



INVASIVE NON-NATIVE SPECIES ASSESSMENT

Final Water Resources Management Plan 2024

South Staffs Water

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Front Cover Image:

Blithfield Reservoir, South Staffs Water

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EXECUTIVE SUMMARY

This report sets out the Invasive Non-Native Species (INNS) risk assessment that has been completed to support the South Staffs Water's Water Resources Management Plan 2024 (WRMP24) which water companies in England and Wales are required to produce every five years.

Through an extensive optioneering process, considering a wide range of potential options to balance future supply and demand, South Staffs Water have selected a feasible list of options and a preferred programme. The feasible list includes both demand side and supply side options, of which only the latter requires INNS assessments. Through ambitious demand management options the preferred programme does not require supply side options.

In determining the WRMP24 preferred programme of options, South Staffs Water used the findings of the option-level assessments to inform the programme appraisal process and to determine the preferred programme. The preferred pathway of the preferred programme or any reasonable alternative programmes for WRMP24 do not require any supply options during the planning period of 2025 to 2050 to meet the supply-demand deficit. This is because an ambitious demand management programme provides the required level of savings to meet the forecasted supply-demand deficit. Despite this, one supply option (Option 2.2.2.1) of raising Blithfield dam by 2m has been included in the adaptive pathway for the preferred programme that would be selected if the demand management options are deemed to fall short of target (refer to overarching WRMP24 for further details). Should this adaptive pathway be taken, Option 2.2.2.1 would be implemented (first year of benefit) in 2036. Option 2.2.2.1 is assessed as presenting a Minor INNS risk.

1. INTRODUCTION

1.1 BACKGROUND

Like all water companies in England and Wales, South Staffs Water (SSW) is required¹ to prepare, maintain and publish a Water Resource Management Plan (WRMP). A WRMP sets out the strategy for water resource and demand management to ensure supplies of safe, clean drinking water are maintained to customers throughout the relevant company's region in a way that is economically, socially, and environmentally sustainable.

WRMPs are reviewed on a rolling five-year basis; South Staffs Water published their last final WRMP (WRMP19) in 2019. This cycle of WRMPs (WRMP24) covers the period 2025 to 2050 and beyond. Section 5.14 of the Water Resource Planning Guidelines (WRPG) published in 2023¹ states that water companies must review whether current abstraction operations and future solutions will risk spreading INNS or create pathways which increase the risk of spreading INNS. South Staffs Water published their draft WRMP24 for consultation (including the Invasive Non-Native Species Assessment Report, Issue 1, 23/09/2022) in November 2022 which was further updated to accompany the revised draft WRMP24 (rdWRMP24) following comments received from a 14 week consultation period between November 2022 and February 2023. South Staffs Water received permission from Defra to publish their WRMP24 in a letter dated 21 August 2024. This INNS Assessment Report (Issue 4) will accompany the final WRMP24, both of which will be published in October 2024.

Invasive non-native species (INNS) of flora and fauna are considered the second biggest threat after habitat loss and destruction of biodiversity worldwide. The annual cost of INNS to the Great Britain economy was estimated in 2010 to be £1.7 billion per year, of which around £ 5 million was attributed to the water industry management of INNS. New and existing INNS also pose a threat to achieving Water Framework Directive (WFD) objectives. The UKWIR project completed by Ricardo Energy & Environment (Ricardo)², provided further evidence of the implications of INNS to the water industry.

Subsequently, the Environment Agency (EA) (2017) set out a position paper on the assessment of the risks of spreading INNS through existing water transfers. The position paper set out the scope, outcomes and timelines expected for risk assessments of raw water transfers and options appraisal that water companies should deliver in Asset Management Plan (AMP)7.

As a result, INNS became a new “driver” within the 2019 Price Review (PR19). In previous price reviews, there was some scope for limited INNS work, justified within the biodiversity drivers. Having a separate driver recognised the increasing evidence and understanding of the risks posed by INNS. The guidance supporting this driver is explicit in stating that “the most cost-beneficial and least damaging way to manage invasive species is to prevent their arrival and spread.” This highlights the need to understand the pathways by which INNS can be transferred and hence be spread. Furthermore, the EA has specifically identified raw water transfers (RWTs) as a subgroup of pathways that should have priority risk assessments (RAs) to assess the potential for INNS to spread.

The INNS guidance indicates that all water companies will need to consider:

- Pathways of spread (understanding and reducing the risk from different pathways);
- Preventing spread (controlling, eradicating, or managing INNS to prevent spread where this will contribute to WFD prevention of deterioration); and
- Action on INNS to achieve conservation objectives of Sites of Special Scientific Interest (SSSI) and sites protected under the Habitats Directive.

