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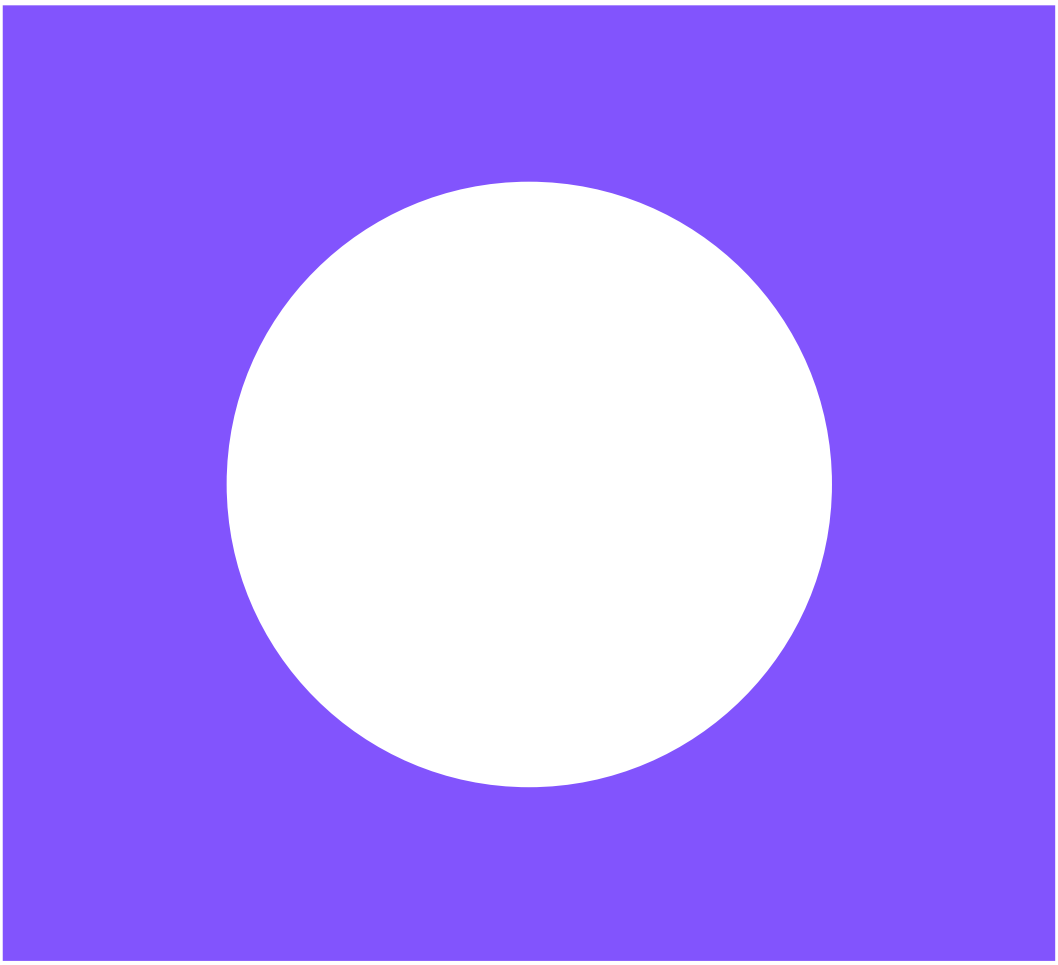

# South West Water, Bristol Water and Bournemouth Water Drought Plan 2027

## SEA Environmental Report: Annex Q - Invasive Non-Native Species (INNS) Risk Assessment

March 2026

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March 2026

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# Contents

## Tables

# Executive summary

As water companies, South West Water, Bristol Water and Bournemouth Water (together referred to as 'SBB' hereafter) have a statutory obligation to produce a drought plan, which sets out how a company intends to manage water resources in response to drought events over a five-year period. The Invasive and Non-native Species (INNS) risk assessment report sits within a suite of environmental assessment documents that accompanies the SBB Drought Plan 2027 ('the Drought Plan'). This assessment process feeds into the plan-making process as part of SBB's Preferred Plan approach.

The purpose of this report is to present the methodology and results of assessments of drought options within the SBB Drought Plan 2027 of creating INNS transfer risk or INNS population changes. In addition, this report includes the assessment of potential in-combination effects of interacting options, and potential cumulative effects through an escalating drought.

Each option being considered has undergone a Level 1 screening, which provides a high-level assessment of INNS transfer risk, and determines any further need for more detailed Level 2 assessments, in-combination assessments and cumulative effects assessments. Level 2 assessments have been undertaken using the Environment Agency's Strategic Resource Option (SRO) Aquatic INNS Risk Assessment Tool (SAI-RAT) v.2.01 ('the tool'). The tool features two separate assessment elements – a raw water transfer risk assessment, and an 'INNS Response Module' (IRM) which qualitatively assesses population responses to changes in water quality, flow velocity, wetted area and water depth. In-combination effects were assessed by analysing how option combinations could create INNS pathways, or exacerbate habitat changes which could affect INNS populations.

Due to programme constraints, some options identified for inclusion within the Preferred Plan have not undergone a Level 2 assessment, where this need was identified at the Level 1 screening. This constraint has also limited in-combination and cumulative effects assessments within the Roadford and Wimbleball Water Resource Zones (WRZ).

Within the Level 1 screening, 38 options were assessed across six WRZs. With respect to INNS transfer 'Risk Magnitude', one option was classed as High risk, eight options were classed as Moderate risk, five options were classed as Low risk, two were classed as Very Low risk and 21 were assessed with a Risk Magnitude of 'None'. One option was assessed as being either Low or Moderate risk depending on optionality. Two options were identified as involving a temporary transfer using new/otherwise unused pathway(s) and therefore required a SAI-RAT risk assessment. A total of 37 options may impact surface water bodies and therefore required an IRM assessment.

Options C-11 (Hawk's Tor Pit (to Colliford Reservoir)) and R-07 (Slade Reservoir) were subject to SAI-RAT risk assessment. Using the tool, these options generated Inherent Risk Scores of 23.17 and 18.17 respectively.

Within the IRM, 27 surface water bodies were identified which may be physically impacted by drought plan options. INNS impacts vary by taxonomic group and habitat type but are generally characterised by mixed or uncertain ecological responses. Aquatic vegetation (e.g., Canadian waterweed (*Elodea canadensis*), Nuttall's waterweed (*Elodea nuttallii*) may increase where wetted area and depth rise in reservoir habitats receiving more water. Riparian vegetation (e.g., Himalayan balsam (*Impatiens glandulifera*), Japanese knotweed (*Fallopia japonica*) may benefit from reduced flow velocity and wetted area. Bivalve molluscs, and snails and shrimps may show negative responses where wetted area and water depth decrease.

With respect to in-combination effects, no interactions were identified between WRZs. Within the Colliford WRZ, potential cumulative effects were assessed as moderate at drought level 2 and high at 3A and 3B. For the Roadford WRZ, potential cumulative effects were assessed as moderate at drought levels 3A and 3B. For the Wimbleball WRZ, potential cumulative effects were identified at moderate risk from drought level 2. No in-combination or cumulative effects were identified for the Isles of Scilly WRZ. For the Bournemouth and Bristol WRZs, the risk of cumulative effects was assessed as moderate at drought level 3B.

The following further assessment work is recommended for relevant options: INNS surveys where data is currently lacking, updated SAI-RAT risk assessments, updated SAI-RAT IRM assessments in light of any modelling results, updated in-combination and cumulative effects assessments, and the evaluation of mitigation requirements for INNS transfer risk or INNS population changes.

# Abbreviations

| Abbreviation | Meaning |
|---|---|
| AA | Appropriate Assessment |
| BH | Borehole |
| DEFRA | Department for Environment, Food & Rural Affairs |
| DO | Deployable Output |
| EA | Environment Agency |
| EAR | Environmental Assessment Report |
| HE | Historic England |
| HOF | Hands-Off Flow |
| HRA | Habitats Regulations Assessment |
| INNS | Invasive Non-Native Species |
| IRM | INNS Response Module |
| IoS | Isles of Scilly |
| L1 | Level 1 |
| L2 | Level 2 |
| Ml/d | Megalitres per day |
| NBN | National Biodiversity Network |
| NE | Natural England |
| NWG | Northumbrian Water Group |
| RWPS | Raw Water Pumping Station |
| RWT | Raw Water Transfer |
| SAI-RAT | SRO Aquatic INNS Risk Assessment Tool |
| SBB | South West Water, Bristol Water and Bournemouth Water |
| SEA | Strategic Environmental Assessment |
| SoR | Statement of Response |
| SRO | Strategic Resource Option |
| ToLS | Test of Likely Significance |
| WFD | Water Framework Directive |
| WRZ | Water Resource Zone |
| WTW | Water Treatment Works |

# 1 Introduction

## 1.1 Background

Water companies have a statutory obligation to produce a drought plan, which sets out how a company intends to manage water resources in response to drought events over a five-year period. In the development of a drought plan, water companies must follow the Environment Agency Water Company Drought Plan Guideline 2025[1]. This sets out the framework and requirements for developing a drought plan in line with the government's objectives to deliver secure, reliable, sustainable and affordable supplies of water, including the need to value nature and connect people with the environment.

The South West Water, Bristol Water and Bournemouth Water (SBB) Drought Plan covers Water Resource Zones (WRZs) in Devon, Cornwall and the Isles of Scilly, as well as Bristol, South Gloucestershire, North Somerset and parts of Somerset, plus Bournemouth, parts of Dorset, Hampshire and Wiltshire. SBB is due to publish its next drought plan in 2027, covering the period from 2027 to 2032. The SBB Drought Plan 2027 provides drinking water to a population of approximately 3.5 million.

As part of the environmental assessment process to support the development of the SBB Drought Plan 2027, an invasive and non-native species (INNS) risk assessment is required under the Wildlife and Countryside Act 1981 and the Invasive Alien Species (Enforcement and Permitting) Order 2019. This assessment follows the following key guidance:

- EA 'Managing the risk of spread of invasive non-native species through raw water transfers', 2022[2]; and
- EA 'Environmental assessment for water company drought planning – supplementary guidance', 2025[1].

A Strategic Environmental Assessment (SEA) is required for the SBB Drought Plan 2027 under the Environmental Assessment of Plans and Programmes Regulations 2004 ('SEA Regulations')[3]. The SEA works to inform the decision-making process through the identification and assessment of significant and cumulative effects that a plan may have on the environment. The SEA process is conducted at a strategic level and enables consultation on the potential effects of a plan with a wide range of stakeholders. The results of the INNS risk assessment feed into the SEA process and the Water Framework Directive (WFD) assessment. Further details can be found in the main SEA Environmental Report, to which this document is appended.

The results of the Level 1 and Level 2 assessments are presented in this appendix report.

[1] Environment Agency (2025). Water Company Drought Plan Guideline, 2025. Available at: https://www.gov.uk/government/publications/water-company-drought-plan-guideline-2025 [accessed January 2026].

[2] Environment Agency (2022). Managing the Risk of Spread of Invasive Non-Native Species through Raw Water Transfers.

[3] GOV.UK (2004) *The Environmental Assessment of Plans and Programmes Regulations 2004*. Available at: https://www.legislation.gov.uk/uksi/2004/1633/contents [accessed January 2026].

## 1.2 SBB Drought Plan 2027 options

The SBB Drought Plan 2027 includes both supply and demand drought options. Supply actions consist of 'operational', 'permit' and 'drought order' actions, as well as local EA agreements. Operational actions tend to be relatively minor activities which SBB can implement without the need for applying for drought permits. In most cases, operational actions have not undergone SEA, HRA, WFD and INNS assessments unless they have been identified as potentially causing harm to the environment or involve activities outside the norm of SBB activities. One operational action has undergone environmental assessments and will be reported on. The remaining supply options involve new or additional activities outside the norm of SBBs usual activities.

Demand options are activities aimed to SBB customers to reduce consumption and therefore retain more water in the natural environment. Due to the nature of the measures, demand options do not require detailed INNS assessment, however, will undergo SEA to identify possible negative and positive effects associated with demand measures.

SBB initially developed a long list of options. Following engagement with regulators, internal SBB workshops and initial environmental screenings, these drought options were refined down to the list presented in the Plan.

The list of options that have undergone assessment includes 33 drought permit options, one action and four local Environment Agency (EA) agreements, and are presented in Table 1.1 below.

### 1.2.1 Removed options

Following the screening of significant environmental constraints and ongoing option development by SBB, some options originally identified by SBB were not progressed. The following options initially underwent early environmental assessment, but were determined as not suitable and have therefore not been considered further within this report:

- C-04b - Stannon Lake - lower hands off level
- C-07b - Park Lake - lower hands off level
- C-29a - Blackpool Pit.
- IS-21 - Transfer 'spare' licence volumes from Tresco to other islands - existing BH source (Borehole by lake).
- IS-08 – Bottled water.
- IS-13 - St Mary's - borehole opportunities requiring permits as above existing licence thresholds.
- IS-15 - Tresco - borehole opportunities with permits as outside of licence conditions.
- IS-20 - St Agnes - borehole opportunities above licence threshold.
- IS-22 - Transfer 'additional' water (>licence) from Tresco to other islands - existing BH source (Borehole by lake).
- IS-23 - Direct abstraction from Great Pool and/or Abbey Pool.

**Table 1.1: Drought Plan 2027 Options**

| Option ID | Option Name | Permit / Action | Option Description |
|---|---|---|---|
| **C-03** | River Fowey at Restormel - increase annual abstraction limit | Permit | Increase the annual abstraction licence limit in order to enable greater abstraction for winter pumped storage to Colliford Reservoir. |

| Option ID | Option Name | Permit / Action | Option Description |
|---|---|---|---|
| **C-04a** | Stannon Lake - increase daily abstraction limit | Permit | Increase the daily abstraction limit at Stannon Lake from 4Ml/d to 6Ml/d by installing temporary pumps and increase annual limit proportionally. Transfer to De Lank and Lowermoor water treatment works (WTW). |
| **C-06** | Colliford Reservoir - reduce compensation flow | Permit | Colliford not releasing compensation flows when making supply releases |
| **C-07a** | Park Lake - increase daily abstraction limit | Permit | Increase the daily abstraction limit at Park Lake from 8 Ml/d to 14 Ml/d. Also need to increase annual and rolling 5 year limit proportionally. |
| **C-10** | Drift Reservoir - reduce compensation flow | Permit | Reduce Drift Reservoir compensation flow by up to 50% |
| **C-11** | Hawk's Tor Pit - abstract from new source | Permit | Transfer 4Ml/d from Hawk's Tor Pit (former quarry) to Colliford Reservoir. |
| **C-17** | Stithians Reservoir - reduce compensation flow | Permit | Reduce Stithians compensation release rate by up to 50%. |
| **C-30** | Siblyback Reservoir - reduce compensation flow | Permit | Siblyback not releasing compensation flows when making supply releases |
| **C-37** | River Cober at Wendron - increase annual licence limit | Permit | Increase of annual abstraction limit which is a key constraint on this licence. |
| **C-40** | Colliford Reservoir - reduce fish bank releases | Local EA agreement | Reduce or not provide / reserve reservoir storage for fish bank releases. Requirement on company undertaking not licence. |
| **R-07** | Slade Reservoir - abstract from new source | Action | Abstract from licensed but disused source. Install temporary pumps to abstract the water and transfer the abstracted water to Hore Down WTW |
| **R-11** | River Lyd to Roadford Reservoir - extend pumped storage abstraction season to include April and May | Permit | Abstract from the River Lyd and transfer into Roadford Reservoir during April and May via existing pipeline (extending currently licensed pumping season of Nov to Mar). |
| **R-20** | Avon Reservoir - reduce compensation flow | Permit | Reduce Avon Reservoir compensation flow by up to 50% for 1 to 4 months in late summer to autumn. |
| **R-21** | Burrator Reservoir - reduce compensation flow | Permit | Reduce the compensation flow at Burrator Reservoir by up to 50% for 1 – 4 months in late summer to autumn |

| Option ID | Option Name | Permit / Action | Option Description |
|---|---|---|---|
| **R-22** | Fernworthy Reservoir - reduce compensation flow | Permit | Reduce the compensation flow at Fernworthy Reservoir by up to 50% for 1 to 4 months in late summer to autumn. |
| **R-23** | Trenchford Reservoir - reduce compensation flow | Permit | Reduce the compensation at Trenchford Reservoir by up to 50% for 1 to 4 months in late summer to autumn |
| **R-24** | Meldon Reservoir - reduce compensation flow | Permit | Reduce the compensation flow at Meldon Reservoir by up to 50% for 1 to 4 months in late summer to autumn |
| **R-25** | Roadford Reservoir - reduce compensation flow | Permit | Roadford not releasing compensation flows when making supply releases. |
| **R-26** | Upper Tamar Lake - reduce compensation flow | Permit | Reduce the compensation flow at Upper Tamar Lake by up to 50% for 1 to 4 months in late summer to autumn |
| **R-45** | River Dart & Littlehempston boreholes - aggregate daily and annual licence limits | Permit | Aggregate daily and annual abstraction limits between Littlehempston boreholes and ranneys licence and River Dart at Littlehempston licence. Full licensed volume cannot be abstracted from boreholes due to hydraulic constraints, but licence is key constraint for river abstraction. |
| **R-48** | Roadford Reservoir - reduce fish bank releases | Local EA agreement | Reduce or not provide / reserve reservoir storage for fish bank releases. Requirement on company undertaking not licence. |
| **W-03** | Wimbleball Reservoir - reduce compensation flow | Permit | Wimbleball not releasing compensation flows when making supply releases. |
| **W-06** | Brampford Speke & Stoke Canon - abstract from new source | Permit | Abstract from licensed but disused borehole sources, releasing the abstracted water into the River Exe and abstracting this water at Pynes WTW. Would need discharge permits / modification to abstraction licence / ordinary drought order. |
| **W-09** | River Exe to Wimbleball Reservoir - extend pumped storage abstraction season to include April and May | Permit | Extension of winter pumped storage season (November to March) to include April and May. |
| **W-22** | Wimbleball Reservoir - reduce fish bank releases | Permit | Reduce or not provide / reserve reservoir storage for fish bank releases |
| **BR-27a** | Blagdon Reservoir - reduce compensation flow | Permit | Reduce the compensation flow at Blagdon Reservoir by up to 50% |

| Option ID | Option Name | Permit / Action | Option Description |
|---|---|---|---|
| **BR-27b** | Blagdon Reservoir - delay water bank releases | Local EA agreement | Delay of Blagdon Reservoir water bank releases until storage has recovered. Expectation that new licence will allow flexibility in timing when agreed with EA. Normally releases made in late summer. |
| **BR-28a** | Chew Valley Lake - reduce compensation flow | Permit | Reduce the compensation flow at Chew Valley Lake by up to 50% |
| **BR-28b** | Chew Valley Lake - delay water bank releases | Local EA agreement | Delay of Chew Valley Lake water bank releases until storage has recovered. Expectation that new licence will allow flexibility in timing when agreed with EA. Normally releases made in late summer |
| **BR-29** | Chew Magna Reservoir - reduce compensation flow | Permit | Reduce the compensation flow at Chew Magna Reservoir by up to 50% |
| **BR-30** | Cheddar Ponds - reduce compensation flow | Permit | Reduce the compensation flow at Cheddar Ponds by up to 50% |
| **BR-31a** | River Axe to Cheddar Reservoir - extend pumped storage abstraction season to include October | Permit | Extend pump storage season for River Axe at Brinscombe to Cheddar Reservoir from Nov-Apr to include October and increase annual abstraction limit proportionally. |
| **BR-31b** | River Axe to Cheddar Reservoir - extend pumped storage abstraction season to include May | Permit | Extend pump storage season for River Axe at Brinscombe to Cheddar Reservoir from Nov-Apr to include May and increase annual abstraction limit proportionally. |
| **BR-47** | River Axe to Cheddar Reservoir - early commissioning of pumped storage abstraction | Permit | Abstraction for pre-treatment and transfer to Cheddar Reservoir licensed for Nov-Apr. Commissioning and priming treatment processes each year takes a few weeks as it requires river water to be optimised (so abstracted water cannot be discharged to reservoir until complete). Allowing abstraction during October for commissioning treatment process with discharge back to abstraction point would allow water to be discharged immediately into reservoir on 1st Nov. May also need to increase annual limit proportionally. |
| **BN-04** | River Stour at Longham - remove low flow constraint | Permit | Remove low flow constraint on River Stour at Longham, allowing increased abstraction. |
| **BN-05** | Stanbridge boreholes – increase daily abstraction limit | Permit | Increase daily abstraction above current licence limit of 12.5Ml/d to 17.5Ml/d with current infrastructure and without borehole 3 and increase annual limit proportionally. |

| Option ID | Option Name | Permit / Action | Option Description |
|---|---|---|---|
| **BN-12** | River Stour at Longham - increase weekly abstraction limit | Permit | River Stour at Longham licence change in April 2028 includes reduction in allowed weekly abstraction total - 310.22 to 222.72Ml/week. Permit to increase weekly limit. |
| **IS-18** | St Martins - increase abstraction from boreholes to greater than 20m3/d | Permit | Drop and resize pumps in existing boreholes to maximise Deployable Outputs (DO) above 20m$^3$/d. |

Source: South West Water, 2025

The EA's Drought Plan Guideline[1] states that water companies must demonstrate they have met their responsibility to monitor, assess and where possible mitigate for the environmental impact of all drought supply options. This will be fully met through the production of detailed Environmental Assessment Reports (EARs) for each supply option taken forward in the final Drought Plan. This is a separate process to this initial INNS risk assessment, which is based on the available information at the time of writing. Further assessment will be undertaken through the Environmental Assessment Report (EAR) process during 2026.

## 1.3 Drought Levels and Environmental Impact

The Department for Environment, Food and Rural Affairs (DEFRA) guidance on Drought Planning states that Drought Plans should demonstrate the actions that will be taken to manage drought at each level. It stipulates:

- Drought Level 1 actions (with a minor environmental impact) are implemented during prolonged dry weather.
- Drought Level 2 and 3a options (with a minor and moderate environmental impact respectively) are implemented during drought.
- Drought Level 3b options (with a major environmental impact) are implemented during a severe drought.

The process of determining the sequencing of drought options as a result of environmental impact has been an iterative process, with early findings from the SEA supporting decision-making. As the SEA process and plan-making tend to go hand-in-hand, the current guidance presents a challenge in using the environmental effects to determine the sequencing of drought options in the plan. Therefore, SBB have had to use professional judgement to supplement early SEA findings in order to put forward a preferred Plan.

There has been ongoing work on the drought options and levels, and as the results of environmental assessments have become available, the environmental impact category and associated confidence levels have been reviewed and updated where necessary. The drought levels reported on reflect the expected drought levels for options at the time of undertaking the assessments.

Due to programme constraints, some options identified for inclusion within the preferred Plan have not undergone stage 2 assessment (HRA Appropriate Assessment (AA), WFD Level 2 and INNS Response Module). However, they have undergone stage 1 assessment (HRA Test of Likely Significance (ToLS), WFD Level 1 and INNS RA), and each have an option-level SEA. Care has been taken to ensure that the majority of the options which will be implemented first, and therefore more likely to be used, have undergone detailed stage 2 assessments. Most of the options within the Preferred Plan which are expected to be implemented in drought levels 1,

2 and 3a have undergone full assessment, with results reported on within the report and technical appendices. The 3b options within the Bournemouth WRZ have also undergone full detailed assessment, as these are the only drought supply options identified within this WRZ. All other 3b options have not yet undergone stage 2 assessment. The guidance states that 3b options are those with a major environmental impact. As such, it was considered imperative to ensure the options within the lower drought levels were fully assessed to ensure that they align with the guidance in having only a minor or moderate environmental impact.

It is possible that as a result of the findings of the more detailed assessments, the sequencing of options within the plan may change.

## 1.4 Environmental Assessment Reports

The EA's Drought Plan Guideline states that water companies must demonstrate they have met their responsibility to monitor, assess and where possible mitigate for the environmental impact of all drought supply options[1].

Drought options which are to be implemented at drought levels 2-3a will also undergo a highly detailed EAR which will include extensive hydrological modelling and ecological surveys which will build upon the assessments undertaken to date in order to reach a state of 'permit readiness'. An EAR methodology document has been developed as part of the SEA work and will be subject to consultation alongside this report. This will set out the detail and structure which will be adhered for every EAR in the Plan. Alongside this, SBB have agreed to set out a timeline for undertaking the EAR work, which can be found in Appendix 5 of the Drought Plan.

## 1.5 Preferred Plan and alternatives

The Preferred plan includes a selection of supply and demand options across the SBB region. All available supply options have been taken forward in the Plan. This has ensured a robust Plan which offers a number of supply options in every WRZ, should they be required during a drought.

It is assumed that for each supply side option, the relevant demand side options will have been active for 28 days prior to the implementation of the relevant supply option for that drought level.

As per EA guidance, options considered to have a minor environmental impact will be implemented first at drought level 1 and 2, with options assesses as having a moderate-major environmental impact implemented at later drought levels (3a and 3b), as these are less likely to be needed.

As every available option has been selected for the Plan, no alternatives to the Preferred Plan were available for assessment. Therefore, the SEA takes the approach of assessing the environmental effects at each drought level, to establish how the environment would likely be affected as a drought worsens, and to support the decision-making in relation to assigning options to drought levels.

## 1.6 Scope of report

The purpose of this report is to present the results of the INNS assessments which have been undertaken on the drought options within the SBB Drought Plan 2027 to assess the risk of INNS introduction and potential impacts as a result of environmental changes associated with the operation of the drought plan options.

This report presents the assessment of 38 drought supply options.

The aims of this report are to:

- Present the results of the 'Level 1 screening' of 38 drought options;
- Use the results of the Level 1 screenings to identify options that require a more detailed 'Level 2 assessment';
- Present the results of the Level 2 assessments; and
- Evaluate potential in-combination and cumulative effects of interacting options within the SBB Drought Plan 2027.

# 2 Methodology

## 2.1 Level 1 screening

### 2.1.1 INNS transfer risk screening methodology

The Level 1 screening is based on the concept of risk as the product of the frequency and severity transfer operation, as the result of a drought option. Therefore, the methodology involves an assessor determining a Frequency of Impact and Severity of Impact, which are combined to give an overall Risk Magnitude.

The Level 1 screening methodology is informed by the Environment Agency's Position Statement on managing the risk of INNS through raw water transfers[2]. The approach to reducing the risk of INNS transfer outlined within this document is focused upon the pathways that transfers create, rather than current INNS distribution. Therefore, the Risk Magnitude rating produced by this Level 1 screening relates to the nature of any pathways created by water resource options and the impacts they are likely to have. Thus, the severity of risk is greater if a transfer links previously unconnected waterbodies, or if it involves the transfer of raw water (rather than treated water or groundwater).

Table 2.1 below shows the criteria used for determining the Frequency of Impact rating.

