

## Vyrnwy Aqueduct – INNS Assessment

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## Technical note:

# Invasive Non-native Species Risk Assessment of the United Utilities Vyrnwy Aqueduct Strategic Resource Option

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## 1. Introduction

- 1.1.1 The United Utilities Vyrnwy Aqueduct (UUVA) Strategic Resource Option (SRO) is being delivered by United Utilities (UU) and is one of three SROs the water company is participating in, the others being United Utilities Sources (UUS) and Severn to Thames Transfer (STT). Although these schemes are separate SROs, they directly interface with each other to enable water to be transferred from North West England to the Midlands and South.
- 1.1.2 To meet the Regulators' Alliance for Progressing Infrastructure Development (RAPID) Gate 1 submission environmental requirements<sup>1</sup>, the UUVA SRO must be subject to a range of environmental assessments. As part of this process, UU commissioned Wood Environment and Infrastructure Solutions UK Ltd<sup>2</sup> (Wood) to undertake a screening assessment of invasive non-native species (INNS) for the options identified for the SRO to determine whether any future schemes will risk spreading INNS or create pathways which increase the risk of spreading INNS.
- 1.1.3 This Technical Note presents the findings of the INNS Screening Assessment of the UUVA SRO options being taken forward at Gate 1.

## 1.2 UU Vyrnwy Aqueduct Strategic Resource Option

- 1.2.1 The UUVA SRO is one of 17 schemes promoted by Ofwat in the PR19 Final Determination<sup>1</sup> to identify new strategic water resources to address the water needs set out in the National Framework for Water Resources<sup>3</sup>. The SRO programme is managed by RAPID and governed through a gated process during AMP7 with the purpose of selecting the strategic resource options which provide best value for customers for delivery in AMP8. The gates are:

**Gate 1:** Initial concept design and decision making;

**Gate 2:** Detailed feasibility, concept design and multi-solution decision making;

**Gate 3:** Developed design, finalised feasibility, pre-planning investigations and planning applications;

**Gate 4:** Planning applications, procurement and land purchase.

- 1.2.2 Gate 1 of this process takes place in July 2021 and involves initial concept design and decision making. The Gate 1 decision, if supportive, will provide further funding for development of the

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<sup>1</sup> See Ofwat (2019) *PR19 final determinations: Strategic regional water resource solutions* and RAPID (2020) *Accelerated Gate One Assessment –summary of process and criteria Version 2*.

<sup>2</sup> Now Wood Group UK Ltd.

<sup>3</sup> Environment Agency (2020) *Meeting our future water needs: a national framework for water resources*. Available from [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/872759/National\\_Framework\\_for\\_water\\_resources\\_main\\_report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/872759/National_Framework_for_water_resources_main_report.pdf) [Accessed September 2020].





schemes and the selected options will be included in the plan development process for the regional plans and Water Resources Management Plans 2024 (WRMP24s), as appropriate.

1.2.3 The purpose of the UUVA SRO, alongside the UUS SRO, is to support the STT SRO proposal to transfer up to 180 mega litres per day (Ml/d) of water from Lake Vyrnwy to the Thames Water region via the River Severn by maintaining supply resilience to UU customers supplied directly from Vyrnwy Aqueduct (if UU were to stop or reduce its abstraction from Vyrnwy Reservoir to facilitate a release of raw water into the Severn to Thames transfer system).

1.2.4 [✂]

1.2.5 It should be noted that, at this stage, the preferred options for the UUVA SRO have not been selected. The options will be selected by Gate 2 (October 2022) with those ultimately chosen being dependent upon further assessment and the volume of water required for trading.

### 1.3 RAPID's Environmental Requirements

1.3.1 RAPID has requested environmental information from water companies to support their respective SROs as part of the Gate 1 submission (July 2021). To meet RAPID's Gate 1 submission requirements<sup>4</sup>, UU is to provide the following information for the UUVA SRO options being taken forward:

- Initial option-level environmental assessments that meet local requirements and comply with Strategic Environmental Assessment (SEA) and Habitats Regulations Assessments (HRA) requirements, including consideration of in-combination effects and identification of environmental risks that need mitigating through the solution design and costing.
- Initial environmental, social, and economic valuations (or metric benefits) consistent with principles in the National Planning Statement and Water Resource Planning Guidelines.

