HyNet North West

OUTLINE CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

Appendix 9: Outline Biosecurity Management Plan

HyNet Carbon Dioxide Pipeline DCO

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 – Regulations 8(1)(c)

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1. INTRODUCTION

1.1. PROJECT OVERVIEW

1.1.1. This document has been prepared on behalf of Liverpool Bay CCS Limited ('the Applicant') and relates to an application ('the Application') for a Development Consent Order (DCO) that has been submitted to the Secretary of State (SoS) for Energy Security and Net Zero under Section 37 of the Planning Act 2008 ('the PA 2008'). The Application relates to the Carbon Dioxide (CO2) pipeline which constitutes the DCO Proposed Development.

1.1.2. The DCO Proposed Development will form part of HyNet North West ('the Project'), which is a hydrogen supply and Carbon Capture and Storage ('CCS') Project. The goal of the Project is to reduce carbon dioxide (CO_2) emissions from industry, homes and transport and support economic growth in the North West of England and North Wales. The wider Project is based on the production of low carbon hydrogen from natural gas. It includes the development of a new hydrogen production plant, pipelines, and the creation of CCS infrastructure. CCS prevents CO_2 entering the atmosphere by capturing it, compressing it, and transporting it for safe, permanent storage.

1.1.3. The DCO Proposed Development is a critical component of the Project which, by facilitating the transportation of carbon dioxide, enables the rest of the Project to be low carbon. The hydrogen production and CO_2 capture and storage elements of the Project do not form part of the DCO Proposed Development and will be delivered under separate consenting processes.

1.1.4. A full description of the DCO Proposed Development is detailed in **Chapter 3 – Description of the DCO Proposed Development** of the consolidated Environmental Statement (ES), submitted at Deadline 4 **[REP4-029]**.

1.2. PURPOSE OF THE DOCUMENT

1.2.1. This Outline Biosecurity Management Plan (OBMP) will act as a control plan which sets out indicative methods to avoid, minimise and mitigate likely environmental effects of the DCO Proposed Development as presented in the **Chapter 09** of the **ES [REP4-041]** and its associated appendices and the **Register of Environmental Actions and Commitments (REAC)** (document reference: **D.6.5.1**) submitted with the DCO Application.

1.2.2. Biosecurity management and mitigation measures detailed within this OBMP are designed in relation to the Construction stage. These measures will be developed further during Detailed Design and will be included within the detailed Biosecurity Management Plan (BMP) in accordance with Requirement 5(2) of the draft DCO **[REP4-008]**.

1.2.3. This OBMP provides the basic requirements of biosecurity upon which the development of a BMP will be produced at the Detailed Design stage by the appointed Construction Contractor(s).

1.2.4. The key objectives of this OBMP and subsequent BMPs are to:

- Provide a framework for managing biosecurity considerations across the DCO Proposed Development, including roles and responsibilities of relevant parties;
- Ensure compliance with relevant legislation, policy, and guidance across both England and Wales;
- Detail relevant licences, permits, and consents that are likely relevant to the DCO Proposed Development;
- Provide appropriate biosecurity mitigation and management measures for identified constraints; and
- Outline proposed monitoring and compliance measures.

2. ROLES AND RESPONSIBILITIES

2.1.1. The Construction Contractor(s) will be responsible for producing the BMP for the DCO using and building on the information outlined within this document. The BMP will be a live document and will be subject to review and updates as required during construction. Monitoring procedures, responsibilities, and compliance actions will be updated as appropriate.

2.1.2. It is the responsibility of the Site Manager to be aware of the contents of both the OBMP and the BMP. The Site Manager and, where applicable, appointed Ecological/Environmental Clerk of Works (ECoW) will ensure that the procedures and measures presented within this OBMP, and subsequent BMP are executed to ensure compliance with relevant legislation and policy (**REAC** item **D-BD-001** (document reference: **D.6.5.1**)).

2.1.3. All site personnel are to be made aware of the scope and contents of this document with a copy of the BMP retained on site during construction. All site personnel will be responsible for preventing the spread of Invasive Non-Native Species (INNS) within or beyond the construction working corridor and site boundaries. Additionally, all site personnel will embody appropriate behaviours and actions to prevent the spread or propagation of other biosecurity concerns, such as avian flu and bovine tuberculosis (bTB). This will be delivered via **REAC** (document reference: **D.6.5.1**) commitments **D-BD-001, D-BD-041,** and **D-BD-042**).

3. BIOSECURITY CONSIDERATIONS

RELEVANT LEGISLATION AND GUIDANCE

3.1.1. Under Wildlife and Countryside Act 1981 (as amended) (Her Majesty's Stationary Office (HMSO), 1981), it is an offence to release, plant or "cause to grow" in the wild any of the invasive species listed under Schedule 9.

3.1.2. The EU Regulation (1143/2014) (European Union, 2014) on the prevention and management of the introduction and spread of invasive alien species was retained in domestic law under the European Union (Withdrawal) Act 2018. It details invasive alien species as one of the main threats to biodiversity, and establishes rules to '*prevent, minimise and mitigate the adverse effects of invasive alien species'*.

3.1.3. In addition, the Great Britain Invasive Non-native Species Strategy (Department for Environment, Food and Rural Affairs (DEFRA), 2023) was first published in 2008 and aims to address INNS issues in Great Britain, covering terrestrial, freshwater and marine environments. The Strategy provides a framework on how to minimise the risks posed by INNS and sets out key aims and actions for addressing the threats posed. One of the key outcomes is to "*reduce establishments of INNS by at least 50% compared to 2000 levels*". It directs landowners and managers to adopt a proactive biosecurity driven approach to INNS management.

3.1.4. The Wales Invasive Non-native Species Group was formed to help identify INNS priorities in Wales. It lists the INNS Priority Species for Action in Wales, which includes, but is not limited to giant hogweed *Heracleum mantegazzianum*, Himalayan balsam *Impatiens glandulifera*, Japanese knotweed *Reynoutria japonica* and Rhododendron *Rhododendron ponticum* (and hybrids) (Wales Biodiversity Partnership, 2023).

3.1.5. There are a number of Local Action Groups within Wales tackling invasive species, including the Dee Invasive Non-Native Species Project. This is a catchment-wide partnership initiative aiming to control and monitor INNS within the Dee catchment.

3.1.6. On a local level, The Flintshire Local Development Plan recognises INNS within the water environment, through policy EN15 (Flintshire County Council, 2023) which outlines the removal of INNS as an integral part of their strategy to improve water quality.

3.1.7. There are further general, multi-species guidance documents associated with INNS and their control, such as the Keep it Clean Campaign[1] (Forestry Commission, 2018) and DEFRA's guidance on how to prevent the spread of harmful weeds and invasive non-native plants (DEFRA, 2014).

[1] Think kit think transport think trees poster professional audience .pdf (publishing.service.gov.uk)

INVASIVE NON-NATIVE SPECIES

3.1.8. Six invasive non-native plant species were identified at various locations throughout the Newbuild Infrastructure Boundary during field surveys (**Appendix 9.1 - Habitats and Designated Sites Survey Report (Volume III)** of the **ES Chapter 9 (Volume II)**) **[REP4-091].**

3.1.9. Fish and macroinvertebrate INNS were further identified during aquatic surveys (**Appendix 9.9 - Aquatic Ecology (Watercourses) Survey report (Volume III) [REP4-114]** and **Appendix 9.10 - Aquatic Ecology (Ponds) Survey Report (Volume III) [REP4-115]** of the **ES Chapter 9 (Volume II)**) **[REP4-042]**.

3.1.10. **Table 1** below details INNS incidentally identified during field surveys, and/or consultation with statutory bodies. Indicative locations within the Newbuild Infrastructure Boundary are provided where available, and illustrated on **Figure 7.42 (Annex A)**.

Table 1 - Non-Native Invasive Species recorded within the Newbuild Infrastructure Boundary

Item	Species	Location
1	Himalayan balsam	Near SJ 4400 7300
2	Japanese knotweed	Near SJ 3522 6764
3	*Rhododendron* sp.	Near SJ 3164 6727
4	Giant hogweed	Near SJ 3792 6971
5	Variegated yellow archangel	Near SJ 3797 6967
6	Japanese knotweed	Near SJ 37397 69500
7	Variegated yellow archangel	Near SJ 28592 66446
8	Sunbleak *Leucaspius delineates*	Shropshire Union Canal
9	Amur bitterling *Rhodeus sericeus*	Shropshire Union Canal
10	Wels catfish *Silurus glanis*	Wepre Brook
11	New Zealand mud snail *Potamopyrgus antipodarum*	River Gowy, Shropshire Union Canal, Wervin Hall Ditch Tributary, Backford Brook, Sealand Main Drain, Broughton Brook, Mancot Brook, Willow Park Brook, New Inn Brook, Alltami Brook, Wepre Brook
12	The flatworm *Girardia tigrina*	Willow Park Brook
13	Demon shrimp *Dikerogammarus haemobaphes*	River Gowy
14	The snail *Physella* sp.	River Gowy

Item	Species	Location
15	The amphipod *Crangonyx pseudogracilis/floridanus*	River Gowy, Stanney Mill Brook, Stanney Main Drain, Shropshire Union Canal, West Central Drain, Hapsford Brook, Wervin Hall Ditch Tributary, Backford Brook, Finchetts Gutter Tributary, Seahill Drain, Sealand Main Drain, Mancot Brook
16	Chinese mitten crab *Eriocheir sinensis*	River Dee
17	Water fern *Azolla filiculoides*	Thornton Ditch 4, Thornton Ditch 6, Seahill Drain
18	Himalayan balsam	River Gowy

OTHER BIOSECURITY CONSIDERATIONS – PATHOGENS AND DISEASES

3.1.11. Potential exists for the occurrence of pathogens or diseases impacting plant and faunal species, soils and crops. This may include, but is not limited to:

- Species related diseases, for example fungal infections in bats and amphibians, such as white-nose syndrome and *Chytridiomycosis* respectively;
- Bovine Tuberculosis (bTB);
- Avian flu; and
- Virulent tree pathogens, such as *Phytophthora ramorum* (affecting oak and other species) and *Hymenoscyphus fraxineus* (affecting ash).

3.1.12. Further detail on the approach taken to respond to the above biosecurity considerations are set out later in this document in line with **REAC** (document reference: **D.6.5.1**) commitment **D-BD-041.**

4. BIOSECURITY MANAGEMENT AND MITIGATION

4.1.1. The biosecurity mitigation measures described below (and included in **Annex C**) are applicable to all works activities and should be applied to all construction areas. The measures below will be delivered in line with **REAC** (document reference: **D.6.5.1**) commitments **D-BD-001**, **D-BD-002**, **D-BD-003**, **D-BD-041**, and **D-BD-042**.

4.1.2. Detailed checks of each works site will be carried out by a suitably experienced ecologist of invasive species prior to construction commencing, to identify the presence and location of any INNS (**D-BD-001** of the **REAC** (document reference: **D.6.5.1**)).

4.1.3. Any instances of INNS discovered will be mapped and incorporated within all relevant site work method statements. Site personnel will be briefed on the known presence of INNS within or adjacent to works locations where these are known but will also be briefed on the key characteristics of key INNS – Japanese knotweed, Giant Hogweed, Himalayan Balsam. Further information and identification traits of key INNS plants are included within **Annex B** of this OBMP.

4.1.4. Where a European Protected Species (EPS) licence is required, specific biosecurity measures relevant to the EPS will be detailed within the EPS licence method statement. Such measures will be included within the BMP following approval of any EPS licence by the relevant bodies (Natural England (NE) or Natural Resources Wales (NRW)).

4.1.5. Details of the consents, licences, and permits that may be required in connection with the construction of the DCO Proposed Development are provided within **Other Consents and Licences [REP4-020]**. This includes reference to the need for an environmental permit to be obtained for the transport and disposal of Japanese knotweed that is classified as a ‘controlled waste’.

GENERAL BIOSECURITY MEASURES

4.1.6. General good practice hygiene and biosecurity measures, in line with **REAC** (document reference: **D.6.5.1**) item **D-BD-041**, will be enforced at all work sites, compounds, and storage locations to prevent the transfer/spread of INNS or other biosecurity concerns. As relevant, all site personnel will be required to:

- Follow good hygiene measures, such as those detailed within Check, Clean and Dry methods (NNSS, 2023a) (**D-BD-041** of the **REAC** (document reference: **D.6.5.1**));
- Disinfect all equipment and clothing, e.g., footwear, between work site locations; and
- Clean and disinfect vehicles between work site locations.

4.1.7. All site personnel will be equipped with Personal Protective Equipment (PPE) and appropriate disinfecting substances to implement biosecurity control measures (**D-BD-041** of the **REAC** (document reference: **D.6.5.1**)). This may comprise disinfectant tablets, sprayers, and brushes.

INVASIVE NON-NATIVE SPECIES

4.1.8. The measures below will be delivered in line with **REAC** (document reference: **D.6.5.1**) commitments **D-BD-001**, **D-BD-002**, **D-BD-003**, **D-BD-041**, and **D-BD-042**.

4.1.9. Works within areas where INNS or other biosecurity concerns are known to be present will be avoided, where practicable. Areas of INNS will be clearly demarcated, and all works personnel or vehicle movements excluded from such areas. Where works within such areas cannot be reasonably avoided, additional precautions will be implemented and are outlined below.

4.1.10. Where INNS are located within the construction corridor, an INNS specialist will be sought to provide options for the treatment and/or removal of INNS in advance of construction commencing (**D-BD-042** of the **REAC** (document Reference: **D.6.5.1)**).

4.1.11. In the event additional stands are identified following the commencement of construction, the following additional precautions will be taken:

- The appointed ECoW will conduct periodic toolbox talks during site briefings prior to works on site commencing, to brief all site personnel on the presence of, or potential for, INNS, in line with **REAC** (document reference: **D.6.5.1**) item **D-BD-001**. Site briefings will include, but are not limited to, providing details of known areas or stands of INNS including provision of exclusion zones and demarcation requirements, and protocols to be adhered to in order to prevent the propagation of any INNS species;
- Areas where INNS are identified on site will be clearly demarcated including an appropriate exclusion zone from any stand/s. The size of the exclusion zone will be determined by the species and in consultation with the ECoW (**D-BD-042** of the **REAC** (document reference: **D.6.5.1**));
- Appropriate signage must be erected in areas with confirmed INNS. These should include details of any exclusion zone and the protection/avoidance requirements in line with **REAC** (document reference: **D.6.5.1**) item **D-BD-042**. Additional signs should be erected to indicate the locations of any contaminated soil, materials, or water; and
- Vehicles and personnel will adhere to the following measures:
  - Vehicles and personnel will not walk or drive through any stands of INNS;
  - Any new stands will be reported to the ECoW and an exclusion zone implemented accordingly, with demarcation erected;

- No tracked vehicles to be used within any demarcated exclusion zone where INNS are present;
- Suitable vehicle and wheel washing facilities should be provided for all vehicles;
- All washing facilities, including wastewater, must be managed to avoid causing harm to the environment;
- Material / water left after washing equipment, footwear, clothing and/or vehicles must be contained, collected, and disposed of by an appropriately licensed waste courier to an appropriate offsite location. Methods for the disposal of contaminated water, to prevent pollution or the spread of INNS, will be determined at the Detailed Design stage;
- Any chemicals required for the control of INNS must be stored responsibly and follow Control of Substances Hazardous to Health (COSHH) guidelines;
- No works will be undertaken in areas where INNS are present. These areas must first be treated and/ or removed by an appropriately trained and experienced contractor with all waste removed by an appropriately licensed waste contractor under a Controlled Substances waste license, before works can proceed;
- Where excavations are carried out within areas with previous INNS presence, this will be overseen by an ECoW, with the ECoW checking the area for any further signs of INNS; and
- Soil contaminated with INNS must be removed from site as soon as possible to an authorised landfill site or other suitable disposal site in line with the conditions of an environmental permit to transport and dispose of a controlled waste. In the event that this is not immediately possible, soil contaminated with INNS must not be stored within 10m of a watercourse.

BOVINE TUBERCULOSIS

4.1.12. The measures below will be delivered in line with **REAC** (document reference: **D.6.5.1**) commitments **D-BD-001**, **D-BD-002**, **D-BD-003**, **D-BD-041**, and **D-BD-042**.

4.1.13. Historic cases of bovine tuberculosis (bTB) have been identified within the Newbuild Infrastructure Boundary and wider landscape.

4.1.14. In the event bTB is identified within any land or farms impacted by works, all works will cease, and an appropriate protocol be implemented or works ceased in any location until the bTB has passed. As a primary stance, works will avoid any areas with confirmed bTB until such time that the outbreak has subsided. If this is not possible and works must continue then, as a last resort, disinfection stations will be deployed at entrances and exits to farms with bTB identified with systematic disinfection of vehicles, machinery and personnel attire required when entering and exiting any areas impacted by bTB.

4.1.15. In areas where bTB is not recorded as being active, biosecurity measures will need to be in place during badger sett closure to reduce the risk of spreading bTB between either badger clans or farms, in line with current government guidance on disease prevention for livestock (GOV, (2015)). The following measures will be undertaken:

- All Construction Contractor(s) involved in badger sett exclusion works must familiarise themselves with guidance designed to reduce the spread of bTB;
- Ensure that personal equipment (including masks, boots and gloves) is worn and equipment used during exclusion activities is disinfected with an appropriate bTB disinfectant (e.g.Virkon) when moving between different sites;
- Construction Contractor(s) must be aware of the principles of hygiene and disease security, including washing of hands with soap and water after undertaking badger exclusion works;
- Keep vehicles clean inside and out, disinfecting vehicles and trailers (preferably with a power hose), paying particular attention to areas where dirt may be hidden such as wheel arches; and
- Clean and disinfect all equipment before and after use and safely dispose of used equipment such as disposable clothing and masks.

4.1.16. Based on the current expected impact on badgers within the Newbuild Infrastructure Boundary outlined above, the risk of causing a perturbation effect to any clan is considered to be negligible. No main setts are currently proposed to be closed and long-term disturbance or disruption to territories is considered to be negligible.

AVIAN INFLUENZA

4.1.17. Avian influenza is currently highly prolific throughout the United Kingdom, with biosecurity measures outlined by the government (GOV, 2023) to help prevent further spread.

4.1.18. Evidence of avian influenza can be indicated through the discovery of a dead bird or several dead birds in the area. In the eventuality that dead birds are discovered on site, these must not be touched or moved under any circumstances with the DEFRA reporting hotline contacted on 03459 33 55 77 to report any incidence.

4.1.19. Measures to prevent the spread of avian influenza include:

- Keep vehicles clean inside and out, disinfecting vehicles and trailers, paying particular attention to areas where dirt may be hidden, such as wheel arches;
- Clean and disinfect all equipment and clothing before and after use and safely dispose of used equipment such as disposable clothing and masks; and
- Avoid coming into direct contact with any deceased wild bird that is found.