**Table 2.1: Frequency of Impact risk criteria in INNS screening**

| Frequency of Impact | Criteria |
|---|---|
| None | No additional frequency of impact risk beyond risk associated with existing operations |
| Infrequent | Only occurs in emergency or during situations not considered part of the normal running of the scheme |
| Periodical | Will happen during start up or shut down, or periodically during routine maintenance or operation of the option |
| Regular | Will occur throughout the regular operation of the option |

Source: Mott MacDonald, 2026.

Table 2.2 below shows the criteria used for determining the Severity of Impact rating.

**Table 2.2: Severity of Impact risk criteria used in INNS screening**

| Severity | Criteria |
|---|---|
| None | No additional severity of impact risk beyond risk associated with existing operations. |
| Very Low | Treated water, effluent or groundwater |
| Low | Raw/untreated/partially treated water transfer, receptor is not a surface or groundwater body (e.g. is a water treatment facility/water treatment works) |
| Medium | Change in volume of transfer between waterbodies which are already connected |
| High | New pathway between waterbodies not current connected or potential to introduce new INNS not currently observed in the UK |

Source: Mott MacDonald, 2026.

Once Frequency of Impact and Severity of Impact were determined for drought option, the results are combined in the matrix (shown in Table 2.3), in order to generate an overall Risk Magnitude rating. Where 'None' was selected for Frequency of Impact and/or Severity of Impact, 'None' was assigned as the Risk Magnitude rating.

**Table 2.3: Calculation matrix for Risk Magnitude rating**

| Frequency/Severity | None | Infrequent | Periodical | Regular |
|---|---|---|---|---|
| None | 0 = None | 0 = None | 0 = None | 0 = None |
| Very Low | 0 = None | 1 = Very Low | 1 = Very Low | 1 = Very Low |
| Low | 0 = None | 2 = Low | 2 = Low | 3 = Low |
| Medium | 0 = None | 3 = Low | 4 = Moderate | 4 = Moderate |
| High | 0 = None | 4 = Moderate | 5 = High | 6 = High |

Source: Mott MacDonald, 2025

### 2.1.2 Progression to further assessment

Progression to Level 2 assessment is based upon a combination of the Level 1 screening result, which assesses INNS transfer risk, and the potential for the option to alter habitat suitability for INNS. This is summarised in Table 2.4 below.

Options which involve a new or temporary transfer which may create or reinstate an INNS pathway were subject to Level 2 risk assessment using the Environment Agency's Strategic Resource Option (SRO) Aquatic INNS Risk Assessment Tool (SAI-RAT) (v.2.01). This aspect of the tool was not considered suitable to assess other options types. However, options which could affect INNS populations through habitat change were subject to assessment using the INNS Response Module (IRM) within SAI-RAT (v.2.01). In practice, this applies to all options types except demand reduction.

All options which could by their nature physically interact were also subject to in-combination effects assessment. Again, in practice, this applied to all options types except demand reduction.

**Table 2.4: Rationale for progression to further assessment**

| Option types | SAI-RAT risk assessment | SAI-RAT IRM | In-combination effects |
|---|---|---|---|
| 1. Temporary transfer using new/otherwise unused pathway(s) | Yes, if Level 1 (L1) is High/ Moderate/ Low | Yes if flow, wetted perimeter, water level or water quality changes are expected relative to baseline (without option) | Yes |
| 2. Extend abstraction season | No | | Yes |
| 3. Increase abstraction licence limit (relative to baseline) - temporary | No | | Yes |
| 4. Lower lake hands off level | No | | Yes |
| 5. Groundwater source | No | | Yes |
| 6. Reduce compensation flow | No | | Yes |
| 7. Fish bank releases | No | | Yes |
| 8. Demand reduction option | No | No | No |

Source: Mott MacDonald, 2026

## 2.2 Level 2 assessment

### 2.2.1 SAI-RAT overview

The current version of SAI-RAT (v.2.01) builds upon other assessment tools such as the Northumbrian Water Group (NWG) raw water transfer assessment tool, the Wessex Water asset assessment tool, and previous iterations of the tool to provide a standardised approach to quantifying the INNS risk associated with SROs. Detailed instructions for use of the tool are provided in the SAI-RAT – User Guide (APEM, 2024).

SAI-RAT v.2.01 includes two independent functions which can be used to assess different aspects of INNS risk:

- Risk assessment – generates risk scores indicating the likelihood of INNS spread for asset and raw water transfer (RWT) components which form a water resource option, see Section 2.2.2.
- INNS Response Module (IRM) – provides a qualitative assessment of INNS responses to changes in water quality, water level, flows and wetted perimeter within aquatic habitats, see Section 2.2.3.

### 2.2.2 SAI-RAT risk assessment

SAI-RAT is underpinned by a pathway-based methodology which requires source assets, RWTs and receptor assets to be identified and assessed. Assets are considered as any discrete water body, property, facility, or package of land where INNS could spread to or from. RWTs are defined as the intentional and artificial movement of water between assets, which could enable the spread of viable INNS from a source to a transfer route and receptor.

Complex schemes could comprise a number of asset and RWT components, which can be assessed collectively within the tool. The tool also allows ‘in-line closed assets’ (e.g. raw water pumping stations (RWPS) located along RWTs, and ‘secondary transfers’ (RWTs connected to scheme components, but not created or altered by the scheme) to be included in assessments.

The tool takes the form of a Microsoft Excel spreadsheet, into which data and information about asset and RWT components are entered by the assessor. The tool generates ‘likelihood’ scores for each asset, which indicates the likelihood that INNS could be spread on or off the asset. The tool combines the RWT input data and asset likelihood scores to generate the following five outputs:

1. The likelihood of INNS spread from the source.
2. The likelihood of INNS spread on/off the transfer route.
3. The severity of INNS impact upon the transfer route – indicates the cost of INNS spreading into recipient locations (APEM, 2024).
4. The severity of INNS impact upon the receptor – indicates the cost of INNS spreading into recipient locations.
5. An overall inherent risk score – combining likelihood and severity scores. Inherent risk scores are presented as a percentage of the highest potential score, with a higher score indicating a higher INNS transfer risk.

SAI-RAT (v2.01) assessment uses the search areas defined in Table 2.5 which are therefore included within the study area for each option assessed.

**Table 2.5: SAI-RAT (v2.01) asset and RWT search areas**

| SAI-RAT element | Search areas |
|---|---|
| Assets | • Approximate length in kilometres of natural water bodies flowing into asset, capped at 20km<br>• INNS records within 1km<br>• Designated sites at source assets<br>• Designated sites within 1km of receptor assets<br>• Priority Habitats within 1km of receptor assets |
| Along RWT routes | • INNS records within 1km<br>• Designated sites within 1km<br>• Priority Habitats within 1km<br>• WFD water bodies within 1km<br>• Terrestrial recreation (i.e. hiking, cycling, horse riding) within 100m<br>• Adjoining water bodies<br>• Predominant broad habitat type surrounding the open water bodies adjoining RWT routes assessed up to 10km upstream |

Source: APEM, 2024

Two options – C-11 and R-07 – were subject to SAI-RAT risk assessment. Within SAI-RAT, these options were divided into asset and RWT components as shown in Table 2.6. SAI-RAT risk assessment inputs are provided in Appendix A.1 (C-11) and Appendix A.2 (R-07).

**Table 2.6: SAI-RAT (v2.01) risk assessment components for options C-11 and R-07**

| Option | Source asset | In-line closed assets | Receptor asset |
|---|---|---|---|
| C-11 | Hawk's Tor Pit | None assessed | Colliford Reservoir |
| R-07 | Slade Reservoirs (considered collectively) | None assessed | Hore Down WTW |

Source: Mott MacDonald, 2026

### 2.2.3 SAI-RAT INNS Response Module

The IRM provides a high-level, qualitative assessment of potential responses of 14 different broad taxonomic INNS groups in response to the following environmental changes:

- Changes in water quality
- Changes in flow velocity
- Changes in wetted area
- Changes in water depth

The IRM assessment for each drought option therefore followed process below:

1. For each option, aquatic habitats which could experience changes in water quality, flow velocity, wetted area or water depth relative to the option not being in place, were identified.
2. For each habitat, the likely direction of each of these four environmental parameters in response to the option, relative to it not being in place, was determined.
3. Aquatic and riparian INNS records were gathered for each habitat.
4. The IRM module within SAI-RAT v.2.01 was used to assess the likely response of each INNS group identified, within each habitat that may be affected.

This assessment requires the identification of INNS present within habitats which may be affected. Open-source macroinvertebrate, macrophyte (aquatic plant) and fish data was obtained using the Environment Agency Ecology & Fish Data Explorer (Environment Agency,

2021) and National Biodiversity Network (NBN) Atlas online records system (NBN Trust, 2024)[4]. As prescribed in SAI-RAT v.2.01 guidance, INNS listed within the Water Framework Directive UK Technical Advisory Group (WFD UK-TAG, 2021) guidance on the classification of aquatic alien species according to their level of impact, were included, as were all records, regardless of age (APEM, 2024).

For the purposes of these assessments, a 'reach' in which a search for INNS was undertaken was defined as the border of the WFD Waterbody in which the option was located.

The outputs of this assessment are presented in a table which provides a high level description of the excepted change to each broad taxonomic INNS group including the expected change in population "Fitness" and the confidence in the overall assessment.

The IRM does not predict likely INNS responses to water quality impacts, as they are complex, and highly species and location specific.

## 2.3 Cumulative and In-Combination Effects

In-combination effects may arise where two or more options interact. This may take the form of INNS pathways being combined, or the interaction of physical responses within a site (for example two options could reduce river flows, leading to a greater overall reduction if they are both implemented).

The implementation of additional options through an escalating drought could lead to cumulative effects at each drought stage. As such, the assessment of in-combination and cumulative effects was undertaken together. For the Preferred Plan, the in-combination and cumulative effects assessment for INNS comprised the following stages, and was applied to all options screened in for this assessment at Level 1:

1. Determination of the specific surface water sites which would be involved in each drought option.
2. An initial plan-level screening of sites to determine potential interactions between WRZs (in the Preferred Plan no interaction between WRZs was identified).
3. Screening of potential option interactions; source, pathway and receptor surface water sites were identified for each drought option as appropriate, to determine sites which could be affected by multiple options. Sites which could be affected by multiple options were progressed to step 4.
4. For each site screened in at step 3, the expected physical response (relating to water quality, flow velocity, wetted perimeter and depth as determined in the IRM analysis for each option was collated and compared to determine if responses to individual options are likely to exacerbate or offset each other. This qualitative analysis was undertaken for each drought level, to determine the cumulative impacts through an escalating drought.
5. For each site screened in at step 3, a qualitative assessment of ecological responses was undertaken by collating and comparing the expected responses of each INNS group to each option as determined in the IRM analysis to understand if responses to individual options are likely to exacerbate or offset each other. Again, this analysis was undertaken for each drought level, to determine the cumulative impacts through an escalating drought.
6. Finally, the results of the screening of options interactions and IRM analysis were combined for each WRZ and at each drought level to give a risk of cumulative effects, following the matrix shown in Table 2.7.

[4] Citations for all species distributions used for this assessment are listed within References

**Table 2.7: Risk of cumulative effects matrix**

| Risk of cumulative effects | Connectivity | Combined INNS response |
|---|---|---|
| None | No option interaction identified in plan at this drought level | No option interaction identified in plan at this drought level |
| Low | Options would not combine to create new/temporary pathway between water bodies currently unconnected<br>One or more options would physically impact the same water body | No potential additional positive INNS population response identified in source or receptor water bodies |
| Moderate | Options would not combine to create new/temporary pathway between water bodies currently unconnected<br>One or more options would physically impact the same water body | Potential additional positive INNS population response identified in source or receptor water bodies |
| High | Options combine to create new/temporary pathway between water bodies not currently connected by individual options | High risk assigned irrespective of INNS response |

Source: Mott MacDonald, 2026

## 2.4 Limitations and Assumptions

### 2.4.1 Generic

All assessments evaluate the potential impact of drought options relative to a baseline scenario in which they are not implemented.

In line with the Position Statement (Environment Agency, 2022), the increased risk of INNS transfer associated with drought options has been assessed, in addition to any risk associated with existing schemes.

Unless stated otherwise within the assessment, it has been assumed transfers of water between assets would occur utilising existing pipelines or infrastructure.

Where construction is required, it is assumed best practice will be implemented to prevent the spread of INNS during this phase, and that construction-phase risks will therefore be minimal.

### 2.4.2 Level 1 screening

C07 a(B): Assumes option will use the same receptors as C-07a. This option assesses This option assesses St. Cleer WTW.

Assumes option will use the same receptors as C-07a. This option assesses This option assesses Colliford Reservoir.

### 2.4.3 SAI-RAT risk assessment

SAI-RAT risk assessments were undertaken with the option information available at the time. These assessments should be updated as options are developed or if more information becomes available.

In-line closed assets such as RWPS were not included within SAI-RAT assessments; however these should be included as appropriate if assessments are updated.

### 2.4.4 SAI-RAT IRM

SAI-RAT IRM assessments were limited by the INNS records available for each relevant site. As options are developed and assessed, further surveys may be required, and IRM assessments should be reviewed.

The SAI-RAT IRM does not predict INNS responses to water quality changes and instead recommends a species-specific approach where potential water quality changes are identified. It is unlikely that INNS responses to water quality can be precisely determined; however, a more detailed evaluation of potential responses on a site-by-site basis may be needed.

### 2.4.5 In-combination and cumulative effects

Due to the complex nature of water quality interactions, it was not possible to undertake a high-level assessment of expected responses to INNS group as a result of habitat changes associated with the operation of drought plan options. In order to fully understand the impacts to INNS populations as a result in water quality changes a species-specific approach would be required for each option to understand this further.

The assessment of in-combination and cumulative effects is dependent on the INNS records available for each relevant site. As options are developed and assessed, further surveys may be required, and IRM assessments should be reviewed.

# 3 Level 1 screening results

This section presents the results of the Level 1 INNS screening assessments for all WRZs. Where these assessments highlighted the requirement for further investigation, Level 2 assessments were undertaken.

## 3.1 Colliford WRZ

A total of 10 options were assessed within the Colliford WRZ. Option C-07a had two alternative receptors options (A and B), so receptor options were assessed separately. The results are presented below in Table 3.1.

One option (C-11) would involve a temporary transfer using a new pathway, and therefore requires a SAI-RAT risk assessment. This option was also assessed as High Risk magnitude.

Two options were assessed with a Moderate Risk Magnitude (of INNS transfer). Four options (including two sub-options) were assessed with Low Risk Magnitude. Five options relating to compensation flow reduction and fish bank releases were assessed with a Risk Magnitude of None.

All options have the potential to result in environmental changes which may affect INNS populations, and therefore require a SAI-RAT IRM assessment.

All transfers would occur within the same WFD Operational Catchment with the exception of options C-07a (St Cleer WTW receptor), which involves water transfer into a catchment classed as ‘receiving to WTW only’. All transfers would occur within the same WFD Management Catchment.

**Table 3.1: Level 1 INNS screening results for the Colliford WRZ**

| Option | Option type | Description of risks/impacts | Catchment connectivity | Frequency of Impact rating | Severity of Impact rating | Risk Magnitude rating | Further assessment(s) |
|---|---|---|---|---|---|---|---|
| C-03: River Fowey at Restormel - increase annual abstraction limit | Increase abstraction volume (relative to baseline) - temporary | • Change in volume of existing transfer between locations already connected<br>• Increased abstraction at existing intake may result in physical impacts to habitats within source reservoir. Habitat changes may affect INNS populations. | Transfer within WFD Operational Catchment | Periodical | Medium | 4 = Moderate | • SAI-RAT IRM<br>• In-combination effects |
| C-04a: Stannon Lake | Increase abstraction volume (relative to baseline) - temporary | • Change in volume of existing transfer between locations already connected Assumes any transferred INNS would be treated/removed at water treatment facility.<br>• Increased abstraction at existing intake may result in physical impacts to habitats within source reservoir. Habitat changes may affect INNS populations. | Transfers within WFD Operational Catchment | Periodical | Low | 2 = Low | • SAI-RAT IRM<br>• In-combination effects |
| C-06: Colliford Reservoir - reduce compensation flow | Reduce compensation flow | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No Transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |
| C-07a (A): Park Lake (to St. Cleer WTW) | Increase abstraction volume (relative to baseline) - temporary | • Change in volume of existing transfer between locations already connected Assumes any transferred INNS would be treated/removed at water treatment facility.<br>• Increased abstraction at existing intake may result in physical impacts to habitats within source reservoir. Habitat changes may affect INNS populations. | Cross WFD Operational Catchment transfer, receiving catchment is receiving to river or reservoir | Periodical | Low | 2 = Low | • SAI-RAT IRM<br>• In-combination effects |

| Option | Option type | Description of risks/impacts | Catchment connectivity | Frequency of Impact rating | Severity of Impact rating | Risk Magnitude rating | Further assessment(s) |
|---|---|---|---|---|---|---|---|
| C-07a (B): Park Lake (to Colliford Reservoir) | Increase abstraction volume (relative to baseline) - temporary | • Change in volume of existing transfer between locations already connected<br>• Increased abstraction at existing intake may result in physical impacts to habitats within source reservoir. Habitat changes may affect INNS populations. | Transfer within WFD Operational Catchment | Periodical | Medium | 4 = Moderate | • SAI-RAT IRM<br>• In-combination effects |
| C-10: Drift Reservoir - reduce compensation flow | Reduce compensation flow | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |
| C-11: Hawk's Tor Pit - abstract from new source | Temporary transfer using new/otherwise unused pathway(s) | • Change in volume and timing of existing transfer between water bodies not currently connected.<br>• Increased abstraction at existing intake may result in physical impacts to habitats within source and receiving reservoirs. Habitat changes may affect INNS populations. | Transfer within WFD Operational Catchment | Periodical | Medium | 5 = High | • SAI RAT RA<br>• SAI-RAT IRM<br>• In-combination effects |
| C-17: Stithians Reservoir - reduce compensation flow | Reduce compensation flow | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |
| C-30: Siblyback Reservoir - reduce compensation flow | Reduce compensation flow | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |

| Option | Option type | Description of risks/impacts | Catchment connectivity | Frequency of Impact rating | Severity of Impact rating | Risk Magnitude rating | Further assessment(s) |
|---|---|---|---|---|---|---|---|
| C-37: River Cober at Wendron - increase annual licence limit | Increase abstraction volume (relative to baseline) - temporary | • Change in volume of existing transfer between locations already connected Assumes any transferred INNS would be treated/removed at water treatment facility.<br>• Increased abstraction at existing intake may result in physical impacts to habitats within source reservoir. Habitat changes may affect INNS populations. | Transfer within WFD Operational Catchment | Periodical | Low | 2 = Low | • SAI-RAT IRM<br>• In-combination effects |
| C-40: Colliford Reservoir - reduce fish bank releases | Fish bank releases | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |

Source: Mott MacDonald, 2026

## 3.2 Roadford WRZ

A total of 11 options were assessed within the Roadford WRZ. The results are presented below in Table 3.2. All options were identified as requiring further assessment.

One option (R-07) would involve a temporary transfer using otherwise unused pathways, and requires a SAI-RAT risk assessment.

One option was assessed with a Moderate Risk Magnitude. Two were assessed with Low Risk Magnitude. Eight options relating to compensation flow reduction and fish bank releases were assessed with a Risk Magnitude of None.

All options have the potential to result in environmental changes which may affect INNS populations, and therefore require a SAI-RAT IRM assessment.

The majority of options transfer water, however the three options transfer water within the same WFD Operational Catchment. The pipeline route of two of these options may (R-07 and R-45) may cross into the adjacent WFD Operational Catchment. All transfers are within the same WFD Management Catchment.

**Table 3.2: Level 1 INNS screening results for the Roadford WRZ**

| Option | Option type | Description of risks/impacts | Catchment connectivity | Frequency of Impact rating | Severity of Impact rating | Risk Magnitude rating | Further assessment(s) |
|---|---|---|---|---|---|---|---|
| R-07 Slade Reservoir - abstract from new source | Temporary transfer using new/otherwise unused pathway(s). | • Change in volume and timing of existing transfer between water bodies assumed already connected.<br>• Increased abstraction at existing intake may result in physical impacts to habitats within source and receiving reservoirs. Habitat changes may affect INNS populations. | Transfer within WFD Operational Catchment however is within an isolated catchment | Periodical | Low | 2= Low | • SAI-RAT RA<br>• SAI-RAT IRM<br>• In-combination effects |
| R-11 River Lyd to Roadford Reservoir - extend pumped storage abstraction season to include April and May | Extend abstraction season | • Change in volume and timing of existing transfer between locations already connected Assumes any transferred INNS would be treated/removed at water treatment facility.<br>• Increased abstraction at existing intake may result in physical impacts to habitats within source reservoir. Habitat changes may affect INNS populations. | Transfer within WFD Operational Catchment | Periodical | Medium | 4 = Moderate | • SAI-RAT IRM<br>• In-combination effects |
| R-20 Avon Reservoir - reduce compensation flow | Reduce compensation flow | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |

| Option | Option type | Description of risks/impacts | Catchment connectivity | Frequency of Impact rating | Severity of Impact rating | Risk Magnitude rating | Further assessment(s) |
|---|---|---|---|---|---|---|---|
| R-21 Burrator Reservoir - reduce compensation flow | Reduce compensation flow | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |
| R-22 Fernworthy Reservoir - reduce compensation flow | Reduce compensation flow | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |
| R-23 Trenchford Reservoir - reduce compensation flow | Reduce compensation flow | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |
| R-24 Meldon Reservoir - reduce compensation flow | Reduce compensation flow | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |

| Option | Option type | Description of risks/impacts | Catchment connectivity | Frequency of Impact rating | Severity of Impact rating | Risk Magnitude rating | Further assessment(s) |
|---|---|---|---|---|---|---|---|
| R-25 Roadford Reservoir - reduce compensation flow | Reduce compensation flow | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |
| R-26 Upper Tamar Lake - reduce compensation flow | Reduce compensation flow | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |
| R-45 River Dart & Littlehempston boreholes - aggregate daily and annual licence limits | Increase abstraction volume (relative to baseline) - temporary | • Change in volume of existing transfer between locations already connected Assumes any transferred INNS would be treated/removed at water treatment facility.<br>• Increased abstraction at existing intake may result in physical impacts to habitats within source reservoir. Habitat changes may affect INNS populations. | Cross WFD Operational Catchment transfer, receiving catchment is receiving to WTW only | Periodical | Low | 2 = Low | • SAI-RAT IRM<br>• In-combination effects |
| R-48 Roadford Reservoir - reduce fish bank releases | Fish bank releases | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |

Source: South West Water, 2025, Mott MacDonald, 2025.

## 3.3 Wimbleball WRZ

A total of four options were assessed within the Wimbleball WRZ. The results are presented below in Table 3.3.

No options would involve a temporary transfer using new or otherwise unused pathways, and therefore no options within this WRZ were subject to a SAI-RAT risk assessment.

One option was assessed with a Moderate Risk Magnitude, and one with a Low Risk Magnitude. Two options relating to compensation flow reduction and fish bank releases were assessed with a Risk Magnitude of None.

All options have the potential to result in environmental changes which may affect INNS populations, and therefore require a SAI-RAT IRM assessment.

All transfers would occur within same WFD Operational Catchment, and therefore the same WFD Management Catchment.

**Table 3.3: Level 1 INNS screening results for Wimbleball WRZ**

| Option | Option type | Description of risks/impacts | Catchment connectivity | Frequency of Impact rating | Severity of Impact rating | Risk Magnitude rating | Further assessment(s) |
|---|---|---|---|---|---|---|---|
| W-03 Wimbleball Reservoir - reduce compensation flow | Reduce compensation flow | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |
| W-06 Brampford Speke & Stoke Canon - abstract from new source | Increase abstraction volume (relative to baseline) - temporary | • Change in volume of existing transfer between locations already connected Assumes any transferred INNS would be treated/removed at water treatment facility.<br>• Increased abstraction at existing intake may result in physical impacts to habitats within source reservoir. Habitat changes may affect INNS populations. | Transfer within WFD water body | Periodical | Low | 2 = Low | • SAI-RAT IRM<br>• In-combination effects |
| W-09 River Exe to Wimbleball Reservoir - extend pumped storage abstraction season to include April and May | Extend abstraction season | • Change in volume and timing of existing transfer between locations already connected.<br>• Increased abstraction at existing intake may result in physical impacts to habitats within source reservoir. Habitat changes may affect INNS populations. | Transfer within WFD Operational Catchment | Periodical | Medium | 4 = Moderate | • SAI-RAT IRM<br>• In-combination effects |
| W-22 Wimbleball Reservoir - reduce fish bank releases | Fish bank releases | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |

Source: South West Water, 2025; Mott MacDonald, 2025.

## 3.4 Bristol WRZ

A total of nine options were assessed within the Bristol WRZ. The results are presented below in Table 3.4.

Three options were assessed with a Moderate Risk Magnitude. Six options relating to compensation flow reduction and fish bank releases were assessed with a Risk Magnitude of None.

All options have the potential to result in environmental changes which may affect INNS populations and therefore require an IRM assessment.

Two transfers occur within the same WFD Operational Catchment, the remaining options do not involve the additional transfer of water.

**Table 3.4: Level 1 INNS screening results for the Bristol WRZ.**

| Option | Option type | Description of risks/impacts | Catchment connectivity | Frequency of Impact rating | Severity of Impact rating | Risk Magnitude rating | Further assessment(s) |
|---|---|---|---|---|---|---|---|
| BR-27a Blagdon Reservoir - reduce compensation flow | Reduce compensation flow | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |
| BR-27b Blagdon Reservoir - delay water bank releases | Fish bank releases | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |
| BR-28a Chew Valley Lake - reduce compensation flow | Reduce compensation flow | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |
| BR-28b Chew Valley Lake - delay water bank releases | Fish bank releases | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |
| BR-29 Chew Magna Reservoir - reduce compensation flow | Reduce compensation flow | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |

| Option | Option type | Description of risks/impacts | Catchment connectivity | Frequency of Impact rating | Severity of Impact rating | Risk Magnitude rating | Further assessment(s) |
|---|---|---|---|---|---|---|---|
| BR-30 Cheddar Ponds - reduce compensation flow | Reduce compensation flow | • No risk of transfer/movement of invasive or non-native species with this option type.<br>• Decreased compensation flow may result in multiple impacts downstream in the river which would receive flows. Habitat changes may affect INNS populations. | No transfer | Periodical | None | 0 = None | • SAI-RAT IRM<br>• In-combination effects |
| BR-31a River Axe to Cheddar Reservoir - extend pumped storage abstraction season to include October | Extend abstraction season | • Change in volume and timing of existing transfer between water bodies assumed already connected.<br>• Increased abstraction at existing intake may result in physical impacts to habitats within source and receiving reservoirs. Habitat changes may affect INNS populations. | Transfer within WFD Operational Catchment | Periodical | Medium | 4= Moderate | • SAI-RAT IRM<br>• In-combination effects |
| BR-31b River Axe to Cheddar Reservoir - extend pumped storage abstraction season to include May | Extend abstraction season | • Change in volume and timing of existing transfer between water bodies assumed already connected.<br>• Increased abstraction at existing intake may result in physical impacts to habitats within source and receiving reservoirs. Habitat changes may affect INNS populations. | Transfer within WFD Operational Catchment | Periodical | Medium | 4= Moderate | • SAI-RAT IRM<br>• In-combination effects |
| BR-47 River Axe to Cheddar Reservoir - early commissioning of pumped storage abstraction | Extend abstraction season | • Change in volume and timing of existing transfer between water bodies assumed already connected.<br>• Increased abstraction at existing intake may result in physical impacts to habitats within source and receiving reservoirs. Habitat changes may affect INNS populations. | Transfer within WFD Operational Catchment | Periodical | Medium | 4= Moderate | • SAI-RAT IRM<br>• In-combination effects |

Source: South West Water, 2025; Mott MacDonald, 2025.

