-mail: [invasives@biodiversityireland.ie](mailto:invasives@biodiversityireland.ie)

Phone: +353 (0)51 306240



**An Roinn Tithíochta,  
Rialtais Áitiúil agus Oidhreacht**  
Department of Housing,  
Local Government and Heritage



**An tSeirbhís Páirceanna Náisiúnta  
agus Fiadhúlra**  
National Parks and Wildlife Service