4.1.20. The BMP will take account of best practice guidance in relation to Avian influenza available at the time of writing, ensuring that the most up to date guidance is followed.

AQUATIC ECOLOGY

4.1.21. The general biosecurity mitigation measures outlined above are applicable to all works activities carried out in, near, or over watercourses. The measures below will be delivered in line with **REAC** (document reference: **D.6.5.1**) commitments **D-BD-001**, **D-BD-002**, **D-BD-003**, **D-BD-041**, and **D-BD-042**.

4.1.22. Should invasive non-native crayfish species be identified during the works activities, works will halt whilst specimens are removed from the watercourse by an appropriately licenced person. The consents and licences required for the removal of invasive non-native crayfish species are outlined within **Other Consents and Licences [REP4-020].**

4.1.23. Should other invasive non-native aquatic species, such as Chinese mitten crab *Eriocheir sinensis*, be encountered during works activities, guidance relating to their removal should be sought from the relevant environmental regulator (e.g. Defra, Natural England, Natural Resources Wales, Environment Agency).

4.1.24. Prior to construction all watercourses that will be subjected to an open trench crossing will be assessed for the presence of any Schedule 9 aquatic species such as water fern *Azolla filiculoides*. Should such species be identified then a method statement regarding appropriate biosecurity measures and dispersal prevention will be drawn up as part of the BMP. These biosecurity measures are including general biosecurity measures, as detailed at above, and provisions for the exclusion of Schedule 9 aquatic species during dewatering activities, where necessary, in line with **D-BD-042** of the **REAC** (document reference: **D.6.5.1**).

5. MONITORING STRATEGY

5.1. SITE MONITORING

5.1.1. As detailed within the **REAC** (document reference: **D.6.5.1**) item **D-BD-003,** an external third-party will be appointed to conduct Environmental Compliance Audits during construction. This will involve an 'Auditing ECoW' undertaking checks of the Construction Contractor(s) and their ECoW(s) to monitor the compliance of the construction works, mitigation, and activities on site against the Environmental Statement (ES), detailed CEMPs, obtained licences, permits, and/or assents, including this OBMP and relevant BMP.

5.1.2. Reports will be produced on a monthly basis (or otherwise agreed) by the Auditing ECoW, along with written and verbal feedback to the Construction Contractor(s) and ECoW on their performance and adherence with the ES, detailed CEMPs, obtained licences, permits, and/or assents, as required.

5.1.3. All site personnel, including the appointed ECoW(s), will have due regard to potential for presence of INNS and will ensure that appropriate biosecurity measures and protocols are implemented in line with the BMP.

6. STAKEHOLDER ENGAGEMENT

6.1. COMMUNICATION

6.1.1. Stakeholder communication and engagement will be undertaken regularly throughout the course of the DCO Proposed Development construction period. This will be detailed in the Stakeholder Communications Plan which will be in accordance with the Outline Stakeholder Communications Plan (document reference: **D.7.45**).

6.1.2. Technical engagement requirements and emergency/incident management procedures will be incorporated into the BMP.

6.1.3. The BMP will be submitted to the relevant council authorities: Flintshire County Council and Chester West and Chester Council, for review and approval as part of the approval of the CEMP in advance of implementation on site.

7. SUMMARY

7.1.1. This OBMP has been produced as part of a suite of measures designed to minimise the environmental impact of construction of the DCO Proposed Development. This OMBP has been prepared to respond to those INNS identified as being present within the Newbuild Infrastructure Boundary and wider landscape as described in the **Chapter 9 Biodiversity (Volume II) [REP4-042], Appendix 9.1 - Habitats and Designated Sites Survey Report (Volume III) [REP4-091]**, **Appendix 9.9 - Aquatic Ecology (Watercourses) Survey report (Volume III) [REP4-114]** and **Appendix 9.10 - Aquatic Ecology (Ponds) Survey Report (Volume III) [REP4-115].**

7.1.2. This document outlines and provides supplementary detail on the mitigation measures detailed within **Chapter 9 Biodiversity [REP4-042]** and the **Outline Construction Environmental Management Plan** (document reference: **D.6.5.4**) in relation to preventing the spread of INNS and the management of other biosecurity concerns, to ensure compliance of the DCO Proposed Development with relevant legislation and guidance.

7.1.3. This OBMP forms the basis upon which a detailed BMP will be developed in advance of construction commencement. The contents of the BMP, which will be considered as a 'live' document, will be subject to review by the Site Manager and/or ECoW, as a minimum, on an annual basis during construction, or otherwise following any updates to baseline data in relation to INNS and biosecurity risks.

8. REFERENCES

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- NNSS (2023f). *Water Fern*. Available: [redacted]
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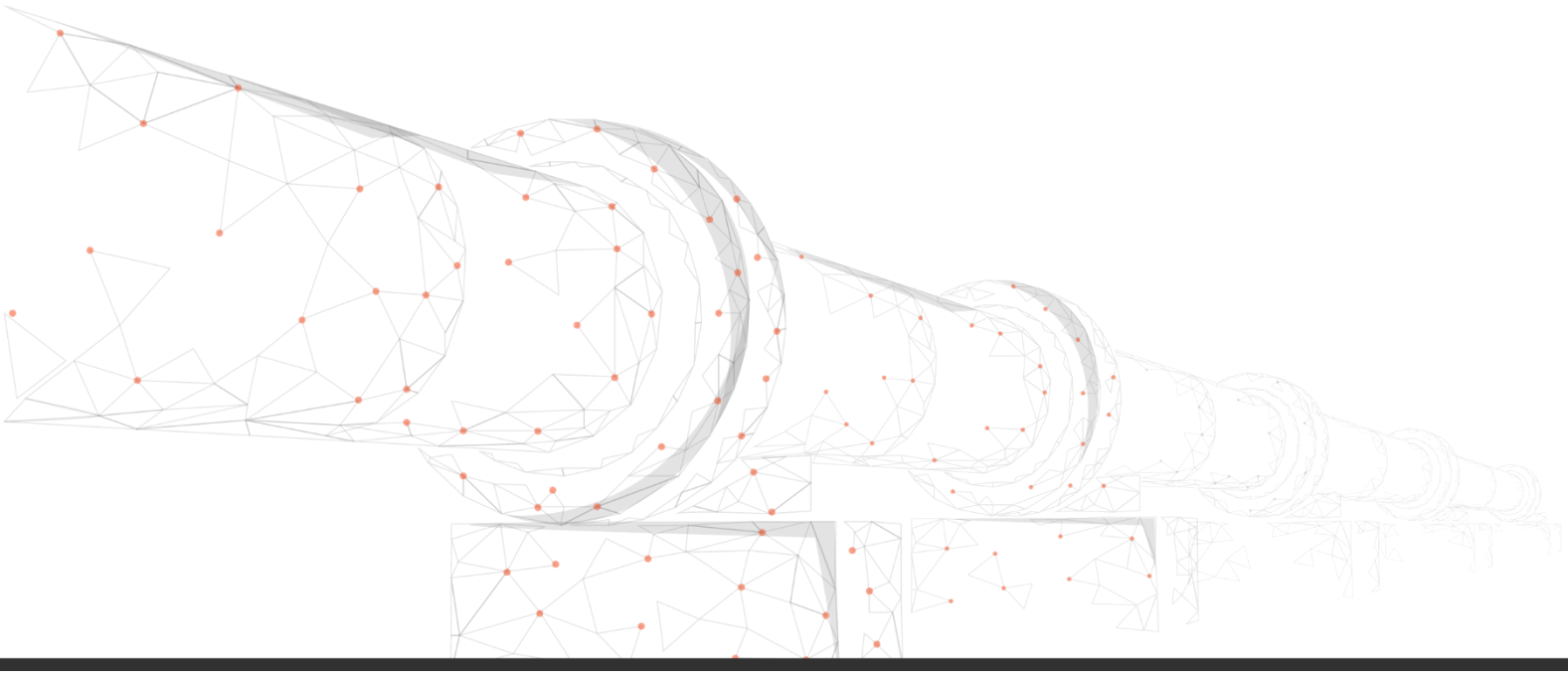
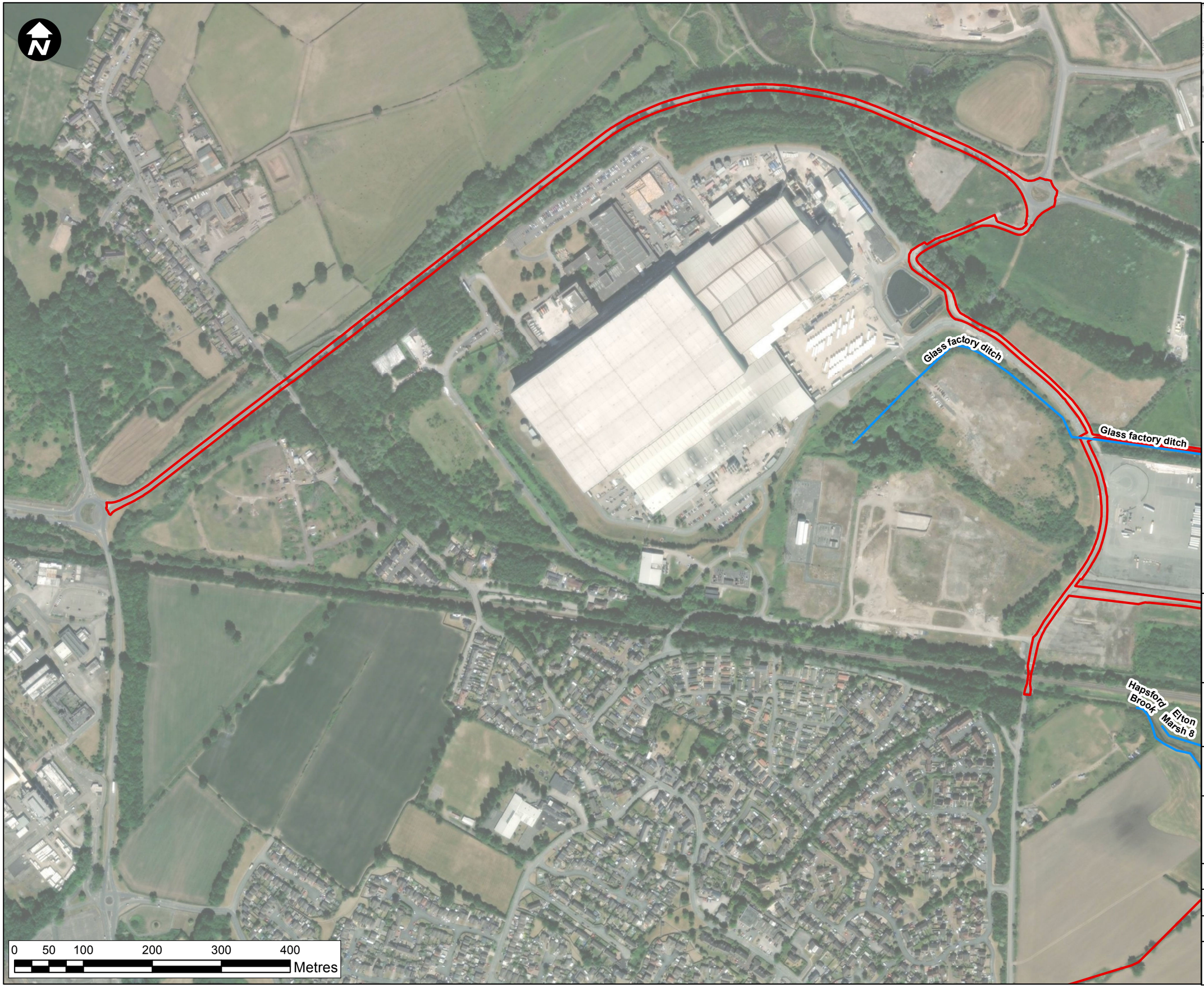
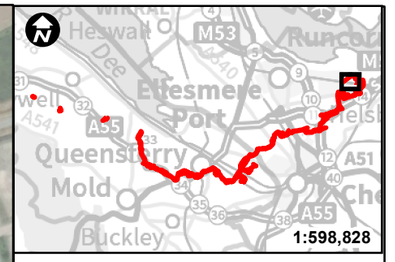
Annexures



Annex A

FIGURE 7.42 – INVASIVE NON-NATIVE SPECIES LOCATIONS





Legend

- Newbuild Infrastructure Boundary
- Watercourses
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 1 of 23

DRAWING STATUS
For Deadline 5

DRAWN	CHECKED	APPROVED	AUTHORISED
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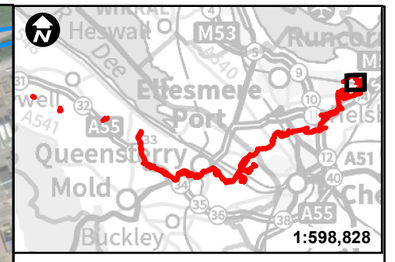

Legend

- Newbuild Infrastructure Boundary
- Watercourses
- Amphipod
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 2 of 23

DRAWING STATUS
For Deadline 5

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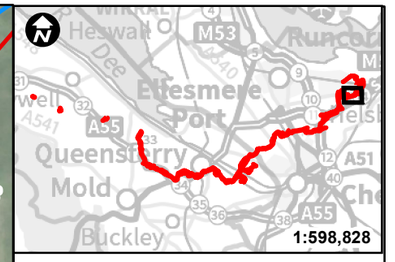
OBMP-7.42-Sheet 2



Legend

- Newbuild Infrastructure Boundary
- Watercourses
- Amphipod
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

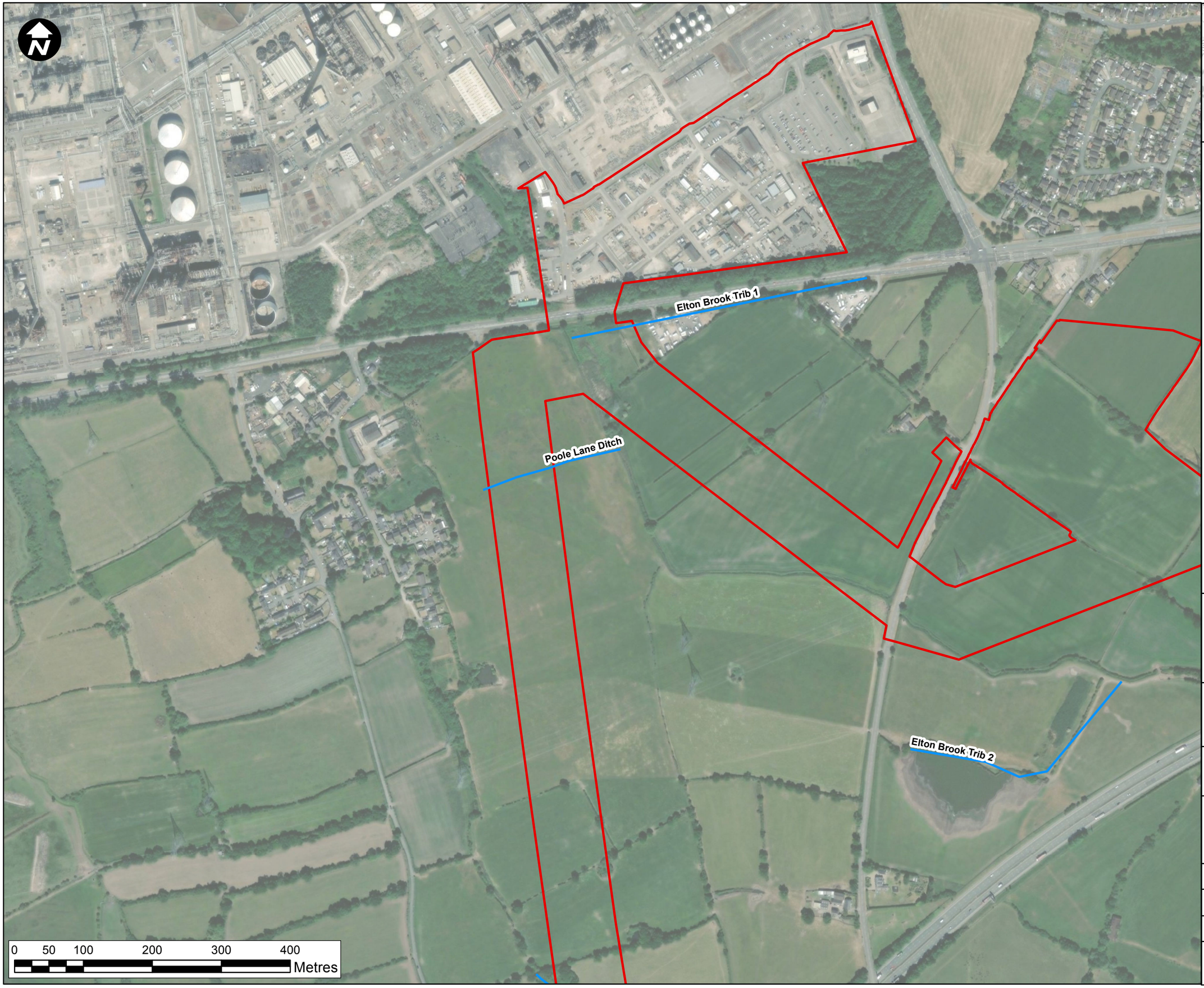
DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 3 of 23

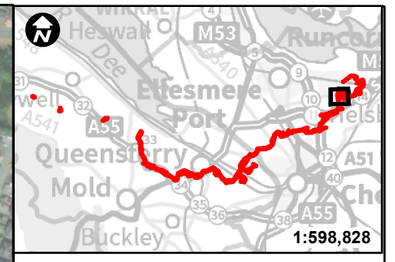
DRAWING STATUS
For Deadline 5

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
1:5,000	03/07/2023	A

DRAWING NUMBER
OBMP-7.42-Sheet 3





Legend

- Newbuild Infrastructure Boundary
- Watercourses
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