This has led to INNS being considered in the Water Industry National Environmental Programme across the water industry with a particular focus on investigating the risks of spreading INNS through options appraisal

¹ Ofwat, NRW & EA (2023), Water resources planning guideline updated 14 April 2023)

² UKWIR (2016). Invasive and Non-Native Species (Inns) Implications on The Water Industry. Report produced by Ricardo Energy & Environment. Report Number 16/DW/02/82. October 2016

for mitigation and companywide biosecurity plans to reduce the risk of distributing INNS through existing activities and operations.

In April 2022 the EA set out a further INNS position paper in relation to the management of risk during new and existing raw water transfers. The position paper set out the levels of assurance required to prevent the spread of INNS during new and existing transfers between isolated and connected catchments. The paper states that mitigation between watercourses “be fail safe, resilient and completely effective for all life stages (large fragments/animals/microscopic organisms and larval stages)”.

1.2 PURPOSE OF THIS REPORT

This report sets out the approach taken in reviewing the INNS risk associated with South Staffs Water’s feasible list of options. A separate Appendix (**Appendix 1**) provides A3 summary sheets of the INNS risk assessment for each feasible option to inform South Staffs Water’s selection of preferred options by identifying higher-risk options (from an INNS distribution perspective) which may require further mitigation.

2. SCREENING OF INNS FOR THE WRMP

2.1 HIGH-LEVEL SCREENING

To ensure that INNS were sufficiently considered as part of the assessment of the feasible options, a high-level risk assessment approach was developed. The outcomes of the high-level risk assessment informed both SEA process and options appraisal and design.

We note that the Environment Agency have developed a risk assessment tool for the next stage (Gate-2) of the gated process for the assessments of Strategic Resource Options (SROs), but this tool provides a more detailed assessment of potential INNS pathways. The high-level risk assessment approach was, therefore, developed in view of the Environment Agency's guidelines for INNS assessment to provide a consistent, rapid approach to identifying INNS risks.

The high-level risk assessment was based on a simple questionnaire which was informed by the descriptions and scheme design information of each feasible option (and the associated components). The questionnaires cover three major aspects of each feasible option (see **Table 2.1**):

- The construction of the option / element
- The operation of the option / element
- The maintenance of the option / element

Table 2.1: Summary of the questionnaire used in the high-level risk assessment (excluding mitigation measures)

Construction Questionnaire			
Q1	Does the option require the construction of new infrastructure	YES = Q2	NO = NO Risk
Q2	Are construction activities limited to within the confines of existing infrastructure? (e.g. Improvements to an existing WTW).	Yes = Q4	NO = Q3
Q3	Are construction activities likely to involve the transport of materials such as transport of soils, vegetation or raw water.	Yes = High Risk	No = Medium Risk
Q4	Are construction activities likely to involve the transport of materials such as soils, vegetation or raw water to/from outside of the existing site.	Yes = Med	NO = Low Risk
Construction Questionnaire			
Q1	Does the option/element involve the transfer/abstraction of raw water?	YES = Q2	NO = Q3
Q2	Does the option/element utilise an open-channel transfer mechanism (e.g. river, canal) AND/OR does the option terminate at an open reservoir/channel?	Yes = High Risk	No = Low Risk
Q3	Does the option/element utilise an open-channel transfer mechanism (e.g. transfer channel) AND/OR does the option terminate at an open reservoir?	Yes = Medium Risk	No = No Risk
Maintenance Questionnaire			
Q1	Does the maintenance activity require the movement of machinery, e.g. dredging, excavators, haulage?	YES = Q2	NO = Q3
Q2	Does the maintenance activity require the removal/transport of biological material? (e.g. screen debris, pipeline fouling)	Yes = High Risk	No = Medium Risk
Q3	Does the maintenance activity require the removal/transport of biological material? (e.g. screen debris, pipeline fouling)	Yes = High Risk	No = Low Risk

2.2 CONSIDERATION OF MITIGATION MEASURES

The outcomes of risk assessment were then reviewed / updated to reflect the residual risk after the implementation of mitigation measures. In updating/reviewing the risk assessment in view of available mitigation measures, standard (best practice) mitigation measures were considered. This included those measures that can reduce the spread and distribution of INNS and limit the pathways of distribution during construction, operation and maintenance of the feasible options. These standard measures include (for example):