1.3.2 To meet RAPID's requirements, the following environmental assessments have been completed:

- Strategic Environmental Assessment<sup>5</sup> (SEA);
- Habitats Regulations Assessment<sup>6</sup> (HRA);
- WFD Screening Assessment<sup>7</sup>;
- Natural Capital Assessment (NCA);
- Biodiversity Net Gain (BNG) Assessment;
- Invasive Non-native Species (INNS) Risk Assessment.

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<sup>4</sup> See Ofwat (2019) *PR19 final determinations: Strategic regional water resource solutions* and RAPID (2020) *Accelerated Gate One Assessment –summary of process and criteria Version 2*.

<sup>5</sup> *Statutory Instrument No.1633 - The Environmental Assessment of Plans and Programmes Regulations 2004*.

<sup>6</sup> *Statutory Instrument No.1012 - Conservation of Habitats and Species Regulations 2017*.

<sup>7</sup> *Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (the Water Framework Directive)*.





1.3.3 This Technical Notes relates to the INNS Risk Assessment.

## 1.4 Invasive Non-native Species – Overview

1.4.1 Invasive non-native species are defined as any species introduced outside of its natural range (past or present) which may negatively impact upon the environment, the economy, or human health.

1.4.2 Both within the UK and internationally INNS are considered the second largest threat to biodiversity, after the loss and destruction of habitat. The Environment Agency estimate the economic consequences of INNS within England to be of the order of £1.7 billion per year (2010 costs<sup>8</sup>).

1.4.3 To protect and improve the ecological and chemical health of the UK's surface and groundwater bodies the UK government, in 2003 transposed into English Law the EU Water Framework Directive (WFD) (2000/60/EC). The Directive required member states to put in place River Basin Management Plans that required a holistic approach to the management of water bodies, looking at the water within the wider ecosystem. The Directive has subsequently been retained in English law (along with amendments) following the UK's exit from Europe.

1.4.4 Although not explicitly mentioned within the Water Framework Directive, UK government administrations have accepted that INNS should be considered as a pressure on water bodies that needs to be considered when implementing the Directive. River basin management plans are therefore required to consider INNS where they are considered to be causing (or contributing to) sites to fail to achieve good ecological status.

1.4.5 Given that most species are difficult or impossible to control or eradicate once introduced into the wild the prevention of their introduction is considered a priority. The Environment Agency (EA) expects water companies to prevent the deterioration of natural water bodies by reducing the risks of spread of INNS and reducing the impacts of INNS<sup>9</sup>.

1.4.6 A list of aquatic alien species classified according to their potential level of impact is published by the UK Technical Advisory Group (UK TAG)<sup>10</sup> along with an Alarm List identifying those species thought to pose a risk to surface waters and their WFD ecological status, but whose presence has not yet been recorded in Great Britain. Species identified by UK TAG currently frequenting freshwater environments, along with their classification have been provided in **Appendix A**.

1.4.7 Within England and Wales, there are a number of further statutory obligations regulating the control of INNS, primarily Section 14 of the Wildlife and Countryside Act 1981 and more recently the Alien Species (Enforcement and Permitting) Order 2019. A comprehensive review of legislation, regulations and Directives designed to control the release and subsequent spread of INNS species within England and Wales is provided by GB Non-Native Species Secretariat<sup>11</sup>.

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<sup>8</sup> Environment Agency (2013) *Water industry strategic environmental requirements (WISER)*. Strategic steer to water companies on the environment, resilience and flood risk for business planning purposes.

<sup>9</sup> Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (the Water Framework Directive).

<sup>10</sup> UKTAG (2015) *UK Technical Advisory Group on the Water Framework Directive. Revised classification of aquatic alien species according to their level of impact*.