## 3.5 Bournemouth WRZ

Three options were assessed within the Bournemouth WRZ. The results are presented below in Table 3.6.

No options would involve a temporary transfer using new or otherwise unused pathways, and therefore no options within this WRZ were subject to a SAI-RAT risk assessment.

Two options were assessed with a Moderate Risk Magnitude, and one with a Very low Risk Magnitude.

Two options have the potential to result in environmental changes which may affect INNS populations and therefore require a SAI-RAT IRM assessment.

All transfers occur within the same WFD water body.

**Table 3.5: Level 1 INNS screening results for the Bournemouth WRZ.**

| Option | Option type | Description of risks/impacts | Catchment connectivity | Frequency of Impact rating | Severity of Impact rating | Risk Magnitude rating | Further assessment(s) |
|---|---|---|---|---|---|---|---|
| BN-04 River Stour at Longham - remove low flow constraint | Increase abstraction volume (relative to baseline) - temporary | • Change in volume and timing of existing transfer between water bodies assumed already connected.<br>• Increased abstraction at existing intake may result in physical impacts to habitats within source and receiving reservoirs. Habitat changes may affect INNS populations. | Transfer within WFD waterbody | Periodical | Medium | 4 = Moderate | • SAI-RAT IRM<br>• In-combination effects |
| BN-05 Stanbridge boreholes – increase daily abstraction limit | Groundwater source | • Very limited risk as the source water is likely to be entirely free of INNS. It is assumed that groundwater is free of INNS, and that accessing it will not permit any additional inputs of INNS. | Transfer within WFD waterbody | Periodical | Very Low | 1 = Very Low | • In-combination effects |
| BN-12 River Stour at Longham - increase weekly abstraction limit | Increase abstraction volume (relative to baseline) - temporary | • Change in volume and timing of existing transfer between water bodies assumed already connected.<br>• Increased abstraction at existing intake may result in physical impacts to habitats within source and receiving reservoirs. Habitat changes may affect INNS populations. | Transfer within WFD waterbody | Periodical | Medium | 4 = Moderate | • SAI-RAT IRM<br>• In-combination effects |

Source: South West Water, 2025; Mott MacDonald, 2025.

## 3.6 Isles of Scilly WRZ

One option was assessed within the Isles of Scilly WRZ. The results are presented below in Table 3.6. The option is a groundwater source and has been assessed with a Risk Magnitude of Very Low. No further assessments were identified for this option.

The receptor location has not yet been confirmed.

**Table 3.6: Level 1 INNS screening results for the Isles of Scilly WRZ**

| Option | Option type | Description of risks/impacts | Catchment connectivity | Frequency of Impact rating | Severity of Impact rating | Risk Magnitude rating | Further assessment(s) |
|---|---|---|---|---|---|---|---|
| IS-18 St Martins - increase abstraction from boreholes to greater than 20m3/d | Groundwater source | • Very limited risk as the source water is likely to be entirely free of INNS. It is assumed that groundwater is free of INNS, and that accessing it will not permit any additional inputs of INNS. | Unconfirmed | Periodical | Very Low | 1 = Very Low | • Not required |

Source: South West Water, 2025; Mott MacDonald, 2025

# 4 Level 2 assessment results

The second stage of the INNS risk assessment has been completed for the selected drought options that were screened in at Level 1. This section provides an overview of the Level 2 INNS assessment findings and summary tables for each option.

## 4.1 Colliford WRZ

### 4.1.1 SAI-RAT risk assessment

#### 4.1.1.1 Option C11

The asset likelihood scores produced by the SAI-RAT risk assessment are summarised in Table 4.1 and Table 4.2. Table 4.1 provides overall 'likelihood' scores for each asset, which indicate the risk of spread of INNS from them, whilst Table 4.2 provides a more detailed breakdown of the contributing factors. The relatively high score for Hawk's Tor Pit is partially due to less information being available at the time of assessment, as where inputs are 'unknown', the tool assumes a worst case scenario.

**Table 4.1: C-11 SAI-RAT asset assessment results**

| Asset Name | Asset Likelihood Score |
|---|---|
| Hawk's Tor Pit | 73.00 |
| Colliford Reservoir | 45.99 |
| Average Score | 59.50 |

Source: Mott MacDonald, 2026

**Table 4.2: C-11 SAI-RAT asset likelihood contributing factor scores**

| Contributing factor | Hawk's Tor Pit | Colliford Reservoir |
|---|---|---|
| Staff/contractor visits | 5 | 5 |
| Staff/contractor enter water | 6 | 6 |
| Vehicle access | 3 | 3 |
| Angling presence | 7 | 7 |
| Angling matches | 4 | 7 |
| Live bait | 4 | 0 |
| Fish stocking | 6 | 3 |
| Boat presence | 8 | 0 |
| Water sports presence | 8 | 0 |
| Water safety equipment | 4 | 4 |
| Mammals and waterfowl | 5 | 5 |
| Sludge/sediment movement | 5 | 5 |
| Terrestrial recreation | 5 | 0 |
| Other long-term activities | 0 | 0 |
| Upstream Natural Waterbodies | 0 | 0.33 |
| RWT inputs | 0 | 0 |

Source: Mott MacDonald, 2026

Table 4.3 presents the summary risk scores for the RWT assessed, whilst Table 4.4 provides a more detailed breakdown of score contributions. The RWT produced an overall Inherent Risk Score of 23.17. This score was somewhat influenced by the receptor location being with an isolated WFD catchment, though the transfer would not cross this catchment boundary.

**Table 4.3: C-11 SA-RAT RWT assessment results**

| RWT Name | Likelihood of spread from source | Likelihood of spread on/off transfer route | Severity (of impact) upon transfer route | Severity (of impact) upon receptor | Inherent Risk Score |
|---|---|---|---|---|---|
| Hawk's Tor Pit to Colliford Reservoir | 38.28 | 8.06 | 1.67 | 16.73 | 23.17 |

Source: Mott MacDonald, 2026

**Table 4.4: C-11 SAI-RAT RWT likelihood and severity score breakdowns**

| Element of score contribution | Contributing criteria | Hawk's Tor Pit to Colliford Reservoir |
|---|---|---|
| RWT likelihood of spread from source score breakdown | Source asset score | 32.85 |
| | Abstraction location | 1.5 |
| | Abstraction depth | 1.5 |
| | Volume/frequency of transfer | 0.6 |
| | Transfer distance | 1.9 |
| RWT likelihood of spread on/off the pathway score breakdown | Volume/frequency of transfer | 0.06 |
| | Staff/contractor visit | 2.5 |
| | Staff/contractor enter water | 3.0 |
| | Vehicle access | 0 |
| | Angling presence | 0 |
| | Angling matches | 0 |
| | Live bait | 0 |
| | Fish stocking | 0 |
| | Boat presence | 0 |
| | Water sports presence | 0 |
| | Water safety equipment | 0 |
| | Mammals and waterfowl | 0 |
| | Sludge/sediment movement | 2.5 |
| | Terrestrial recreation | 0 |
| | Other long-term activities | 0 |
| | Adjoining natural water bodies | 0 |
| | Assets along transfer route | 0 |
| | Pathway water bodies crossed | 0 |
| RWT severity (of impact) upon pathway score breakdown | WFD-UKTAG INNS present at source | 0 |
| | Pathway designation | 1.7 |
| | Pathway Priority Habitat | 0 |
| | Pathway WFD status | 0 |
| RWT severity (of impact) upon receptor score breakdown | WFD-UKTAG INNS present at source | 0 |
| | Receptor designation | 0 |
| | Receptor Priority Habitat | 0 |
| | Receptor WFD status | 6.4 |

| Element of score contribution | Contributing criteria | Hawk's Tor Pit to Colliford Reservoir |
|---|---|---|
| | Isolated Receptor Catchment | 0 |
| | Transfer distance | 0.3 |
| | Source/receptor location | 10 |
| | Existing connections | 0 |
| | WFD-UKTAG INNS present along pathway | 0 |

Source: Mott MacDonald, 2026

### 4.1.2 SAI-RAT IRM

The potential physical responses to drought options in surface water bodies in the Colliford WRZ are summarised below in Table 4.5. The potential impacts to INNS groups as a result of these changes is presented in Table 4.6.

**Table 4.5: Potential physical responses in surface waterbodies within Colliford WRZ**

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| C-03 River Fowey at Restormel - increase annual abstraction limit | Source habitat | River Fowey (Lower River Fowey Water Body) | River | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth | None | Level 2 WFD assessment concluded 'The reduction in water downstream of the abstraction point due to the increased drought permit abstraction could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. At this time no appropriate supporting information is available to confirm if the extended pumped storage scheme will operate under the current Hands of Flow (HOF) value, and as such a precautionary approach has been taken. This could have an adverse effect on physicochemical parameters, to be confirmed following further investigations.' |
| | Pathway | N/A enclosed artificial transfer (e.g. pipeline) | N/A enclosed artificial transfer (e.g. pipeline) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | None | None |

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| | Receptor habitat | Colliford reservoir (Colliford Lake Water Body) | Offline water body | Decrease in water quality | No change | Increase in wetted area | Increase in average depth | None | Level 2 WFD assessment concluded 'Minor localised impact to physicochemical quality elements anticipated as a result of minor and localised changes in flow and velocity from increased discharge, leading to a marginal increase in pollutant load' |
| C-04a Stannon Lake – increase daily abstraction limit | Source habitat | Stannon Lake (Stannon Lake Water Body) | Offline water body | No change | No change | Decrease in wetted area | Decrease in average depth | None | WFD assessment did not identify a risk of water quality deterioration |
| | Pathway | N/A enclosed artificial transfer (e.g. pipeline) | N/A enclosed artificial transfer (e.g. pipeline) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | None | None |
| | Receptor habitat | De Lank WTW and Lowermoor WTW | Non-habitat (e.g. WTW) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | None | None |
| C-06 Colliford Reservoir - reduce compensation flow | Source habitat | Colliford reservoir (Colliford Lake Water Body) | Offline water body | No change | No change | Increase in average depth | Increase in average depth | None | WFD assessment did not identify a risk of water quality deterioration |
| | Pathway | N/A no transfer | N/A no transfer | N/A no transfer | N/A no transfer | N/A no transfer | N/A no transfer | Reduced compensation flow downstream | None |

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| | Receptor habitat | River Fowey (Lower River Fowey Water Body) | River | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth | None | Level 2 WFD assessment concluded 'The cessation of water discharged into this water course via compensation flow releases could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters in upstream water bodies but considering the dilution potential of the rivers that join the Fowey along this reach, impacts to physicochemical quality elements are assumed minor and localised. Additionally minor localised impacts on temperature are anticipated' |
| C-07a (A): Park Lake (to St. Cleer WTW) | Source habitat | Park Lake (Fowey (Upper) Water Body) | Offline water body | Unconfirmed | No change | Decrease in wetted area | Decrease in average depth | May increase chances of INNS/propagule spread with greater transfer volume | WFD Level 2 investigation not required |
| | Pathway | N/A enclosed artificial transfer (e.g. pipeline) | N/A enclosed artificial transfer (e.g. pipeline) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | None |
| | Receptor habitat | St. Cleer WTW | N/A WTW | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | WFD Level 2 investigation not required |

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| C-07a (B): Park Lake (to Colliford Reservoir) | Source habitat | Park Lake (Fowey (Upper) Water Body) | Offline water body | Unconfirmed | No change | Decrease in wetted area | Decrease in average depth | May increase chances of INNS/propagule spread with greater transfer volume | WFD Level 2 investigation not required |
| | Pathway | N/A enclosed artificial transfer (e.g. pipeline) | N/A enclosed artificial transfer (e.g. pipeline) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | None | None |
| | Receptor habitat | Colliford reservoir (Colliford Lake Water Body) | Offline water body | Unconfirmed (assessed as No change) | No change | Increase in wetted area | Increase in average depth | None | WFD Level 2 investigation not required |
| C-11: Hawk's Tor Pit - abstract from new source | Source habitat | Haws Tor Pit (Warleggan River Water Body) | Offline water body | Unconfirmed (assessed as No change) | No change | Decrease in wetted area | Decrease in average depth | None | Temporary connectivity, or risk of connectivity. Level 2 (L2) WFD assessment not required. |
| | Pathway | N/A enclosed artificial transfer (e.g. pipeline) | N/A enclosed artificial transfer (e.g. pipeline) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | None | None |
| | Receptor habitat | Colliford Reservoir (Colliford Lake Water Body) | Offline water body | Unconfirmed (assessed as No change) | No change | Increase in wetted area | Increase in average depth | None | L2 WFD assessment not required. |
| C-30: Siblyback Reservoir - reduce compensation flow | Source habitat | Siblyback Lake (Siblyback Lake Water Body | Offline water body | No change | No change | Increase in wetted area | Increase in average depth | None | WFD assessment did not identify a risk of water quality deterioration |
| | Pathway | N/A no transfer | N/A no transfer | N/A no transfer | N/A no transfer | N/A no transfer | N/A no transfer | Reduced compensation flow downstream | None |

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| | Receptor habitat | C-30-2 Trekeivesteps abstraction, Fowey Operational Catchment, Fowey (Upper) Water Body | River | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth | Reduced compensation flow downstream | WFD level 2 assessment for C-03 3 concluded ' The cessation of water discharged into this water course via compensation flow releases could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. At this point downstream, impacts to water quality as a result of changes in flow velocity and volume are assumed minor and localised. Minor localised impact on temperature anticipated.' |
| | | C-30-3 Restormel abstraction, Lower River Fowey Water Body | | | | | | | |

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| C-37: River Cober at Wendron - increase annual licence limit | Source habitat | River Cober (Upper River Cober Water Body) | River | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth | May increase chances of INNS/propagule spread during extended season | WFD Level 2 assessment concluded: The reduction in water downstream of the abstraction point due to the increased abstraction could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters. Further investigations could include modelling, and analysis of additional information relating to hands off flow (HOF) conditions, and the provision of supporting releases from Stithians. |
| | Pathway | N/A enclosed artificial transfer (e.g. pipeline) | N/A enclosed artificial transfer (e.g. pipeline) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | None | None |
| | Receptor habitat | Wendron WTW | Non-habitat (WTW) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | None | None |

Source: Mott MacDonald, 2026

**Table 4.6: Potential impacts to INNS populations due to potential impacts to surface water bodies within Colliford WRZ**

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| C-03 River Fowey at Restormel - increase annual abstraction limit | Aquatic vegetation | Canadian waterweed (*Elodea canadensis*), Nuttall's waterweed (*Elodea nuttallii*), | Water quality: Species-specific approach<br>Flow velocity: Positive/ variable (High confidence)<br>Wetted area: Negative (High confidence)<br>Depth: Negative (high confidence) | Pipeline - no habitat changes | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive/ Variable (high confidence)<br>Depth: Positive (high confidence) | Unclear response in source habitat. Overall positive response in the receptor habitat, potential population increase. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. May increase chances of INNS/propagule spread with greater transfer volume. Species recorded in both source and receptor, therefore the introduction of this species to a new habitat is not expected. |
| | Bivalve | *Physa acuta*[5] | Water quality: Species-specific approach<br>Flow velocity: Variable (High confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (high confidence) | Pipeline - no habitat changes | Not recorded | Unclear response in source habitat. Not present in the receptor, though possible. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in the source only, therefore may increase chances of INNS/propagule spread with greater transfer volume |
| | Shrimp | *Crangonyx pseudogracilis* | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence) | Pipeline - no habitat changes | Not recorded | Unclear response in source habitat. Not present in the receptor, though possible. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in source only, therefore may increase chances of INNS/propagule spread with greater transfer volume |

[5] *Physa acuta* is a snail/gastropod but has been assessed as a bivalve within the SAI-RAT IRM tool.

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Riparian vegetation | Himalayan balsam (*Impatiens glandulifera*) | Water quality: Species-specific approach<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (High confidence) | Pipeline - no habitat changes | Not recorded | Positive response in the source habitat, potential population increase. Not present in the receptor habitat, though possible. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in the source only, therefore may increase chances of INNS/propagule spread with greater transfer volume |
| | Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/unknown (low confidence) | Pipeline - no habitat changes | Not recorded | Unclear response in source habitat. Not present in the receptor, though possible. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in the source only, therefore may increase chances of INNS/propagule spread with greater transfer volume |
| | Aquatic / riparian vegetation | Australian swamp stonecrop (*Crassula helmsii*) | Not present | Pipeline - no habitat changes | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Negative (high confidence)<br>Depth: Positive/ variable (high confidence) | Not present in the source habitat. Unclear response in the receptor habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. May increase chances of INNS/propagule spread with greater transfer volume. Species recorded in receptor, therefore the introduction of this species to a new habitat is not expected. |
| C-04a Stannon Lake – increase daily abstraction limit | Shrimp | *Crangonyx pseudogracilis* | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence) | Pipeline - no habitat changes | WTW- no habitat changes | Unclear, possible negative response in receptor habitat. Limited risk of spread through pipeline burst, however it is assumed INNS will be removed at receptor. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| C-06 Colliford Reservoir - reduce compensation flow | Aquatic vegetation | Canadian waterweed (*Elodea canadensis*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive/ variable (high confidence)<br>Depth: Positive (high confidence) | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Negative (high confidence)<br>Depth: Negative (high confidence) | Possible positive response in the source habitat. Unclear response in receptor. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in both source and receptor so reduced risk of new introduction. |
| | Bivalve | *Physa acuta* | Not present | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (high confidence) | Unclear possible negative response in the receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in receptor only therefore reduced risk of new introductions. |
| | Shrimp | *Crangonyx pseudogracilis* | Not recorded | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence) | Unclear response in the receptor habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in receptor only therefore reduced risk of new introductions. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Riparian vegetation | Himalayan balsam (*Impatiens glandulifera*), Rhododendron (*Rhododendron ponticum* (+ hybrids)), Japanese knotweed (*Fallopia japonica*), Monkey-flower (*Mimulus cupreus*, *M. guttatus* and hybrids) | Not recorded | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (High confidence) | Positive response in the receptor habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in receptor only therefore reduced risk of new introductions. |
| | Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Not recorded | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/unknown (low confidence) | Unclear response in the receptor habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in receptor only therefore reduced risk of new introductions. |
| | Aquatic / riparian vegetation | Australian swamp stonecrop (*Crassula helmsii*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Negative (high confidence)<br>Depth: Positive/ variable (high confidence) | N/A no transfer | Not recorded | Unclear response in the source habitat. Not recorded in pathway and receptor habitats. Species recorded in source only therefore there is a risk of INNS/propagule spread to the receptor. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| C-07a (A) Park Lake (to St. Cleer WTW) | Aquatic / riparian vegetation | Australian swamp stonecrop (*Crassula helmsii*) | Water quality: Species specific approach<br>Flow velocity: No change<br>Wetted area: Positive (high confidence)<br>Depth: Negative/ variable (high confidence) | Pipeline - no habitat changes | WTW- no habitat changes | Unclear response in source. Potential risk of the introduction of this species to a new habitat through pipeline bursts. Assumes INNS will be removed at receptor.<br>For potential responses in source habitat(s) - INNS were only assessed if located within the source- Australian swamp stonecrop (Crassula helmsii) only recorded in source though other INNS were recorded in wider water body catchment. |
| C-07a (B) Park Lake (to Colliford Reservoir) | Aquatic / riparian vegetation | Australian swamp stonecrop (*Crassula helmsii*) | Water quality: Species specific approach<br>Flow velocity: No change<br>Wetted area: Positive (high confidence)<br>Depth: Negative/ variable (high confidence) | Pipeline - no habitat changes | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Negative (high confidence)<br>Depth: Positive/ variable (high confidence) | Unclear response in source and receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in both source and receptor, therefore the introduction of this species to a new habitat is not expected.<br>For potential responses in source habitat(s) - INNS were only assessed if located within the source- Australian swamp stonecrop (Crassula helmsii) only recorded in source though other INNS were recorded in wider water body catchment. |
| | Aquatic vegetation | Canadian waterweed (*Elodea canadensis*), Nuttall's waterweed (*Elodea nuttallii*), | Not recorded | Pipeline - no habitat changes | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive/ Variable (high confidence)<br>Depth: Positive (high confidence) | Positive response in the receptor habitat. Species recorded in receptor, therefore the introduction of this species to a new habitat is not expected. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| C-11 Hawk's Tor Pit - abstract from new source | Aquatic vegetation | Canadian waterweed (*Elodea canadensis*), Nuttall's waterweed (*Elodea nuttallii*) | Not recorded | Pipeline - no habitat changes | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive/ variable (high confidence)<br>Depth: Positive (high confidence) | Positive response in the receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in receptor, therefore the introduction of this species to a new habitat is not expected. |
| | Aquatic / riparian vegetation | Australian swamp stonecrop (*Crassula helmsii*) | Not recorded | Pipeline - no habitat changes | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Negative (high confidence)<br>Depth: Positive/ variable (high confidence) | Unclear response in the receptor habitat. Species recorded in receptor, therefore the introduction of this species to a new habitat is not expected. |
| C-30 Siblyback Reservoir - reduce compensation flow | Aquatic vegetation | Canadian waterweed (*Elodea canadensis*), Nuttall's waterweed (*Elodea nuttallii*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive/ variable (high confidence)<br>Depth: Positive (high confidence) | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Negative (high confidence)<br>Depth: Negative (high confidence) | Positive response in the source habitat. Unclear response in both receptor habitats. Potential INNS response to water quality changes identified in pathway habitats; species specific responses to be reviewed following any further water quality investigations. Species recorded in the source and receptor therefore risk of INNS/propagule transfer reduced. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Aquatic / riparian vegetation | Australian swamp stonecrop (*Crassula helmsii*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Negative (high confidence)<br>Depth: Positive/ variable (high confidence) | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Negative/ variable (high confidence)<br>Not recorded at Restormel abstraction | Unclear response at the source habitat. Unclear, possible positive response downstream of the Trekeivesteps abstraction. Potential INNS response to water quality changes identified downstream of Trekeivesteps abstraction; species specific responses to be reviewed following any further water quality investigations. Species recorded in the source and receptor therefore risk of INNS/propagule transfer reduced. |
| | Shrimp | *Crangonyx pseudogracilis* | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive (medium confidence)<br>Depth: Variable (low confidence) | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence) | Unclear response at the source habitat. Unclear response downstream of both receptor habitats. Potential INNS response to water quality changes identified in pathway habitats; species specific responses to be reviewed following any further water quality investigations. Species recorded in the source and receptor therefore risk of INNS/propagule transfer reduced. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Riparian vegetation | Himalayan balsam (*Impatiens glandulifera*), Japanese knotweed (*Fallopia japonica*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Negative (high confidence)<br>Depth: Negative/ variable (low confidence) | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive/variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (high confidence) | Negative response in the source habitat. Positive response downstream of both abstraction points. Potential INNS response to water quality changes identified in pathway habitat; species specific responses to be reviewed following any further water quality investigations. Himalayan balsam (*Impatiens glandulifera*) recorded in the source and receptor therefore risk of INNS/propagule transfer reduced. Japanese knotweed (*Fallopia japonica*) recorded only in the source, therefore there is an increased risk of new population introductions. |
| | Bivalve | Physa acuta, Wautier's Limpet (*Ferissia wautieri*) | Not recorded | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (high confidence) | Unclear response in receptor habitats. Potential INNS response to water quality changes identified in receptor habitats; species specific responses to be reviewed following any further water quality investigations. Species recorded in the receptor only therefore the risk of INNS/propagule spread of these species is reduced,. Wautier's limpet only recorded at Restormel abstraction location. |
| | Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Not recorded | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/ unknown (low confidence) | Unclear response in both receptor habitats. Potential INNS response to water quality changes identified in receptor habitats; species specific responses to be reviewed following any further water quality investigations. Species recorded in the receptor only therefore there is a risk of INNS/propagule spread of these species is reduced. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Crayfish | North American signal crayfish (*Pacifastacus leniusculus*) | Not recorded | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive (medium approach)<br>Wetted area: Negative (medium confidence)<br>Depth: Negative (medium confidence)<br>Not recorded at Restormel abstraction | Unclear response in downstream of Restormel abstraction. Potential INNS response to water quality changes identified downstream of Restormel abstraction; species specific responses to be reviewed following any further water quality investigations. Species only recorded within receptor therefore the risk of INNS/propagule spread of these species is reduced |
| C-37 River Cober at Wendron - increase annual licence limit | Shrimp | ***Cragonyx*** pseudogracilis | Water quality: Species specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence) | Pipeline- no habitat changes | WTW- no habitat changes | Unclear response in the source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. |
| | Snail | Jenkin's spire shell (*Potamopyrgus antipodarum)* | Water quality: species specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable / unknown (low confidence) | Pipeline- no habitat changes | WTW- no habitat changes | Unclear response in the source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Riparian vegetation | Japanese knotweed (*Fallopia japonica*)<br>Himalayan balsam (*Impatiens glandulifera*) | Water quality: species specific approach<br>Flow velocity: Positive / variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (high confidence) | Pipeline- no habitat changes | WTW- no habitat changes | Positive response in the source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. |

Source: APEM, 2024; Mott MacDonald, 2025

## 4.2 Roadford WRZ

### 4.2.1 SAI-RAT risk assessment

#### 4.2.1.1 Option R-07

The asset likelihood scores produced by the SAI-RAT risk assessment are summarised in Table 4.7 and Table 4.8. Table 4.7 provides overall 'likelihood' scores for each asset, which indicate the risk of spread of INNS from them, whilst Table 4.8 provides a more detailed breakdown of the contributing factors. Slade Reservoir generated an Asset Likelihood Score of 51.32; this is somewhat higher than the score of 19.00 generated by Hore Down WTW; this is due to there being more risks of spread from open reservoirs than from a WTW.