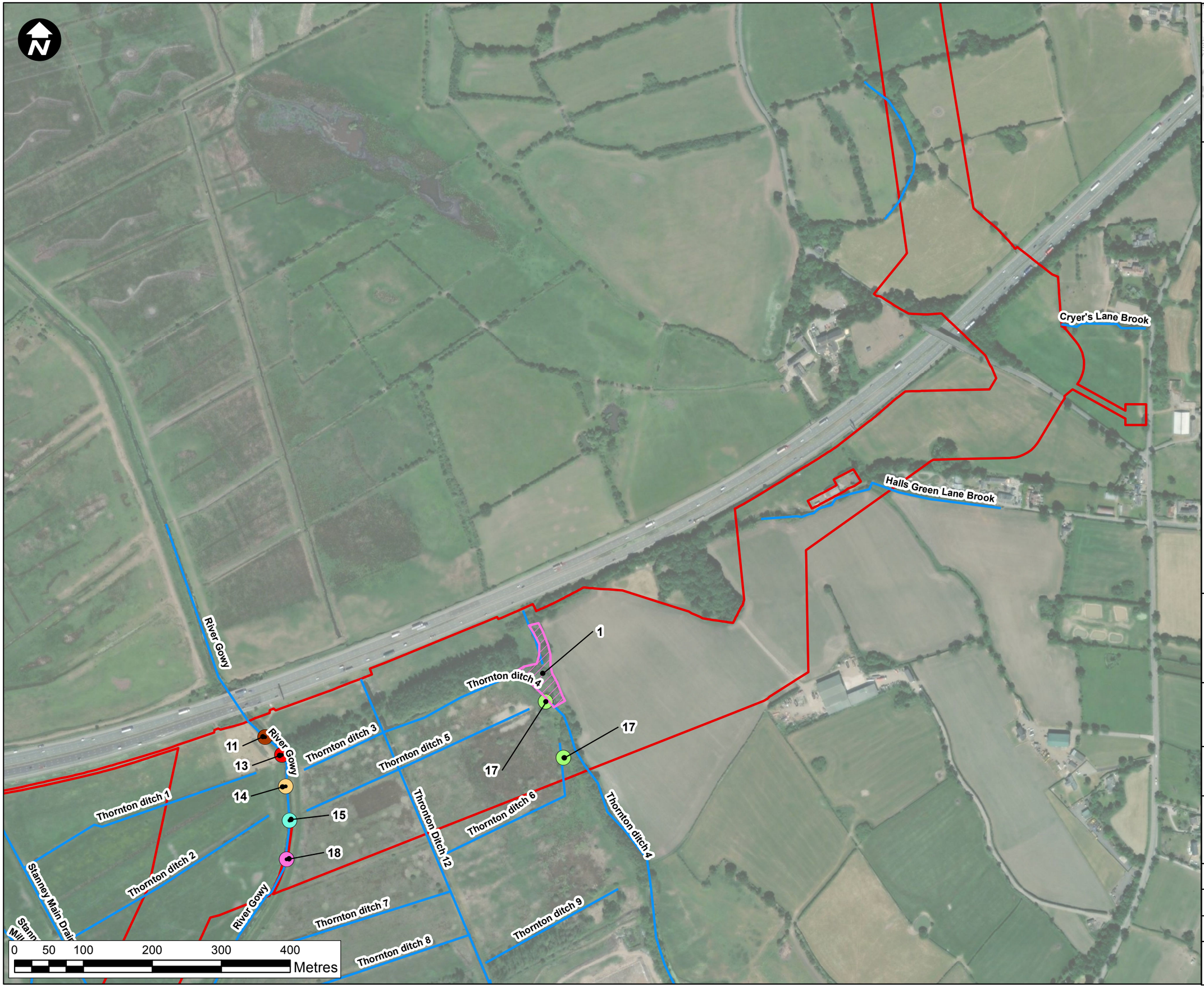
DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 4 of 23

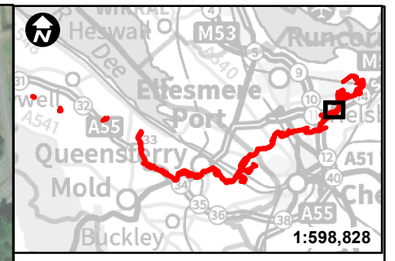
DRAWING STATUS
For Deadline 5

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
1:5,000	03/07/2023	A

DRAWING NUMBER
OBMP-7.42-Sheet 4





Legend

- Newbuild Infrastructure Boundary
- Watercourses
- Amphipod
- Demon shrimp
- Himalayan balsam
- New Zealand mud snail
- Snail
- Water fern
- Himalayan balsam
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 5 of 23

DRAWING STATUS
For Deadline 5

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
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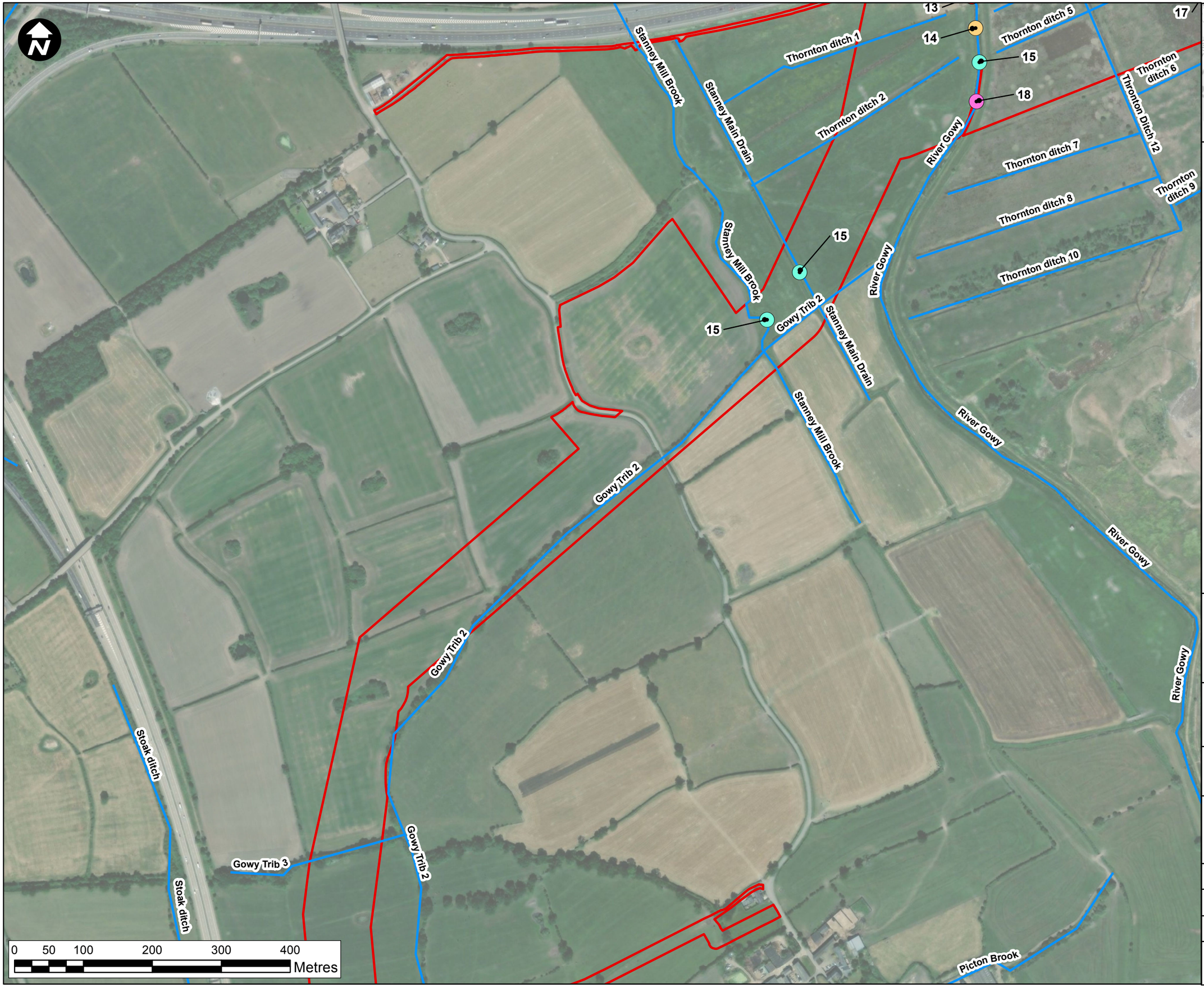
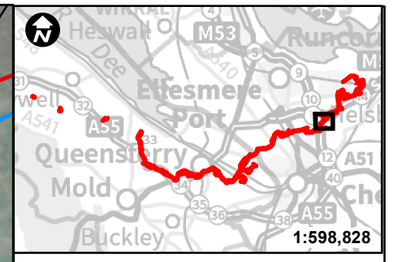
DRAWING NUMBER
OBMP-7.42-Sheet 5





Legend

- Newbuild Infrastructure Boundary
- Watercourses
- Amphipod
- Demon shrimp
- Himalayan balsam
- Snail
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

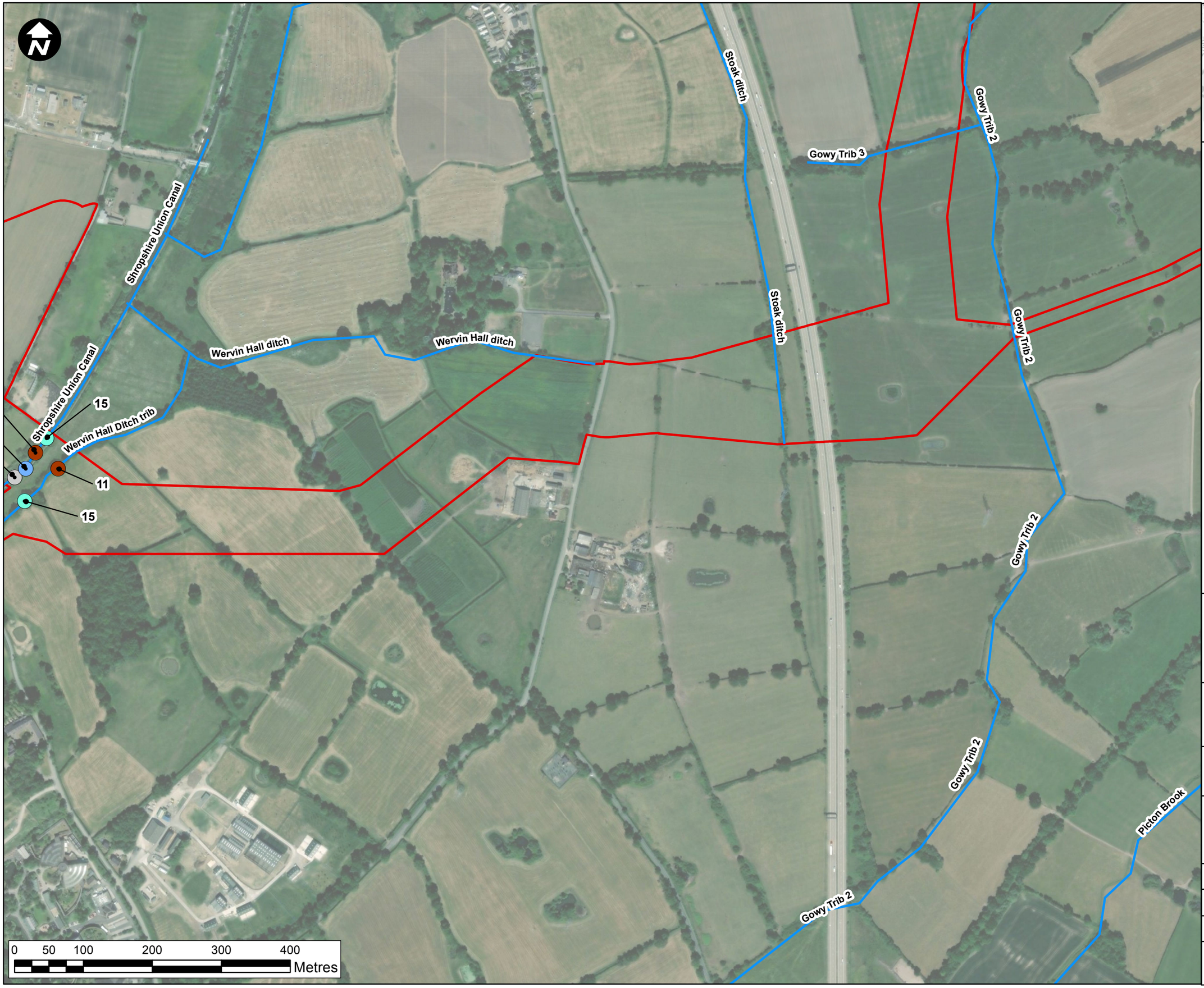
DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 6 of 23

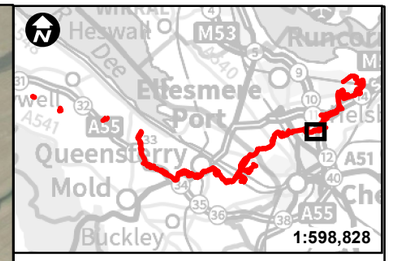
DRAWING STATUS
For Deadline 5

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
1:5,000	03/07/2023	A

DRAWING NUMBER
OBMP-7.42-Sheet 6





Legend

- Newbuild Infrastructure Boundary
- Watercourses
- Amphipod
- Amur bitterling
- New Zealand mud snail
- Sunbleak
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 7 of 23

DRAWING STATUS
For Deadline 5

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
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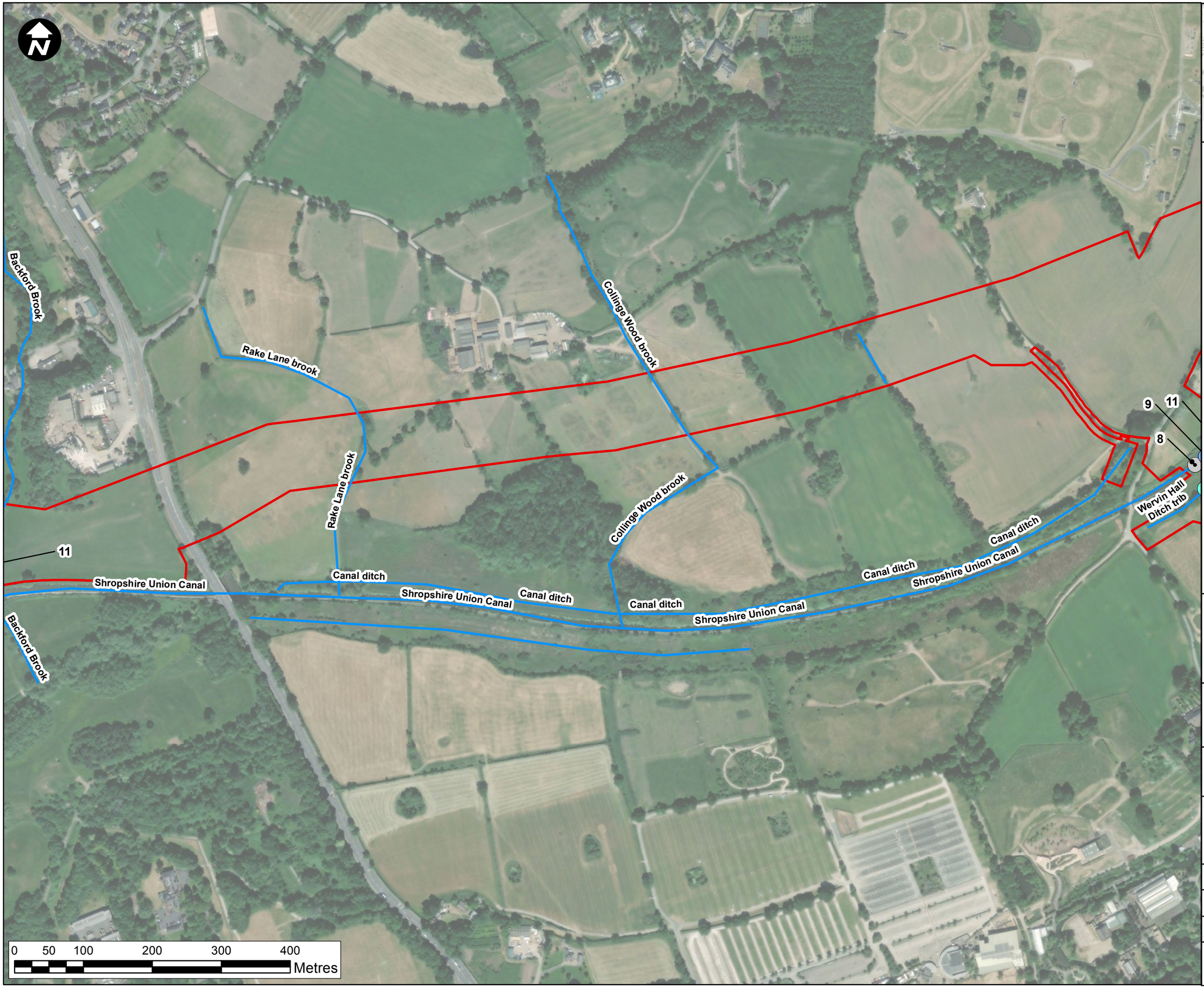
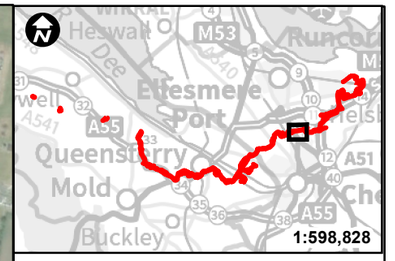
DRAWING NUMBER
OBMP-7.42-Sheet 7





Legend

- Newbuild Infrastructure Boundary
- Watercourses
- Amphipod
- Amur bitterling
- Sunbleak
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