<sup>11</sup> GB Non-Native Species Secretariat - <http://www.nonnativespecies.org/home/>





## 1.5 This Technical Note

1.5.1 This Technical Note presents the findings of the INNS Screening Assessment for the preferred list of UUVA SRO options. The remainder of this Technical Note is structured as follows:

- **Section 2:** Outlines the methodology for the INNS Screening Assessment;
- **Section 3:** Describes the options identified for the UUVA SRO;
- **Section 4:** Describes the results of the raw Screening Assessment and the premise on which these were made;
- **Section 5:** Presents a summary of the assessment and the conclusions of the INNS Screening Assessments to inform UU's Gate 1 submission.

## 2. INNS Assessment

### 2.1 Methodology

2.1.1 An assessment was undertaken to identify the likelihood of each of the UUVA options being taken forward at Gate 1 from contributing to the spread of INNS species.

2.1.2 The assessment methodology adopted has taken into consideration a number of key documents including the EA (2019) 'Assessing the impact of new water transfers on the risk of spread of Invasive non-native species'; EA (2019) 'Environmental assessment for water company drought planning - supplementary guidance and UKTAG (2013) 'Guidance on the assessment of alien species pressures'.

2.1.3 For each option, a summary of the scheme, pertinent to the INNS assessment has been provided (**Table 3-1 UUVA SRO Options**).

2.1.4 An assessment based on a matrix comprising the **likelihood** of the potential INNS transfer and the **impact** upon the receiving water was adopted to identify sites most at risk from propagating INNS.

2.1.5 It should be noted that, post-Gate 1, there will be a need to review the approach to the INNS assessment of the UUVA options to ensure that there is consistency with the methodologies employed for the assessments of the Regional Plan and WRMPs. However, at this stage, it is not anticipated that any such review would materially affect the findings of the assessment presented in this Technical Note.

### 2.2 Likelihood

2.2.1 The likelihood considered the prevalence and category of INNS in the source supply. The presence of an INNS species within the source water was based on known occurrence within a 5km radius of the abstraction coordinates. Data was drawn from a review of free to access databases including NBN Atlas and the EA Ecology & Fish Data Explorer and key sources such as Gallardo and Aldridge (2013).

2.2.2 Species can be spread from place to place through a variety of methods, that can be grouped into common pathways, that include e.g., recreational activities, vehicle, operative and plant movements, sludge transfer and raw water transfer. Where water is abstracted direct from a borehole, it has been assumed that no INNS are present within the source water and that the risk of transfer is,



therefore, '**Negligible**'. Where water is pumped directly to a WTW located within the source water catchment (and subject to coarse screening, coagulations, flocculation, settlements, and fine filtration), the potential impact is considered '**Low**'. However, where the WTW lies outside of the source catchment area, the risk of transferring species has the potential to be '**Medium**' as water may on occasion bypass the treatment facilities e.g. via break-pressure tanks, start-up to waste and wash-outs.

- 2.2.3 The assessment of likelihood assumes that all reasonable mitigation will be put in place to prevent spread. This mitigation of INNS may include the following:
- Check, clean, dry procedures should be adopted.
  - Plant such as pumps should be cleaned prior to moving. Any heavy encrustations and holdfasts should be removed with scrapers, prior to pressure-washing. Particular attention should be paid to parts of the structure where access is difficult. Washings must not be allowed to enter the water environment. Waste produced from the cleaning process must be disposed of appropriately.
  - Footwear should be clean (visually free from soil and debris) before operatives leave site. Where necessary footwear should be disinfected.
  - Vehicles should be kept clean – in particular any accumulated mud should be removed before the vehicle moves off the site. Where necessary wheel arches should be disinfected.
  - At high-risk sites access should be kept to a minimum. Vehicles should be parked on hard standing.
  - Where multiple sites are visited, high risk sites should be the last to be visited in the day.
- 2.2.4 Where a new raw water transfer scheme creates a hydrological pathway between water bodies not already connected, or were a proposed scheme increases the risk between locations already linked the only mitigation available may comprise treatment processes to remove all life stages of potential INNS (see para 2.2.2).
- 2.2.5 Measures adopted or trialled elsewhere for the control or eradication of INNS from raw water abstractions (although not necessarily for public water supply) include chemical treatment e.g. chlorination, or introduction of piscicides (such as antimycin A, rotenone and salicylanilide I), ultra-violet light treatment and the use of electric gradients to euthanise e.g. fish.