**Table 4.7: R-07 SAI-RAT asset assessment results**

| Asset Name | Asset Likelihood Score |
|---|---|
| Slade Reservoirs | 51.32 |
| Hore Down WTW | 19.00 |
| Average Score | 35.16 |

Source: Mott MacDonald, 2026

**Table 4.8: R-07 SAI-RAT asset likelihood contributing factor scores**

| Contributing factor | Slade Reservoirs | Hore Down WTW |
|---|---|---|
| Staff/contractor visits | 5 | 5 |
| Staff/contractor enter water | 6 | 6 |
| Vehicle access | 3 | 3 |
| Angling presence | 6 | 0 |
| Angling matches | 7 | 0 |
| Live bait | 0 | 0 |
| Fish stocking | 4 | 0 |
| Boat presence | 0 | 0 |
| Water sports presence | 0 | 0 |
| Water safety equipment | 4 | 0 |
| Mammals and waterfowl | 5 | 0 |
| Sludge/sediment movement | 5 | 5 |
| Terrestrial recreation | 5 | 0 |
| Other long-term activities | 0 | 0 |
| Upstream Natural Waterbodies | 0 | 0 |
| RWT inputs | 0 | 0 |

Source: Mott MacDonald, 2026

Table 4.9 presents the summary risk scores for the RWTs assessed, whilst

Table 4.10 provides a more detailed breakdown of score contributions. The RWT produced an overall Inherent Risk Score of 18.75.

### Table 4.9: R-07 SAI-RAT RWT assessment results

| RWT Name | Likelihood of spread from source | Likelihood of spread on/off transfer route | Severity (of impact) upon transfer route | Severity (of impact) upon receptor | Inherent Risk Score |
|---|---|---|---|---|---|
| Slade Reservoirs to Hore Down WTW | 28.00 | 9.51 | 0.30 | 2.17 | 18.75 |

Source: Mott MacDonald, 2025

### Table 4.10: R-07 SAI-RAT RWT likelihood and severity score breakdowns

| Element of score contribution | Contributing criteria | Slade Reservoirs to Hore Down WTW |
|---|---|---|
| RWT likelihood of spread from source score breakdown | Source asset score | 23.01 |
| | Abstraction location | 1.5 |
| | Abstraction depth | 1.5 |
| | Volume/frequency of transfer | 0.07 |
| | Transfer distance | 1.83 |
| RWT likelihood of spread on/off the pathway score breakdown | Volume/frequency of transfer | 0 |
| | Staff/contractor visit | 2.5 |
| | Staff/contractor enter water | 3 |
| | Vehicle access | 1.5 |
| | Angling presence | 0 |
| | Angling matches | 0 |
| | Live bait | 0 |
| | Fish stocking | 0 |
| | Boat presence | 0 |
| | Water sports presence | 0 |
| | Water safety equipment | 0 |
| | Mammals and waterfowl | 0 |
| | Sludge/sediment movement | 2.5 |
| | Terrestrial recreation | 0 |
| | Other long-term activities | 0 |
| | Adjoining natural water bodies | 0 |
| | Assets along transfer route | 0 |
| | Pathway water bodies crossed | 0 |
| RWT severity (of impact) upon pathway score breakdown | WFD-UKTAG INNS present at source | 0.30 |
| | Pathway designation | 0 |
| | Pathway Priority Habitat | 0 |
| | Pathway WFD status | 0 |
| RWT severity (of impact) upon receptor score breakdown | WFD-UKTAG INNS present at source | 1.28 |
| | Receptor designation | 0 |
| | Receptor Priority Habitat | 0 |
| | Receptor WFD status | 0 |
| | Isolated Receptor Catchment | 0 |

| Element of score contribution | Contributing criteria | Slade Reservoirs to Hore Down WTW |
|---|---|---|
| | Transfer distance | 0.42 |
| | Source/receptor location | 10 |
| | Existing connections | 0 |
| | WFD-UKTAG INNS present along pathway | 0 |

Source: Mott MacDonald, 2026

### 4.2.2 SAI-RAT IRM

The expected impacts to surface waterbodies are summarised below in Table 4.11. The potential impacts to INNS groups as a result of these changes is presented in Table 4.12.

**Table 4.11: Expected impacts to surface waterbodies within Roadford WRZ**

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| R-07 Slade Reservoir - abstract from new source | Source | Slade Reservoir (Slade Lower Reservoir Water Body and Slade Higher Reservoir Water Body. | Online water body | Decrease in water quality (Slade Lower only) | No change | Decrease in wetted area | Decrease in average depth | Temporary connectivity, or risk or connectivity | Within the Slade Lower Reservoir Waterbody Level 2 WFD assessment concluded 'The changes in level / quantity of water in lake due to abstraction could result in a minor reduction in dilution potential of the lake for water quality parameters, potentially exacerbating any impact of pollutants. Minor and localised impacts anticipated'.<br>Within the Within the Slade Higher Reservoir Waterbody Level 2 WFD assessment concluded 'minimal impact' |
| | Pathway | N/A enclosed artificial transfer (e.g. pipeline) | N/A enclosed artificial transfer (e.g. pipeline) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A | N/A |
| | Receptor | Hore Down WTW | Non-habitat (e.g. WTW) | No change | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A | N/A |

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| R-11 River Lyd to Roadford Reservoir - extend pumped storage abstraction season to include April and May | Source | River Lyd (Lower River Lyd Water Body) | River | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth | None | Level 2 WFD assessment concluded 'the reduction in water discharged into this watercourse could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters, to be confirmed following recommended further investigations. |
| | Pathway | N/A enclosed artificial transfer (e.g. pipeline) | N/A enclosed artificial transfer (e.g. pipeline) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | Transfer period extended from November-March to November-May | None |
| | Receptor | Roadford Reservoir (Roadford Lake Water Body) | Offline water body | Decrease in water quality | No change | Increase in wetted area | Increase in average depth | None | Level 2 WFD assessment concluded potential 'minor and localised impact' on physiochemical quality elements. |
| R-25 Roadford Reservoir - reduce compensation flow | Source habitat | Roadford Reservoir (Roadford Lake Water Body) | Offline water body | No change | No change | Increase in wetted area | Increase in average depth | None | WFD assessment did not identify a risk of water quality deterioration |
| | Pathway | N/A no transfer | N/A no transfer | N/A no transfer | N/A no transfer | N/A no transfer | N/A no transfer | Reduced compensation flow downstream | None |

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| | Receptor habitat | River Tamar (Lower River Tamar Water Body) | River | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth | None | Level 2 WFD assessment concluded 'The cessation of water discharged into this water course via compensation flow releases could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. However at this point on the Tamar, a minor and localised impact physicochemical parameters is anticipated. Minor localised impacts on temperature anticipated.' |
| R-45 River Dart & Littlehempston boreholes - aggregate daily and annual licence limits | Source habitat | River Dart (Dart Water Body) | River | No change | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth | May increase chances of INNS/propagule spread with greater transfer volume | Level 2 WFD assessment concluded the increased abstraction is 'unlikely to result in an adverse reduction in dilution potential of the river for water quality parameters. This is anticipated to have a minor and localised effect on physicochemical parameters.' The assessment also predicts 'minor localised impact' on temperature. Overall, 'no deterioration between status classes' are anticipated. |
| | Pathway | N/A enclosed artificial transfer (e.g. pipeline) | N/A enclosed artificial transfer (e.g. pipeline) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | None | None |

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| | Receptor habitat | Littlehempston WTW | Non-habitat (e.g. WTW) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | None | None |

Source: Mott MacDonald, 2026

**Table 4.12: Potential impacts to INNS populations due to predicted to surface water bodies within Roadford WRZ**

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| R-07 Slade Reservoir - abstract from new source | Aquatic / riparian vegetation | Japanese knotweed *(Fallopia japonica)* | Water quality: Species-specific approach recommended<br>Flow velocity: No change<br>Wetted area: Positive (high confidence)<br>Depth: Positive (high confidence) | Pipeline - no habitat changes | WTW- no habitat changes | Positive response in the source habitat. Potential for INNS/propagule spread into adjacent water body.<br>Japanese knotweed currently only recorded in Slade Lower Reservoir Water Body (GB30843764). Potential for reduction in wetted area and depth across both reservoirs to facilitate the spread into Slade Higher Reservoir Water Body (GB30843794) |
| R-11 River Lyd to Roadford Reservoir - extend pumped storage abstraction season to include April and May | Shrimp | *Cragonyx pseudogracilis* | Water quality: Species-specific approach recommended<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low medium) | Pipeline - no habitat changes | Not recorded | Unclear response in source habitat. Increased transfer volume and so increased INNS transfer risk.<br>Potential increase in propagule transfer during extended season, introduction of new species possible.. |
| | Riparian vegetation | Japanese knotweed (*Fallopia japonica*), Giant hogweed (*Heracleum mantegazzianum*), Himalayan balsam (*Impatiens glandulifera*) | Water quality: Species-specific approach recommended<br>Flow velocity: Positive / variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (high confidence) | Pipeline - no habitat changes | Not recorded | Positive impact at source habitat, potential population increase.<br>Potential increase in propagule transfer during extended season, could introduce species int receptor though potential negative response at receptor as riparian habitat availability would be reduced as depth increases. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Snail | Jenkin's spire shell (*Potamopyrgus antipodarum)* | Water quality: Species-specific approach recommended<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable / unknown (low confidence) | Pipeline - no habitat changes | Water quality: Species-specific approach recommended<br>Flow velocity: No change<br>Wetted area: Positive (high confidence)<br>Depth: Variable / unknown (low confidence) | Unclear response in source habitat.<br>Potential increase in propagule transfer during extended season, though introduction of new species is not expected.<br>Unclear response in receptor habitat. |
| | Aquatic vegetation | Nuttall's waterweed (*Elodea nuttallii*) | Not recorded | Pipeline - no habitat changes | Water quality: Species-specific approach recommended<br>Flow velocity: No change<br>Wetted area: Positive / variable (high confidence)<br>Depth: Positive (high confidence) | Positive impact at receptor habitat. Potential population increase. |
| | Aquatic / riparian vegetation | Australian swamp stonecrop (*Crassula helmsii*) | Not recorded | Pipeline - no habitat changes | Water quality: Species-specific approach recommended<br>Flow velocity: No change<br>Wetted area: Negative (high confidence)<br>Depth: Positive / variable (high confidence) | Unclear response in receptor. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| R-25 Roadford Reservoir - reduce compensation flow | Aquatic vegetation | Canadian waterweed (*Elodea canadensis*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive/ variable (high confidence)<br>Depth: Positive (high confidence) | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Negative (high confidence)<br>Depth: Negative (high confidence) | Positive response in the source habitat. Unclear response in receptor habitat. Potential INNS response to water quality changes identified in pathway habitats; species specific responses to be reviewed following any further water quality investigations. Species recorded in the source and receptor therefore the risk of INNS/propagule spread of these species is reduced. |
| | Bivalve | *Physa acuta* | Not recorded | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (high confidence) | Not recorded in the source habitat. Unclear response in the pathway habitat. Potential INNS response to water quality changes identified in pathway habitats; species specific responses to be reviewed following any further water quality investigations. Species recorded in the receptor only therefore the risk of INNS/propagule spread of these species is reduced. |
| | Fish | Rainbow trout (*Oncorhynchus mykiss*) | Not recorded | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative/ variable (medium confidence)<br>Depth: Variable (high confidence) | Not recorded in the source. Unclear response in the pathway habitat. Potential INNS response to water quality changes identified in pathway habitats; species specific responses to be reviewed following any further water quality investigations. Species recorded in the receptor only therefore the risk of INNS/propagule spread of these species is reduced. |
| | Shrimp | *Crangonyx pseudogracilis* | Not recorded | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence) | Not recorded in the source. Unclear response in receptor habitat. Potential INNS response to water quality changes identified in pathway habitats; species specific responses to be reviewed following any further water quality investigations. Species recorded in the receptor only therefore the risk of INNS/propagule spread of these species is reduced. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Riparian vegetation | Giant hogweed (*Heracleum mantegazzianum*), Monkey-flower (*Mimulus cupreus, M. guttatus* and hybrids), Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*) | Not recorded | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (high confidence) | Not recorded in the source. Positive response in the pathway habitat. Potential INNS response to water quality changes identified in pathway habitats; species specific responses to be reviewed following any further water quality investigations. Species recorded in the source and receptor therefore the risk of INNS/propagule spread of these species is reduced. |
| | Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive (high confidence)<br>Depth: Variable/ unknown (low confidence) | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/ unknown (low confidence) | Unclear response in the source habitat. Unclear response in the pathway habitat. Potential INNS response to water quality changes identified in pathway habitats; species-specific responses to be reviewed following any further water quality investigations. Species recorded in the source and receptor therefore the risk of INNS/propagule spread of these species is reduced. |
| | Aquatic / riparian vegetation | Australian swamp stonecrop (*Crassula helmsii*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Negative (high confidence)<br>Depth: Positive/ variable (high confidence) | N/A no transfer | Not recorded | Unclear response in the source habitat. Not recorded in the pathway. Potential INNS response to water quality changes identified in pathway habitats; species specific responses to be reviewed following any further water quality investigations. Species recorded in the source therefore there is a risk of INNS/propagule spread of these species to the receptor. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| R-45 River Dart & Littlehempston boreholes - aggregate daily and annual licence limits | Fish | Goldfish / Crucian carp hybrid | Water quality: no change<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative / variable (medium confidence)<br>Depth: Variable (high confidence) | Pipeline - no habitat changes | WTW - no habitat changes | Potential negative impact on Goldfish / crucian carp hybrid at source. Lower flows reduce habitat quality and food availability, and decreased depth decreases habitat availability. |
| | Riparian vegetation | Himalayan balsam (*Impatiens glandulifera*), Japanese knotweed (*Fallopia japonica*), Monkey-flower (*Mimulus cupreus, M. guttatus* and hybrids), | Water quality: no change<br>Flow velocity: Positive / variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (high confidence) | Pipeline - no habitat changes | WTW - no habitat changes | Potential positive impact on invasive riparian vegetation at source. Decreased velocity can provide desirable conditions for settlement and seed establishment. Decreased depth increases suitable habitat area. |
| | Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Water quality: no change<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable / unknown (low confidence) | Pipeline - no habitat changes | WTW - no habitat changes | Unclear impact on Jenkins' spire shell at source. Slower flows are favourable to the snail; however this limits dispersion. Decreased wetted area reduces habitat and food availability, however the species is highly adaptable. |

Source: APEM, 2024; Mott MacDonald, 2025

## 4.3 Wimbleball WRZ

### 4.3.1 SAI-RAT Risk Assessment

Within the Wimbleball WRZ, no transfers were identified as identified as a temporary transfer using new/otherwise unused pathway(s), therefore, no options were assessed using the full SAI-RAT.

### 4.3.2 SAI-RAT IRM

The expected impacts to surface waterbodies are summarised below in Table 4.13. The potential impacts to INNS groups as a result of these changes is presented in Table 4.14.

**Table 4.13: Expected impacts to surface waterbodies within Wimbleball WRZ**

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| W-03 Wimbleball Reservoir - reduce compensation flow | Source habitat | Wimbleball reservoir (Wimbleball Lake Water body) | Offline water body | No change | No change | Increase in wetted area | Increase in average depth | None | WFD assessment did not identify a risk of water quality deterioration |
| | Pathway | N/A no transfer | N/A no transfer | N/A no transfer | N/A no transfer | N/A no transfer | N/A no transfer | Reduced compensation flow downstream | N/A |
| | Receptor | River Exe (W-03-2 and W-03-3) (Exe (Barle to Culm) Water Body) | River | Decrease in water quality | Decrease in flow velocity | Decrease in wetted area | Decrease in average depth | Reduced compensation flow downstream | Level 2 WFD assessment concluded 'The cessation of water discharged into this water course via compensation flow releases could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. However, in this catchment considering the flow record, impacts are assumed to be minor and localised on physicochemical parameters. Minor localised impacts on temperature anticipated'.. |
| W-06 Brampford Speke & Stoke Canon - abstract from new source | Source habitat | Brampford Speke & Stoke Canon Boreholes | Non-habitat (e.g. boreholes) | No change | No change | No change | No change | N/A | No habitat changes anticipated due to abstraction from boreholes |

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| | Pathway | River Exe (Exe (Culm to Creedy) Water Body) | River | No change | Increased average flow velocity | Increase in wetted area | Increase in average depth | | Level 2 WFD assessment concluded 'the change in flow volume and velocity between discharge and abstraction point is unlikely to impact the dilution potential of the river for water quality parameters. This is anticipated to have a negligible impact on physicochemical parameters.' Overall, 'no deterioration between status classes' are anticipated. |
| | Receptor habitat | Pynes WTW | Non-habitat (e.g. WTW) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A | None |
| W-09 River Exe to Wimbleball Reservoir - extend pumped storage abstraction season to include April and May | Source habitat | River Exe (Exe (Haddeo to Barle) Water Body) | River | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth | May increase chances of INNS/propagule spread during extended season | Level 2 WFD assessment concluded 'The potential reduction in water downstream of the abstraction point during the additional month of operation could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. Due to operation of this scheme within HOF conditions, there is an anticipated minor impact on physicochemical parameters' |
| | Pathway | Existing pipeline | Non-habitat (e.g. WTW) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | Transfer period extended from November-March to November-May | No |

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| | Receptor habitat | Wimbleball Reservoir (Wimbleball Lake Water body) | Online water body | No change | No change | Increase in wetted area | Increase in average depth | No | Level 2 WFD assessment concluded no change in water quality. |

Source: Mott MacDonald, 2026

**Table 4.14: Potential impacts to INNS populations due to potential impacts to surface water bodies within Wimbleball WRZ**

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| W-03 Wimbleball Reservoir - reduce compensation flow | Aquatic vegetation | Nuttall's waterweed (*Elodea nuttallii*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive/ variable<br>Depth: Positive (high confidence) | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive/variable (high confidence)<br>Wetted area: Negative (high confidence)<br>Depth: Negative (high confidence) | Positive response in the source habitat. Unclear response in the receptor habitat. Potential INNS response to water quality changes identified in receptor habitats; species specific responses to be reviewed following any further water quality investigations. Species recorded in the source and receptor therefore the risk of INNS/propagule spread of these species is reduced. |
| | Aquatic / riparian vegetation | Australian swamp stonecrop (*Crassula helmsii*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Negative (high confidence)<br>Depth: positive/ variable (high confidence) | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Negative/ variable (high confidence) | Unclear response in the source habitat. Unclear response in receptor habitat. Potential INNS response to water quality changes identified in pathway habitats; species specific responses to be reviewed following any further water quality investigations. Species recorded in the source and receptor therefore the risk of INNS/propagule spread is reduced. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Fish | Rainbow trout (*Oncorhynchus mykiss*) | Not recorded | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative/ variable (medium confidence)<br>Depth: Variable (High confidence) | Not recorded in the source habitat. Unclear response in the receptor habitat. Potential INNS response to water quality changes identified in receptor habitats; species specific responses to be reviewed following any further water quality investigations. Species recorded in the receptor only therefore risk of INNS/propagule spread risk is reduced. |
| | Shrimp | *Crangonyx pseudogracilis* | Not recorded | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence) | Not recorded in the source habitat. Unclear response in receptor habitat. Potential INNS response to water quality changes identified in pathway habitats; species specific responses to be reviewed following any further water quality investigations. Species recorded in the receptor only therefore risk of INNS/propagule spread risk is reduced. |
| | Riparian vegetation | Himalayan balsam (*Impatiens glandulifera*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Negative (high confidence)<br>Depth: Negative/ variable (low confidence) | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive/variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (high confidence) | Negative response in the source habitat. Positive response in the receptor habitat. Potential INNS response to water quality changes identified in pathway habitats; species specific responses to be reviewed following any further water quality investigations. Species recorded in the source and receptor therefore the risk of INNS/propagule spread is reduced. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Not recorded | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/ unknown (low confidence) | Not recorded in source habitat. Unclear response in receptor habitat. Potential INNS response to water quality changes identified in pathway habitats; species specific responses to be reviewed following any further water quality investigations. Species recorded in the receptor only therefore risk of INNS/propagule spread risk is reduced. |
| W-06 Brampford Speke & Stoke Canon - abstract from new source | Aquatic vegetation | Canadian waterweed (*Elodea canadensis*), Nuttall's waterweed (*Elodea nuttallii*). | Boreholes- no habitat changes | Water quality: No change<br>Flow velocity: Negative / variable (high confidence)<br>Wetted area: Positive / variable (high confidence)<br>Depth: Positive (high confidence) | WTW- no habitat changes | Unclear response of aquatic vegetation in pathway. Increased flow can reduce viable habitat for INNS, however increased wetted area and depth can increase viable habitat. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Fish | Rainbow trout (*Oncorhynchus mykiss*), common carp (*Cyprinus carpio*) | Boreholes- no habitat changes | Water quality: No change<br>Flow velocity: Variable (high confidence)<br>Wetted area: Positive (medium confidence)<br>Depth: Variable (high confidence) | WTW- no habitat changes | Unclear response of fish in pathway. Increased flow rate has a variable effect on fish INNS, reducing spawning success whilst increasing food availability. |
| | Shrimp | *Cragonyx pseudogracilis* | Boreholes- no habitat changes | Water quality: No change<br>Flow velocity: Negative (medium confidence)<br>Wetted area: Positive (medium confidence)<br>Depth: variable (low confidence) | WTW- no habitat changes | Unclear response of shrimp in pathway. INNS shrimps tend to prefer slow moving rivers; however increased flow can create better food availability. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Riparian vegetation | Himalayan balsam (*Impatiens glandulifera*), Japanese knotweed (*Fallopia japonica*) | Boreholes- no habitat changes | Water quality: No change<br>Flow velocity: Negative / variable (low confidence)<br>Wetted area: Negative (high confidence)<br>Depth: Negative / variable (low confidence) | WTW- no habitat changes | Potential negative impact on INNS riparian vegetation in the pathway. Increased depth lowers propagation potential and decreases viable habitat. However, higher flow rates increase potential seed dispersal downstream. |
| | Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Boreholes- no habitat changes | Water quality: No change<br>Flow velocity: Variable (high confidence)<br>Wetted area: Positive (medium confidence)<br>Depth: Variable (high confidence) | WTW- no habitat changes | Unclear possible positive impact in pathway. Risk of INNS/propagule spread reduced due to treatment at WTW. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Crayfish | North American signal crayfish (*Pacifastacus leniusculus*) | Boreholes- no habitat changes | Water quality: No change<br>Flow velocity: Variable (medium confidence)<br>Wetted area: Positive (medium confidence)<br>Depth: Positive (medium confidence) | WTW- no habitat changes | Unclear possible positive impact in pathway. Risk of INNS/propagule spread reduced due to treatment at WTW. |
| W-09 River Exe to Wimbleball Reservoir - extend pumped storage abstraction season to include April and May | Fish | Rainbow trout (*Oncorhynchus mykiss*) | Water quality: Species specific approach recommended<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative / variable (medium confidence)<br>Depth: Variable (high confidence) | Pipeline- no habitat changes | Not recorded | Unclear response at source. Potential INNS response to water quality changes identified in source habitats; species specific responses to be reviewed following any further water quality investigations. Potential for species to be introduced into receptor habitat. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Riparian vegetation | Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*) | Water quality: Species specific approach recommended<br>Flow velocity: Positive / variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (high confidence) | Pipeline- no habitat changes | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Negative (high confidence)<br>Depth: Negative / variable (low confidence) | Positive response within source habitat due to increased habitat availability. Possible overall negative response at receptor as habitat availability is decreased. Potential INNS response to water quality changes identified in source habitats; species specific responses to be reviewed following any further water quality investigations.<br>Japanese knotweed recorded at source only, therefore there is a potential risk of introduction of this species into receptor. Himalayan balsam recorded at both source and receptor. |
| | Snail | Jenkin's spire shell (*Potamopyrgus antipodarum*) | Water quality: Species specific approach recommended<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable / unknown (low confidence) | Pipeline- no habitat changes | Not recorded | Unclear response at source habitat. Potential INNS response to water quality changes identified in source habitats; species specific responses to be reviewed following any further water quality investigations. Species recorded in source only therefore there is an additional risk of new introductions. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Crayfish | North American signal crayfish (*Pacifastacus leniusculus*) | Water quality: Species specific approach recommended<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Negative (medium confidence) | Pipeline- no habitat changes | Not recorded | Unclear response in source. Potential INNS response to water quality changes identified in source habitats; species specific responses to be reviewed following any further water quality investigations. Potential for species to be introduced into receptor habitat. |
| | Aquatic vegetation | Nuttall's waterweed (*Elodea nuttallii*) | Not recorded | Pipeline- no habitat changes | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive / variable (high confidence)<br>Depth: Positive (high confidence) | Potential positive impact on Nuttall's waterweed in the receptor. Increased wetted area and depth provides additional habitat and could help propagation.. |
| | Aquatic / riparian vegetation | Australian swamp stonecrop (*Crassula helmsii*) | Not recorded | Pipeline- no habitat changes | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Negative (high confidence)<br>Depth: Positive / variable (high confidence) | Unclear response in receptor. |

Source: APEM, 2024; Mott MacDonald, 2025

## 4.4 Bristol WRZ

### 4.4.1 SAI-RAT risk assessment

Within the Bristol WRZ, no transfers were identified as identified as a temporary transfer using new/otherwise unused pathway(s), therefore, no options were assessed using the full SAI-RAT.

### 4.4.2 SAI-RAT IRM

The expected impacts to surface waterbodies are summarised below in Table 4.15. The potential impacts to INNS groups as a result of these changes is presented in Table 4.16.