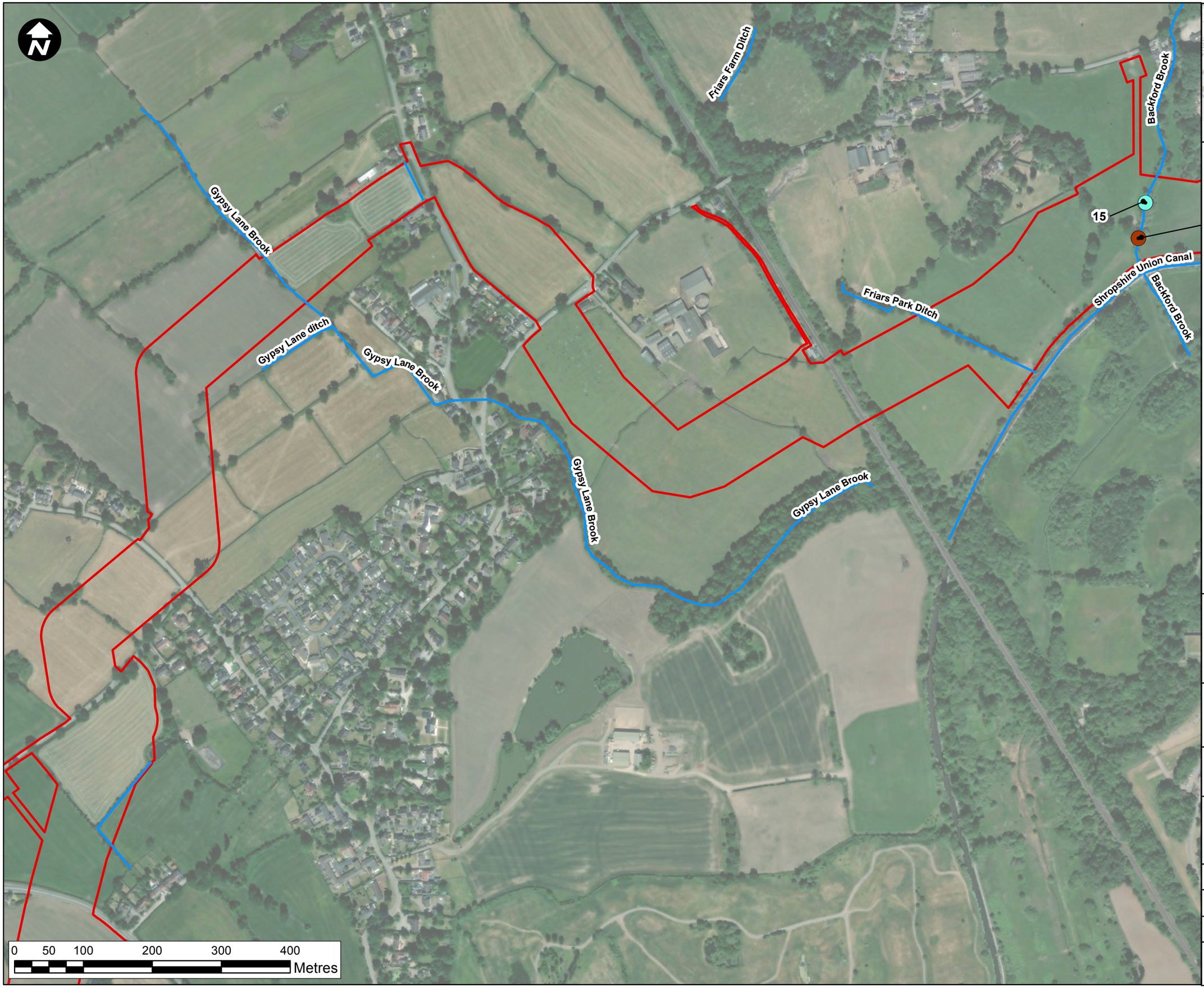
DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 8 of 23

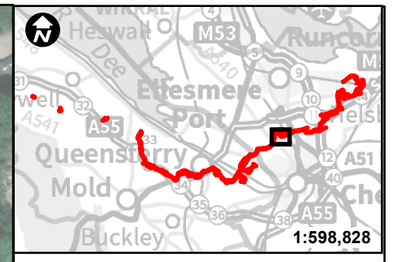
DRAWING STATUS
For Deadline 5

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
1:5,000	03/07/2023	A

DRAWING NUMBER
OBMP-7.42-Sheet 8





Legend

- Newbuild Infrastructure Boundary
- Watercourses
- Amphipod
- New Zealand mud snail
- xx OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

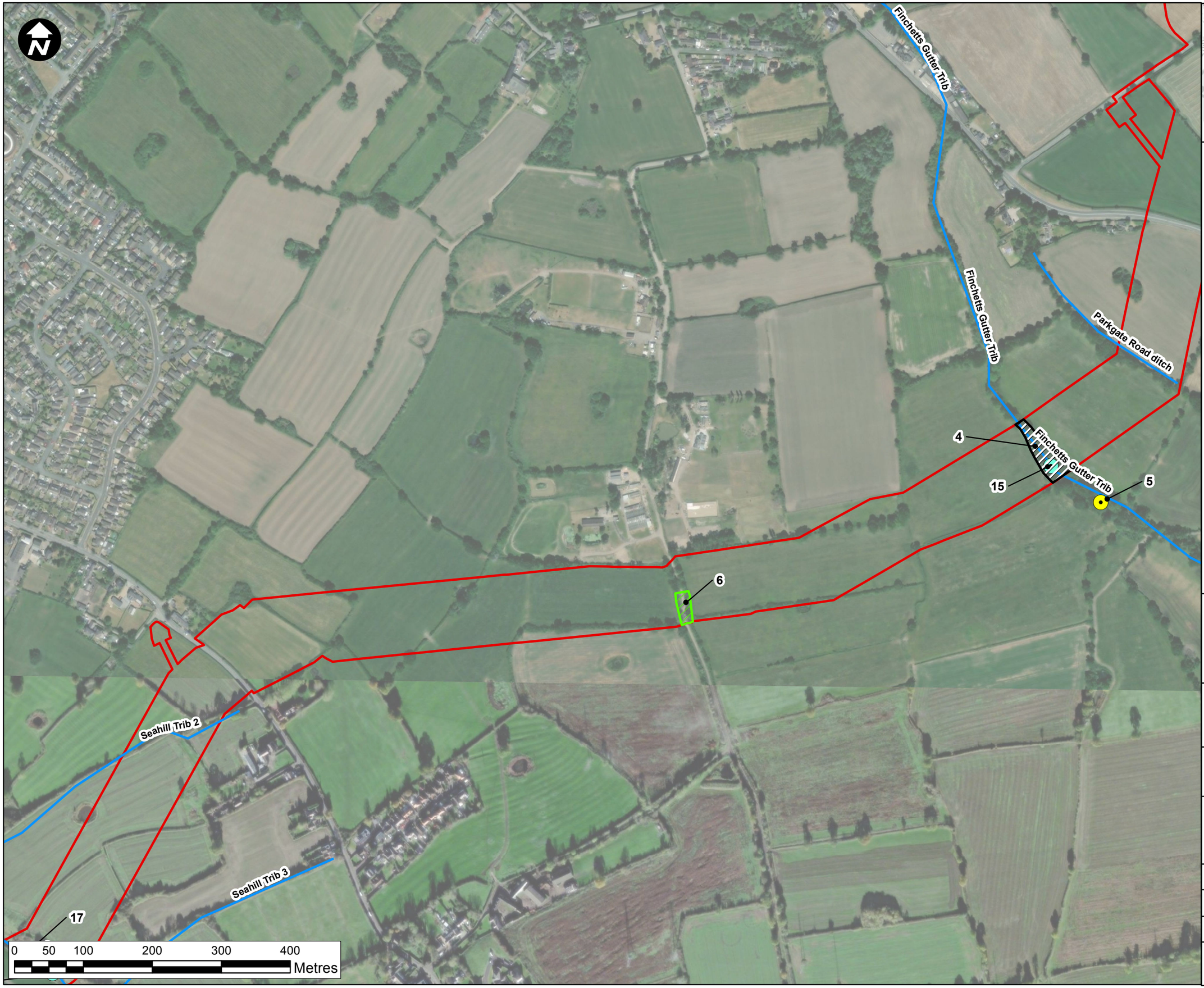
DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 9 of 23

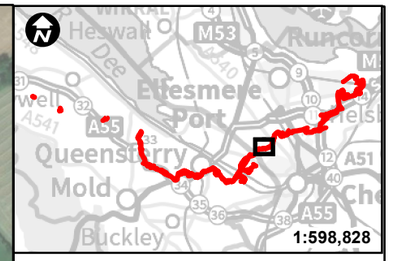
DRAWING STATUS
For Deadline 5

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
1:5,000	03/07/2023	A

DRAWING NUMBER
OBMP-7.42-Sheet 9





Legend

- Newbuild Infrastructure Boundary
- Watercourses
- Amphipod
- Variegated yellow arch angel
- Water fern
- Giant hogweed
- Japanese knotweed
- xx OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

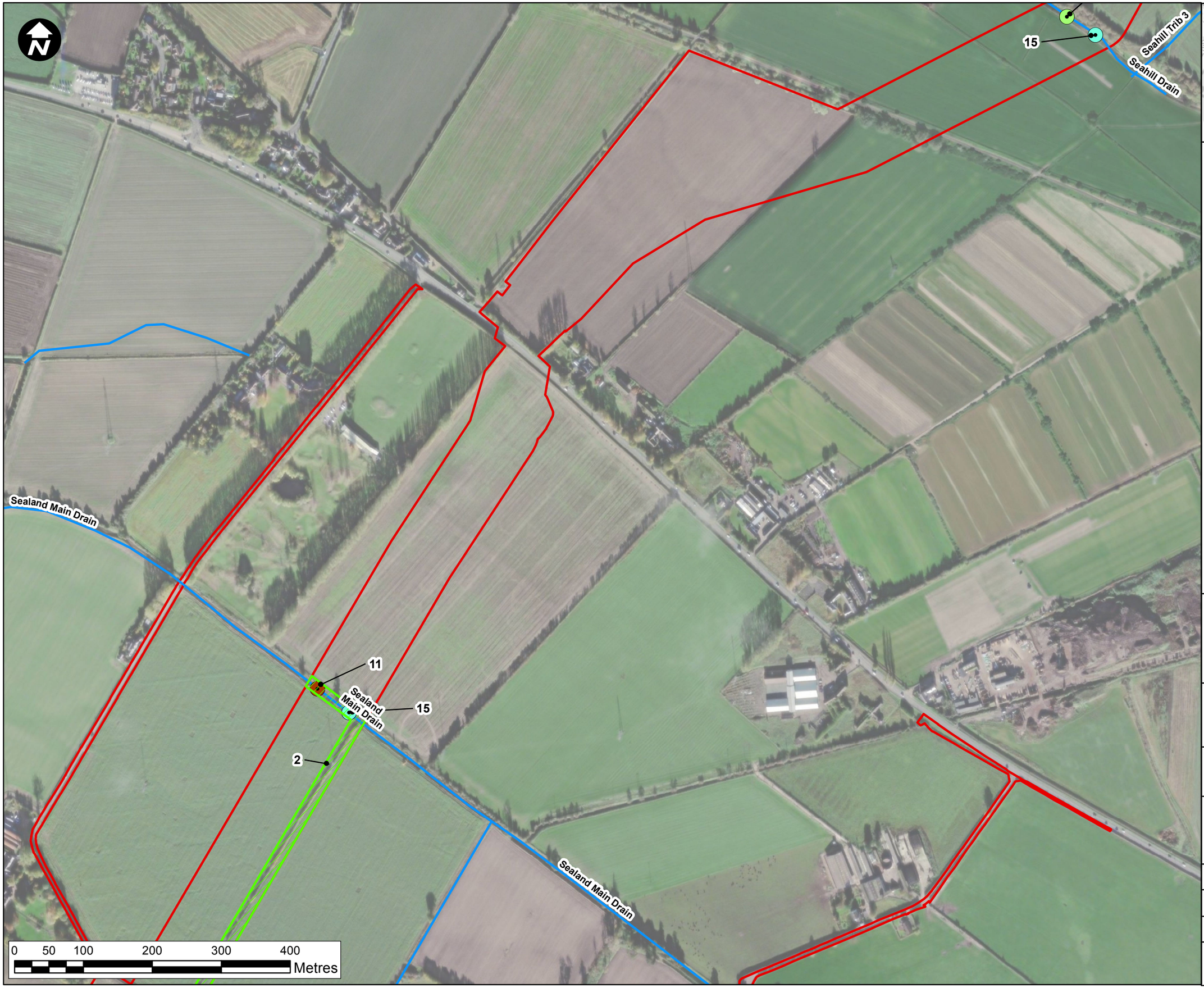
DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 10 of 23

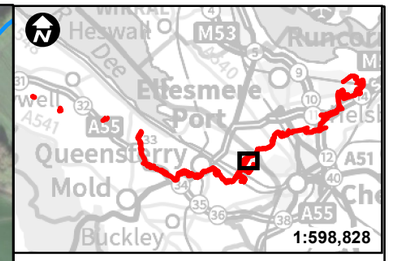
DRAWING STATUS
For Deadline 5

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
1:5,000	03/07/2023	A

DRAWING NUMBER
OBMP-7.42-Sheet 10





Legend

- Newbuild Infrastructure Boundary
- Watercourses
- Amphipod
- New Zealand mud snail
- Water fern
- Japanese knotweed
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 11 of 23

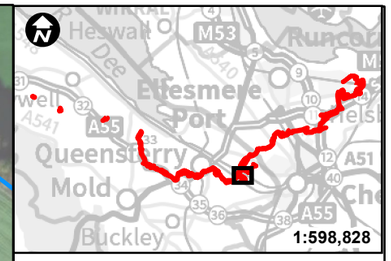
DRAWING STATUS
For Deadline 5

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
1:5,000	03/07/2023	A

DRAWING NUMBER
OBMP-7.42-Sheet 11

River Dee
River Dee
16
River Dee
Sealand Main Drain
River Dee
Railway ditch 2
Railway ditch 1
Railway ditch 1
Railway ditch 2
0 50 100 200 300 400
Metres



Legend

- Newbuild Infrastructure Boundary
- Watercourses
- Chinese mitten crab
- Japanese knotweed
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

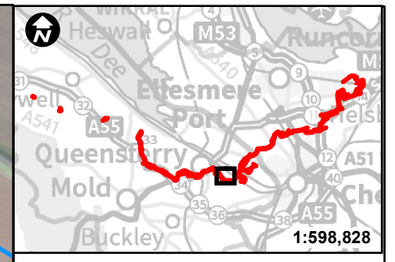
DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 12 of 23

DRAWING STATUS
For Deadline 5

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
1:5,000	03/07/2023	A

DRAWING NUMBER
OBMP-7.42-Sheet 12



Legend

- Newbuild Infrastructure Boundary
- Watercourses
- Amphipod
- New Zealand mud snail
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

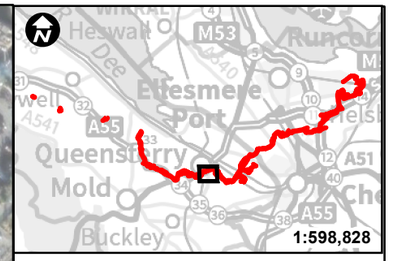
DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 13 of 23

DRAWING STATUS
For Deadline 5

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
1:5,000	03/07/2023	A

DRAWING NUMBER
OBMP-7.42-Sheet 13



Legend

- Newbuild Infrastructure Boundary
- Watercourses
- Amphipod
- Flatworm
- New Zealand mud snail
- Rhododendron sp
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

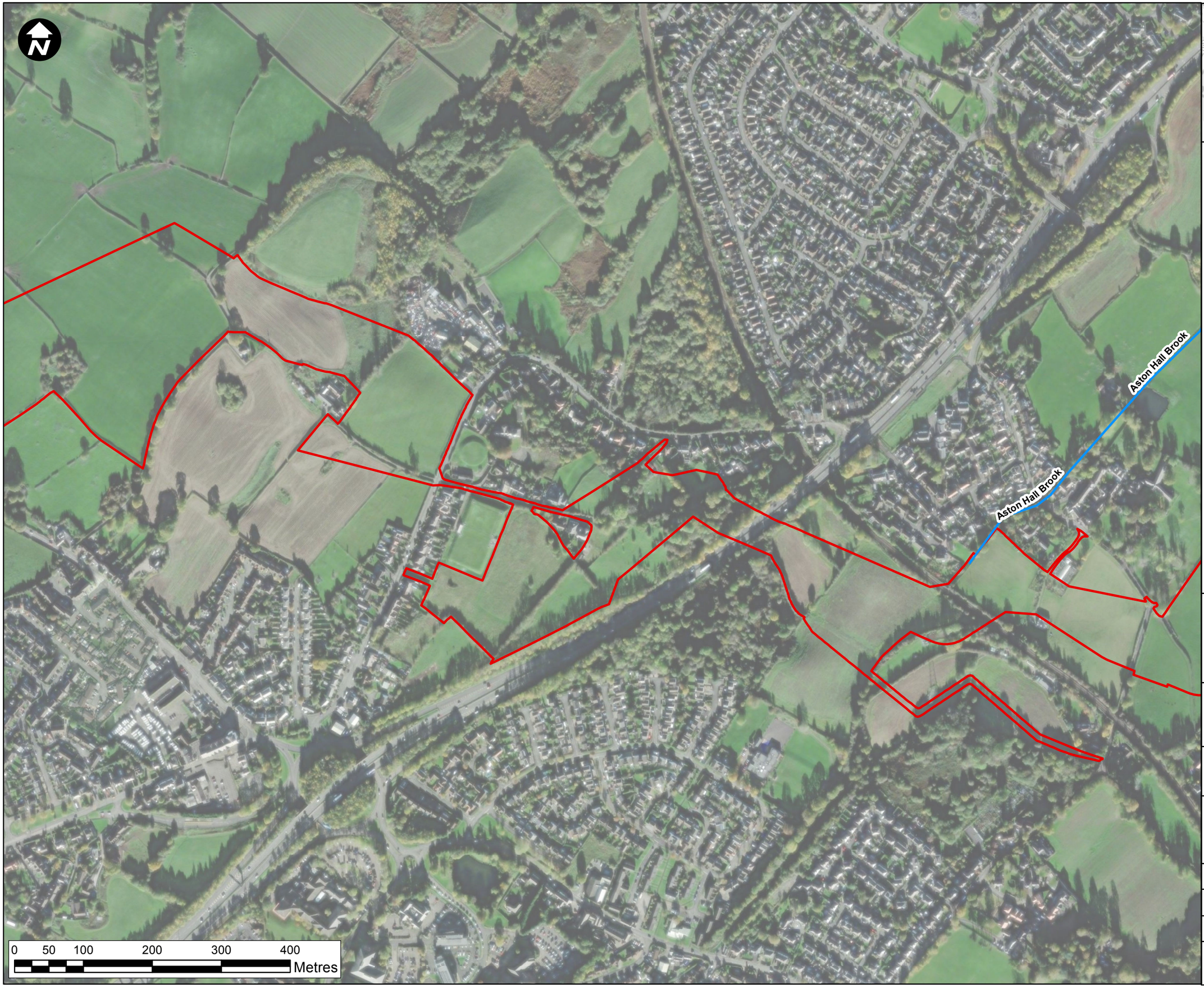
DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 14 of 23

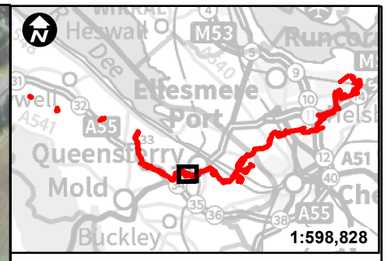
DRAWING STATUS
For Deadline 5

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
1:5,000	03/07/2023	A

DRAWING NUMBER
OBMP-7.42-Sheet 14





Legend

- Newbuild Infrastructure Boundary
- Watercourses
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 15 of 23