- Pre-construction considerations:
 - Ensuring detailed checks and risk assessments are carried out for INNS within initial site feasibility assessments and surveys.
 - Where any INNS are present, ensuring contractors understand the risks and implications of managing it, as well as your legal requirements.
 - Where any INNS are identified as a risk of being introduced, spread within, or moved off site, ensure mitigation measures are considered at the early planning stage, and ensure enough time is given to implement them.
 - Consider phasing construction to allow time to deal with the presence and/or risk of spread of INNS.
 - Ensure INNS and locations (mapped) are incorporated within all relevant site method statements, including the site Ecological Protection Plan and Species Protection Plans, where appropriate.
 - Where a species requires long-term management (e.g. Japanese knotweed), ensuring a site management plan is put together that addresses all issues associated with it
 - Nominating a designated Clerk of Works/ecologist to manage the issue of INNS on your site from an early stage.
- Equipment / machinery used in construction or maintenance of options
 - Clear signs/markings should be used to warn staff working there that a site/area contains INNS (where known).
 - Where contaminated soil, materials or water are located, signage should be erected to indicate them.
 - Personnel working on or between sites should ensure their clothing and footwear are cleaned where appropriate to prevent spread
 - Tracked vehicles should not be used within areas known to contain INNS (especially where plan fragments are known to be present).
 - All vehicles leaving the construction and or operational sites and / or transporting infested soil/materials must be thoroughly pressure-washed in a designated wash-down area before being used for other work.
 - Where cross-contamination is possible (i.e. from one site to another), consider designating vehicles or machinery to specific sites where possible to prevent spread.
 - Material / water left after vehicles have been pressure-washed must be contained, collected and disposed of appropriately
 - All wash facilities including wastewater from washing vehicles, equipment or personnel should be managed in a responsible way so as not to not cause harm to the environment

In addition to those standard measure listed above, it is noted that South Staffs Water deliver company-wide biosecurity protocols and standard operating procedures to ensure that operations are tied to biosecurity practices.

It is also recognised that any soil or plant material contaminated with INNS can cause ecological damage and may be classified as controlled waste. This includes any waste material generated at either Water Treatment Works or Wastewater Treatment Works (in relation to effluent re-use options) including waste from the treatment process and from any intake screens. It's an offence to keep, treat or dispose of waste that could harm the environment and human health. It has, therefore, been assumed that any waste during construction, operation and maintenance will be disposed of at an authorised landfill site or suitable disposal site and that such waste will be transported by a registered waste carrier.

It has been assumed that any construction, operational or maintenance waste containing INNS would not be composted. It has also been assumed that, where waste (including soils) has been treated for INNS using any chemical process such waste would be treated as hazardous waste (due to the persistent nature of the chemical) and should be disposed of at a suitable hazardous waste site.

For the review of the feasible and preferred list of options, only standard (best practice) mitigation measures are considered (as listed above). Where an option will result in a significant risk of INNS distribution and this risk cannot be mitigated in consideration of best practice measures, the risk assessment for that option is not amended.

This includes, for example, options that include a raw water transfer where a new pathway/connection is established, and the scheme may require physical and or chemical treatment to reduce the risk. This approach was adopted to identify where the design of the scheme will require further consideration and the risk can be reviewed once more information on the mitigation/treatment measures is available.

2.3 ASSESSMENT OUTPUTS

INNS screening has been completed for the list of feasible options. As stated above, the assessment has considered best practice mitigation measures and or embedded measures that already form part of the scheme design.

The risk assessment was based on the best available data at the time of writing regarding the measures that will be adopted to reduce control and/or eradicate INNS during the operation of an option. The current assessments were used to help inform South Staffs Water selection of the preferred options list.

A separate A3 summary page of the risk assessment results for each of the feasible and preferred options has been provided as a separate Appendix to this report. These A3 summary sheets include:

1. The name and reference number of the feasible option,
2. A “heatmap” to visualise the catchment risk associated with each feasible option,
3. A short list of species associated with the feasible option, including an indication of whether the species is likely to be distributed through the associated activities and the inherent risk score for each species (based on the Great Britain Non-Native Species Secretariat),
4. Notes on the key activities (construction, operation and maintenance) that are considered applicable to feasible option,
5. Notes on the key mitigation measures to considered during activities (construction, operation and maintenance) and any information pertinent to scheme design,
6. A breakdown of the risk assessment for the construction, operation and maintenance activities with and without mitigation measures, and
7. A summary of the overall risk assessment as a Red, Amber, Green (RAG) rating (post mitigation).