**Table 4.15: Expected impacts to surface waterbodies within Bristol WRZ**

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| Br-27a Blagdon Reservoir - reduce compensation flow | Source habitat | Blagdon Reservoir (Blagdon Lake Water Body) | Offline water body | Unconfirmed (assessed as No change) | No change | Increase in wetted area | Increase in average depth | None | WFD assessment did not identify a risk of water quality deterioration however further investigation required. |
| | Pathway | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | Reduced compensation flow downstream | None |
| | Receptor habitat | River Yeo (Yeo- source to conf Congresbury) | River | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth | None | Level 2 WFD assessment concluded 'the reduction in water discharged into this watercourse could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters, to be confirmed following recommended further investigations.' |
| Br-27b Blagdon Reservoir - delay water bank releases | Source habitat | Blagdon Reservoir (Blagdon Lake Water Body) | Offline water body | Unconfirmed (assessed as No change) | No change | Increase in wetted area | Increase in average depth | None | WFD assessment did not identify a risk of water quality deterioration however further investigation required. |
| | Pathway | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | Reduced compensation flow downstream | None |

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| | Receptor habitat | River Yeo (Yeo- source to conf Congresbury) | River | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth | None | Level 2 WFD assessment concluded 'the reduction in water discharged into this watercourse could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters, to be confirmed following recommended further investigations.' |
| Br-28a Chew Valley Lake - reduce compensation flow | Source habitat | Chew valley Lake (Chew Valley Lake Water body) | Offline water body | Unconfirmed (assessed as No change) | No change | Increase in wetted area | Increase in average depth | None | WFD assessment did not identify a risk of water quality deterioration however further investigation required. |
| | Pathway | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | Reduced compensation flow downstream | None |
| | Receptor habitat | River Chew (Chew Valley Lake to conf Winford Brook Water Body) | River | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth | None | Level 2 WFD assessment concluded 'the reduction in water discharged into this watercourse could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters, to be confirmed |

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | following recommended further investigations.' |
| Br-28b Chew Valley Lake - delay water bank releases | Source habitat | Chew valley Lake (Chew Valley Lake Water body) | Offline water body | Unconfirmed (assessed as No change) | No change | Increase in wetted area | Increase in average depth | None | WFD assessment did not identify a risk of water quality deterioration however further investigation required. |
| | Pathway | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | Reduced compensation flow downstream | None |
| | Receptor habitat | River Chew (Chew Valley Lake to conf Winford Brook Water Body) | River | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth | None | Level 2 WFD assessment concluded 'the reduction in water discharged into this watercourse could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters, to be confirmed following recommended further investigations.' |
| Br-29 Chew Magna Reservoir - reduce compensation flow | Source habitat | Chew Magna Reservoir (within Winford Bk - source to conf R Chew Water Body) | Offline water body | Unconfirmed (assessed as No change) | No change | Increase in wetted area | Increase in average depth | None | WFD level 2 does not list Chew Magma Reservoir as a relevant waterbody and no assessment has been made. The waterbody has been assessed assuming no change to water quality- may need WFD confirmation |

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| | Pathway | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | Reduced compensation flow downstream | None |
| | Receptor habitat | Winford Brook (Winford Bk - source to conf R Chew Water Body) | River | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth | None | Level 2 WFD assessment concluded 'the reduction in water discharged into this watercourse could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters, to be confirmed following recommended further investigations.' |
| Br-30 Cheddar Ponds - reduce compensation flow | Source habitat | Cheddar Ponds (within Cheddar Yeo - source to conf River Axe Water Bod) | Offline water body | Potentially no change - waterbody not assessed in the WFD level 2 assessment | No change | Increase in wetted area | Increase in average depth | None | WFD level 2 does not list Cheddar Reservoir as a relevant waterbody and no assessment has been made. The waterbody has been assessed assuming no change to water quality- may need WFD confirmation |
| | Pathway | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | N/A (no transfer) | Reduced compensation flow downstream | None |

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| | Receptor habitat | Cheddar Yeo (Cheddar Yeo - source to conf River Axe Water body) | River | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth | None | Level 2 WFD assessment concluded 'the reduction in water discharged into this water course could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters, to be confirmed following further investigations. Minor localised impacts on temperature anticipated.' |
| Br-31a River Axe to Cheddar Reservoir - extend pumped storage abstraction season to include October | Source habitat | River Axe (Axe - Cocklake to Brean Cross Sluice Water Body) | River | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth | None | WFD level 2 assessment concluded ' The reduction in water downstream of the abstraction point due to the increased drought permit abstraction could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters, to be confirmed following further investigations. Minor localised impacts on temperature anticipated' |

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| | Pathway | N/A | N/A enclosed artificial transfer (e.g. pipeline) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | Pump storage season extended from Nov-April to Oct-April, may increase chances of INNS/propagule spread during extended season. | None |
| | Receptor habitat | Cheddar Reservoir (Cheddar Reservoir Water Body) | Offline water body | No change | No change | Increase in wetted area | Increase in average depth | None | WFD assessment did not identify a risk of water quality deterioration |
| Br-31b River Axe to Cheddar Reservoir - extend pumped storage abstraction season to include May | Source habitat | River Axe (Axe - Cocklake to Brean Cross Sluice Water Body) | River | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth | None | WFD level 2 assessment concluded ' The reduction in water downstream of the abstraction point due to the increased drought permit abstraction could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters, to be confirmed following further investigations. Minor localised impacts on temperature anticipated' |

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| | Pathway | N/A | N/A enclosed artificial transfer (e.g. pipeline) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | Pump storage season extended from Nov-April to Nov-Mayl, may increase chances of INNS/propagule spread during extended season. | None |
| | Receptor habitat | Cheddar Reservoir (Cheddar Reservoir Water Body) | Offline water body | No change | No change | Increase in wetted area | Increase in average depth | None | WFD assessment did not identify a risk of water quality deterioration |
| Br-47 River Axe to Cheddar Reservoir - early commissioning of pumped storage abstraction | Source habitat | River Axe (Axe - Cocklake to Brean Cross Sluice Water Body) | River | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth | None | WFD level 2 assessment concluded ' The reduction in water downstream of the abstraction point due to the increased drought permit abstraction could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters, to be confirmed following further investigations. Minor localised impacts on temperature anticipated' |

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| | Pathway | N/A | N/A enclosed artificial transfer (e.g. pipeline) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | Changing abstraction times for commissioning treatment, may increase chances of INNS/propagule spread during extended season. | None |
| | Receptor habitat | Cheddar Reservoir (Cheddar Reservoir Water Body) | Offline water body | No change | No change | Increase in wetted area | Increase in average depth | None | WFD assessment did not identify a risk of water quality deterioration |

**Table 4.16: Potential response to INNS populations due to predicted changes to surface water bodies within Bristol WRZ**

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| Br-27a Blagdon Reservoir - reduce compensation flow BR-27b Blagdon Reservoir - delay water bank releases | Aquatic vegetation | Nuttall's waterweed (*Elodea nuttallii*), Canadian waterweed (*Elodea canadensis*), Least duckweed (*Lemna minuta* (*minuscula*)), Water Fern (*Azolla filiculoides*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive/ variable (high confidence)<br>Depth: Positive (high confidence) | N/A no transfer | Water quality: Species-specific approach recommended<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Negative (high confidence)<br>Depth: Negative (high confidence) | Positive response in source habitat. Unclear response in receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in source and receptor , therefore the introduction of this species to a new habitat is not expected. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Shrimp | *Crangonyx pseudogracilis* | Not recorded | N/A no transfer | Water quality: Species-specific approach recommended<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence) | Unclear response in receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in source and receptor habitat, therefore the introduction of this species to a new habitat is not expected. |
| | Riparian vegetation | Himalayan balsam (*Impatiens glandulifera*) | Not recorded | N/A no transfer | Water quality: Species-specific approach recommended<br>Flow velocity: Positive/variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (high confidence) | Positive response in receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in receptor, therefore the introduction of this species to a new habitat is not expected. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive (high confidence)<br>Depth: Variable unknown (low confidence) | N/A no transfer | Water quality: Species-specific approach recommended<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/ unknown (low confidence) | Unclear, possible positive response in source. Unclear response in receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in source and receptor habitat, therefore the introduction of this species to a new habitat is not expected. |
| | Fish | Rainbow trout (*Oncorhynchus mykiss*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive (Medium confidence)<br>Depth: Variable (high confidence) | N/A no transfer | Water quality: Species-specific approach recommended<br>Flow velocity: No change<br>Wetted area: Positive (medium confidence)<br>Depth: Variable (high confidence) | Unclear, possible positive response in source. Unclear response in receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in source and receptor habitat, therefore the introduction of this species to a new habitat is not expected. |
| BR-28a Chew Valley Lake - reduce compensatio n flowBR-28b Chew Valley Lake - delay water bank releases | Aquatic vegetation | Canadian waterweed (*Elodea canadensis*), Least duckweed (*Lemna minuta* (*minuscula*)), Nuttall's waterweed (*Elodea nuttallii*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive/ variable (high confidence)<br>Depth: Positive (High confidence) | N/A no transfer | Water quality: Species-specific approach recommended<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Negative (high confidence)<br>Depth: Negative (high confidence) | Positive response in source habitat. Unclear response in receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in source and receptor , therefore the introduction of this species to a new habitat is not expected. Only Elodea nuttalii recorded in the source. All species recorded in receptor therefore new introduction unlikely. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Fish | Rainbow trout (*Oncorhynchus mykiss*) | Not recorded | N/A no transfer | Water quality: Species-specific approach recommended<br>Flow velocity: Variable (High confidence)<br>Wetted area: Negative/ variable (medium confidence)<br>Depth: Variable (high confidence) | Unclear response in receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in source and receptor habitat, therefore the introduction of this species to a new habitat is not expected. |
| | Shrimp | *Crangonyx pseudogracilis* | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive (medium confidence)<br>Depth: Variable (low confidence) | N/A no transfer | Water quality: Species-specific approach recommended<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence) | Possible positive response in source habitat, unclear response in receptor. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in receptor, therefore the introduction of this species to a new habitat is not expected. |
| | Riparian vegetation | Himalayan balsam (*Impatiens glandulifera*) | Not recorded | N/A no transfer | Water quality: Species-specific approach recommended<br>Flow velocity: Positive/variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (high confidence) | Positive response in receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in source and receptor habitat, therefore the introduction of this species to a new habitat is not expected. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive (high confidence)<br>Depth: Variable/ unknown (low confidence) | N/A no transfer | Water quality: Species-specific approach recommended<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/ unknown (low confidence) | Unclear, possible positive response in source. Unclear response in receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in source and receptor habitat, therefore the introduction of this species to a new habitat is not expected. |
| Br-29 Chew Magna Reservoir - reduce compensation flow | Bivalve | Zebra mussel (*Dreissena polymorpha*) | Not recorded in source, recorded upstream of the source | N/A no transfer | Water quality: Species-specific approach recommended<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (high confidence) | Not recorded in source habitat, though may be present as located in an upstream channel connected to source. Unclear response in receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species found in receptor, therefore the introduction of this species to a new habitat is not expected. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Fish | Rainbow trout (*Oncorhynchus mykiss*), Brook charr (*Salvelinus fontinalis*) | Not recorded, both recorded upstream of the source | N/A no transfer | Water quality: Species-specific approach recommended<br>Flow velocity: Variable (High confidence)<br>Wetted area: Negative/ variable (medium confidence)<br>Depth: Variable (high confidence) | Not recorded in source habitat, but may be present as located in an upstream channel connected to source. Unclear response in the receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species found in receptor, therefore the introduction of this species to a new habitat is not expected. |
| | Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Not recorded, recorded upstream of the source | N/A no transfer | Water quality: Species-specific approach recommended<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/ unknown (low confidence) | Not recorded in source habitat. Unclear response in the receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species found in receptor, therefore the introduction of this species to a new habitat is not expected. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Crayfish | North American signal crayfish (*Pacifastacus leniusculus*) | Not recorded | N/A no transfer | Water quality: Species-specific approach recommended<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Negative (medium confidence) | Not recorded in the source habitat. Unclear response in receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species found in receptor, therefore the introduction of this species to a new habitat is not expected. |
| Br-30 Cheddar Ponds - reduce compensation flow | Aquatic vegetation | Nuttall's waterweed (*Elodea nuttallii*), Least duckweed (*Lemna minuta* (*minuscula*)), Canadian waterweed (*Elodea canadensis*), Water Fern (*Azolla filiculoides*) | Not recorded | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Negative (high confidence)<br>Depth: Negative (high confidence) | Unclear, possible negative response in the receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in receptor, therefore the introduction of this species to a new habitat is not expected. |
| | Fish | Grass carp (*Ctenopharyngodon idella*) | Not recorded | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Variable (High confidence)<br>Wetted area: Negative/ variable (medium confidence)<br>Depth: Variable (high confidence) | Unclear response in receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in receptor, therefore the introduction of this species to a new habitat is not expected. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Shrimp | *Crangonyx pseudogracilis* | Not recorded | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence) | Unclear response in receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in receptor, therefore the introduction of this species to a new habitat is not expected. |
| | Riparian vegetation | Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*) | Not recorded | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (high confidence) | Positive response in receptor. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in receptor, therefore the introduction of this species to a new habitat is not expected. |
| | Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Not recorded | N/A no transfer | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/ unknown (low confidence) | Unclear response in receptor habitat. Potential INNS response to water quality changes identified in receptor habitat; specific responses to be reviewed following any further water quality investigations. Species recorded in receptor, therefore the introduction of this species to a new habitat is not expected. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| Br-31a/Br31b River Axe to Cheddar Reservoir - extend pumped storage abstraction season to include October/May | Aquatic vegetation | Nuttall's waterweed (*Elodea nuttallii*), Floating pennywort (*Hydrocotyle ranunculoides*), Canadian waterweed (*Elodea canadensis*) | Water quality: Species-specific approach<br>Flow velocity: Positive/variable (high confidence)<br>Wetted area: Negative (high confidence)<br>Depth: Negative (high confidence) | Pipeline - no habitat changes | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive/ variable (high confidence)<br>Depth: Positive (high confidence) | Unclear response in the source. Positive response in the receptor habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Nuttall's waterweed (Elodea nuttallii) recorded in source and receptor, the introduction of this species to a new habitat is not expected. Floating pennywort (Hydrocotyle ranunculoides), Canadian waterweed (Elodea canadensis) recorded only in source, therefore there is a risk of INNS/propagule spread of these species. |
| | Bivalve | *Physa acuta* | Water quality: Species-specific approach<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (high confidence) | Pipeline - no habitat changes | Not recorded | Unclear response in the source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Recorded in the source therefore there is a risk of INNS/propagule spread of these species to the receptor. |
| | Aquatic / riparian vegetation | American skunk-cabbage (*Lysichiton americanus*) | Water quality: Species-specific approach<br>Flow velocity: Positive/ Variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Negative/ Variable (high confidence) | Pipeline - no habitat changes | Not recorded | Unclear, possible positive response in the source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Recorded in the source therefore there is a risk of INNS/propagule spread of these species to the receptor. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Fish | Sunbleak (*Leucaspius delineatus*), Common carp (*Cyprinus carpio*) | Water quality: Species-specific approach<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative/variable (medium confidence)<br>Depth: Variable (high confidence) | Pipeline - no habitat changes | Not recorded | Unclear response in the source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Recorded in the source therefore there is a risk of INNS/propagule spread of these species to the receptor. |
| | Shrimp | *Crangonyx pseudogracilis* | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence) | Pipeline - no habitat changes | Not recorded | Unclear response in the source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Recorded in the source therefore there is a risk of INNS/propagule spread of these species to the receptor. |
| | Riparian vegetation | Himalayan balsam (*Impatiens glandulifera*) | Water quality: Species-specific approach<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (high confidence) | Pipeline - no habitat changes | Not recorded | Positive response in the source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Recorded in the source therefore there is a risk of INNS/propagule spread of these species to the receptor. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/ unknown (low confidence) | Pipeline - no habitat changes | Not recorded | Unclear response in the source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Recorded in the source therefore there is a risk of INNS/propagule spread of these species to the receptor. |
| | Crayfish | North American signal crayfish (*Pacifastacus leniusculus*) | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Negative (medium confidence) | Pipeline - no habitat changes | Not recorded | Unclear response in the source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Recorded in the source therefore there is a risk of INNS/propagule spread of these species to the receptor. |
| Br-47 River Axe to Cheddar Reservoir - early commissioning of pumped storage abstraction | Aquatic vegetation | Nuttall's waterweed (*Elodea nuttallii*), Floating pennywort (*Hydrocotyle ranunculoides*), Canadian waterweed (*Elodea canadensis*) | Water quality: Species-specific approach<br>Flow velocity: Positive/variable (high confidence)<br>Wetted area: Negative (high confidence)<br>Depth: Negative (high confidence) | Pipeline - no habitat changes | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive/ variable (high confidence)<br>Depth: Positive (high confidence) | Unclear response in the source. Positive response in the receptor habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Nuttall's waterweed (Elodea nuttallii) recorded in source and receptor, the introduction of this species to a new habitat is not expected. Floating pennywort (Hydrocotyle ranunculoides), Canadian waterweed (Elodea canadensis) recorded only in source, therefore there is a risk of INNS/propagule spread of these species. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Bivalve | *Physa acuta* | Water quality: Species-specific approach<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (high confidence) | Pipeline - no habitat changes | Not recorded | Unclear response in the source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Recorded in the source therefore there is a risk of INNS/propagule spread of these species to the receptor. |
| | Aquatic / riparian vegetation | American skunk-cabbage (*Lysichiton americanus*) | Water quality: Species-specific approach<br>Flow velocity: Positive/ Variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Negative/ Variable (high confidence) | Pipeline - no habitat changes | Not recorded | Unclear, possible positive response in the source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Recorded in the source therefore there is a risk of INNS/propagule spread of these species to the receptor. |
| | Fish | Sunbleak (*Leucaspius delineatus*), Common carp (*Cyprinus carpio*) | Water quality: Species-specific approach<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative/variable (medium confidence)<br>Depth: Variable (high confidence) | Pipeline - no habitat changes | Not recorded | Unclear response in the source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Recorded in the source therefore there is a risk of INNS/propagule spread of these species to the receptor. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Shrimp | *Crangonyx pseudogracilis* | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence) | Pipeline - no habitat changes | Not recorded | Unclear response in the source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Recorded in the source therefore there is a risk of INNS/propagule spread of these species to the receptor. |
| | Riparian vegetation | Himalayan balsam (*Impatiens glandulifera*) | Water quality: Species-specific approach<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (high confidence) | Pipeline - no habitat changes | Not recorded | Positive response in the source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Recorded in the source therefore there is a risk of INNS/propagule spread of these species to the receptor. |
| | Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/ unknown (low confidence) | Pipeline - no habitat changes | Not recorded | Unclear response in the source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Recorded in the source therefore there is a risk of INNS/propagule spread of these species to the receptor. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Crayfish | North American signal crayfish (*Pacifastacus leniusculus*) | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Negative (medium confidence) | Pipeline - no habitat changes | Not recorded | Unclear response in the source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Recorded in the source therefore there is a risk of INNS/propagule spread of these species to the receptor. |

Source: APEM, 2024; Mott MacDonald, 2025

## 4.5 Bournemouth WRZ

### 4.5.1 SAI-RAT risk assessment

Within the Bournemouth WRZ, no transfers were identified as identified as a temporary transfer using new/otherwise unused pathway(s), therefore, no options were assessed using the full SAI-RAT.

### 4.5.2 SAI-RAT IRM

The expected impacts to surface waterbodies are summarised below in Table 4.17. The potential impacts to INNS groups as a result of these changes is presented in Table 4.18.

**Table 4.17: Expected impacts to surface waterbodies within Bournemouth WRZ**

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| BN-04 River Stour at Longham - remove low flow constraint | Source | River Stour (Stour (Lower) Water body) | River | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth | May increase chances of INNS/propagule spread with greater transfer volume | Level 2 WFD assessment concluded 'the reduction in water downstream of the abstraction point due to the increased drought permit abstraction (which does not have appropriate supporting information to confirm if the extended pumped storage scheme will operate under the current HOF value) could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters, to be confirmed following further investigations. |
| | Pathway | Pipeline | Non-habitat (e.g. WTW) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A | N/A |
| | Receptor | Longham Lakes | Offline water body | Unconfirmed (assessed as No change) | No change | Increase in wetted area | Increase in average depth | May increase chances of INNS/propagule spread with greater transfer volume | Not assessed at WFD Level 2 |

| Option | Option component | Habitat name | Component type | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact | Other option impacts | Additional comments |
|---|---|---|---|---|---|---|---|---|---|
| BN-12 River Stour at Longham - increase weekly abstraction limit | Source | River Stour | River | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth | May increase chances of INNS/propagule spread with greater transfer volume | Level 2 WFD assessment concluded 'the reduction in water downstream of the abstraction point due to the increased drought permit abstraction (which does not have appropriate supporting information to confirm if the extended pumped storage scheme will operate under the current HOF value) could result in a reduction in dilution potential of the river for water quality parameters, potentially exacerbating any impact of pollutants. This could have an adverse effect on physicochemical parameters, to be confirmed following further investigations. |
| | Pathway | Pipeline | Non-habitat (e.g. WTW) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A (no habitat) | N/A | N/A |
| | Receptor | Longham Lakes | Offline water body | Unconfirmed (assessed as No change) | No change | Increase in wetted area | Increase in average depth | May increase chances of INNS/propagule spread with greater transfer volume | Not assessed at WFD L2 |

Source: Mott MacDonald, 2025

**Table 4.18: Potential impacts to INNS populations due to potential impacts to surface water bodies within Bournemouth WRZ**

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| BN-04 River Stour at Longham - remove low flow constraint | Aquatic vegetation | Least duckweed (*Lemna minuta* (*minuscula*)), Nuttall's waterweed (*Elodea nuttallii*), Canadian waterweed (*Elodea canadensis*), Water Fern (*Azolla caroliniana*) | Water quality: Species-specific approach<br>Flow velocity: Positive/variable (High confidence)<br>Wetted area: Negative (High confidence)<br>Depth: Negative (High confidence) | Pipeline - no habitat changes | Recorded in waterbody catchment but not in receptor. | Unclear response in source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species identified in source are not recorded in receptor, therefore there is the potential of an introduction of these species to the receiving water body. |
| | Bivalve | *Physa acuta* | Water quality: Species-specific approach<br>Flow velocity: Variable (High confidence)<br>Wetted area: Negative (Medium confidence)<br>Depth: Variable (High confidence) | Pipeline - no habitat changes | Recorded in waterbody catchment but not in receptor. | Unclear response in source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species identified in source are not recorded in receptor, therefore there is the potential of an introduction of these species to the receiving water body. |
| | Fish | Common carp (*Cyprinus carpio*), Rainbow trout (*Oncorhynchus mykiss*) | Water quality: Species-specific approach<br>Flow velocity: Variable (High confidence)<br>Wetted area: Negative/variable (Medium confidence)<br>Depth: Variable (High confidence) | Pipeline - no habitat changes | Recorded in waterbody catchment but not in receptor. | Unclear response in source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species identified in source are not recorded in receptor, therefore there is the potential of an introduction of these species to the receiving water body. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Shrimp | *Crangonyx pseudogracilis* | Water quality: Species-specific approach<br>Flow velocity: Positive (Medium confidence)<br>Wetted area: Negative (Medium confidence)<br>Depth: Variable (Low confidence) | Pipeline - no habitat changes | Recorded in waterbody catchment but not in receptor. | Unclear response in source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species identified in source are not recorded in receptor, therefore there is the potential of an introduction of these species to the receiving water body. |
| | Aquatic / riparian vegetation | Himalayan balsam (*Impatiens glandulifera*), Giant knotweed (*Fallopia sachalinensis*), Giant hogweed (*Heracleum mantegazzianum*), Orange balsam (*Impatiens capensis*) | Water quality: Species-specific approach<br>Flow velocity: Positive/variable (High confidence)<br>Wetted area: Positive (High)<br>Depth: Positive (High) | Pipeline - no habitat changes | Recorded in waterbody catchment but not in receptor. | Positive response in source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species identified in source are not recorded in receptor, therefore there is the potential of an introduction of these species to the receiving water body. |
| | Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Water quality: Species-specific approach<br>Flow velocity: Positive (Medium confidence)<br>Wetted area: Negative (Low confidence)<br>Depth: Variable/unknown (Low confidence) | Pipeline - no habitat changes | Recorded in waterbody catchment but not in receptor. | Unclear response in source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species identified in source are not recorded in receptor, therefore there is the potential of an introduction of these species to the receiving water body. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| BN-12 River Stour at Longham - increase weekly abstraction limit | Aquatic vegetation | Least duckweed (*Lemna minuta* (*minuscula*)), Nuttall's waterweed (*Elodea nuttallii*), Canadian waterweed (*Elodea canadensis*), Water fern (*Azolla caroliniana*) | Water quality: Species-specific approach<br>Flow velocity: Positive/variable (High confidence)<br>Wetted area: Negative (High confidence)<br>Depth: Negative (High confidence) | Pipeline - no habitat changes | Recorded in waterbody catchment but not in receptor. | Unclear response in source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species identified in source are not recorded in receptor, therefore there is the potential of an introduction of these species to the receiving water body. |
| | Bivalve | *Physa acuta* | Water quality: Species-specific approach<br>Flow velocity: Variable (High confidence)<br>Wetted area: Negative (Medium confidence)<br>Depth: Variable (High confidence) | Pipeline - no habitat changes | Recorded in waterbody catchment but not in receptor. | Unclear response in source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species identified in source are not recorded in receptor, therefore there is the potential of an introduction of these species to the receiving water body. |
| | Fish | Common carp (*Cyprinus carpio*), Rainbow trout (*Oncorhynchus mykiss*) | Water quality: Species-specific approach<br>Flow velocity: Variable (High confidence)<br>Wetted area: Negative/variable (Medium confidence)<br>Depth: Variable (High confidence) | Pipeline - no habitat changes | Recorded in waterbody catchment but not in receptor. | Unclear response in source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species identified in source are not recorded in receptor, therefore there is the potential of an introduction of these species to the receiving water body. |

| Option | INNS groups present | INNS | Potential response in source habitat(s) | Potential response in pathway habitat(s) | Potential response in receptor habitat(s) | Potential overall response to option |
|---|---|---|---|---|---|---|
| | Shrimp | *Crangonyx pseudogracilis* | Water quality: Species-specific approach<br>Flow velocity: Positive (Medium confidence)<br>Wetted area: Negative (Medium confidence)<br>Depth: Variable (Low confidence) | Pipeline - no habitat changes | Recorded in waterbody catchment but not in receptor. | Unclear response in source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species identified in source are not recorded in receptor, therefore there is the potential of an introduction of these species to the receiving water body. |
| | Aquatic / riparian vegetation | Himalayan balsam (*Impatiens glandulifera*), Giant knotweed (*Fallopia sachalinensis*), Giant hogweed (*Heracleum mantegazzianum*), Orange balsam (*Impatiens capensis*) | Water quality: Species-specific approach<br>Flow velocity: Positive/variable (High confidence)<br>Wetted area: Positive (High)<br>Depth: Positive (High) | Pipeline - no habitat changes | Recorded in waterbody catchment but not in receptor. | Positive response in source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species identified in source are not recorded in receptor, therefore there is the potential of an introduction of these species to the receiving water body. |
| | Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Water quality: Species-specific approach<br>Flow velocity: Positive (Medium confidence)<br>Wetted area: Negative (Low confidence)<br>Depth: Variable/unknown (Low confidence) | Pipeline - no habitat changes | Recorded in waterbody catchment but not in receptor. | Unclear response in source habitat. Potential INNS response to water quality changes identified in source habitat; specific responses to be reviewed following any further water quality investigations. Species identified in source are not recorded in receptor, therefore there is the potential of an introduction of these species to the receiving water body. |

Source: APEM, 2024; Mott MacDonald, 2025

## 4.6 Isles of Scilly WRZ

### 4.6.1 SAI-RAT risk assessment

No further assessment was required in relation to option IS-18.

# 5 Cumulative / In-combination Effects

## 5.1 Preferred Plan overview

The initial plan-level screening of option interactions determined that there would be no interaction between drought options within separate WRZs in the Preferred Plan. As such, the in-combination and cumulative effects assessment has been undertaken separately for each WRZ in sections 5.2 to 5.5. A high-level risk of cumulative effects rating was determined for each plan and at each drought level.