DRAWING STATUS
For Deadline 5

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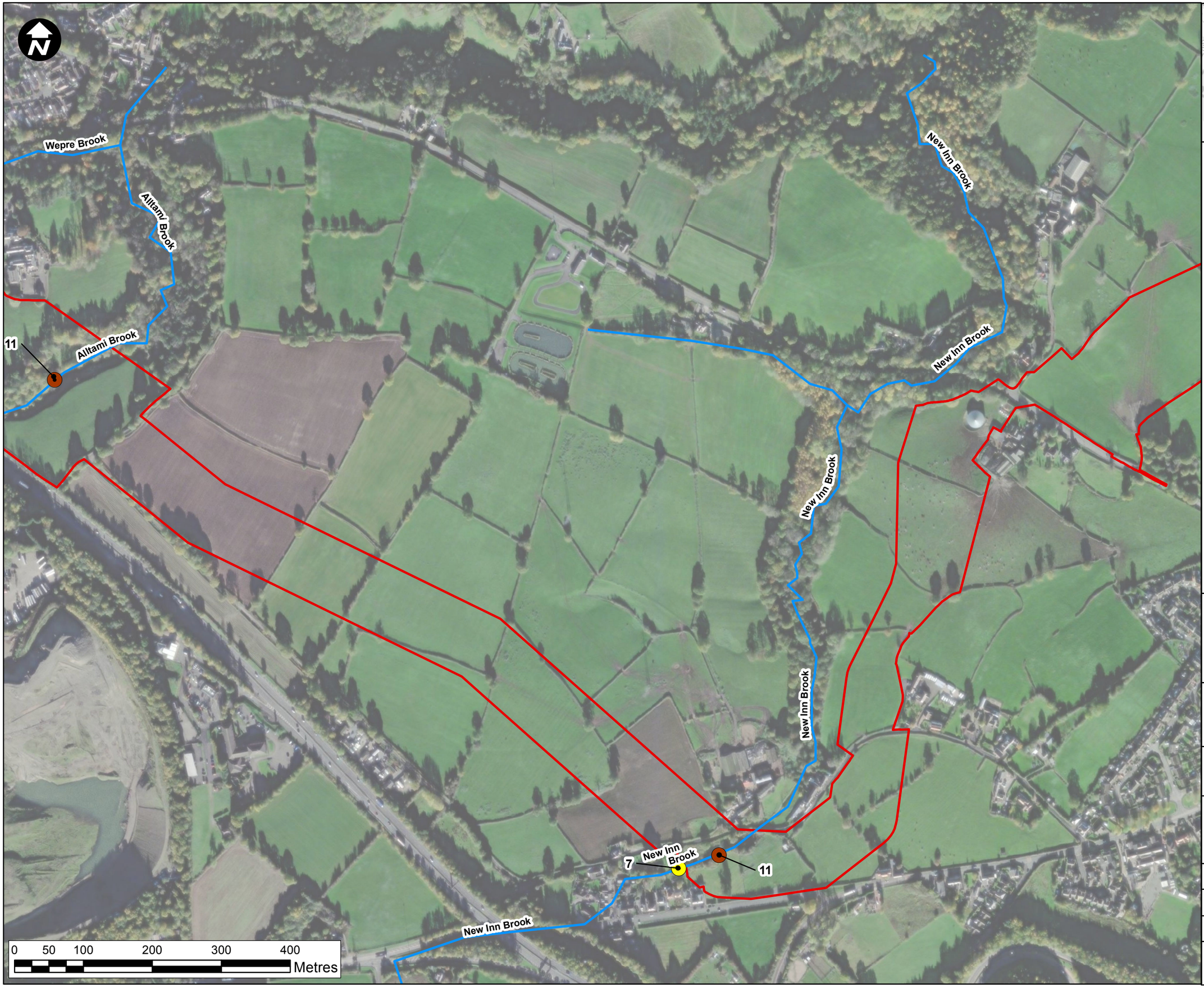
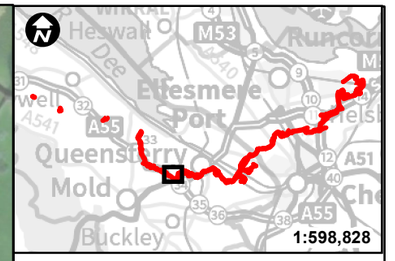
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
1:5,000	03/07/2023	A

DRAWING NUMBER
OBMP-7.42-Sheet 15





Legend

- Newbuild Infrastructure Boundary
- Watercourses
- New Zealand mud snail
- Variegated yellow arch angel
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations

Sheet 16 of 23

DRAWING STATUS
For Deadline 5

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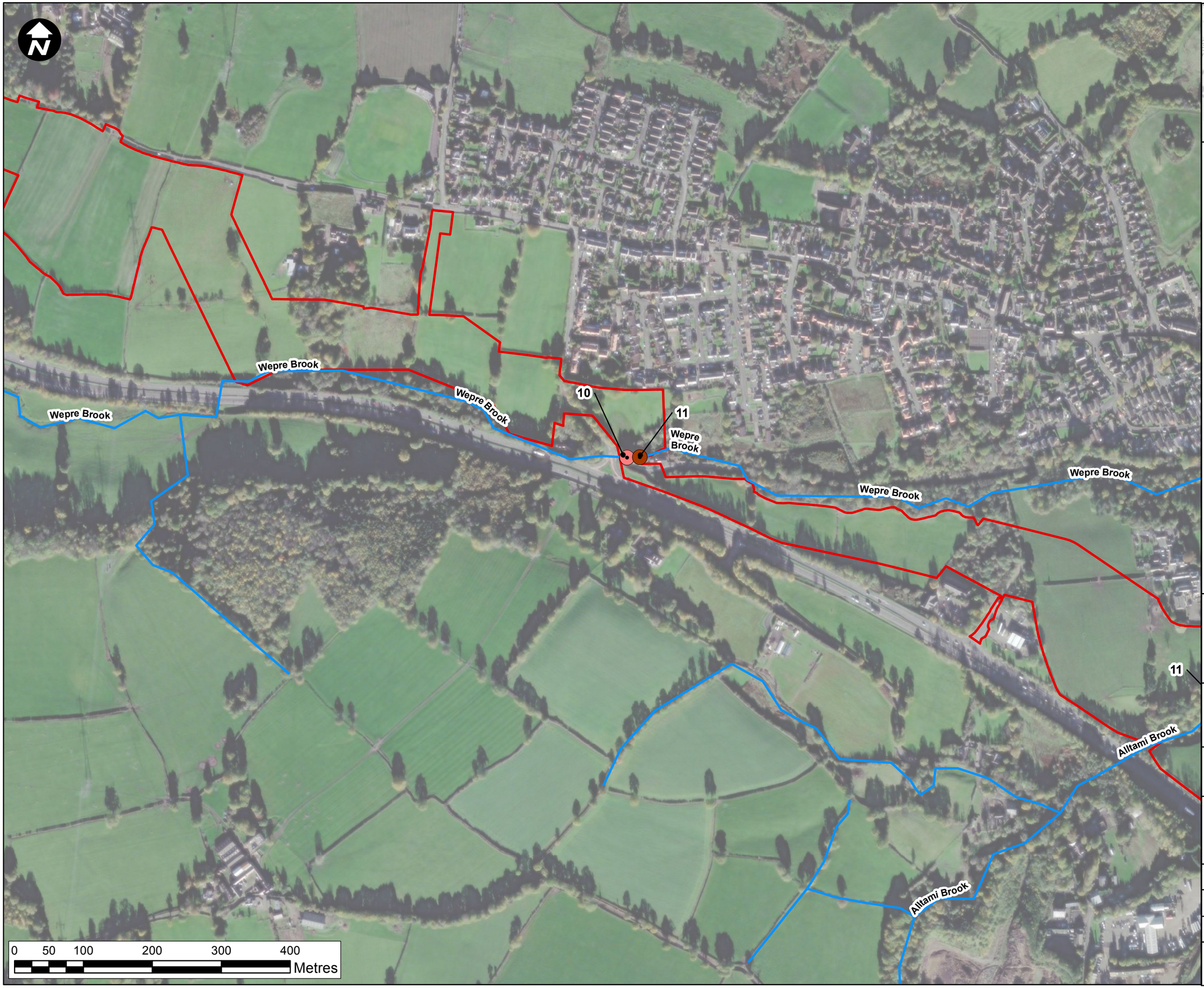
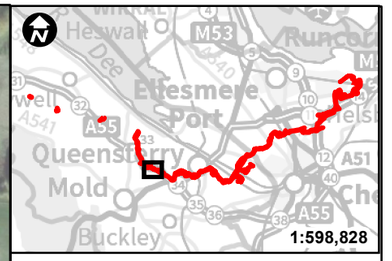
SCALE @ A3 SIZE	DATE	REVISION
1:5,000	03/07/2023	A

DRAWING NUMBER
OBMP-7.42-Sheet 16





Legend

- Newbuild Infrastructure Boundary
- Watercourses
- New Zealand mud snail
- Wels catfish
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

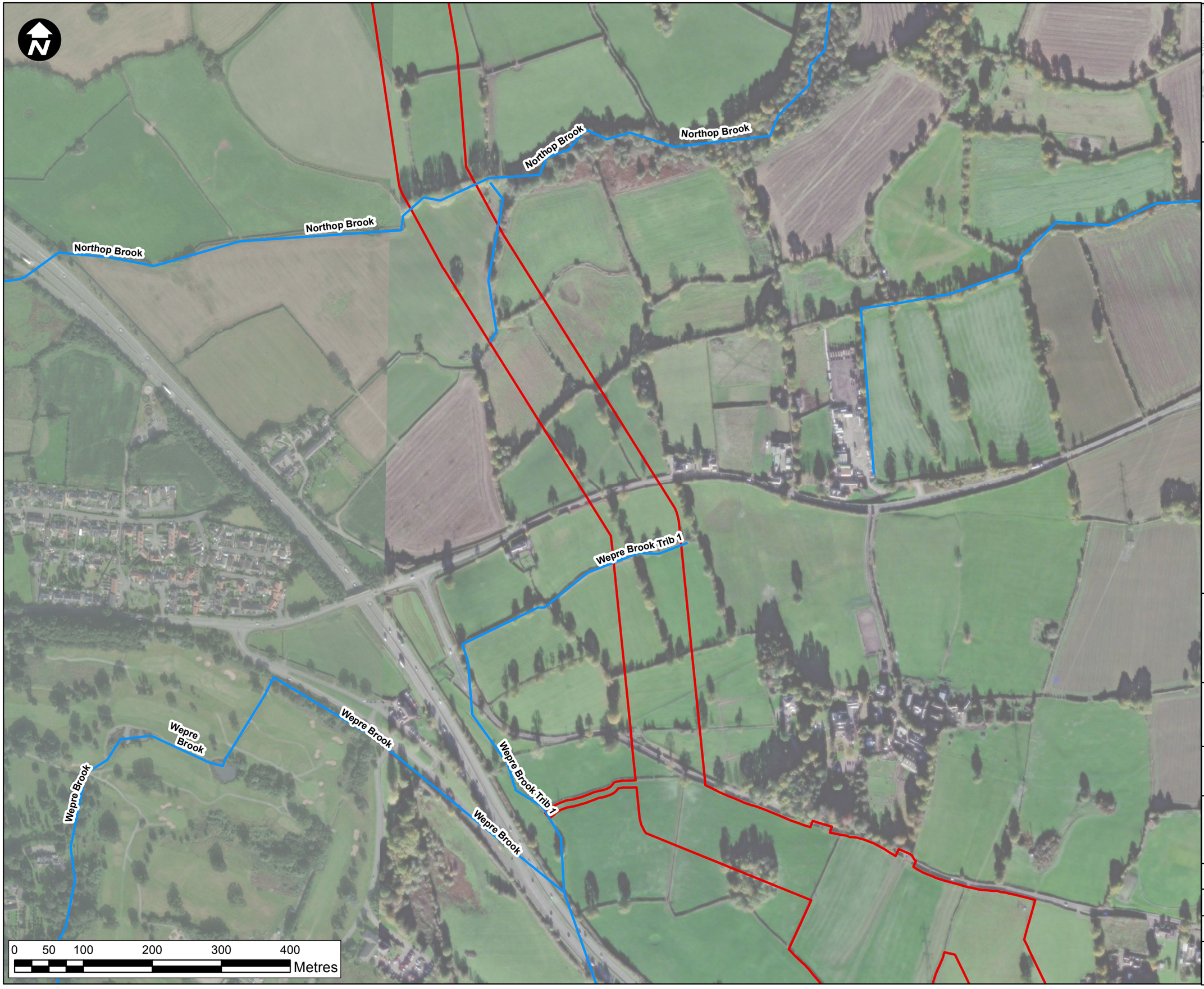
DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 17 of 23

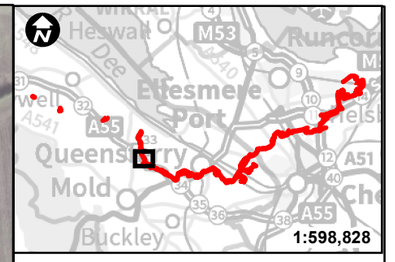
DRAWING STATUS
For Deadline 5

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
1:5,000	03/07/2023	A

DRAWING NUMBER
OBMP-7.42-Sheet 17





Legend

- Newbuild Infrastructure Boundary
- Watercourses
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 18 of 23

DRAWING STATUS
For Deadline 5

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SCALE @ A3 SIZE	DATE	REVISION
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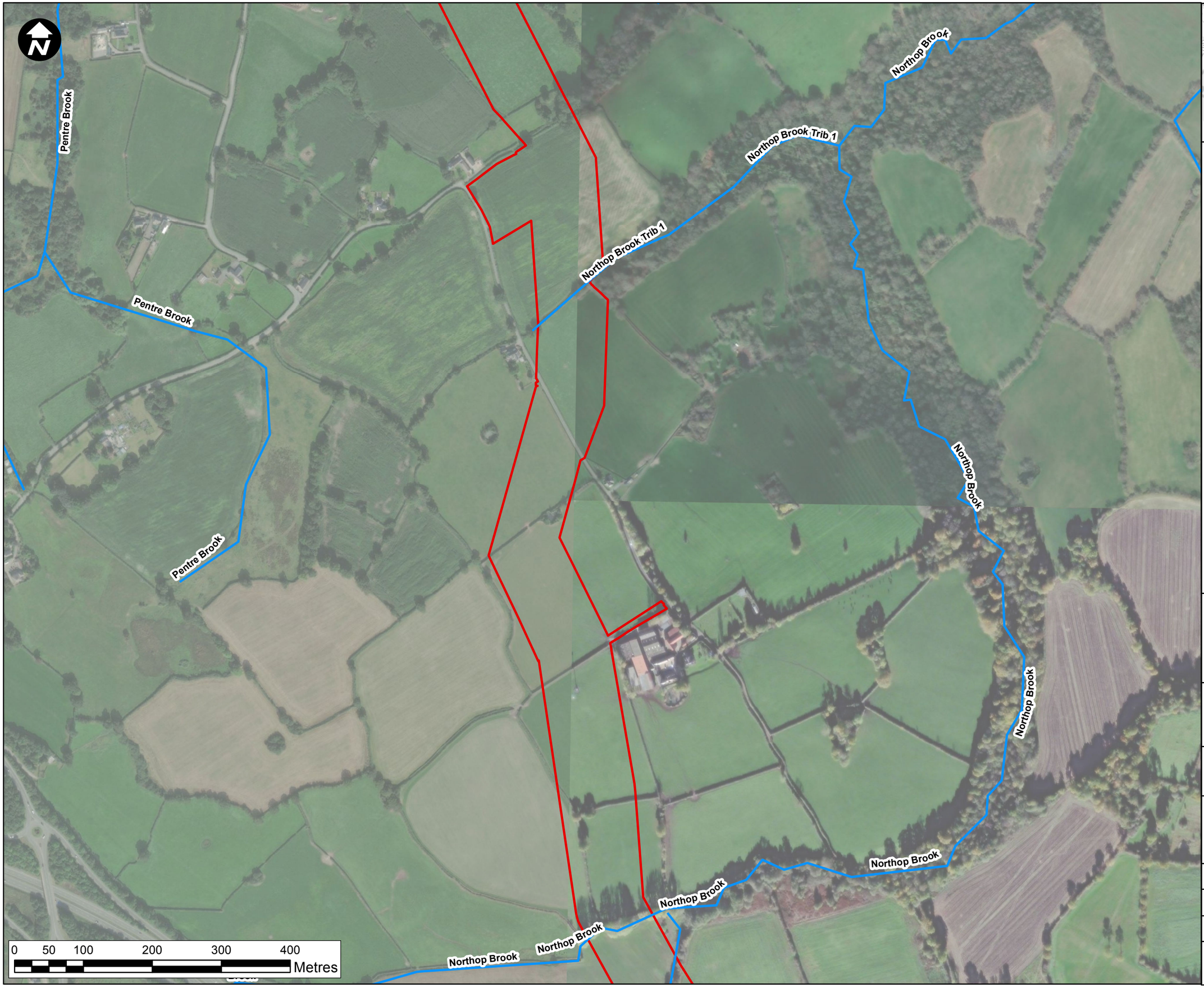
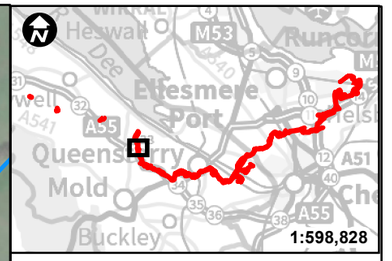
DRAWING NUMBER
OBMP-7.42-Sheet 18





Legend

- Newbuild Infrastructure Boundary
- Watercourses
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 19 of 23