## 2.3 Impact

- 2.3.1 The potential for impact of INNS species has been categorised by UKTAG<sup>7</sup>. Where the potential impact of a species has yet to be categorised then a classification of **High** (worst case) has been assumed.
- 2.3.2 The impact also considers the sensitivity of the receiving water body, taking into account both the prevalence of INNS in the receiving water course and any pertinent conservation designation or protected species present.

## 2.4 Risk Assessment

- 2.4.1 The likely risk presented by INNS at each of the UUVA SROs has been assigned based on the matrix tool described in **Figure 2-1** and **Table 2-1**.

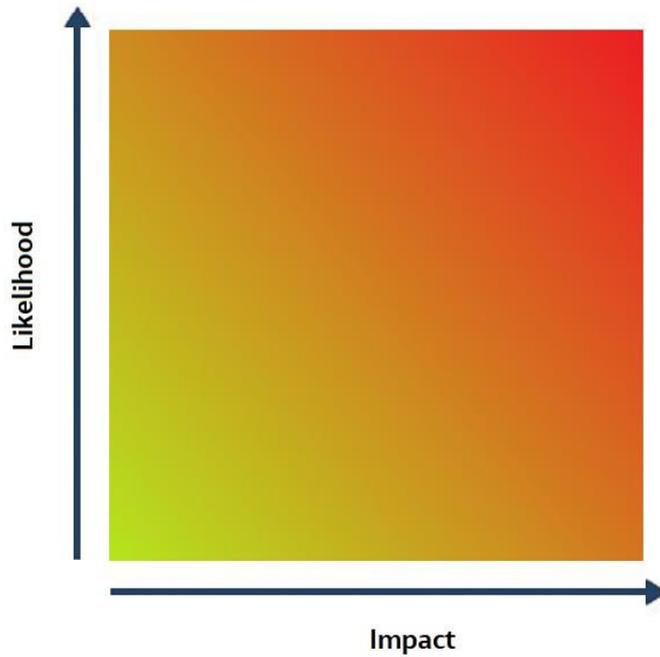


Figure 2-1 Matrix tool adopted in the assessment of INNS

Table 2-1 Impact Classification Categories

Level of impact	Description of impact
Negligible	Likelihood of INNS present in source water negligible e.g. source water drawn from a bore hole.
Low	Impact classification of INNS species found in or near (5km) source water Low and/or transmission pathway low risk e.g., secondary treatment. Assumes all reasonable biosecurity measures adopted.
Medium	Impact classification of INNS species found in or near (5km) source water ≤ High and transmission pathway low/negligible e.g., secondary treatment. Assumes all reasonable biosecurity measures adopted; or Impact classification of INNS species found in or near (5km) source water ≤ Medium and transmission pathway ≤ medium e.g., primary treatment. Assumes all reasonable biosecurity measures adopted.
High	Impact classification of INNS species found in or near (5km) source High or GB NNSS alert species. Raw water transfer or transmission pathway considered medium risk e.g., primary treatment.





### 3. The UU Vyrnwy Aqueduct SRO Options

#### 3.1 Overview

3.1.1 The options for the UUVA SRO being taken forward at Gate 1 have been selected following a process of options identification and appraisal. UU initially identified five possible options for the SRO that were subject to an initial round of screening (Primary Screening), although in this instance all five options were deemed to be potentially feasible. The five feasible options were then assessed in terms of their Average Incremental Cost (AIC) and subject to initial environmental assessment. Taking into account the AIC and the findings of the initial environmental assessments, as well as ongoing engagement with stakeholders, a preferred list of two options for the UUVA SRO was identified.

#### 3.2 UU Vyrnwy Aqueduct SRO Options

3.2.1 The UUVA SRO options being taken forward at Gate 1 comprise of two engineering options to maintain service to the customers supplied directly from the Vyrnwy Aqueduct.