There has been ongoing work on the drought options and levels, and as the results of environmental assessments have become available, the environmental impact category and associated confidence levels have been reviewed and updated where necessary. The drought levels reported on reflect the expected drought levels for options at the time of undertaking the assessments.

## 5.2 Colliford WRZ

### 5.2.1 Site screening

Table 5.1 below shows the screening of options in the Colliford WRZ. This shows that two habitats were identified as being potentially impacted by in-combination effects – the River Fowey and Colliford Reservoir.

For the River Fowey, this would only occur at drought level 3A and above, as options C-06 and C-30 could then interact with option C-03.

Colliford Reservoir could be impacted by options C-03 and C-07a (sub-option B only) at drought level 2. At drought level 3A and above these three options may also interact with options C-06 and C-11. At drought level 3B these options may also interact with C-40.

**Table 5.1: Screening of option interactions in the Colliford WRZ**

| Option ID | C-03 | C-07a | C-37 | C-04a | C-06 | C-11 | C-30 | C-10 | C-17 | C-40 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Drought level** | 2 | 2 | 2 | 3A | 3A | 3A | 3A | 3B | 3B | 3B |
| **River Fowey** | S | | | | R | | R | | | |
| **Colliford Reservoir** | R | R (C07a B) | | | S | R | | | | S |
| **Park Lake** | | S | | | | | | | | |
| **River Cober** | | | S | | | | | | | |
| **Stannon Lake** | | | | S | | | | | | |
| **River Fowey** | | | | | R | | | | | |
| **Hawks Tor Pit** | | | | | | S | | | | |
| **Siblyback Lake** | | | | | | | S | | | |
| **Siblyback ds waterbodies** | | | | | | | R | | | |
| **Drift Reservoir** | | | | | | | | S | | |
| **Newlyn Combe River** | | | | | | | | R | | |
| **St Neot River** | | | | | | | | | | R |

| Option ID | C-03 | C-07a | C-37 | C-04a | C-06 | C-11 | C-30 | C-10 | C-17 | C-40 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Stithian Reservoir** | | | | | | | | | S | |
| **River Kennel** | | | | | | | | | R | |

Source: Mott MacDonald, 2026. S = Source, R = Receptor

### 5.2.2 River Fowey

Physical cumulative and in-combination effects within the River Fowey are assessed within Table 5.2 below. This shows that at drought level 2, the River Fowey would only be impacted by option C-03.

A drought level 3A, physical impacts from options C-06 and C-30 could combine with C-03, and they could align so as to increase their magnitude. As such, drought level 3A could lead to a greater combined decrease in water quality, flow, wetted area and depth than these options would cause individually.

No further interactions were identified at drought level 3B; therefore this drought level would cause no additional physical impacts to the River Fowey.

**Table 5.2: Physical in-combination and cumulative effects on the River Fowey**

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| 2 | C-03 | S | Decrease in water quality (TBC following further investigations) | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth |
| **2** | **Drought level 2 in-combination effects** | | **Decrease in water quality** | **Decrease in average flow velocity** | **Decrease in wetted area** | **Decrease in average depth** |
| 3A | C-06 | R/P | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth |
| 3A | C-30 | R/P | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth |
| **3A** | **Drought level 3A cumulative effects** | | **Additional decrease in water quality** | **Additional decrease in flow** | **Additional decrease in wetted area** | **Additional decrease in depth** |
| No additional interacting options identified at drought level 3B | | | | | | |
| **3B** | **Drought level 3B cumulative effects** | | **As drought level 3A** | **As drought level 3A** | **As drought level 3A** | **As drought level 3A** |

Source: Mott MacDonald, 2026. * S = Source, P = Pathway.

For each INNS group identified within the River Fowey, potential in-combination and cumulative effects are shown in Table 5.3 below. In-combination effects could occur at drought level 3A, with no additional effects at drought level 3B. For the groups aquatic vegetation, bivalve, shrimp, snail and crayfish, the specific population response is unclear due to the contradicting effects of different physical impacts. For riparian vegetation, such as Himalayan balsam (*Impatiens glandulifera*), rhododendron (*Rhododendron ponticum* (+ hybrids)), Japanese knotweed (*Fallopia japonica*), monkey-flower (*Mimulus cupreus*, *M. guttatus* and hybrids) a likely additional positive population response (i.e. an increase) predicted at drought level 3A.

**Table 5.3: Predicted in-combination and cumulative INNS responses in the River Fowey**

| INNS group | Drought level | 2 | 3A | 3B |
|---|---|---|---|---|
| | Options | C-03 | C-03, C-06, C-30 | As 3A |
| Aquatic vegetation | Canadian waterweed (*Elodea canadensis*), Nuttall's waterweed (*Elodea nuttallii*) | Water quality: Species specific approach – would require further investigation Flow velocity: Positive/ variable (high confidence) Wetted area: Negative (high confidence) Depth: Negative (high confidence) **Combined response: Unclear** | Water Quality: Species specific approach – would require further investigation Flow velocity: Positive/ variable (high confidence) Wetted area: Negative (high confidence) Depth: Negative (high confidence) **Combined response: Unclear** | |
| Bivalve | *Physa acuta*, Wautier's Limpet (*Ferissia wautieri*) | Water quality: Species specific approach – would require further investigation Flow velocity: Variable (High confidence) Wetted area: Negative (medium confidence) Depth: Variable (high confidence) **Combined response: Unclear** | Water quality: Species specific approach – would require further investigation Flow velocity: Variable (high confidence) Wetted area: Negative (medium confidence) Depth: Variable (high confidence) **Combined response: Unclear** | As 3A |
| Shrimp | Northern River Crangonyctid (*Crangonyx pseudogracilis*) | Water quality: Species specific approach – would require further investigation Flow velocity: Positive (medium confidence) Wetted area: Negative (medium confidence) Depth: Variable (low confidence) **Combined response: Unclear** | Water quality: Species specific approach – would require further investigation Flow velocity: Positive (medium confidence) Wetted area: Negative (medium confidence) Depth: Variable (low confidence) **Combined response: Unclear** | As 3A |

| INNS group | Drought level | 2 | 3A | 3B |
|---|---|---|---|---|
| | Options | C-03 | C-03, C-06, C-30 | As 3A |
| Riparian vegetation | Himalayan balsam (*Impatiens glandulifera*), Rhododendron (*Rhododendron ponticum* (+ hybrids)), Japanese knotweed (*Fallopia japonica*), Monkey-flower (*Mimulus cupreus*, *M. guttatus* and hybrids) | Water quality: Species specific approach – would require further investigation. Flow velocity: Positive/ variable (high confidence) Wetted area: Positive (high confidence) Depth: Positive (High confidence) Combined response: **Likely positive** | Water quality: Species specific approach – would require further investigation Flow velocity: Positive/ variable (high confidence) Wetted area: Positive (high confidence) Depth: Positive (High confidence) Combined response: **Likely additional positive** | As 3A |
| Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Water quality: Species specific approach – would require further investigation Flow velocity: Positive (medium confidence) Wetted area: Negative (low confidence) Depth: Variable/unknown (low confidence) **Combined response: Unclear** | Water quality: Species specific approach – would require further investigation Flow velocity: Positive (medium confidence) Wetted area: Negative (low confidence) Depth: Variable/unknown (low confidence) **Combined response: Unclear** | As 3A |
| Crayfish | North American signal crayfish (*Pacifastacus leniusculus*) | Not recorded | Water quality: Species specific approach – would require further investigation Flow velocity: Positive (medium approach) Wetted area: Negative (medium confidence) Depth: Negative (medium confidence) **Combined response: Unclear** | As 3A |

Source: Mott MacDonald, 2026.

### 5.2.3 Colliford Reservoir

Physical cumulative and in-combination effects within Colliford Reservoir are assessed within Table 5.4 below. This shows that at drought level 2, Colliford Reservoir would be impacted by drought options C-03 and C-07a (B sub-option only). The physical in-combination effects of these two options could be an additional increase in wetted area and average depth, whilst potential water quality effects may require further investigation.

At drought level 3A, physical impacts from options C-06 and C-11 could combine with C-03 and C-07a (B sub-option only) to cause a greater overall increase in depth and wetted area than

these options would cause individually. Similarly to drought level 2, potential water quality impacts may require further investigation.

At drought level 3B, option C-40 could further interact with the drought level 2 and 3A options, and would likely further exacerbate these impacts, causing a greater overall increase in wetted area and depth. No additional potential water quality impacts were identified at drought level 3B.

However, these drought options would be implemented in the event of an escalating drought. Whilst implementing these options may increase in wetted area and depth in Colliford Reservoir, they may offset the lower water levels caused by the drought itself, therefore leading to more stable water levels in the longer term.

**Table 5.4: Physical in-combination and cumulative effects on Colliford Reservoir**

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| 2 | C-03 | R | Decrease in water quality | No change | Increase in wetted area | Increase in average depth |
| 2 | C-07a | R (C07a B) | Unconfirmed | No change | Increase in wetted area | Increase in average depth |
| **2** | **Drought level 2 in-combination effects** | | **Unconfirmed** | **No change** | **Additional increase in wetted area** | **Additional increase in depth** |
| 3A | C-06 | S | No change | No change | Increase in wetted area | Increase in average depth |
| 3A | C-11 | R | Unconfirmed | No change | Increase in wetted area | Increase in average depth |
| **3A** | **Drought level 3A cumulative effects** | | **No additional change** | **No change** | **Additional increase in wetted area** | **Additional increase in depth** |
| **3B** | C-40 | S | No change | No change | Increase in wetted area | Increase in average depth |
| **3B** | **Drought level 3B cumulative effects** | | **No additional change** | **No change** | **Additional increase in wetted area** | **Additional increase in depth** |

Source: Mott MacDonald, 2026. * S = Source, P = Pathway

For each INNS group identified within Colliford Reservoir, in-combination and cumulative effects are shown in Table 5.5 below. In-combination effects could occur at all drought levels, with additional cumulative effects at each. For aquatic vegetation, such Canadian waterweed (*Elodea canadensis*) and Nuttall's waterweed (*Elodea nuttallii*), a positive population response (i.e. an increase) is expected at all drought levels, with increasing cumulative effects at each level, due to an increase in wetted area and depth. However, if these drought options serve to offset the physical impacts of drought and maintain reservoir levels, then this effect may not occur. For the group aquatic/riparian vegetation, which includes Australian swamp stonecrop (*Crassula helmsii*), the expected response is unclear due to the contradicting effects of different physical impacts.

**Table 5.5: Predicted in-combination and cumulative INNS responses in Colliford Reservoir.**

| INNS group | Drought level | 2 | 3A | 3B |
|---|---|---|---|---|
| | Options | C-03, C07a B | C-03, C07a B, C-06, C-11 | C-03, C07a B, C-06, C-11, C-40 |
| Aquatic vegetation | Canadian waterweed (*Elodea canadensis*) Nuttall's waterweed (*Elodea nuttallii*) | Water quality: Species specific approach Flow velocity: No change Wetted area: Positive/ variable (high confidence) Depth: Positive (high confidence) **Combined response: Likely additional positive** | Water quality: No additional change Flow velocity: No change Wetted area: Positive/ variable (high confidence) Depth: Positive (high confidence) **Combined response: Likely additional positive** | Water quality: No additional change Flow velocity: No change Wetted area: Positive/ variable (high confidence) Depth: Positive (high confidence) **Combined response: Likely additional positive** |
| Aquatic / riparian vegetation | Australian swamp stonecrop (*Crassula helmsii*) | Water quality: Species specific approach Flow velocity: No change Wetted area: Negative (high confidence) Depth: Additional positive/variable (high confidence) **Combined response: Unclear** | Water quality: No additional change Flow velocity: No change Wetted area: Negative (high confidence) Depth: Additional positive/variable (high confidence) **Combined response: Unclear** | Water quality: No additional change Flow velocity: No change Wetted area: Negative (high confidence) Depth: Additional positive/variable (high confidence) **Combined response: Unclear** |

Source: Mott MacDonald, 2026

## 5.3 Roadford WRZ

### 5.3.1 Site screening

Table 5.6 below shows the screening of options in the Roadford WRZ. This shows that two habitats were identified as being potentially impacted by in-combination effects – Roadford Reservoir and the River Tamar.

For Roadford Reservoir, options R-11 and R-25 may may interact at drought level 3A. At drought level 3B option R-48 may also interact with these options.

The River Tamar would be impacted by drought level 3B only, when options R-25 and R-26 impact compensation flows.

**Table 5.6: Screening of option interactions in the Roadford WRZ**

| Option ID | R-07 | R-11 | R-45 | R-25 | R-20 | R-21 | R-22 | R-23 | R-24 | R-26 | R-48 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Drought level** | 2 | 2 | 2 | 3A | 3B | 3B | 3B | 3B | 3B | 3B | 3B |
| **Slade Reservoir** | S | | | | | | | | | | |
| **Hore Down WTW** | R | | | | | | | | | | |
| **River Lyd** | | S | | | | | | | | | |
| **Roadford Reservoir** | | R | | S | | | | | | | S |
| **Littlehempston boreholes** | | | S | | | | | | | | |
| **River Dart** | | | S | | | | | | | | |
| **Littlehempston WTW** | | | R | | | | | | | | |

| Option ID | R-07 | R-11 | R-45 | R-25 | R-20 | R-21 | R-22 | R-23 | R-24 | R-26 | R-48 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **River Avon** | | | | | S | | | | | | |
| **Avon Reservoir** | | | | | R | | | | | | |
| **Burrator Reservoir** | | | | | | S | | | | | |
| **River Meavy** | | | | | | R | | | | | |
| **Fenworthy Reservoir** | | | | | | | S | | | | |
| **South Teign River** | | | | | | | R | | | | |
| **Trenchford Reservoir** | | | | | | | | S | | | |
| **Beadon Brook** | | | | | | | | R | | | |
| **Meldon Reservoir** | | | | | | | | | S | | |
| **West Okement River** | | | | | | | | | R | | |
| **River Tamar** | | | | R | | | | | | R | |
| **Upper Tamar Lake** | | | | | | | | | | S | |
| **River Wolf** | | | | | | | | | | | R |

Source: Mott MacDonald, 2026. S = Source, R = Receptor

### 5.3.2 Roadford Reservoir

Physical cumulative and in-combination effects within Roadford Reservoir are assessed within Table 5.7 below. At drought level 2, the reservoir would only be affected by option R-11.

At drought level 3A, the physical impacts of options R-11 and R-25 could combine to cause an additional increase in wetted area and average depth.

Similarly, at drought level 3B, R-48 could further exacerbate these impacts, causing a greater overall increase in wetted area and depth.

However, these options would be implemented in the event of an escalating drought. Whilst implementing these options may increase in wetted area and depth in the reservoir, they may offset the lower water levels caused by the drought itself, therefore leading to more stable water levels in the longer term.

No potential in-combination water quality impacts were identified in Roadford Reservoir.

**Table 5.7: Physical in-combination and cumulative effects in Roadford Reservoir**

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| 2 | R-11 | R | Decrease in water quality | No change | Increase in wetted area | Increase in average depth |
| **2** | **No interacting options identified at drought level 2** | | | | | |
| 3A | R-25 | S | No change | No change | Increase in wetted area | Increase in average depth |
| **3A** | **Drought level 3A cumulative effects** | | **No additional change** | **No change** | **Additional increase in wetted area** | **Additional increase in depth** |
| **3B** | R-48 | S | No change | No change | Increase in wetted area | Increase in average depth |
| **3B** | **Drought level 3B cumulative effects** | | **No additional change** | **No change** | **Additional increase in wetted area** | **Additional increase in depth** |

Source: Mott MacDonald, 2026. S = Source, R = Receptor

For each INNS group identified within Roadford Reservoir, in-combination and cumulative effects are shown in Table 5.8 below. In-combination effects could occur at drought level 3B. For the groups aquatic/riparian vegetation and snail, the specific population response is unclear due to the contradicting effects of different physical impacts. For aquatic vegetation (Canadian pondweed) an additional positive population response (i.e. an increase) is predicted at drought level 3B.

**Table 5.8: Predicted in-combination and cumulative INNS responses in Roadford Reservoir**

| INNS group | Drought level | 2 | 3A | 3B |
|---|---|---|---|---|
| | Options | R-11 | As 2 | R-25, R-48 |
| Aquatic vegetation | Canadian pondweed (*Elodea canadensis*) | Water quality: Species specific response<br>Flow velocity: No change<br>Wetted area: Positive/ variable (high confidence)<br>Depth: Positive (high confidence)<br>**Combined response: Likely positive** | N/A | Water quality: Species specific response<br>Flow velocity: No change<br>Wetted area: Positive/ variable (high confidence)<br>Depth: Positive (high confidence)<br>**Combined response: Likely additional positive** |
| Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive (high confidence)<br>Depth: Variable/ unknown (low confidence)<br>**Combined response: Unclear** | N/A | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive (high confidence)<br>Depth: Variable/ unknown (low confidence)<br>**Combined response: Unclear** |
| Aquatic / riparian vegetation | Australian swamp stonecrop (*Crassula helmsii*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Negative (high confidence)<br>Depth: Positive/ variable (high confidence)<br>**Combined response: Unclear** | N/A | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Negative (high confidence)<br>Depth: Positive/ variable (high confidence)<br>**Combined response: Unclear** |

Source: Mott MacDonald, 2026

### 5.3.3 River Tamar

Physical cumulative and in-combination effects within the River Tamar are assessed within Table 5.9 below. The river would not be affected by any drought options at level 2, and at level 3A would only be affected by option R-25.

At drought level 3B, options R-25 and R-26 may interact and lead to a greater reduction in flow velocity, wetted area and depth than these options would cause individually.

No potential in-combination or cumulative water quality impacts were identified in the River Tamar.

**Table 5.9: Physical in-combination and cumulative effects on the River Tamar**

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| 2 | No interacting options identified at drought level 2 | | | | | |
| **2** | **No interacting options identified at drought level 2** | | | | | |
| 3A | R-25 | R | No change | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth |
| **3A** | **No interacting options identified at drought level 3A** | | | | | |
| **3B** | **R-26** | **R** | **No change** | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth |
| **3B** | **Drought level 3B cumulative effects** | | **No change** | **Additional decrease in flow** | **Additional decrease in wetted area** | **Additional decrease in depth** |

Source: Mott MacDonald, 2026. * S = Source, P = Pathway.

For each INNS group identified within the River Tamar, in-combination and cumulative effects are shown in Table 5.10 below. In-combination effects could occur at drought level 3B. For the groups aquatic vegetation, shrimp and snail, the specific population response is unclear due to the contradicting effects of different physical impacts. For bivalves and fish an additional negative population response (i.e. decrease) may be possible at drought level 3B.

**Table 5.10: Predicted in-combination and cumulative INNS responses in the River Tamar**

| INNS group | Drought level | 2 | 3A | 3B |
|---|---|---|---|---|
| | Options | N/A | R-25 | R-26 |
| Aquatic vegetation | Canadian pondweed (*Elodea canadensis*) | N/A | Water quality: Species-specific approach<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Negative (high confidence)<br>Depth: Negative (high confidence)<br>**Combined response: Unclear** | Water quality: Species-specific approach<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Negative (high confidence)<br>Depth: Negative (high confidence)<br>**Combined response**: **Unclear** |

| INNS group | Drought level | 2 | 3A | 3B |
|---|---|---|---|---|
| | Options | N/A | R-25 | R-26 |
| Bivalve | *Physa acuta* | N/A | Water quality: Species-specific approach<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (high confidence)<br>**Combined response: Unclear (possible negative)** | Water quality: Species-specific approach<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (high confidence)<br>**Combined response**: **Unclear (possible combined negative)** |
| Fish | Rainbow trout (*Oncorhynchus mykiss*) | N/A | Water quality: Species-specific approach<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative/ variable (medium confidence)<br>Depth: Variable (high confidence)<br>**Combined response: Unclear (possible negative)** | Water quality: Species-specific approach<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative/ variable (medium confidence)<br>Depth: Variable (high confidence)<br>**Combined response: Unclear (possible combined negative)** |
| Shrimp | Northern river crangonyctid *(Crangonyx pseudogracilis)* | N/A | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence)<br>**Combined response: Unclear** | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence)<br>**Combined response: Unclear** |

| INNS group | Drought level | 2 | 3A | 3B |
|---|---|---|---|---|
| | Options | N/A | R-25 | R-26 |
| Riparian vegetation | Giant hogweed (*Heracleum mantegazzianum*), Monkey-flower (*Mimulus cupreus*, M. *guttatus* and hybrids), Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*) | N/A | Water quality: Species-specific approach<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Positive (high confidence)<br>**Combined response: Positive** | Water quality: Species-specific approach<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Positive (high confidence)<br>**Combined response: Additional positive** |
| Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | N/A | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/ unknown (low confidence)<br>**Combined response: Unclear** | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/ unknown (low confidence)<br>**Combined response: Unclear** |

Source: Mott MacDonald, 2026

## 5.4 Wimbleball WRZ

### 5.4.1 Site screening

Table 5.11 below shows the screening of options in the Wimbleball WRZ. This shows that three habitats were identified as being potentially impacted by in-combination effects – Wimbleball Reservoir, the River Haddeo and the River Exe.

All in-combination effects would occur at drought level 2, with no additional options implemented at later stages. Wimbleball Reservoir could experience in-combination effects from options W-03 and W-09, the River Haddeo could be impacted by options W-03 and W-22, and the River Exe could be impacted by options W-03, W-06 and W-09.

**Table 5.11: Screening of option interactions in the Wimbleball WRZ**

| Option ID | W-03 | W-06 | W-09 | W-22 |
|---|---|---|---|---|
| **Drought level** | 2 | 2 | 2 | 2 |
| **Wimbleball Reservoir** | S | | R | S |
| **River Haddeo** | R | | | R |
| **River Exe** | R | P | S | |
| **Brampford Speke boreholes** | | S | | |
| **Stoke Canon boreholes** | | S | | |
| **Pynes WTW** | | R | | |

Source: Mott MacDonald, 2026. S = Source, R = Receptor

### 5.4.2 Wimbleball Reservoir

Physical in-combination effects within Wimbleball Reservoir are assessed within Table 5.12 below. All in-combination effects would occur at drought level 2, with potential interactions between options W-03, W-09 and W-22. This combination of options could lead to a greater overall increase in wetted area and depth than they would cause individually. As no options would be implemented at later drought levels, no cumulative effects would occur.

However, these options would be implemented in the event a drought. Whilst implementing these options may increase in wetted area and depth in the reservoir, they may offset the lower water levels caused by the drought itself, therefore leading to more stable water levels in the longer term.

No potential in-combination or cumulative water quality impacts were identified in Wimbleball Reservoir.

**Table 5.12: Physical in-combination and cumulative effects on Wimbleball Reservoir**

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| 2 | W-03 | S | No change | No change | Increase in wetted area | Increase in average depth |
| 2 | W-09 | R | No change | No change | Increase in wetted area | Increase in average depth |
| 2 | W-22 | S | No change | No change | Increase in wetted area | Increase in average depth |
| **2** | **Drought level 2 in-combination effects** | | | | | |
| 3A | No additional interacting options identified at drought level 3A | | | | | |
| **3A** | **No additional interacting options identified at drought level 3A** | | | | | |
| **3B** | No additional interacting options identified at drought level 3B | | | | | |
| **3B** | **No additional interacting options identified at drought level 3B** | | | | | |

Source: Mott MacDonald, 2026. * S = Source, P = Pathway

For each INNS group identified within the Wimbleball Reservoir, in-combination and cumulative effects are shown in Table 5.13 below. In-combination effects would only likely occur at level 2. For the groups aquatic vegetation and riparian vegetation, there may be an additional positive (i.e. increase) in population. For aquatic / riparian vegetation (i.e. Australian swamp stonecrop (*Crassula helmsii*)), the predicted response is unclear.

**Table 5.13: Predicted in-combination and cumulative INNS responses in Wimbleball Reservoir**

| INNS group | Drought level | 2 | 3A | 3B |
|---|---|---|---|---|
| | Options | W-03, W-09, W-22 | As 2 | As 2 |
| Aquatic vegetation | Nuttall's pondweed (*Elodea nuttallii*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive/ variable<br>Depth: Positive (high confidence)<br>**Combined response: Likely additional positive** | N/A | N/A |
| Aquatic / riparian vegetation | Australian swamp stonecrop (*Crassula helmsii*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Negative (high confidence)<br>Depth: positive/ variable (high confidence)<br>**Combined response: Unclear** | N/A | N/A |
| Riparian vegetation | Himalayan balsam (*Impatiens glandulifera*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Negative (high confidence)<br>Depth: Negative/ variable (low confidence)<br>**Combined response: Likely additional negative** | N/A | N/A |

Source: Mott MacDonald, 2026

### 5.4.3 River Haddeo

Physical in-combination effects on the River Haddeo are assessed within Table 5.14 below. In-combination effects would occur at drought level 2, with potential interactions between options W-03 and W-22. This combination of options could lead to a greater overall increase in wetted area and depth than they would cause individually. As no options would be implemented at later drought levels, no cumulative effects would occur.

No potential in-combination or cumulative water quality impacts were identified.

**Table 5.14: Physical in-combination and cumulative effects on the River Haddeo**

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| 2 | W-03 | R | No change | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth |
| 2 | W-22 | R | No change | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth |
| **2** | **Drought level 2 in-combination effects** | | **No change** | **Additional decrease in flow** | **Additional decrease in wetted area** | **Additional decrease in depth** |
| 3A | No additional interacting options identified at drought level 3A | | | | | |
| **3A** | **No additional interacting options identified at drought level 3A** | | | | | |
| **3B** | No additional interacting options identified at drought level 3B | | | | | |
| **3B** | **No additional interacting options identified at drought level 3B** | | | | | |

Source: Mott MacDonald, 2026. * S = Source, P = Pathway

For each INNS group identified within the River Haddeo, in-combination and cumulative effects are shown in Table 5.15 below. In-combination effects would only occur at drought level 2. For the groups aquatic vegetation, aquatic / riparian vegetation, fish, shrimp and snail the response is unclear. For riparian vegetation, there may be an additional positive (i.e. increase) in population.