DRAWING STATUS
For Deadline 5

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
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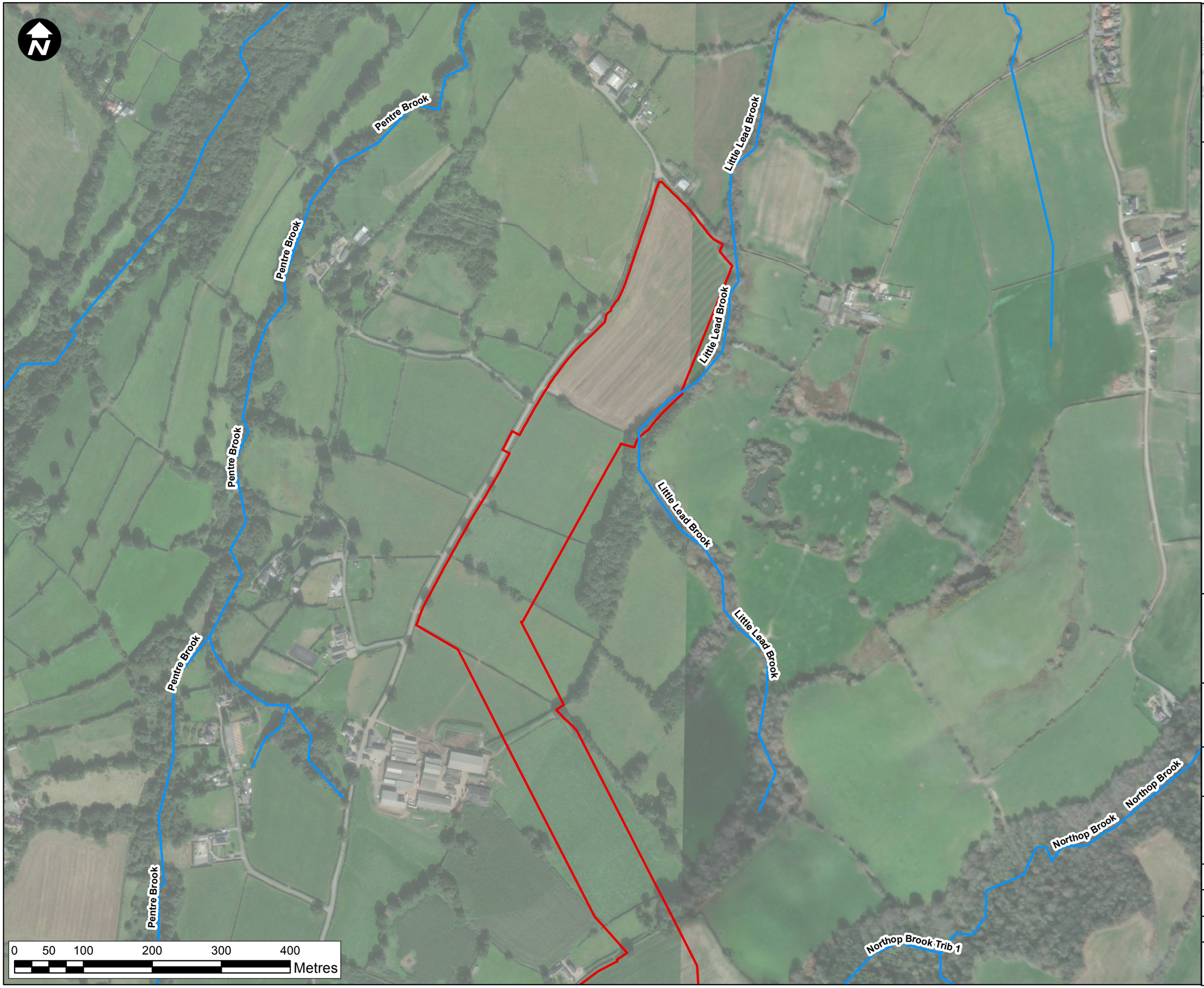
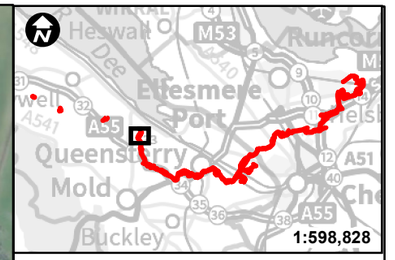
DRAWING NUMBER
OBMP-7.42-Sheet 19





Legend

- Newbuild Infrastructure Boundary
- Watercourses
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 20 of 23

DRAWING STATUS
For Deadline 5

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
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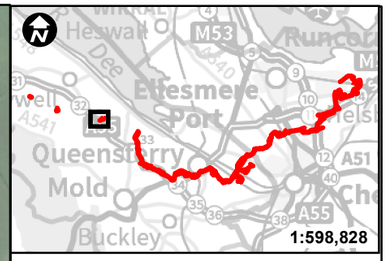
DRAWING NUMBER
OBMP-7.42-Sheet 20



Legend

- Newbuild Infrastructure Boundary
- Watercourses
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 21 of 23

DRAWING STATUS
For Deadline 5

DRAWN	CHECKED	APPROVED	AUTHORISED
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SCALE @ A3 SIZE	DATE	REVISION
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DRAWING NUMBER
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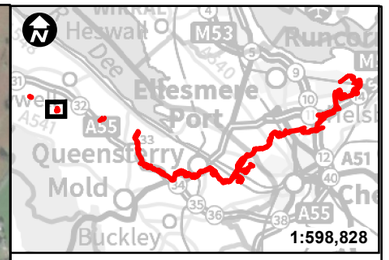

Legend

Newbuild Infrastructure Boundary

XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE

HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE

Figure 7.42 - Invasive Non-Native Species Locations

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DRAWING STATUS

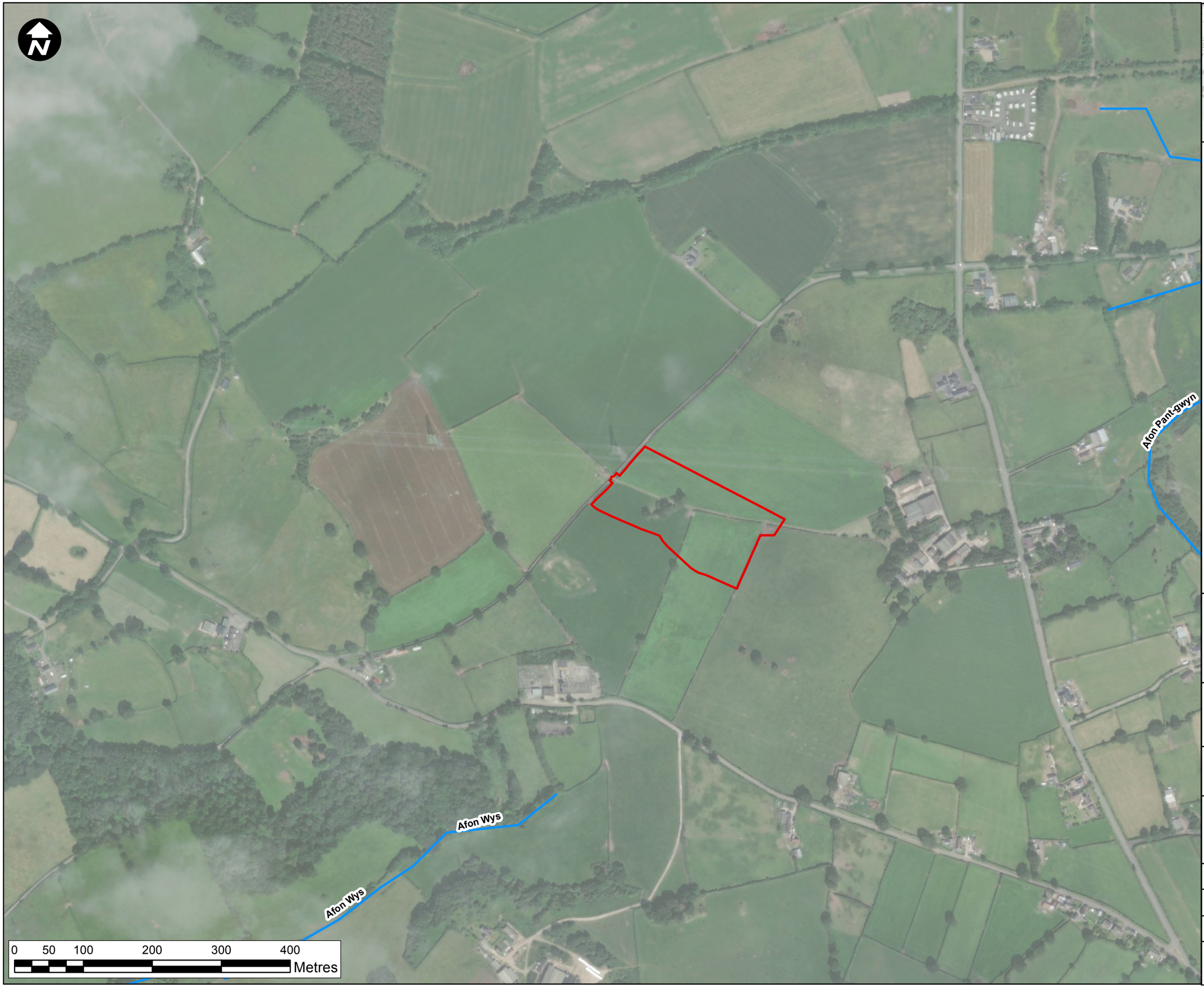
For Deadline 5

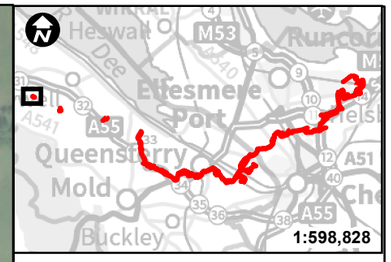
DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
1:5,000	03/07/2023	A

DRAWING NUMBER

OBMP-7.42-Sheet 22





Legend

- Newbuild Infrastructure Boundary
- Watercourses
- XX OBMP Table 1 Item Reference

HyNet North West

PROJECT TITLE
HyNet North West Carbon Dioxide Pipeline DCO

DRAWING TITLE
Figure 7.42 - Invasive Non-Native Species Locations
Sheet 23 of 23

DRAWING STATUS
For Deadline 5

DRAWN	CHECKED	APPROVED	AUTHORISED
SW	JOK	DC	SP

SCALE @ A3 SIZE	DATE	REVISION
1:5,000	03/07/2023	A

DRAWING NUMBER
OBMP-7.42-Sheet 23

Annex B

SPECIES IDENTIFICATION

INVASIVE NON-NATIVE SPECIES

VARIEGATED YELLOW ARCHANGEL

Variegated yellow archangel (*Lamiastrum galeobdolon argentatum*) is identifiable by its hairy, heart/ oval shaped leaves which are mottled with conspicuous silvery blotches. The flowers are hooded and yellow and occur in whorls up the stem with clusters of bell-shaped nutlets beneath them. The plant is widely distributed throughout the United Kingdom but is particularly prevalent in England and Wales being found in gardens, woodland, and hedgerows.



www.nonnativespecies.org

Produced by Olaf Booy, Max Wade and Vicky White of RPS

Giant Hogweed

Species Description

Scientific name: *Heracleum mantegazzianum*
AKA: Efwr enfawr (Welsh)
Native to: Caucasus mountains in south west Russia and Georgia
Habitat: Widespread, most common on river banks

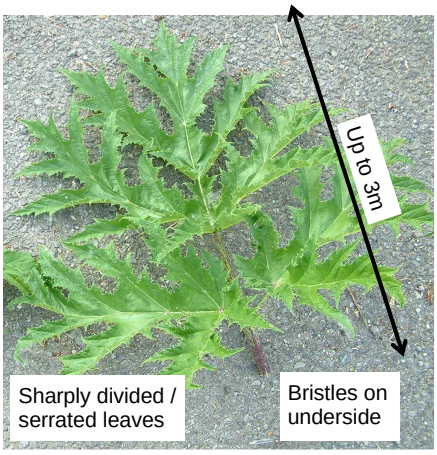
Easy to identify when fully grown by height, size of leaves and size of flowers. Can be confused with native hogweed when not fully grown or when growth is stunted (e.g. regrowth after cutting).

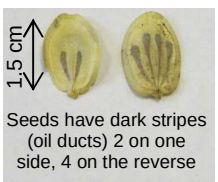
Introduced as an ornamental. First recorded wild in the UK in the late 19th century. Spreads solely by seeds, mainly through deliberate planting, wind dispersal and in water courses. Now common across much of the UK. Contact with any part of this plant must be avoided as even minute amounts of sap can cause blistering of the skin following exposure to sunlight. Other negative impacts include out-competing native flora, river bank erosion and increase in flood risk. Can cause delays/ additional costs on development sites where the plant must be removed as controlled waste in order to comply with legislation.

Giant hogweed is listed under Schedule 9 to the Wildlife and Countryside Act 1981 with respect to England, Wales and Scotland. As such it is an offence to plant or otherwise cause this species to grow in the wild. Under the Environmental Protection Act 1990, giant hogweed is also classified as controlled waste.

For details of legislation go to www.nonnativespecies.org/legislation.

Key ID Features





For more information visit **www.nonnativespecies.org**

Produced by Olaf Booy, Max Wade and Vicky White of RPS

Himalayan Balsam

Species Description

Scientific name: *Impatiens glandulifera*
AKA: Policeman's Helmet, Indian Balsam, Jac y Neidiwr (Welsh)
Native to: West and central Himalayas
Habitat: Found mostly on river banks and in damp woodland, can grow in other damp habitat

A tall, attractive, annual herb with explosive seed heads. Although easy to identify as a mature plant with its pink-purple flowers, fleshy stem and characteristic leaves, the seedlings and last year's dead stems of this annual are more difficult to spot.

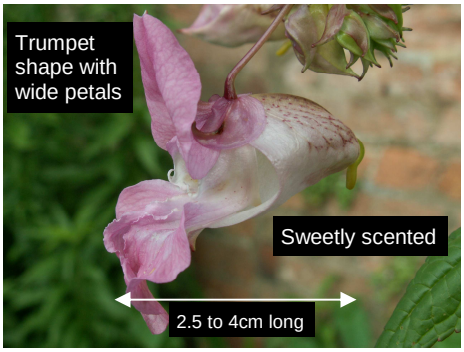
Introduced as a garden plant in the early 19th century and first recorded in the wild in 1855. Often favoured by the general public for its aesthetic appeal and is still deliberately planted on occasion. Now widespread in the UK, especially along urban rivers. Spreads solely by seeds, which are small and easily carried by wind or water.

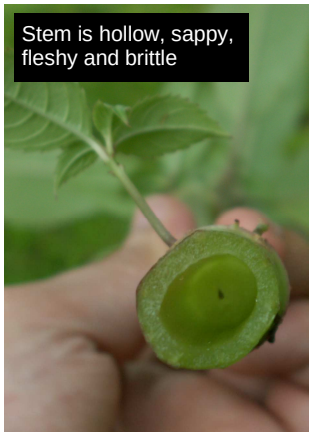
Out-competes native species in ecologically sensitive areas, particularly river banks. Where it grows in dense stands along river banks it can impede flow at times of high rainfall, increasing the likelihood of flooding. Die back of extensive stands over winter can leave river banks bare and exposed to erosion.

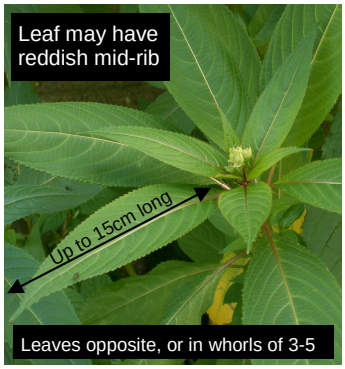
Himalayan balsam is listed under Schedule 9 to the Wildlife and Countryside Act 1981 with respect to England and Wales. As such, it is an offence to plant or otherwise allow this species to grow in the wild.

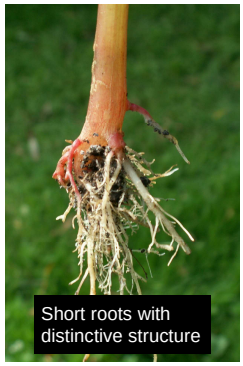
For details of legislation go to www.nonnativespecies.org/legislation.

Key ID Features







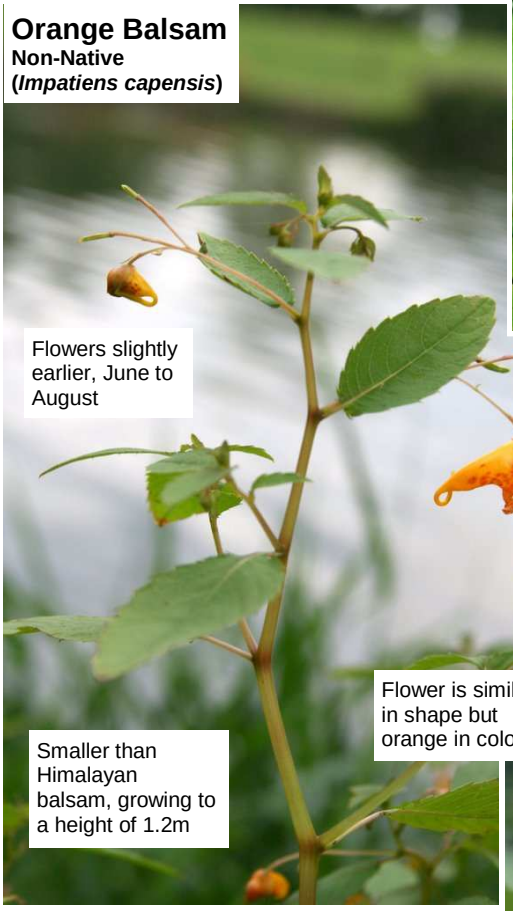


Identification throughout the year

Can be identified at most times of the year: March-June by its seedlings, stem and leaf shape, from July to September by its stem, leaf shape and flowers. More difficult to identify over winter (October to February), look for hay like remains and distinctive root structure.

Similar Species

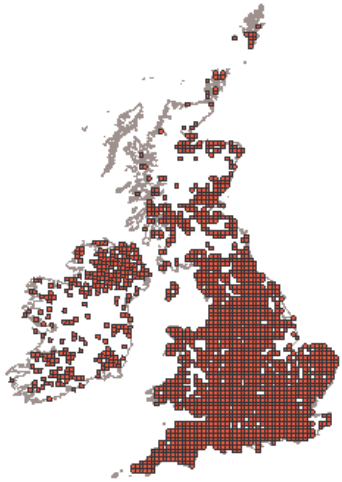
Orange Balsam
Non-Native
(*Impatiens capensis*)



Orange balsam is much less aggressive than Himalayan balsam, forming smaller less dense stands

Distribution

Widespread and common across the whole of the UK. Primarily on riverbanks and in other damp areas.