3.2.2 The options summarised in **Table 3-1**.

Table 3-1 UUVA SRO Options

Option Number	Option Name	Summary Description
Option A	Norton to Oswestry WTW	[✂]
Option B	Huntington via Cotebrook to Oswestry WTW	[✂]





## 4. Options Assessment

- 4.1.1 Each of the UUVA SRO options in Error! Reference source not found. have been assessed using the approach described in **Section 2**
- 4.1.2 The assessments are based on available data and evidence as far as possible, primarily spatial data on NBN Atlas, Defra's MAGIC Map, the EA's Ecology & Fish Data Explorer website and the engineering scopes provided for each option. Were pertinent preliminary assessments considered feedback received to date from the EA, Natural England, and Natural Resources Wales. However, due to the limited nature of the engineering and baseline information available at this stage, expert opinion has been employed in most cases on the SRO options.



Table 3 1 Level 1 INNS Screening Impacts from Option Activities

Option Number	Name	Source water	Receiving water	Pathway for transfer	INNS present in and within 5 km of the source supply.	INNS present in source also present in or within 5km of receiving water course? (Y/N)	Conservation designation or protected species present within receiving water body	Potential likelihood (risk) of transfer for each INNS category				Perceive risk category and rationale (mitigation to be determined – see Section 2.2).
								Aquatic plants	Riparian plants	Attached aquatic invertebrates and fish eggs	Free swimming invertebrates and fish	
Option A	Norton to Oswestry WTW	[X]	[X]	Treated water transfer via trunk main.	No INNS recorded by NBN Atlas at Norton Tower. Two INNS recorded at orig. source Lake Vyrnwy including: Japanese knotweed ( <i>Fallopia japonica</i> ) and Himalayan balsam ( <i>Impatiens glandulifera</i> ).	No aquatic INNS recorded within NBN Atlas at [X]  Two INNS Himalayan balsam ( <i>Impatiens glandulifera</i> ) Common monkey-flower ( <i>Mimulus guttatus</i> ), recorded at the Oswestry WTW one of which <i>I. glandulifera</i> is found at source	No designated sites in or within the boundary of Oswestry WTW. Smooth Newt ( <i>Lissotriton vulgaris</i> ) and Great Crested Newt ( <i>Triturus cristatus</i> ) recorded within boundary of Oswestry WTW	Low	Low	Low	Low	Low No INNS recorded at [X] Two riparian INNS recorded at primary water source one of which present in receiving water body. Water to receive secondary treatment at WTW including dosing with Hypochlorite prior to release. No additional abstraction.
Low	Huntington via Cotebrook to Oswestry	[X]	[X]	Treated water transfer via main.	There are a number of INNS within the R.Deer catchment (primary source) within 5km of the abstraction, including: Australian swamp stonecrop <i>Crassula helmsii</i> Floating pennywort <i>Hydrocotyle ranunculoides</i> Water fern <i>Azolla filiculoides</i> Parrot's feather <i>Myriophyllum aquaticum</i> Curly water-thyme <i>Lagarosiphon major</i> Canadian pondweed <i>Elodea canadensis</i> Nuttall's pondweed <i>Elodea nuttallii</i> Japanese knotweed <i>Fallopia japonica</i> Himalayan balsam <i>Impatiens glandulifera</i> Giant hogweed <i>Heracleum mantegazzianum</i> Chinese mitten crab <i>Eriocheir sinensis</i> Zebra mussel <i>Dreissena polymorpha</i> Jenkins' spire shell <i>Potamopyrgus antipodarum</i> Sweetflag <i>Acorus calamus</i> Orange balsam <i>Impatiens capensis</i> Orfe <i>Leuciscus idus</i> Freshwater amphipod <i>Crangonyx pseudogracilis</i> Grass carp <i>Ctenopharyngodon idella</i> Monkey-flower <i>Mimulus guttatus</i> American skunk-cabbage <i>Lysichiton americanus</i> Common Carp – high impact <i>Cyprinus carpio</i>	n/a No aquatic INNS recorded adjacent to the Cotebrook balancing tanks. Two INNS Himalayan balsam ( <i>Impatiens glandulifera</i> ) Common monkey-flower ( <i>Mimulus guttatus</i> ), both of which are found at source, have been recorded at the Oswestry WTW.		Low	Low	Low	Low	Low Although INNS found within primary source, secondary treatment at Huntington in Dee catchment including dosing with Hypochlorite. No additional abstraction.