**Table 5.15: Predicted in-combination and cumulative INNS responses in the River Haddeo**

| INNS group | Drought level | 2 | 3A | 3B |
|---|---|---|---|---|
| | Options | W-03, W-22 | As 2 | As 2 |
| Aquatic vegetation | Nuttall's pondweed (*Elodea nuttallii*) | Water quality: Species-specific approach<br>Flow velocity: Positive/variable (high confidence)<br>Wetted area: Negative (high confidence)<br>Depth: Negative (high confidence)"<br>Combined response: Unclear | N/A | N/A |
| Aquatic / riparian vegetation | Australian swamp stonecrop (*Crassula helmsii*) | "Water quality: Species-specific approach<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Negative/ variable (high confidence)<br>Combined response: Unclear | N/A | N/A |

| INNS group | Drought level | 2 | 3A | 3B |
|---|---|---|---|---|
| | Options | W-03, W-22 | As 2 | As 2 |
| Fish | Rainbow trout (*Oncorhynchus mykiss*) | Water quality: Species-specific approach<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative/ variable (medium confidence)<br>Depth: Variable (High confidence)<br>**Combined response: Unclear (possible negative)** | N/A | N/A |
| Shrimp | Northern River crangonyctid (*Crangonyx pseudogracilis*) | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence)<br>**Combined response: Unclear** | N/A | N/A |
| Riparian vegetation | Himalayan balsam (*Impatiens glandulifera*) | Water quality: Species-specific approach<br>Flow velocity: Positive/variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (high confidence)<br>**Combined response: Likely additional positive** | N/A | N/A |
| Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/ unknown (low confidence)<br>**Combined response: Unclear** | N/A | N/A |

Source: Mott MacDonald, 2026

### 5.4.4 River Exe

Physical in-combination effects on the River Exe are assessed within Table 5.16 below. In-combination effects would occur at drought level 2, with potential interactions between options W-03, W-06 and W-22.

Options W-03 and W-09 may act to decrease flow velocity, wetted area and depth; however option W-06 may increase these parameters between the discharge and abstraction points. The

combined hydrological and hydraulic effects of these options may require further investigation, and the results of any such investigation will be reviewed with respect to impacts on INNS.

There is potential for in-combination water quality effects which for individual options are expected to be minor localised; however it is recommended to review potential INNS responses in light of ongoing investigations.

As no options would be implemented at later drought levels, no cumulative effects would occur.

**Table 5.16: Physical in-combination and cumulative effects on the River Exe**

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| 2 | W-03 | R | No change | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth |
| 2 | W-06 | P | Decrease in water quality | Increase in average flow velocity | Increase in wetted area | Increase in average depth |
| 2 | W-09 | S | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth |
| **2** | **Drought level 2 in-combination effects** | | Potential additional decease in water quality | Potential additional overall decrease in average flow velocity | Potential additional overall decrease in average wetted area | Potential additional overall decrease in average depth |
| 3A | No additional interacting options identified at drought level 3A | | | | | |
| **3A** | **No additional interacting options identified at drought level 3A** | | | | | |
| **3B** | No additional interacting options identified at drought level 3B | | | | | |
| **3B** | **No additional interacting options identified at drought level 3B** | | | | | |

Source: Mott MacDonald, 2026. * S = Source, P = Pathway

For each INNS group identified within the Exe, in-combination and cumulative effects are shown in Table 5.17 below. In-combination effects would only be expected at drought level 2. For the groups aquatic vegetation, shrimp, snail and crayfish the response is unclear. For riparian vegetation, there may be an additional positive (i.e. increase) in population. For fish, there may be an additional negative (i.e. decrease) in population.

**Table 5.17: Predicted in-combination and cumulative INNS responses in the River Exe**

| INNS group | Drought level | 2 | 3A | 3B |
|---|---|---|---|---|
| | Options | W-03, W-06, W-09 | As 2 | As 2 |
| Aquatic vegetation | Canadian pondweed (*Elodea canadensis*), Nuttall's pondweed (*Elodea nuttallii*). | Water quality: Species-specific approach<br>Flow velocity: Positive/variable (high confidence)<br>Wetted area: Negative (high confidence)<br>Depth: Negative (high confidence)<br>**Combined response: Unclear** | N/A | N/A |

| INNS group | Drought level | 2 | 3A | 3B |
|---|---|---|---|---|
| | Options | W-03, W-06, W-09 | As 2 | As 2 |
| Fish | Rainbow trout (*Oncorhynchus mykiss*), common carp (*Cyprinus carpio*) | Water quality: Species-specific approach<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative/ variable (medium confidence)<br>Depth: Variable (High confidence)<br>**Combined response: Unclear possible negative** | N/A | N/A |
| Shrimp | Northern River crangonyctid (*Cragonyx pseudogracilis*) | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence)<br>**Combined response: Unclear** | N/A | N/A |
| Riparian vegetation | Himalayan balsam (*Impatiens glandulifera)* , Japanese knotweed (*Fallopia japonica)* | Water quality: Species-specific approach<br>Flow velocity: Positive/variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (high confidence)<br>**Combined response: Positive** | N/A | N/A |
| Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/ unknown (low confidence)<br>**Combined response: Unclear** | N/A | N/A |
| Crayfish | North American signal crayfish (*Pacifastacus leniusculus*) | Water quality: Species specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Negative (medium confidence)<br>**Combined response: Unclear** | N/A | N/A |

## 5.5 Bristol WRZ

### 5.5.1 Site screening

Table 5.18 below shows the screening of options in the Bristol WRZ. This shows that the following habitats were identified as being potentially impacted by in-combination effects: Blagdon Reservoir, River Yeo, Chew Valley Lake, River Chew, River Axe and Cheddar Reservoir. The receptor of option BR-29 (Winford Brook) is a tributary of the River Chew, therefore there may be additional impacts to this habitat associated with the operation of BR-29.

A total of three habitats may experience short term impacts if any interaction occurs between level 1 options and level 3A options. Within Blagdon Reservoir, cumulative effects may be expected as both BR-27B (level 1) and BR-27a (level 3A) utilise this habitat as a source of water. Similarly, within River Yeo, cumulative effects of BR-27B and BR-27a through the use of this habitat as a receptor. Furthermore, cumulative effects may occur within Chew Valley Lake as this habitat is used as a source for both option BR-28b and BR-28b. However, as level 1 option are only intended to be used for a short period of time (2 weeks), the chance of habitat impacts is likely reduced and therefore the change of changes to INNS populations is also likely reduced.

There is the potential for interactions between options to impact habitat within the River Chew. At level 3A, both option BR-28a and BR-29 (indirectly) utilise the River Chew as a receptor. Should there be any interaction between level 1 and level 3A options, there may also be additional short terms impacts through the interaction of option BR-28b, which also utilises the River Chew as a receptor.

The River Axe is used as a source by option BR-47 under level 2 which could interact with options BR-31a and BR-31b under level 3A. Similarly, the receptor of these options, Cheddar Reservoir could be impacted by the combination of these three options at level 3A.

**Table 5.18: Screening of option interactions in the Bristol WRZ**

| **Option ID** | BR-27b | BR-28b | BR-47 | BR-27a | BR-28a | BR-29 | BR-30 | BR-31a | BR-31b |
|---|---|---|---|---|---|---|---|---|---|
| **Drought level** | 1 | 1 | 2 | 3A | 3A | 3A | 3A | 3A | 3A |
| Blagdon Reservoir | S | | | S | | | | | |
| River Yeo | R | | | R | | | | | |
| Chew Valley Lake | | S | | | S | | | | |
| River Chew | | R | | | R | R* | | | |
| River Axe | | | S | | | | | S | S |
| Cheddar Reservoir | | | R | | | | | R | R |
| Chew Magna | | | | | | S | | | |
| Winford Brook (tributary of River Chew) | | | | | | R* | | | |
| Cheddar Ponds | | | | | | | S | | |
| Cheddar Yeo | | | | | | | R | | |

Source: Mott MacDonald, 2026. S = Source, R = Receptor; * = indirect impact via Winford Brook

### 5.5.2 Blagdon Reservoir

Physical cumulative and in-combination effects within Blagdon Reservoir are assessed within Table 5.19 below. This shows that at drought level 1, Blagdon Reservoir would only be impacted by option BR-27b.

A drought level 3A, physical impacts from options BR-27b and BR-27a may potentially combine in the short term, and they could align so as to increase their magnitude. As such, drought level 3A could lead to a greater combined increase in wetted area and depth than these options would cause individually should these options interact.

No further interactions were identified at drought level 3B, therefore this drought level would cause no additional physical impacts to Blagdon Reservoir.

**Table 5.19: Physical in-combination and cumulative effects on Blagdon Reservoir**

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| 1 | BR-27b | S | No change | No change | Increase in wetted area | Increase in depth |
| **1** | **Drought level 1 in-combination effects** | | **No change** | **No change** | **Increase in wetted area** | **Increase in depth** |
| 2 | No additional interacting options identified at drought level 3B | | | | | |
| **2** | **Drought level 2 cumulative effects** | | **As drought level 1** | **As drought level 1** | **As drought level 1** | **As drought level 1** |
| 3A | BR-27a | S | No change | No change | Increase in wetted area | Increase in depth |
| **3A** | **Drought level 3A cumulative effects** | | **No change** | **No change** | **Additional increase in wetted area** | **Additional increase in depth** |
| No additional interacting options identified at drought level 3B | | | | | | |
| **3B** | **Drought level 3B cumulative effects** | | **As drought level 3A** | **As drought level 3A** | **As drought level 3A** | **As drought level 3A** |

Source: Mott MacDonald, 2026. * S = Source, P = Pathway.

For each INNS group identified within Blagdon Reservoir, in-combination and cumulative effects are shown in Table 5.20 below. In-combination effects could occur at drought level 3A, with no additional effects at drought level 3B. For the groups fish and snail, the specific population response is unclear due to the contradicting effects of different physical impacts. For aquatic vegetation (Nuttall's waterweed) an additional positive population response (i.e. an increase) is predicted at drought level 3A.

**Table 5.20: Predicted in-combination and cumulative INNS responses in Blagdon Reservoir**

| INNS group | Drought level | 1 | 2 | 3A | 3B |
|---|---|---|---|---|---|
| | Options | Br-27b | As 2 | BR-27a | As 3A |
| Aquatic vegetation | Nuttall's waterweed (*Elodea nuttallii*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive/ variable (high confidence)<br>Depth: Positive (high confidence)<br>**Combined response: Likely positive** | As 2 | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive/ variable (high confidence)<br>Depth: Positive (high confidence)<br>**Combined response: Likely positive** | As 3A |

| INNS group | Drought level | 1 | 2 | 3A | 3B |
|---|---|---|---|---|---|
| | Options | Br-27b | As 2 | BR-27a | As 3A |
| Fish | Rainbow trout (*Oncorhynchus mykiss*) | Water quality: No change Flow velocity: No change Wetted area: Positive (medium confidence) Depth: Variable (high confidence) **Combined response: Unclear** | As 2 | Water quality: No change Flow velocity: No change Wetted area: Positive (medium confidence) Depth: Variable (high confidence) **Combined response: Unclear** | As 3A |
| Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Water quality: No change Flow velocity: No change Wetted area: Positive (high confidence) Depth: Variable/Unknown (low confidence) **Combined response: Unclear** | As 2 | Water quality: No change Flow velocity: No change Wetted area: Positive (high confidence) Depth: Variable/Unknown (low confidence) **Combined response: Unclear** | As 3A |

Source: Mott MacDonald, 2026.

### 5.5.3 River Yeo

Physical cumulative and in-combination effects within the River Yeo are assessed within Table 5.21 below. This shows that at drought level 1, the River Yeo would only be impacted by option BR-27b.

A drought level 3A, physical impacts from options BR-27b and BR-27a may potentially combine in the short term, and they could align so as to increase their magnitude. As such, drought level 3A could lead to a greater combined decrease in water quality, flow, wetted area and depth than these options would cause individually should these options interact.

No further interactions were identified at drought level 3B, therefore this drought level would cause no additional physical impacts to Blagdon Reservoir.

**Table 5.21: Physical in-combination and cumulative effects on the River Yeo**

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| 1 | BR-27b | R | Decrease in water quality | Decrease in flow velocity | Decrease in wetted area | Decrease in depth |
| **1** | **Drought level 1 in-combination effects** | | **Decrease in water quality** | **Decrease in flow velocity** | **Decrease in wetted area** | **Decrease in depth** |
| 2 | No additional interacting options identified at drought level 3B | | | | | |
| **2** | **Drought level 2 cumulative effects** | | **As drought level 1** | **As drought level 1** | **As drought level 1** | **As drought level 1** |
| 3A | BR-27a | R | Decrease in water quality | Decrease in flow velocity | Decrease in wetted area | Decrease in depth |

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| **3A** | **Drought level 3A cumulative effects** | | **Additional decrease in water quality** | **Additional decrease in water quality** | **Additional decrease in flow velocity** | **Additional increase in wetted area** |
| No additional interacting options identified at drought level 3B | | | | | | |
| **3B** | **Drought level 3B cumulative effects** | | **As drought level 3A** | **As drought level 3A** | **As drought level 3A** | **As drought level 3A** |

Source: Mott MacDonald, 2026. * S = Source, P = Pathway

For each INNS group identified within Blagdon Reservoir, in-combination and cumulative effects are shown in Table 5.22 below. In-combination effects could occur at drought level 3A, with no additional effects at drought level 3B. For the groups aquatic vegetation, fish, shrimp and snail, the specific population response is unclear due to the contradicting effects of different physical impacts. For riparian vegetation (Himalayan balsam) an additional positive population response (i.e. an increase) is predicted at drought level 3A.

**Table 5.22: Predicted in-combination and cumulative INNS responses in the River Yeo**

| INNS group | Drought level | 1 | 2 | 3A | 3B |
|---|---|---|---|---|---|
| | Options | Br-27b | As 2 | BR-27a | As 3A |
| Aquatic vegetation | Nuttall's waterweed (*Elodea nuttallii*), Canadian waterweed (*Elodea canadensis*), Least duckweed (*Lemna* minuta) Water fern (*Azolla filiculoides*) | Water quality: Species specific approach Flow velocity: Positive/variable (high confidence) Wetted area: Negative (high confidence) Depth: Negative (high confidence) **Combined response: Unclear** | N/A | Water quality: Species specific approach Flow velocity: Positive/variable (high confidence) Wetted area: Negative (high confidence) Depth: Negative (high confidence) **Combined response: Unclear** | N/A |
| Fish | Rainbow trout (*Oncorhynchus mykiss*) | Water quality: Species specific approach Flow velocity: Variable (high confidence) Wetted area: Negative/variable (medium confidence) Depth: Variable (high confidence) **Combined response: Unclear** | N/A | Water quality: Species specific approach Flow velocity: Variable (high confidence) Wetted area: Negative/variable (medium confidence) Depth: Variable (high confidence) **Combined response: Unclear** | N/A |

| INNS group | Drought level | 1 | 2 | 3A | 3B |
|---|---|---|---|---|---|
| | Options | Br-27b | As 2 | BR-27a | As 3A |
| Shrimp | *Crangonyx pseudogracilis* | Water quality: Species specific approach Flow velocity: Positive (medium confidence) Wetted area: Negative (medium confidence) Depth: Variable (low confidence) **Combined response: Unclear** | N/A | Water quality: Species specific approach Flow velocity: Positive (medium confidence) Wetted area: Negative (medium confidence) Depth: Variable (low confidence) **Combined response: Unclear** | N/A |
| Riparian vegetation | Himalayan balsam (*Impatiens glandulifera*) | Water quality: Species specific approach Flow velocity: Positive (medium confidence) Wetted area: Positive (high confidence) Depth: Positive (high confidence) **Combined response: Likely additional positive** | N/A | Water quality: Species specific approach Flow velocity: Positive (medium confidence) Wetted area: Positive (high confidence) Depth: Positive (high confidence) **Combined response: Likely additional positive** | N/A |
| Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Water quality: Species specific approach Flow velocity: Positive (medium confidence) Wetted area: Negative (low confidence) Depth: Variable/Unknown(low confidence) **Combined response: Unclear** | N/A | Water quality: Species specific approach Flow velocity: Positive (medium confidence) Wetted area: Negative (low confidence) Depth: Variable/Unknown(low confidence) **Combined response: Unclear** | N/A |

Source: Mott MacDonald, 2026.

### 5.5.4 Chew Valley Lake

Physical cumulative and in-combination effects within Chew Valley Lake are assessed within Table 5.23 below. This shows that at drought level 1, Chew Valley Lake would only be impacted by option BR-28b.

A drought level 3A, physical impacts from options BR-28b and BR-28a may potentially combine in the short term, and they could align so as to increase their magnitude. As such, drought level

3A could lead to a greater combined increase in wetted area and depth than these options would cause individually should these options interact.

No further interactions were identified at drought level 3B, therefore this drought level would cause no additional physical impacts to Chew Valley Lake

**Table 5.23: Physical in-combination and cumulative effects on Chew Valley Lake**

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| 1 | BR-28b | S | No change | No change | Increase in wetted area | Increase in depth |
| **1** | **Drought level 1 in-combination effects** | | **No change** | **No change** | **Increase in wetted area** | **Increase in depth** |
| 2 | No additional interacting options identified at drought level 3B | | | | | |
| **2** | **Drought level 2 cumulative effects** | | **As drought level 1** | **As drought level 1** | **As drought level 1** | **As drought level 1** |
| 3A | BR-28a | S | No change | No change | Increase in wetted area | Increase in depth |
| **3A** | **Drought level 3A cumulative effects** | | **No change** | **No change** | **Additional increase in wetted area** | **Additional increase in depth** |
| No additional interacting options identified at drought level 3B | | | | | | |
| **3B** | **Drought level 3B cumulative effects** | | **As drought level 3A** | **As drought level 3A** | **As drought level 3A** | **As drought level 3A** |

Source: Mott MacDonald, 2026. * S = Source, P = Pathway

For each INNS group identified within Chew Valley Lake, in-combination and cumulative effects are shown in Table 5.24 below. In-combination effects could occur at drought level 3A, with no additional effects at drought level 3B. For the INNS groups shrimp and snail, the specific population response is unclear due to the contradicting effects of different physical impacts. For aquatic vegetation (Nuttall's waterweed and Canadian waterweed) an additional positive population response (i.e. an increase) is predicted at drought level 3A.

**Table 5.24: Predicted in-combination and cumulative INNS responses in Chew Valley Lake**

| INNS group | Drought level | 1 | 2 | 3A | 3B |
|---|---|---|---|---|---|
| | Options | Br-28b | As 2 | BR-28a | As 3A |
| Aquatic vegetation | Canadian waterweed (*Elodea canadensis*), Nuttall's waterweed (*Elodea nuttallii*) | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive/ variable (high confidence)<br>Depth: Positive (high confidence)<br>**Combined response: Likely additional positive** | N/A | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive/ variable (high confidence)<br>Depth: Positive (high confidence)<br>**Combined response: Likely additional positive** | N/A |

| INNS group | Drought level | 1 | 2 | 3A | 3B |
|---|---|---|---|---|---|
| | Options | Br-28b | As 2 | BR-28a | As 3A |
| Shrimp | *Crangonyx pseudogracilis* | Water quality: No change Flow velocity: No change Wetted area: Positive (medium confidence) Depth: Variable (low confidence) **Combined response: Unclear** | N/A | Water quality: No change Flow velocity: No change Wetted area: Positive (medium confidence) Depth: Variable (low confidence) **Combined response: Unclear** | N/A |
| Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Water quality: No change Flow velocity: No change Wetted area: Positive (high confidence) Depth: Variable/Unknown (low confidence) **Combined response: Unclear** | N/A | Water quality: No change Flow velocity: No change Wetted area: Positive (high confidence) Depth: Variable/Unknown (low confidence) **Combined response: Unclear** | N/A |

Source: Mott MacDonald, 2026.

### 5.5.5 River Chew

Physical cumulative and in-combination effects within the River Chew are assessed within Table 5.25 below. This shows that at drought level 1, the River Yeo would only be impacted by option BR-28b.

A drought level 3A, physical impacts from options BR-28b and indirectly from BR-29 may potentially combine, and they could align so as to increase their magnitude. As such, drought level 3A could lead to a greater combined decrease in water quality, flow, wetted area and depth than these options would cause individually should these options interact.

No further interactions were identified at drought level 3B, therefore this drought level would cause no additional physical impacts to the River Chew.

**Table 5.25: Physical in-combination and cumulative effects on the River Chew**

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| 1 | BR-28b | R | Decrease in water quality | Decrease in flow velocity | Decrease in wetted area | Decrease in depth |
| **1** | **Drought level 1 in-combination effects** | | **Decrease in water quality** | **Decrease in flow velocity** | **Decrease in wetted area** | **Decrease in depth** |
| 2 | No additional interacting options identified at drought level 2 | | | | | |
| **2** | **Drought level 2 cumulative effects** | | **As drought level 1** | **As drought level 1** | **As drought level 1** | **As drought level 1** |
| 3A | BR-28a | R | Decrease in water quality | Decrease in flow velocity | Decrease in wetted area | Decrease in depth |

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| 3A | BR-29 | R | Decrease in water quality | Decrease in flow velocity | Decrease in wetted area | Decrease in depth |
| **3A** | **Drought level 3A cumulative effects** | | **Additional decrease in water quality** | **Additional decrease in water quality** | **Additional decrease in flow velocity** | **Additional decrease in wetted area** |
| No additional interacting options identified at drought level 3B | | | | | | |
| **3B** | **Drought level 3B cumulative effects** | | **As drought level 3A** | **As drought level 3A** | **As drought level 3A** | **As drought level 3A** |

Source: Mott MacDonald, 2026. * S = Source, P = Pathway

For each INNS group identified within the River Chew, in-combination and cumulative effects are shown in Table 5.26 below. In-combination effects could occur at drought level 3A, with no additional effects at drought level 3B. For the groups aquatic vegetation, fish, shrimp, snail, bivalve and crayfish, the specific population response is unclear due to the contradicting effects of different physical impacts. For riparian vegetation (Himalayan balsam) an additional positive population response (i.e. an increase) is predicted at drought level 3A. INNS identified within the direct receptor of BR-29 (Winford Brook) are unlikely to be impacted by in-combination effects and have not been included within this assessment.

**Table 5.26: Predicted in-combination and cumulative INNS responses in the River Chew**

| INNS group | Drought level | 1 | 2 | 3A | 3B |
|---|---|---|---|---|---|
| | Options | Br-28b | As 2 | BR-28a, BR-29 (indirectly) | As 3A |
| Aquatic vegetation | Canadian waterweed (*Elodea canadensis*), Least duckweed (*Lemna minuta* (*minuscula*)), Nuttall's waterweed (*Elodea nuttallii*) | Water quality: Species specific approach Flow velocity: Positive/variable (high confidence) Wetted area: Negative (high confidence) Depth: Negative (high confidence) **Combined response: Unclear** | N/A | Water quality: Species specific approach Flow velocity: Positive/variable (high confidence) Wetted area: Negative (high confidence) Depth: Negative (high confidence) **Combined response: Unclear** | N/A |
| Fish | Rainbow trout (*Oncorhynchus mykiss*) | Water quality: Species specific approach Flow velocity: Variable (high confidence) Wetted area: Negative/variable (medium confidence) Depth: Variable (high confidence) **Combined response: Unclear** | N/A | Water quality: Species specific approach Flow velocity: Variable (high confidence) Wetted area: Negative/variable (medium confidence) Depth: Variable (high confidence) **Combined response: Unclear** | N/A |

| INNS group | Drought level | 1 | 2 | 3A | 3B |
|---|---|---|---|---|---|
| | Options | Br-28b | As 2 | BR-28a, BR-29 (indirectly) | As 3A |
| Shrimp | *Crangonyx pseudogracilis* | Water quality: Species specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence)<br>**Combined response: Unclear** | N/A | Water quality: Species specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence)<br>**Combined response: Unclear** | N/A |
| Riparian vegetation | Himalayan balsam (*Impatiens glandulifera*) | Water quality: Species specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (high confidence)<br>**Combined response: Likely additional positive** | N/A | Water quality: Species specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (high confidence)<br>**Combined response: Likely additional positive** | N/A |
| Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | Water quality: Species specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/ Unknown (low confidence)<br>**Combined response: Unclear** | N/A | Water quality: Species specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/ Unknown (low confidence)<br>**Combined response: Unclear** | N/A |

| INNS group | Drought level | 1 | 2 | 3A | 3B |
|---|---|---|---|---|---|
| | Options | Br-28b | As 2 | BR-28a, BR-29 (indirectly) | As 3A |
| Aquatic vegetation | Canadian waterweed (*Elodea canadensis*), Least duckweed (*Lemna minuta* (*minuscula*)), Nuttall's waterweed (*Elodea nuttallii*) | Water quality: Species specific approach Flow velocity: Positive/variable (high confidence) Wetted area: Negative (high confidence) Depth: Negative (high confidence) **Combined response: Unclear** | N/A | Water quality: Species specific approach Flow velocity: Positive/variable (high confidence) Wetted area: Negative (high confidence) Depth: Negative (high confidence) Combined response: Unclear | N/A |
| Fish | Rainbow trout (*Oncorhynchus mykiss*)Brook charr (*Salvelinus fontinalis*) | Water quality: Species specific approach Flow velocity: Variable (high confidence) Wetted area: Negative/ variable (medium confidence) Depth: Variable (high confidence) Combined response: Unclear | N/A | Water quality: Species specific approach Flow velocity: Variable (high confidence) Wetted area: Negative/ variable (medium confidence) Depth: Variable (high confidence) Combined response: Unclear | N/A |

Source: Mott MacDonald, 2026.

### 5.5.6 River Axe

Physical cumulative and in-combination effects within the River Axe are assessed within Table 5.27 below. No impacts are expected at drought level 1. At drought level 2, the River Axe would only be impacted by option BR-47.

A drought level 3A, physical impacts from options BR-31a and BR-31b may potentially combine which each other and BR-47, and they could align so as to increase their magnitude. As such, drought level 3A could lead to a greater combined decrease in water quality, flow, wetted area and depth than these options would cause individually should these options interact.

No further interactions were identified at drought level 3B, therefore this drought level would cause no additional physical impacts to the River Axe.

**Table 5.27: Physical in-combination and cumulative on the River Axe**

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| No interacting options identified at drought level 1 | | | | | | |
| **1** | **Drought level 1 in-combination effects** | | **No change** | **No change** | **No change** | **No change** |

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| 2 | BR-47 | S | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth |
| **2** | **Drought level 2 cumulative effects** | | **Decrease in water quality** | **Decrease in flow velocity** | **Decrease in wetted area** | **Decrease in depth** |
| 3A | BR-31a | S | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth |
| 3A | BR-31b | S | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth |
| **3A** | **Drought level 3a cumulative effects** | | **Additional decrease in water quality** | **Additional decrease in flow velocity** | **Additional decrease in wetted area** | **Additional decrease in depth** |
| No additional interacting options identified at drought level 3B | | | | | | |
| **As drought level 3A** | **As drought level 3A** | | **As drought level 3A** | **As drought level 3A** | **As drought level 3A** | **As drought level 3A** |

Source: Mott MacDonald, 2026. * S = Source, P = Pathway.

For each INNS group identified within the River Axe, in-combination and cumulative effects are shown in Table 5.28 below. In-combination effects could occur at drought level 3A, with no additional effects at drought level 3B. For the groups aquatic vegetation, bivalve, aquatic/riparian vegetation, fish, shrimp, snail and crayfish, the specific population response is unclear due to the contradicting effects of different physical impacts. For riparian vegetation (Himalayan balsam) an additional positive population response (i.e. an increase) is predicted at drought level 3A.