Source: NBN Gateway. Check website for current distribution

References and further reading:

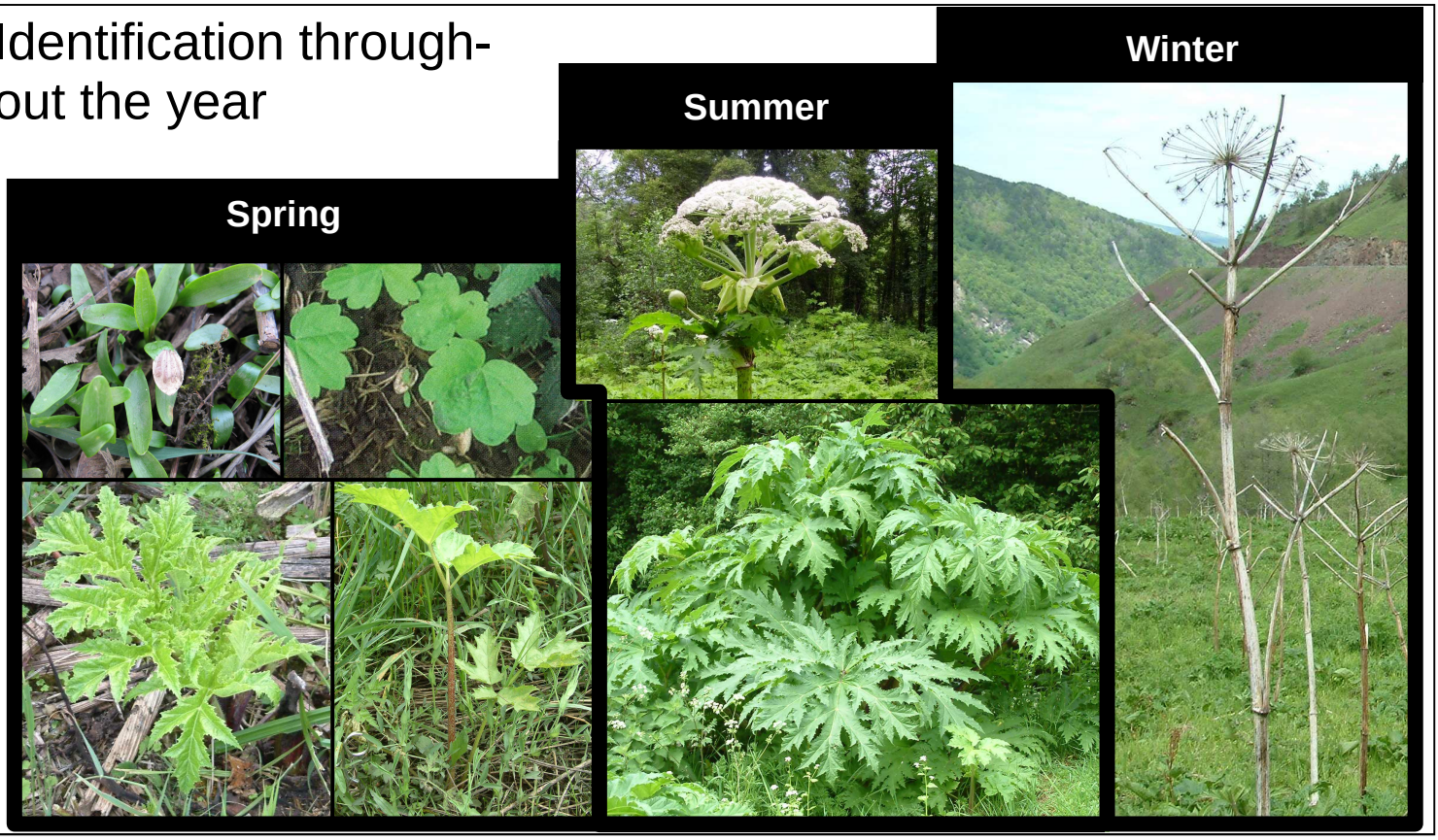
Blamey, M, Fitter, R and Fitter, A (2003) *"The Wild Flowers of Britain and Ireland. The Complete Guide to the British and Irish Flora".* A & C Black

Preston, C D, Pearman, D A and Dines, T A (editors) (2002) *"New Atlas of the British and Irish Flora".* Oxford University Press

Stace, C (1999) *"Field Flora of the British Isles".* Cambridge University Press

Photos from: Olaf Booy, Mike Harris, Max Wade

Identification throughout the year

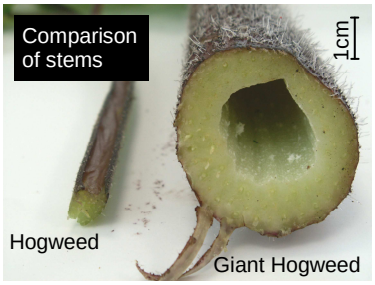


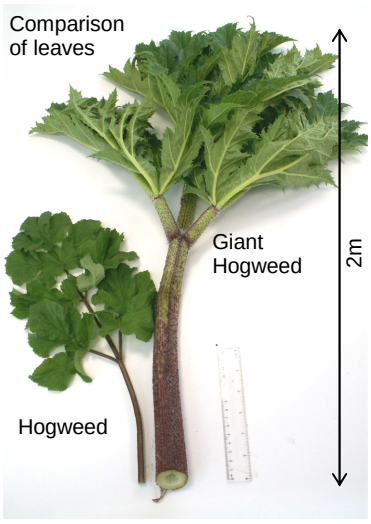
Similar Species

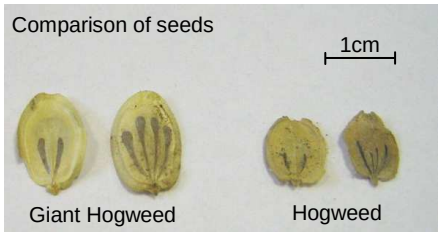
When in full height it is difficult to confuse giant hogweed with any other plant. While still growing or stunted, possibly as a result of disturbance, it can be confused with some other native plants. The most likely species with which it might confused is hogweed.

Key differences between hogweed and giant hogweed include the height, width of stem, size of leaf, size of flower head and size of seed.

Hogweed
Native
(*Heracleum sphondylium*)

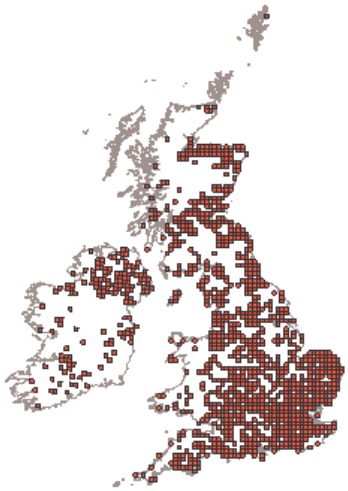






Distribution

Widespread and common across much of the UK. Extensive infestations are found particularly in Scotland and the north of England. Less abundant in Cornwall. Often associated with large rivers.



Source: NBN Gateway. Check website for current distribution

References and further reading:

Blamey, M, Fitter, R and Fitter, A (2003) *"The Wild Flowers of Britain and Ireland. The Complete Guide to the British and Irish Flora."* A & C Black

Booy, O and Wade, P M (2007) "*Giant Hogweed Management in the United Kingdom*". RPS Group plc

Pyšek P, Cock, M J W, Nentwig, W & Ravn, H P (2007) "*Ecology and Management of Giant Hogweed (*Heracleum mantegazzianum*)".* CAB International

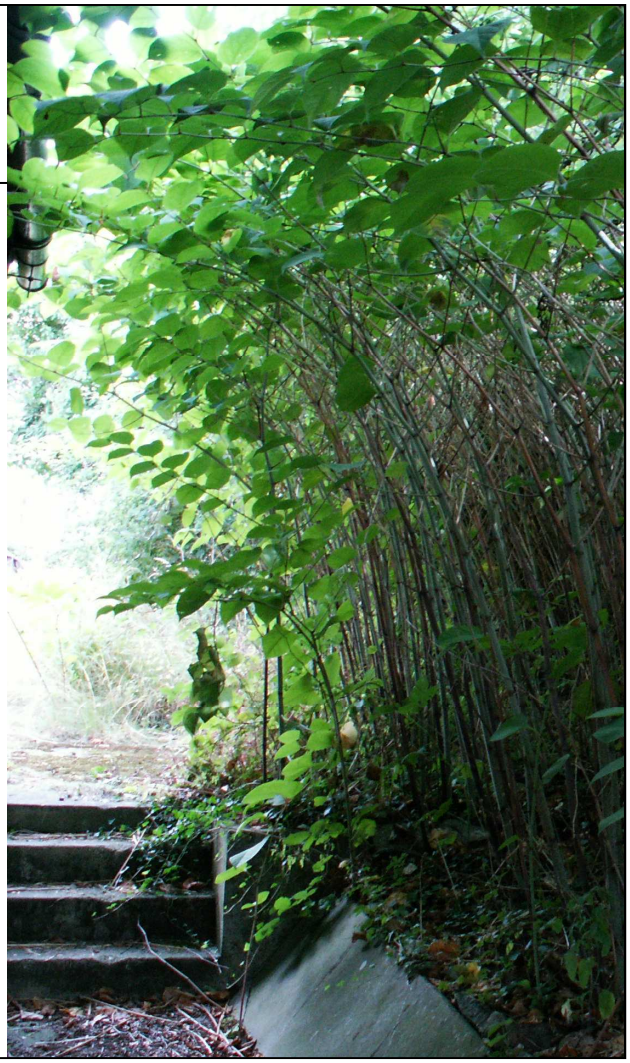
Stace, C (1999) *"Field Flora of the British Isles".* Cambridge University Press

Photos from: Olaf Booy, Steve Smith, Vicky White

www.nonnativespecies.org

Produced by Olaf Booy, Max Wade and Vicky White of RPS

Japanese Knotweed



Species Description

Scientific name: *Fallopia japonica*
AKA: Japanese Bamboo, Pysen saethwr (Welsh), *Polygonum cuspidatum*, *Reynoutria japonica*
Native to: Japan, Taiwan, northern China
Habitat: Common in urban areas, particularly on waste land, railways, road sides and river banks

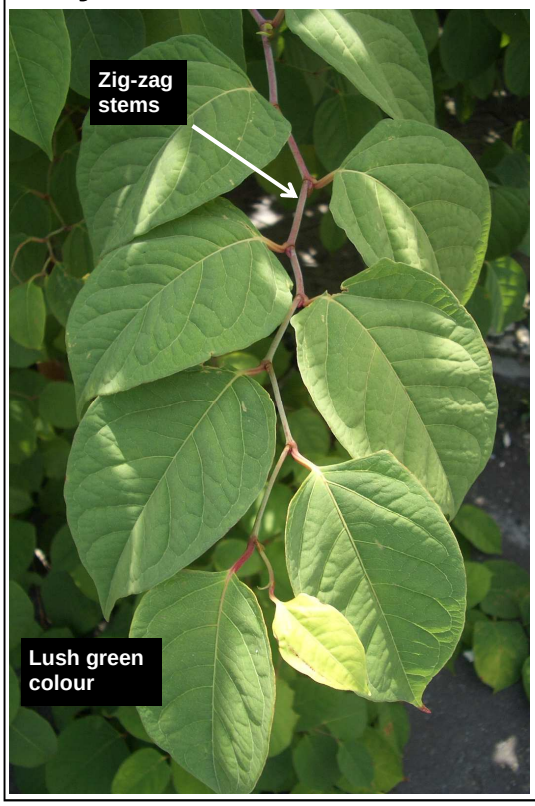
Tall herbaceous perennial with bamboo like stems. Often grows into dense thickets. Characteristic leaves and stems, persistence of last year's dead canes and distinctive rhizome (underground root-like stems) enables year round identification.

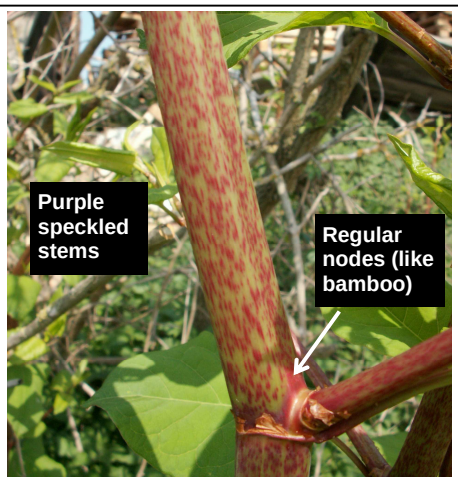
Introduced in the early 19th century as an ornamental plant. Now common and wide-spread across the UK. Spreads rapidly in the wild by natural means and as a result of spread by humans. Spread is solely by vegetative means, either fragments of rhizome or stem. Does not produce seed in the UK. Negative impacts include outcompeting native flora, contributing to river bank erosion and increasing the likelihood of flooding. Can also cause significant delays and cost to development as well as structural damage (it can grow through asphalt and some other surfaces).

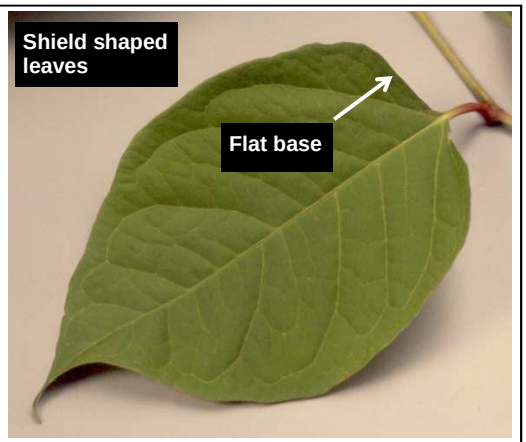
Japanese Knotweed is listed under Schedule 9 to the Wildlife and Countryside Act 1981 with respect to England, Wales and Scotland. As such it is an offence to plant of other-wise cause Japanese knotweed to grow in the wild. Under the Environmental Protection Act 1990, Japanese Knotweed is classified as controlled waste.

For details of legislation go to www.nonnativespecies.org/legislation.

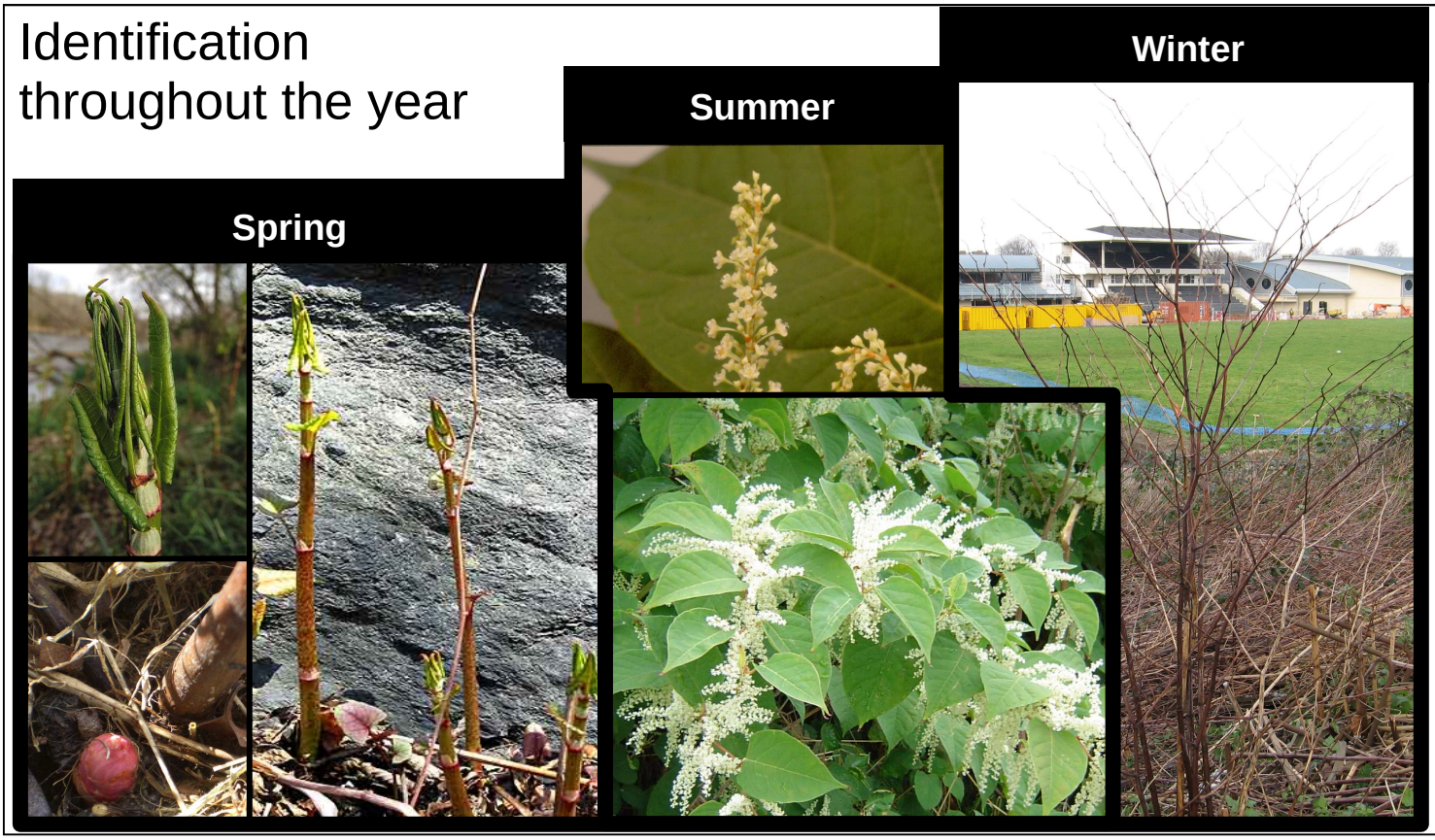
Key ID Features





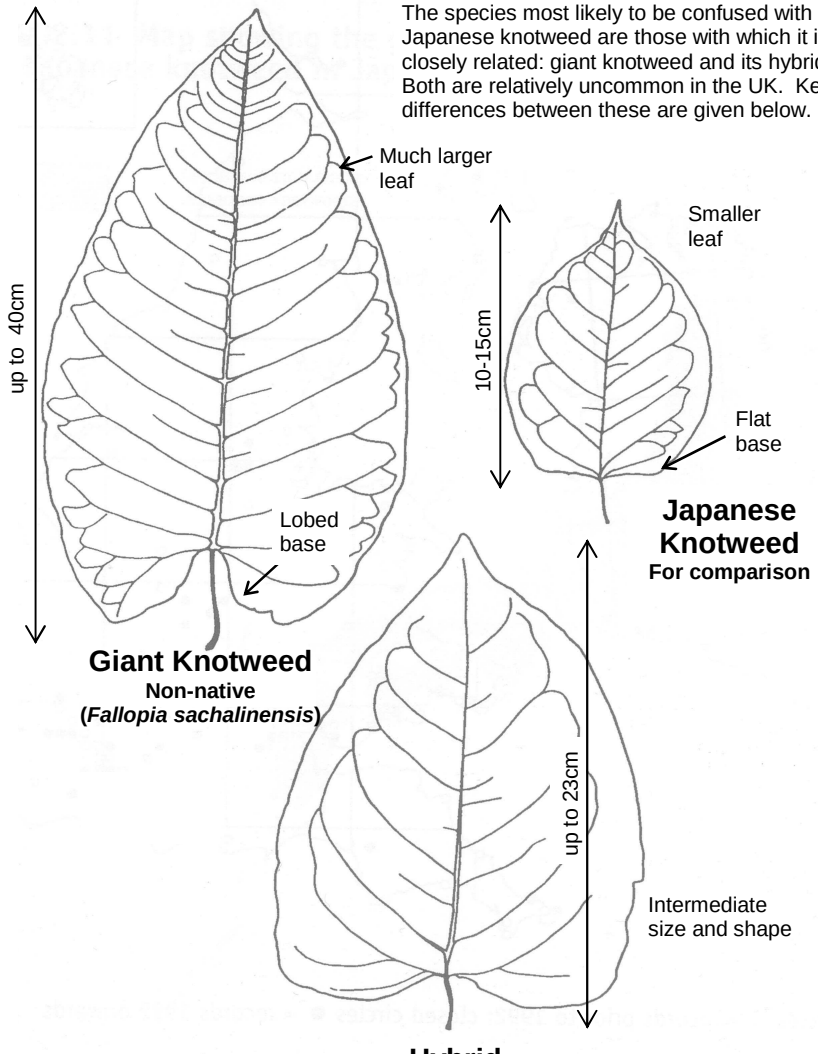


Identification throughout the year



Similar Species

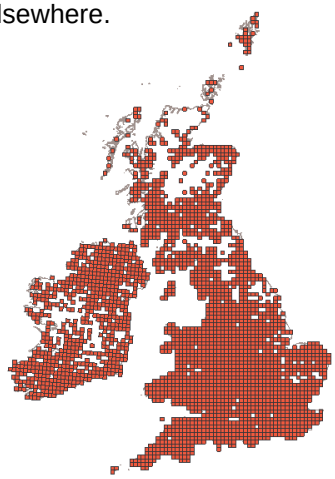
The species most likely to be confused with Japanese knotweed are those with which it is closely related: giant knotweed and its hybrid. Both are relatively uncommon in the UK. Key differences between these are given below.