3. FEASIBLE OPTIONS INNS ASSESSMENT OUTCOMES

This section outlines:

- The options in the feasible list for SSW WRMP24 that have been subject to INNS assessment.
- The final outcomes of the INNS assessment for each of the options in the feasible list for SSW WRMP24.

3.1 FEASIBLE OPTIONS INCLUDED IN THE INNS ASSESSMENT

Through an extensive optioneering process, considering a wide range of potential options to balance future supply and demand, South Staffs Water has selected the most suitable options to make up the feasible options list. This list includes both demand-side and supply-side options, of which only the latter requires an INNS Risk Assessment. The 16 supply-side options, which are the focus of the INNS assessments, are presented in **Table 3.1** below.

Table 3.1 List of SSW WRMP24 feasible options which have been subject to an INNS Assessment

Option Category	WRMP24 Ref.	Option Name
River Abstraction	2.1.1.1	40 MI/d capacity raw water abstraction from the Trent to Blithfield
Reservoir storage	2.2.1.1	Increase storage at Blithfield: Increase dam height by 1m
Reservoir storage	2.2.2.1	Increase storage at Blithfield: Increase dam height by 2m
Reservoir storage	2.3.1	Chelmarsh Reservoir 15 MI/d - <2m raising
Reservoir storage	2.3.2	Chelmarsh Reservoir 30 MI/d - up to 2m raising
Reservoir storage	6.1.1	40 MI/d capacity treatment works on the Trent, with 14 day storage
Reservoir storage	6.1.3	70 MI/d capacity treatment works on the Trent, with 14 day storage
Third Party	7.1.2.1	Third Party Option: Canal & River Trust: Birmingham Blithfield surplus
Third Party	7.1.5	Canal & Rivers Trust: Chasewater options
Third Party	7.5.1.1	United Utilities (UU) Vyrnwy reservoir raw water release 15 MI/d to River Severn to support SSW
Third Party	7.5.1.2	UU Vyrnwy reservoir raw water release 30 MI/d to River Severn to support SSW
Third Party	7.5.1.3	UU Vyrnwy reservoir raw water release 45 MI/d to River Severn to support SSW
Third Party	7.5.1.4	UU Vyrnwy reservoir raw water release 75 MI/d to River Severn to support SSW
Third Party	8.1.1	Third-party option: potable import in Burton-upon-Trent
Third Party	8.1.5	Drill new GW source with licence trade from Third Party Company X
Third Party	8.3.1	New raw water storage reservoir close to the River Trent

3.2 FEASIBLE OPTION INNS ASSESSMENT SUMMARY

This section presents a summary of the INNS assessment completed for all options included in the feasible list. It is the outcome of risk assessments and A3 outputs which are reported within a separate Appendix to this report. The feasible option INNS assessment summary is presented in **Table 3.2**.

Table 3.2 Feasible option INNS assessment summary

Option Name	WRMP24 Ref.	Construction		Operation		Maintenance	
		Pre Mitigation	Post Mitigation	Pre Mitigation	Post Mitigation	Pre Mitigation	Post Mitigation
40 MI/d capacity raw water abstraction from the Trent to Blithfield	2.1.1.1	Major	Minor	Major	Major	Major	Negligible
Increase storage at Blithfield: Increase dam height by 1m	2.2.1.1	Minor	Minor	Negligible	Negligible	Major	Negligible
Increase storage at Blithfield: Increase dam height by 2m	2.2.2.1	Minor	Minor	Negligible	Negligible	Major	Negligible
Chelmarsh Reservoir 15 MI/d - <2m raising	2.3.1	Major	Minor	Moderate	Negligible	Major	Negligible
Chelmarsh Reservoir 30 MI/d - up to 2m raising	2.3.2	Major	Minor	Moderate	Negligible	Major	Negligible
40 MI/d capacity treatment works on the Trent, with 14 day storage	6.1.1	Major	Minor	Major	Minor	Major	Negligible
70 MI/d capacity treatment works on the Trent, with 14 day storage	6.1.3	Major	Minor	Major	Minor	Major	Negligible
Third Party Option: Canal & River Trust: Birmingham Blithfield surplus	7.1.2.1	Major	Minor	Major	Major	Major	Negligible
Canal & Rivers Trust: Chasewater options	7.1.5	Major	Minor	Major	Major	Major	Negligible
United Utilities (UU) Vyrnwy reservoir raw water release 15 MI/d to River Severn to support SSW	7.5.1.1	Negligible	Negligible	Major	Negligible	Major	Negligible
UU Vyrnwy reservoir raw water release 30 MI/d to River Severn to support SSW	7.5.1.2	Negligible	Negligible	Major	Negligible	Major	Negligible
UU Vyrnwy reservoir raw water release 45 MI/d to River Severn to support SSW	7.5.1.3	Negligible	Negligible	Major	Negligible	Major	Negligible
UU Vyrnwy reservoir raw water release 75 MI/d to River Severn to support SSW	7.5.1.4	Negligible	Negligible	Major	Negligible	Major	Negligible
Third-party option: potable import	8.1.1	Major	Minor	Negligible	Negligible	Minor	Negligible
Third Party Option: drill new GW source with licence trade	8.1.5	Major	Minor	Negligible	Negligible	Minor	Negligible
Third-party option: new raw water storage reservoir close to the River Trent	8.3.1	Major	Minor	Major	Moderate	Minor	Negligible