## 5. Summary of Assessment Results

- 5.1.1 An INNS screening assessment has been undertaken of the two UUVA SRO options being taken forward at Gate 1.
- 5.1.2 Both source options were considered to present a **Low** risk of INNS transfer.
- 5.1.3 It is recommended that all options are reviewed post Gate 1 to take account of the latest available information.



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## Appendix A

Table A-0-1 Classification of aquatic alien species found in the UK in terms of their impact on native habitats and biota. Habitat classification: R, rivers; L, lakes; T, transitional waters; C, coastal waters (Source UKTAG, 2013)

	Common Name	Species	Plant/ Animal	Habitat	Species with updated risk assessments by GBNNSS
High Impact	Australian swamp stonecrop	<i>Crassula helmsii</i>	P	L	Yes
	Floating pennywort	<i>Hydrocotyle ranunculoides</i>	P	R	Yes
	Water fern	<i>Azolla filiculoides</i>	P	R/L	Yes
	Parrot's feather	<i>Myriophyllum aquaticum</i>	P	L	Yes
	Curly water-thyme	<i>Lagarosiphon major</i>	P	L	Yes
	Water primrose	<i>Ludwigia grandiflora</i>	P	L	Yes
	Canadian pondweed	<i>Elodea canadensis</i>	P	R/L	Pending
	Nuttall's pondweed	<i>Elodea nuttallii</i>	P	R/L	Pending
	Japanese knotweed	<i>Fallopia japonica</i>	P	R	Yes
	Giant knotweed	<i>Fallopia sachalinensis</i>	P	R	Yes
	Japanese knotweed/ Giant knotweed hybrid	<i>Fallopia x bohémica</i>	P	R	No
	Himalayan balsam	<i>Impatiens glandulifera</i>	P	R	Pending
	Giant hogweed	<i>Heracleum mantegazzianum</i>	P	R	Pending
	Rhododendron	<i>Rhododendron ponticum</i> (+ hybrids)	P	R	No
	North American signal crayfish	<i>Pacifastacus leniusculus</i>	A	R/L	Yes
	Red swamp crayfish	<i>Procambarus clarkii</i>	A	R/L	Yes
	Virile crayfish	<i>Orconectes virilis</i>	A	R/L	Yes
	Freshwater amphipod	<i>Dikerogammarus villosus</i>	A	R/L	Yes
	Freshwater amphipod	<i>Dikerogammarus haemobaphes</i>	A	R/L	Yes
	Mysid crustacean	<i>Hemimysis anomala</i>	A	R/L	No
Chinese mitten crab	<i>Eriocheir sinensis</i>	A	R/T/C	Yes	
Zebra mussel	<i>Dreissena polymorpha</i>	A	R/L	Yes	
Asiatic clam	<i>Corbicula fluminea</i>	A	R/L	Yes	
Topmouth gudgeon	<i>Pseudorasbora parva</i>	A	L	Yes	
Goldfish	<i>Carassius auratus</i>	A	R/L	No	
Moderate Impact	Carolina water-shield	<i>Cabomba caroliniana</i>	P	R/L	Yes
	Large-flowered water-thyme	<i>Egeria densa</i>	P	L	Yes
	Marbled crayfish	<i>Procambarus</i> spp.	A	R/L	Yes
	Spiny cheeked crayfish	<i>Orconectes limosus</i>	A	R/L	Yes
	Pikeperch (zander)	<i>Sander lucioperca</i>	A	R/L	Yes
	Jenkins' spire shell	<i>Potamopyrgus antipodarum</i>	A	R/L/T/C	Yes
Low Impact	Sweetflag	<i>Acorus calamus</i>	P	R	No
	Montbretia	<i>Crococsmia x crocosmiiflora</i>	P	R	No
	Orange balsam	<i>Impatiens capensis</i>	P	R	No