Source: Child and Wade (2000). The Japanese Knotweed Manual

Distribution

Widespread and common across the UK. Notably extensive infestations are found in the south-west of England, south Wales and Greater London, however similarly extensive populations can also be found elsewhere.



Source: NBN Gateway. Check website for current distribution

References and further reading:

Blamey, M, Fitter, R and Fitter, A (2003) *"The Wild Flowers of Britain and Ireland. The Complete Guide to the British and Irish Flora."* A & C Black

Child, L E and Wade, P M (2000) "The Japanese Knotweed Manual". Packard

Environment Agency (2006) "*The Japanese Knotweed Code of Practice".* Environment Agency

Preston, C D, Pearman, D A and Dines, T A (editors) (2002) *"New Atlas of the British and Irish Flora".* Oxford University Press

Stace, C (1999) *"Field Flora of the British Isles".* Cambridge University Press

Photos from: Olaf Booy, Helen Parish, Max Wade, Vicky White

www.nonnativespecies.org

Produced by Olaf Booy, Max Wade and Vicky White of RPS

Rhododendron

Species Description

Scientific name: *Rhododendron ponticum*
AKA: Rhododendron
Native to: South-west Europe and south-west Asia. UK's stock is believed to come from Spain.
Habitat: Common on acid, peaty or sandy soils in woodland, heathland, rocky hill-sides, river banks, gardens and parks

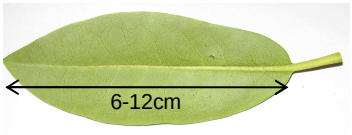
A large evergreen shrub with leathery leaves, attractive purple to pink flowers and solid stems forming into a trunk when mature. Relatively easy to identify, but can be confused with cherry laurel or horticultural varieties of rhododendron. However, horticultural varieties of rhododendron are relatively rarely found in the wild. Spreads by suckers and seed, which are small and carried long distances by wind.

Introduced by gardeners in the late 18th century into parks and woodlands, where it was also used for game cover. Still widely planted, particularly by gardeners. Often grows in ecologically sensitive habitats, such as heath, broad-leaved woodland and dunes, where dense growth can considerably alter the structure of the habitat.

For details of legislation go to www.nonnativespecies.org/legislation.

Key ID Features

Leathery leaves with dull green upper surface



Pale underside

Identification throughout the year

Varies little throughout the year as leaves are evergreen and woody stems remain the same. Flowers appear May to June followed by seed pods.

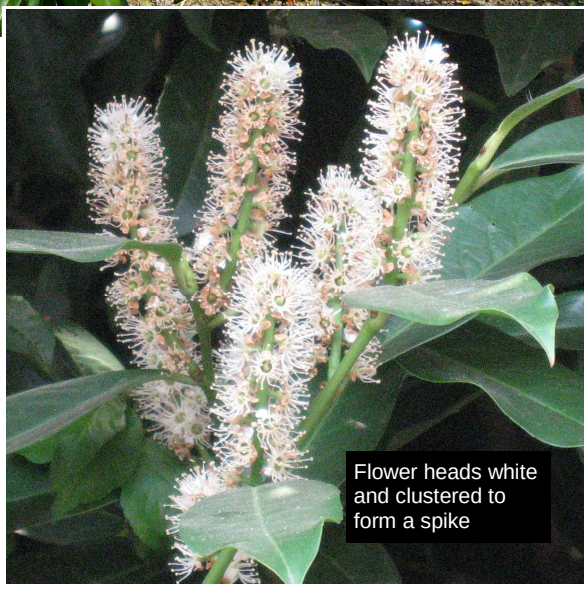
Distribution

Widespread across the whole of the UK, most common in the south and west.

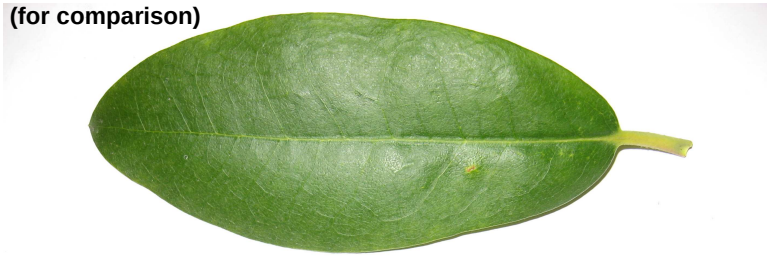
Source: NBN Gateway. Check website for current distribution

Similar Species

Cherry laurel
Non-native
(*Prunus laurocerasus*)



***Rhododendron* leaf (for comparison)**



Cherry laurel leaf

Varieties of Rhododendron

There are a large number of highly sought after species and varieties of rhododendron, of which the invasive *Rhododendron ponticum* is just one. It is unusual to encounter other varieties or species outside of planted habitats.

References in the further reading list can be used to distinguish between the different varieties if necessary.

Examples of rhododendron varieties:

References and further reading:

Cullen, J (2005) *"Hardy rhododendron species: a guide to identification".* Collins

Preston, C D and Croft, J M (1997) *"Aquatic plants in Britain and Ireland".* Harley Books

Preston, C D, Pearman, D A and Dines, T A (editors) (2002) *"New Atlas of the British and Irish Flora".* Oxford University Press

Stace, C (1999) *"Field Flora of the British Isles".* Cambridge University Press

Photos from: Olaf Booy, David Fenwick, Mike McCabe, Helen Parish

Produced by Olaf Booy, Max Wade and Vicky White of RPS

Water Fern

Species Description

Scientific name: *Azolla filiculoides*
AKA: Fairy Fern, Cyfrdwy (Welsh)
Native to: North and Central America
Habitat: Still and slow flowing water bodies (e.g. ponds, drainage channels, ditches, canals)

Very small free-floating water plant that forms dense mats. Unmistakeable when in its red form and relatively easy to distinguish from duckweeds in its green form. Can be seen most months of the year. Spreads mainly vegetatively though can produce minute spores.

Introduced for ornamental use in ponds and aquaria. First recorded in 1883 and has spread rapidly throughout England in the last 50 years. Infrequent in Scotland and Northern Ireland. Can be inadvertently carried on water plants from garden centres. Out-competes native species by forming a dense covering on the surface of the water, blocking out light, causing deoxygenation, preventing air-breathing insects from reaching the surface and reducing water temperatures. Dense and continuous stands can be a health hazard as the water surface appears solid.

Water fern is listed under Schedule 9 to the Wildlife and Countryside Act 1981 with respect to England, Wales and Scotland. As such it is an offence to plant or otherwise cause this species to grow in the wild.

For details of legislation go to www.nonnativespecies.org/legislation.

Key ID Features

Usually green but often has a reddish tinge and can be completely red when exposed to stresses (such as cold temperatures, brackish waters or shading)

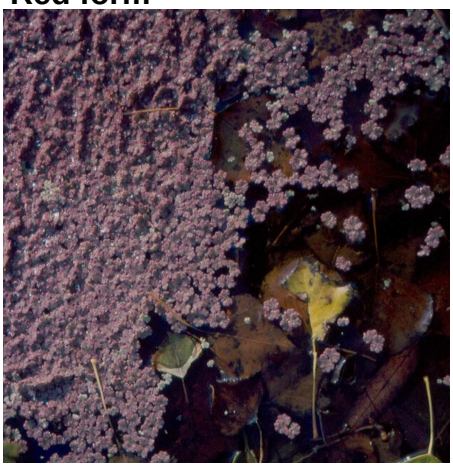
Forms dense mats but can also be present as a few fronds amongst emergent or other floating vegetation

Identification throughout the year

Plants can be present year round, but often die back in winter. Colour can vary considerably through the year. Green in spring/ summer often turns red during cold weather in autumn/winter.

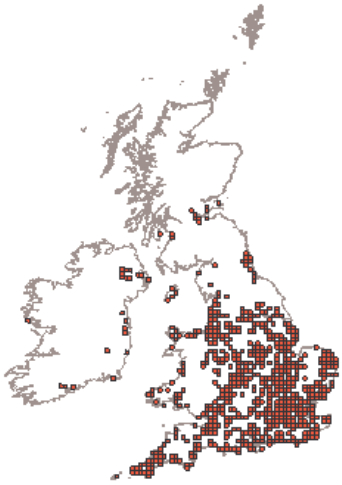
Green form

Red form



Distribution

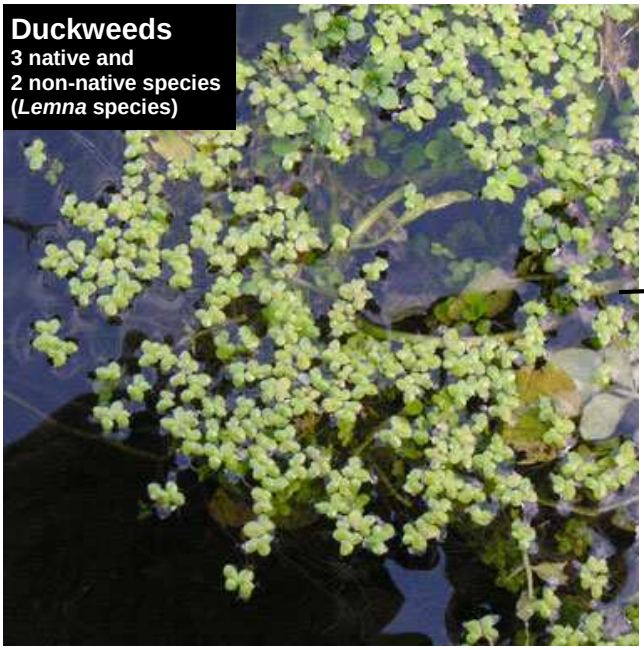
Sporadic distribution in southern and central England. Has spread north to Yorkshire and into Wales but relatively few locations in Scotland and Northern Ireland.



Source: NBN Gateway. Check website for current distribution

Similar Species

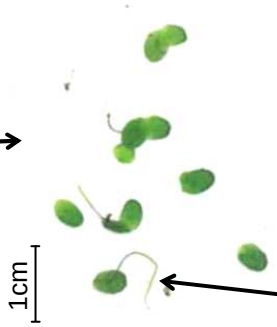
Duckweeds
3 native and
2 non-native species
(*Lemna* species)



Common Duckweed
Native
(*Lemna minor*)

Light green colour

Smaller than water fern (only 1.5 - 4mm across)



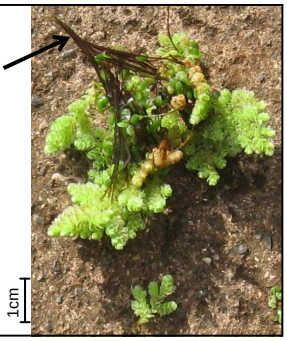
Single round leaves, not branched

White to light green root attached to each leaf

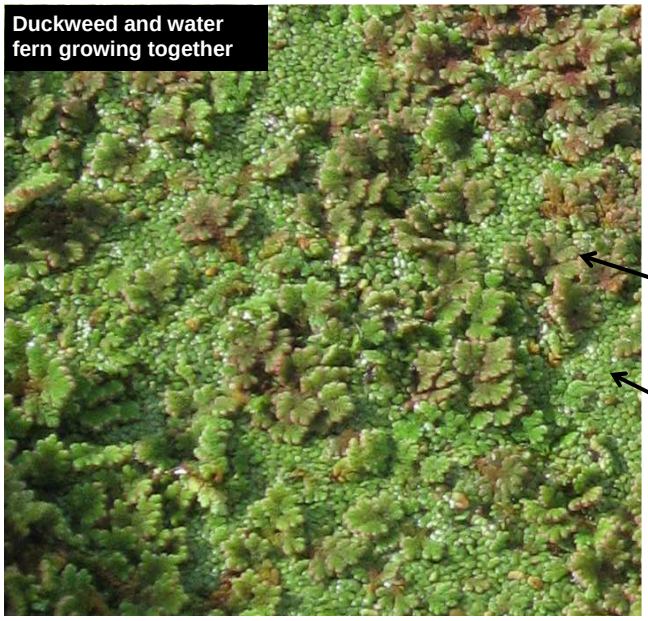
Water Fern
For comparison

Multiple dark brown roots

Leaves are much larger (up to 2.5cm) and branching



Duckweed and water fern growing together



Water fern

Duckweed

References and further reading:

Blamey, M, Fitter, R and Fitter, A (2003) *"The Wild Flowers of Britain and Ireland. The Complete Guide to the British and Irish Flora".* A & C Black

Preston, C D and Croft, J M (1997) *"Aquatic plants in Britain and Ireland".* Harley Books

Preston, C D, Pearman, D A and Dines, T A (editors) (2002) *"New Atlas of the British and Irish Flora".* Oxford University Press

Stace, C (1999) *"Field Flora of the British Isles".* Cambridge University Press

Photos from: Olaf Booy, Anne Halpin, Peter Llewellyn, Alisdair Mason, Max Wade

Annex C

BIOSECURITY REAC COMMITMENTS

Unique ES Reference	Action/Commitment/Mitigation (including Monitoring Requirements)	Objective	Organisation/Individual Delivering Measure
D-BD-001	Prior to construction, a team of suitably qualified and experienced Ecological Clerk of Works (ECoWs), will be appointed to support, oversee and monitor the Construction Contractor(s) with the implementation of measures defined within the OCEMP. Multiple ECoWs may be required during construction to ensure appropriate oversight of multiple active works locations. Broadly, the ECoW will: • Provide ecological advice to the Construction Contractor(s) over the entire construction programme, at all times as required. • Undertake or oversee pre-construction surveys for protected species in the areas affected by the DCO Proposed Development. • Monitor ecological conditions during the Construction Stage to identify additional constraints that may arise as a result of natural changes to ecological baseline over time, e.g., the monitoring of badger activity within and in close proximity to construction works. • Provide ecological toolbox talks to site personnel to make them aware of ecological constraints and information; highlight mitigation to minimise impacts; and make site personnel aware of their responsibility with regards to wildlife and sensitive habitats in the context of legislation and policy. Toolbox talks will include, as required, all ecological receptors considered within the ES as a minimum. • Monitor the implementation of mitigation measures during the Construction Stage to ensure compliance with protected species legislation, licensing, and commitments within the ES. The ECoW will have previous experience in similar ECoW roles and be approved by the Applicant. The ECoW will be appointed in advance of the main construction programme commencing to ensure pre-construction surveys are undertaken and any advance mitigation measures required are implemented.	To ensure implementation of mitigation measures, track compliance with commitments and legal requirements.	The Applicant / Construction Contractor(s)
D-BD-002	All necessary permits, licenses and assents will be applied for from relevant bodies in advance of construction or enabling works commencing. Only once licence/permit applications have been granted, and any initial licenced actions completed, can works commence. Licences and permits are likely to include, but are not limited to, derogation licences for protected species, permits for in-water works, etc. Assents are likely to be required for works in proximity to statutory designated sites.	To protect sites, habitats and fauna and comply with conservation legislation, local and	Construction Contractor(s)

Unique ES Reference	Action/Commitment/Mitigation (including Monitoring Requirements)	Objective	Organisation/Individual Delivering Measure
		national policies.	
D-BD-003	The Applicant will appoint an external, third-party to conduct Environmental Compliance Audits during construction of the DCO Proposed Development. The 'Auditing ECoW' will undertake checks of the Construction Contractor(s) and their ECoW(s) reporting on compliance of construction works, mitigation and activities on site against the ES and Detailed CEMPs, as well as any obtained licenses, permits or assents. The Auditing ECoW will produce monthly reports (or otherwise agreed reporting deadlines in response to on site activities) and provide written and verbal feedback to the Construction Contractor(s) and ECoW on performance and adherence with the ES, Detailed CEMPs, licenses, permits and assents throughout the construction period, as required.	To ensure implementation of mitigation measures and legal requirements.	The Applicant
D-BD-041	Invasive Non-Native Species (INNS) are present within the Newbuild Infrastructure Boundary (**Appendix 9.1: Habitats and Designated Sites Survey Report, Volume III**). A Biosecurity Method Statement will be implemented throughout the construction of the DCO Proposed Development. The Biosecurity Method Statement will detail the locations and extent of any INNS identified, alongside appropriate measures to control and prevent spread or propagation of INNS. High-level recommendations for the treatment and removal of INNS will be identified. Appropriate good hygiene measures (e.g., Check, Clean, Dry methods will be detailed. Workers should be equipped with the necessary equipment, Personal Protective Equipment (PPE) and substances to implement biosecurity control measures, including effective hygiene and sanitation practices. This will most frequently comprise disinfectant tablets, sprayers, and brushes to clean and disinfect equipment and PPE prior to entering/leaving construction areas. Other noteworthy biosecurity considerations (e.g. avian flu, bovine TB) will also be referenced within the Biosecurity Management Plan.	To prevent the spread of invasive species and manage other biosecurity concerns.	Construction Contractor(s)
D-BD-042	Where INNS are located and within the construction corridor, engagement of an INNS specialist will be sought whom will provide options for treatment and or removal in advance of construction. Any remaining stands of INNS will be subject to exclusion zones which will be clearly and physically demarcated and enforced around areas of invasive species to avoid spread or propagation. The extent of buffer will be determined by the species and in consultation with the ECoW. Biosecurity measures, as detailed within a Biosecurity Management Plan to be prepared at detailed design will be implemented during construction to prevent the spread of INNS.	To prevent the spread of invasive species and manage other biosecurity concerns.	Construction Contractor(s)