Several options within the feasible list are identified as presenting a Moderate to Major INNS transfer risks. A post mitigation operational risk summary taken from the A3 outputs (provided within a separate appendix to this report) is provided within **Table 3.3** below.

Table 3.3 Post mitigation risk assessment summary for schemes within the feasible list which are deemed to present a Moderate or Major INNS transfer risk.

Scheme	Post-mitigation operational risk	Risk assessment summary
2.1.1.1	Major	The scheme will establish a new pathway for the distribution of INNS. There is no existing pathway of transfer to Blithfield Reservoir from the River Trent, the transfer of water in an upstream direction will create a new pathway for transferring INNS which may not currently be present at the reservoir and within the downstream watercourse. Mitigation to prevent the transfer of INNS propagules during the transfer in order to reduce the INNS transfer risk.
7.1.2.1	Major	The use of a canal as a transfer mechanism in this scenario poses a high risk, although there is an existing canal, the use of a canal for the transfer of raw water will provide a primary and secondary pathway for the transfer of INNS. Additionally, abstraction and transfer to Blithfield reservoir represent a new distribution pathway from a canal with significant boating traffic and numerous secondary pathways for the distribution of INNS. Mitigation is limited to standard best practice biosecurity measures (such as signs, wash-down facilities for recreational users, etc) which are likely to only be effective in reducing secondary pathway risks.
7.1.5	Major	The use of a canal as a transfer mechanism in this scenario poses a high risk, although there is an existing canal, the use of a canal for the transfer of raw water will provide a primary and secondary pathway for the transfer of INNS. Additionally, the discharge of raw water to Craner Brook represents a new INNS distribution pathway from a canal with significant boating traffic and numerous secondary pathways for the distribution of INNS. Mitigation is limited to standard best practice biosecurity measures (such as signs, wash-down facilities for recreational users, etc) which are likely to only be effective in reducing secondary pathway risks.
8.3.1	Moderate	The construction of a new reservoir fed by raw water abstraction will establish new habitat and transfer pathway for INNS. Additionally, the reservoir will provide new secondary pathways for the distribution of INNS. Although not terminating at an open channel or reservoir the transfer of raw water from the proposed reservoir to Seedy Mill WTW also represents a risk of INNS transfer over a significant distance and between operational catchments. Risk will be reduced if a local treatment works could be constructed in the Burton-Upon-Trent area. Best practice biosecurity measures (such as signs, wash down facilities for recreational users, etc) may also reduce secondary transfer risks at the proposed reservoir.

4. PREFERRED OPTIONS INNS ASSESSMENT OUTCOMES

In determining the WRMP24 preferred plan of options, South Staffs Water used the findings of the feasible options assessments to inform the programme appraisal process and to determine the preferred programme. The WRMP24 does not require any supply options during the planning period of 2025 to 2050 to meet the deficit in the preferred programme because of the ambitious demand management programme which provides the required level of savings.

One supply option (Option 2.2.2.1) involving raising Blithfield dam by 2m has been included in the adaptive pathway for the preferred programme and would be selected if the demand options are deemed to fall short of target (refer to overarching WRMP24 for further details). Should this adaptive pathway be taken, Option 2.2.2.1 would be implemented (first year of benefit) in 2036. The preferred option INNS assessment outcomes for option 2.2.2.1 is presented in **Table 3.2** above with overall post mitigation risk not exceeding Minor RAG rating status. Risk assessments and A3 outputs are reported within a separate Appendix to this report.

Appendices

Appendix 1: INNS risk assessments for feasible options

A separate A3 summary page of the risk assessment results for each of the feasible options has been provided as a separate Appendix.



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