	Common Name	Species	Plant/ Animal	Habitat	Species with updated risk assessments by GBNNSS
Green	Lupin	<i>Lupinus nootkatensis</i>	P	R	No
	Pink purslane	<i>Montia sibirica</i>	P	R	No
	Cape pondweed	<i>Aponogeton distachyos</i>	P	L	No
	Water hyacinth	<i>Eichhornia crassipes</i>	P	L	Yes
	Giant butterbur	<i>Petasites japonicus</i>	P	R/L	Pending
	Tapegrass	<i>Vallisneria spiralis</i>	P	R	No
	Orfe	<i>Leuciscus idus</i>	A	R/L	No
	Freshwater amphipod	<i>Crangonyx pseudogracilis</i>	A	R/L	Yes
	Noble crayfish	<i>Astacus astacus</i>	A	R/L	Yes
	Narrow-clawed (Turkish) crayfish	<i>Astacus leptodactylus</i>	A	R/L	Yes
	Pumpkinseed	<i>Lepomis gibbosus</i>	A	R/L	Pending
	Rainbow trout	<i>Oncorhynchus mykiss</i>	A	R/L	No
	Grass carp	<i>Ctenopharyngodon idella</i>	A	R/L	No
	Red	Least duckweed	<i>Lemna minuta (minuscula)</i>	P	R/L
Monkey-flower		<i>Mimulus cupreus, M. guttatus</i> and hybrids	P	R	Pending
Other non-native <i>Myriophyllum</i> species			P	L	Pending
Freshwater coelenterate		<i>Craspedacusta sowerbyi</i>	A	R/L	No
Freshwater triclad		<i>Dugesia tigrina</i> <i>Phagocata woodworthi</i> <i>Planaria torva</i>	A	R/L	No
Freshwater mollusc - Asiatic clam		<i>Corbicula fluminea</i>	A	R/L	Pending
Freshwater molluscs		<i>Ferissia wautieri</i> <i>Marstoniopsis scholtzi</i> <i>Menetus dilatatus</i> <i>Musculium transversum</i> <i>Physa acuta</i> <i>Physa gyrina</i> <i>Physa heterostropha</i>	A	R/L	No
Freshwater oligochaetes		<i>Branchiura sowerbyi</i> <i>Limnodrilus cervix</i>	A	R/L	No
Polychaete		<i>Hypania invalida</i>	A	R/L/T	No
Freshwater copepods		<i>Achtheres percarum</i> <i>Ergasilus briani</i> <i>Ergasilus sieboldi</i> <i>Neoergasilus japonicus</i> <i>Tracheliastes polycolpus</i>	A	R/L	No
Other freshwater malacostracans		<i>Asellus communis</i> <i>Corophium curvispinum</i>	A	R/L	No
Brook charr		<i>Salvelinus fontinalis</i>	A	R/L	No
Black bullhead		<i>Ameiurus melas</i>	A	R/L	Pending
Sunbleak		<i>Leucaspius delineatus</i>	A	L	Pending
Bitterling		<i>Rhodeus amarus</i>	A	R/L	No
Sterlet/Sturgeons		All species except <i>A. sturio</i> , which is protected on Schedule 5 of the Wildlife & Countryside Act	A	R/T/C	Pending
European (wels) catfish		<i>Silurus glanis</i>	A	R/L	Pending





	Common Name	Species	Plant/ Animal	Habitat	Species with updated risk assessments by GBNNSS
	South American waterweed	<i>Elodea callitrichoides</i> / <i>Hydrocharis callitrichoides</i>	P	R/L	No
	Swordleaf rush	<i>Juncus ensifolius</i>	P	R/L	No
	Floating primrose willow	<i>Ludwigia peploides</i>	P	R/L	No
	Freshwater amphipod	<i>Echinogammarus ischnus</i>	P	R/L/T	No
	Freshwater amphipod	<i>Echinogammarus trichiatus</i>	P	R/L/T	No
	White river crayfish	<i>Procambarus acutus</i>	P	R/L	Pending
	Freshwater cnidarian	<i>Cordylophora caspia</i>	P	R/L/T/C	No
Waiting List	Water Fern – high impact	<i>Azolla caroliniana</i>	P	R/L	Pending
	American skunk-cabbage – high impact	<i>Lysichiton americanus</i>	P	R/L	Yes
	Common Carp – high impact	<i>Cyprinus carpio</i>	A	R/L	Pending
	Quagga mussel – high impact	<i>Dreissena rostriformis bugensis</i>	A	R/L	Yes