**Table 5.28: Predicted in-combination and cumulative INNS responses in the River Axe**

| INNS group | Drought level | 1 | 2 | 3A | 3B |
|---|---|---|---|---|---|
| | Options | N/A | BR-47 | BR-31a, BR-32b | As 3A |
| Aquatic vegetation | Nuttall's waterweed (*Elodea nuttallii*), Floating pennywort (*Hydrocotyle ranunculoides*), Canadian waterweed (*Elodea canadensis*) | N/A | Water quality: Species specific approach<br>Flow velocity: Positive/variable (high confidence)<br>Wetted area: Negative (high confidence)<br>Depth: Negative (high confidence)<br>**Combined response: Unclear** | Water quality: Species specific approach<br>Flow velocity: Positive/variable (high confidence)<br>Wetted area: Negative (high confidence)<br>Depth: Negative (high confidence)<br>**Combined response: Unclear** | N/A |

| INNS group | Drought level | 1 | 2 | 3A | 3B |
|---|---|---|---|---|---|
| | Options | N/A | BR-47 | BR-31a, BR-32b | As 3A |
| Bivalve | *Physa acuta* | N/A | Water quality: Species specific approach<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (high confidence)<br>**Combined response: Unclear** | Water quality: Species specific approach<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (high confidence)<br>**Combined response: Unclear** | N/A |
| Aquatic / riparian vegetation | American skunk-cabbage (*Lysichiton americanus*) | N/A | Water quality: Species specific approach<br>Flow velocity: Positive/variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Negative/variable (high confidence)<br>**Combined response: Unclear** | Water quality: Species specific approach<br>Flow velocity: Positive/variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Negative/variable (high confidence)<br>**Combined response: Unclear** | N/A |
| Fish | Sunbleak (*Leucaspius delineatus*), Common carp (*Cyprinus carpio*) | N/A | Water quality: Species specific response<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative/variable (medium confidence)<br>Depth: Variable (high confidence)<br>**Combined response: Unclear** | Water quality: Species specific response<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative/variable (medium confidence)<br>Depth: Variable (high confidence)<br>**Combined response: Unclear** | N/A |

| INNS group | Drought level | 1 | 2 | 3A | 3B |
|---|---|---|---|---|---|
| | Options | N/A | BR-47 | BR-31a, BR-32b | As 3A |
| Shrimp | *Crangonyx pseudogracilis* | N/A | Water quality: Species specific response<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence)<br>**Combined response: Unclear** | Water quality: Species specific response<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (low confidence)<br>**Combined response: Unclear** | N/A |
| Riparian vegetation | Himalayan balsam (*Impatiens glandulifera*) | N/A | Water quality: Species specific response<br>Flow velocity: Positive/variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (high confidence)<br>**Combined response: Likely additional positive** | Water quality: Species specific response<br>Flow velocity: Positive/variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (high confidence)<br>**Combined response: Likely additional positive** | N/A |
| Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | N/A | Water quality: Species specific response<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/unknown (low confidence)<br>**Combined response: Unclear** | Water quality: Species specific response<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/unknown (low confidence)<br>**Combined response: Unclear** | N/A |

| INNS group | Drought level | 1 | 2 | 3A | 3B |
|---|---|---|---|---|---|
| | Options | N/A | BR-47 | BR-31a, BR-32b | As 3A |
| Crayfish | North American signal crayfish (*Pacifastacus leniusculus*) | N/A | Water quality: Species specific response<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Negative (medium confidence)<br>**Combined response: Unclear** | Water quality: Species specific response<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Negative (medium confidence)<br>**Combined response: Unclear** | N/A |
| Aquatic vegetation | Nuttall's waterweed (*Elodea nuttallii*), Floating pennywort (*Hydrocotyle ranunculoides*), Canadian waterweed (*Elodea canadensis*) | N/A | Water quality: Species specific approach<br>Flow velocity: Positive/variable (high confidence)<br>Wetted area: Negative (high confidence)<br>Depth: Negative (high confidence)<br>**Combined response: Unclear** | Water quality: Species specific approach<br>Flow velocity: Positive/variable (high confidence)<br>Wetted area: Negative (high confidence)<br>Depth: Negative (high confidence)<br>**Combined response: Unclear** | N/A |

Source: Mott MacDonald, 2026.

### 5.5.7 Cheddar Reservoir

Physical cumulative and in-combination effects within Cheddar Reservoir are assessed within Table 5.29 below. No impacts are expected at drought level 1. At drought level 2, the reservoir would only be impacted by option BR-47.

A drought level 3A, physical impacts from options BR-31a and BR-31b may potentially combine which each other and with BR-47, and they could align so as to increase their magnitude. As such, drought level 3A could lead to a greater combined increase in wetted area and depth than these options would cause individually should these options interact.

No further interactions were identified at drought level 3B, therefore this drought level would cause no additional physical impacts to Cheddar Reservoir.

**Table 5.29: Physical in-combination and cumulative effects on Cheddar Reservoir**

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| No interacting options identified at drought level 1 | | | | | | |
| **1** | **Drought level 1 in-combination effects** | | **No change** | **No change** | **No change** | **No change** |
| 2 | BR-47 | R | No change | No change | Increase in wetted area | Increase in depth |

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| **2** | **Drought level 2 cumulative effects** | | **No change** | **No change** | **Increase in wetted area** | **Increase in depth** |
| 3A | BR-31a | R | No change | No change | Increase in wetted area | Increase in depth |
| 3A | BR-31b | R | No change | No change | Increase in wetted area | Increase in depth |
| **3A** | **Drought level 3 cumulative effects** | | **No change** | **No change** | **No change** | **Additional increase in wetted area** |
| No additional interacting options identified at drought level 3B | | | | | | |
| **As drought level 3A** | **As drought level 3A** | | **As drought level 3A** | **As drought level 3A** | **As drought level 3A** | **As drought level 3A** |

Source: Mott MacDonald, 2026. * S = Source, P = Pathway

For each the one INNS group identified within Cheddar Reservoir (aquatic vegetation), predicted in-combination and cumulative effects are shown in Table 5.30. In-combination effects could occur at drought level 3A, with no additional effects at drought level 3B. For aquatic vegetation, (Nuttall's waterweed), an additional positive population response (i.e. an increase) is predicted at drought level 3A.

**Table 5.30: Predicted in-combination and cumulative INNS responses in Cheddar Reservoir**

| INNS group | Drought level | 1 | 2 | 3A | 3B |
|---|---|---|---|---|---|
| | Options | N/A | BR-47 | BR-31a, BR-31b | As 3A |
| Aquatic vegetation | Nuttall's waterweed (*Elodea nuttallii*) | N/A | Water quality: No change<br>Flow velocity: No change<br>Wetted area: Positive/ variable (high confidence)<br>Depth: Positive (high confidence)<br>**Combined response: Likely additional positive** | Water quality No change<br>Flow velocity: No change<br>Wetted area: Positive/ variable (high confidence)<br>Depth: Positive (high confidence)<br>**Combined response: Likely additional positive** | N/A |

Source: Mott MacDonald, 2026.

## 5.6 Bournemouth WRZ

### 5.6.1 Site screening

Table 5.31 below shows the screening of options in the Bournemouth WRZ. This shows that two habitats were identified as being potentially impacted by in-combination effects – the River Stour and Longham Lakes.

For both habitats, this would only occur at drought level 3B, as options BN-04 and BN-12 would interact.

**Table 5.31: Screening of option interactions in the Bournemouth WRZ**

| Option ID | BN-04 | BN-05 | BN-12 |
|---|---|---|---|
| **Drought level** | 3B | 3B | 3B |
| River Stour | S | | S |
| Longham Lakes | R | | R |
| Stanbridge Boreholes | | S | |
| Stanbridge WTW | | R | |

Mott MacDonald, 2026. S = Source, R = Receptor

### 5.6.2 River Stour

Physical cumulative and in-combination effects within the River Stour are assessed within Table 5.32 below. At drought level 3B, physical impacts from options BN-04 and BN-12 could combine, and they could align so as to increase their magnitude. As such, drought level 3B could lead to a greater combined decrease in water quality, flow, wetted area and depth than these options would cause individually.

**Table 5.32: Physical in-combination and cumulative effects on the River Stour.**

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| 2 | No interacting options identified at drought level 2 | | | | | |
| **2** | **No interacting options identified at drought level 2** | | | | | |
| 3A | No interacting options identified at drought level 3A | | | | | |
| **3A** | **No interacting options identified at drought level 3A** | | | | | |
| 3B | BN-04 | S | Decrease in water quality | Decrease in average flow velocity | Decrease in wetted area | Decrease in average depth |
| 3B | BN-12 | S | Decrease in water quality | Decrease in average flow velocity | Decease in wetted area | Decrease in average depth |
| **3B** | **Drought level 3B cumulative effects** | | **Additional decrease in water quality** | **Additional decrease in average flow velocity** | **Additional decrease in wetted area** | **Additional decrease in average depth** |

Source: Mott MacDonald, 2026. * S = Source, P = Pathway.

For each INNS group identified within the River Stour, in-combination and cumulative effects are shown in Table 5.33 below. In-combination effects could occur at drought level 3B. For the groups aquatic vegetation, bivalve, shrimp, and snail, the specific population response is unclear due to the contradicting effects of different physical impacts. For riparian vegetation, such as Himalayan balsam, giant knotweed (*Fallopia sachalinensis*), giant hogweed (*Heracleum mantegazzianum*) and orange balsam (*Impatiens capensis*) an additional positive population response (i.e. an increase) is predicted at drought level 3B.

**Table 5.33: Predicted in-combination and cumulative INNS responses in the River Stour**

| INNS group | Drought level | 2 | 3A | 3B |
|---|---|---|---|---|
| | Options | N/A | N/A | BN-04, BN-12 |
| Aquatic vegetation | Least duckweed (*Lemna minuta* (*minuscula*)), Nuttall's waterweed (*Elodea nuttallii*), Canadian waterweed (*Elodea canadensis*), Water fern (*Azolla caroliniana*) | N/A | N/A | Water quality: Species specific approach<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Negative (high confidence)<br>Depth: Negative (high confidence)<br>**Combined response: Unclear** |
| Bivalve | *Physa acuta* | N/A | N/A | Water quality: Species specific approach<br>Flow velocity: Variable (High confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (high confidence)<br>**Combined response: Unclear** |
| Fish | Common carp (*Cyprinus carpio*), Rainbow trout (*Oncorhynchus mykiss*) | N/A | N/A | Water quality: Species specific approach<br>Flow velocity: Variable (high confidence)<br>Wetted area: Negative/variable (medium confidence)<br>Depth: Positive (High confidence)<br>**Combined response: Unclear** |
| Shrimp | *Crangonyx pseudogracilis* | N/A | N/A | Water quality: Species specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (medium confidence)<br>Depth: Variable (high confidence)<br>**Combined response: Unclear** |

| INNS group | Drought level | 2 | 3A | 3B |
|---|---|---|---|---|
| | Options | N/A | N/A | BN-04, BN-12 |
| Riparian vegetation | Himalayan balsam (*Impatiens glandulifera*), Giant knotweed (*Fallopia sachalinensis*), Giant hogweed (*Heracleum mantegazzianum*), Orange balsam (*Impatiens capensis*) | N/A | N/A | Water quality: Species specific approach<br>Flow velocity: Positive/ variable (high confidence)<br>Wetted area: Positive (high confidence)<br>Depth: Positive (High confidence)<br>**Combined response: Likely additional positive** |
| Snail | Jenkins' spire shell (*Potamopyrgus antipodarum*) | N/A | N/A | Water quality: Species-specific approach<br>Flow velocity: Positive (medium confidence)<br>Wetted area: Negative (low confidence)<br>Depth: Variable/unknown (low confidence)<br>**Combined response: Unclear** |

Source: Mott MacDonald, 2026.

### 5.6.3 Longham Lakes

Physical cumulative and in-combination effects within Longham Lakes are assessed within Table 5.34below. This shows that at drought level 3B, Longham Lakes would be impacted by drought options BN-04 and BN-05. The physical in-combination effect of these two options could be an additional increase in wetted area and average depth, whilst potential water quality effects may require further investigation. No additional interacting options were identified at previous drought levels.

**Table 5.34: Physical in-combination and cumulative effects on Longham Lakes**

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| 2 | No interacting options identified at drought level 2 | | | | | |
| **2** | **No interacting options identified at drought level 2** | | | | | |
| | No interacting options identified at drought level 3A | | | | | |
| **3A** | **No interacting options identified at drought level 3A** | | | | | |
| **3B** | BN-04 | R | Unconfirmed (assessed as No change) | No change | Increase in wetted area | Increase in average depth |
| **3B** | BN-12 | R | Unconfirmed (assessed as No change) | No change | Increase in wetted area | Increase in average depth |

| Drought level | Option ID | Source/ pathway/ receptor* | Expected water quality impact | Expected flow velocity impact | Expected wetted area impact | Expected depth impact |
|---|---|---|---|---|---|---|
| **3B** | **Drought level 3B cumulative effects** | | **Assumed no additional change** | **No change** | **Additional increase in wetted area** | **Additional increase in depth** |

Source: Mott MacDonald, 2026. * S = Source, P = Pathway.

Within Longham Lakes, no records of INNS groups were identified; therefore no in-combination and cumulative effects are expected with regards to changes in INNS populations. However, the transfer of additional raw water may result in an increased risk of transfer and introduction into Longham Lakes and future monitoring is recommended.

## 5.7 Isles of Scilly WRZ

At the time of this submission, one option from the Isles of Scilly WRZ are in the Preferred Plan; therefore, no options required in-combination or cumulative effects assessment. However, this requirement will be reviewed as appropriate as the drought plan develops.

## 5.8 Cumulative effects summary

Table 5.35 below summarises the assessed risk of cumulative effects across the Preferred Plan, across all WRZs and at all drought levels.

The high risk identified for Colliford WRZ at drought level 3A and 3B is driven by option C-11 which would transfer water from Hawk's Tor Pit to Colliford Reservoir, creating a pathway to other water bodies receiving water from Colliford Reservoir.

Moderate risk ratings reflect option combinations which could exacerbate habitat changes which have the potential to increase INNS populations.

Where Moderate and High risks of cumulative effects have been identified, further investigation will be required to understand site-specific risks and potential mitigation.

**Table 5.35: Overall risk of cumulative effects**

| Drought level | 1 | 2 | 3A | 3B |
|---|---|---|---|---|
| Colliford WRZ | None | Moderate | High | High |
| Roadford WRZ | None | None | Moderate | Moderate |
| Wimbleball WRZ | None | Moderate | Moderate | Moderate |
| Isles of Scilly WRZ | None | None | None | None |
| Bournemouth WRZ | None | None | None | Moderate |
| Bristol WRZ | None | None | None | Moderate |
| Preferred Plan (inter-WRZ) | None | None | None | None |

Source: Mott MacDonald, 2026

# 6 Conclusions

## 6.1 Level 1 Summary

- Ten options were assessed in the Colliford WRZ. One option was assessed with High Risk magnitude. Two options were assessed with a Moderate Risk Magnitude (of INNS transfer). Four options (including two sub-options) were assessed with Low Risk Magnitude. Five options relating to compensation flow reduction and fish bank releases were assessed with a Risk Magnitude of None. All options could result in environmental changes which may affect INNS populations.
- Eleven options were assessed within the Roadford WRZ. One option would involve a temporary transfer using an otherwise unused pathway. One option was assessed with a Moderate Risk Magnitude, two were assessed with a Low Risk Magnitude, and eight were assessed with a Risk Magnitude of None. All options could result in environmental changes which may affect INNS populations.
- Four options were assessed within the Wimbleball WRZ. One option was assessed with a Moderate Risk Magnitude, and one with a Low Risk Magnitude. Two options relating to compensation flow reduction and fish bank releases were assessed with a Risk Magnitude of None. All options could result in environmental changes which may affect INNS populations.
- One option was assessed in the Isles of Scilly WRZ. This involves a groundwater source and has been assessed as a Risk Magnitude of Very Low. No potential impacts on INNS populations were identified, and further assessments were recommended.
- Three options were assessed within the Bournemouth WRZ. Two options were assessed with a Moderate Risk Magnitude, and one with a Very low Risk Magnitude. Two options could result in environmental changes which may affect INNS populations.
- Nine options were assessed within the Bristol WRZ. Three options were assessed with a Moderate Risk Magnitude. Six options relating to compensation flow reduction and fish bank releases were assessed with a Risk Magnitude of None. All options could result in environmental changes which may affect INNS populations.

## 6.2 Level 2 Summary

### 6.2.1 SAI-RAT risk assessment

Two options – C-11 and R-07 – would involve temporary transfers using an otherwise unused pathway, and were therefore subject to a SAI-RAT risk assessment. Using the tool Option C-11 generated an Inherent Risk Score of 23.17, and Option R-07 generated an Inherent Risk Score of 18.17.

### 6.2.2 SAI-RAT IRM

Most options could result in environmental changes which may affect INNS populations, and should therefore be assessed using the SAI-RAT IRM. The results of options assessed at the time of reporting are as follows:

#### 6.2.2.1 Colliford WRZ – Summary of Key Impacts

- **Option C-03:**
  - *River Fowey:* Potential decreases in water quality, flow velocity, wetted area and depth. Five INNS groups recorded; riparian vegetation may increase; responses of other groups unclear.

  - *Colliford Reservoir:* Possible decrease in water quality and increase in area and depth. Two INNS groups recorded with unclear responses.
- **Option C-04a:**
  - *Stannon Lake:* Possible reductions in wetted area and depth. One INNS group recorded with unclear response.
- **Option C-06:**
  - *Colliford Reservoir:* Potential increase in area and depth. Two INNS groups present; one may respond positively, one unclear.
  - *Lower River Fowey:* Possible reductions in water quality, flow velocity, wetted area and depth. Five INNS groups recorded; one may respond positively and one negatively, others unclear.
- **Option C-07a (A):**
  - *Park Lake:* Possible decreases in area and depth. One INNS group recorded with unclear response.
- **Option C-07a (B):**
  - *Park Lake:* Potential decrease in area and depth; one INNS group recorded with unclear response.
  - *Colliford Reservoir:* Potential increase in area and depth; two INNS groups recorded, one may respond positively, one unclear.
- **Option C-11:**
  - *Hawk's Tor Pit:* Possible decrease in area and depth; no INNS recorded.
  - *Colliford Reservoir:* Potential increase in area and depth; two INNS groups recorded, one may respond positively, one unclear.
- **Option C-30:**
  - *Siblyback Lake:* Possible increases in area and depth. Four INNS groups recorded; some may respond positively, one negatively, others unclear.
  - *Lower River Fowey:* Potential decreases in water quality, flow velocity, wetted area and depth. Seven INNS groups recorded; two may respond positively, others unclear.
- **Option C-37:**
  - *River Cober:* Possible decreases in water quality, flow velocity, wetted area and depth. Three INNS groups recorded; one may respond positively, others unclear.

#### 6.2.2.2 Roadford WRZ – Summary of Key Impacts

- **Option R-07:**
  - *Slade Reservoir*: Possible decrease in water quality (Lower Slade only) wetted area and depth. Ons INNS group recorded which may respond positively.
- **Option R-11:**
  - *River Lyd*: Possible decreases in water quality, flow velocity, wetted area and depth. Three INNS groups recorded, one may respond positively, others unclear.
  - *Roadford Reservoir:* Possible decrease in water quality, wetted area and depth. Three INNS groups recorded, one may respond positively, others unclear.
- **Option R-25:**
  - *Roadford Reservoir*: Possible increase in wetted area and depth. Three INNS groups recorded, one may respond positively, others unclear
  - *River Tamar*: Potential decreases in water quality, flow velocity, wetted area and depth. Six INNS groups recorded, one may have positive response, unclear for other groups.

- **Option R-45:**
  - *River Dart*: Potential decrease in flow, wetted area and depth. Three INNS groups recorded; two may respond positively, other has an unclear response.

#### 6.2.2.3 Wimbleball WRZ – Summary of Key Impacts

- **Option W-03**
  - *Wimbleball Reservoir:* Potential increase in wetted area and depth. Three INNS groups recorded, one may respond positively, one negatively and unclear response for other.
  - *River Exe:* Potential decreases in water quality, flow velocity, wetted area and depth. Six INNS groups recorded, one may respond positively, unclear for other groups.
- **Option W-06**
  - *River Exe:* Potential increase in flow velocity, wetted area and depth. Six INNS groups identified, two may respond positively, one negatively, other groups unclear.
- **Option W-09**
  - *River Exe:* Potential decreases in water quality, flow velocity, wetted area and depth. Four INNS groups identified. One may respond positively, other groups unclear.
  - *Wimbleball Reservoir:* Potential increase in wetted area and depth. Three INNS groups identified. One may respond positively, other groups unclear.

#### 6.2.2.4 Bristol WRZ – Summary of Key Impacts

- **Options BR-27a and BR-27b**
  - *Blagdon Reservoir*: Potential increase in wetted area and depth: Three INNS groups identified which may respond positively to habitat changes.
  - *River Yeo*: Potential decreases in water quality, flow velocity, wetted area and depth. Five INNS groups recorded, one may respond positively, the rest unclear.
- **Options BR-28a and BR-28b**
  - *Chew Valley Lake*: Potential increase in wetted area and depth. Three INNS groups recorded, which may respond positively to habitat changes.
  - *River Chew*: Potential decreases in water quality, flow velocity, wetted area and depth. Five INNS groups identified, one may respond positively, unclear response for others.
- **Option BR-29**
  - *Chew Magna*: Potential increase in wetted area and depth: No INNS recorded in Chew Magna
  - *Winford Brook*: Potential decreases in water quality, flow velocity, wetted area and depth. Four INNS groups recorded with unclear responses noted for all.
- **Option BR-30**
  - *Cheddar Ponds*: Potential increase in wetted area and depth. No INNS recorded in Cheddar Ponds.
  - *Cheddar Yeo*: Potential decreases in water quality, flow velocity, wetted area and depth. Five INNS groups recorded, one may react positively while one may be impacted negatively. The remaining groups have an unclear response.
- **Option BR-31a, BR-31b and BR-47**
  - *River Axe*: Potential decreases in water quality, flow velocity, wetted area and depth. Eight INNS groups recorded, two groups may respond positively, while remaining groups have an unclear response.
  - *Cheddar Reservoir:* Potential increase in wetted area and depth. One INNS group recorded which may respond positively.

#### 6.2.2.5 Bournemouth WRZ – Summary of Key Impacts

- **Options BN-04 and BN-12**
  - *River Stour*: Possible decreases in water quality, flow velocity, wetted area and depth. Six INNS groups identified. One may respond positively, other groups unclear response.
  - *Longham Lakes*: Potential for wetted area and depth to increase. No INNS groups recorded in Longham Lakes.

#### 6.2.2.6 Isles of Scilly WRZ – Summary of Key Impacts

- No options selected for further assessment within this WRZ

## 6.3 Cumulative / In-combination Effects Summary

The initial plan-level screening of option interactions determined that there would be no interaction between drought options within separate WRZs in the Preferred Plan.

- Within the Colliford WRZ the following impacts were identified:
  - Two habitats were identified as being potentially impacted by in-combination effects – the River Fowey and Colliford Reservoir.
  - The River Fowey may experience cumulative physical responses at stages 2 and 3A through an escalating drought in the form of flow, wetted areas and depth decreases. Predicted INNS responses are unclear for most groups, but populations of riparian INNS could increase.
  - Colliford Reservoir may experience cumulative physical responses at all drought stages in the form of increased wetted area and depth; however these may offset the drought impact and maintain water levels. This may increase populations of non-native aquatic macrophytes, but the response of Australian stonecrop is unclear.
- Within the Roadford WRZ the following impacts were identified:
  - Two habitats were identified as being potentially impacted by in-combination effects – Roadford Reservoir and the River Tamar.
  - Roadford Reservoir would be impacted at drought level 2, and could experience further cumulative effects at drought level 3A and 3B as option R-11 could interact with options R-25 and R-48.
  - The River Tamar would be impacted by option R-25 at drought level 3A only, which could interact with option R-26 at drought level 3B.
- Within the Wimbleball WRZ the following impacts were identified:
  - Three habitats were identified as being potentially impacted by in-combination effects – Wimbleball Reservoir, the River Haddeo and the River Exe. All options within this WRZ would be implemented at drought level 2.
  - Wimbleball Reservoir would be impacted by options W-03, W-09 and W-22.
  - The River Haddeo would be impacted by options W-03 and W-22.
  - The River Exe would be impacted by options W-03, W-06 and W-09.
- Within the Bournemouth WRZ the following impacts were identified:
  - Two habitats were identified as being potentially impacted by in-combination effects – the River Stour and Longham Lakes.
  - For both habitats, this would only occur at drought level 3B, as options BN-04 and BN-12 would interact.
  - Within the River Stour this could lead to a greater combined decrease in water quality, flow, wetted area and depth. For riparian vegetation this could result in a positive

population response. For other identified INNS groups population response is unclear due to the contradicting effects of different physical impacts.

  - Within Longham Lakes, this may lead to additional increase in wetted area and average depth, whilst potential water quality effects may require further investigation. No INNS records were identified within Longham Lakes; therefore potential in-combination effects on INNS groups or species could not be assessed.

- Within the Bristol WRZ the following impacts were identified:
  - Six habitats were identified as being potentially impacted by in-combination effects– Blagdon Reservoir, River Yeo, Chew Valley Lake, River Chew, River Axe and Cheddar Reservoir.
  - Blagdon Reservoir and the River Yeo may experience cumulative effects at drought level 3A if options BR-27b and BR-27a interact.
  - Chew Valley Lake may experience cumulative effects at levels BR-28b and BR-28a interact.
  - The River Chew may be impacted at level 3A through interactions between options BR28bm BR-28a and BR-29.
  - The River Axe and Cheddar Reservoir could be impacted by option BR-47 at level 2 which could interact with options BR-31a and BR-31b at level 3A.
  - Interactions between different drought plan options may result in a greater combined increase in wetted area and depth for the following habitats: Blagdon Reservoir, Chew Valley Lake, and Cheddar Reservoir. This may lead to a positive population response in any INNS aquatic vegetation present. The population response for other INNS groups in response to combined impacts in unclear.
  - Interactions between different drought plan options may result in a greater combined decrease in water quality, flow, wetted area and depth for the following habitats: River Yeo, River Chew, and River Axe. This may lead to a positive population response in any INNS riparian vegetation present. The population response for other INNS groups in response to combined impacts in unclear.
- Within the Isles of Scilly WRZ only one option is in the Preferred Plan and there is therefore no potential for in-combination or cumulative effects.

# 7 Next steps

## 7.1 Further Assessments

Current assessment limitations and uncertainties are discussed in Section 2.4. Further work may be required to progress or increase confidence in these assessments to ensure the robust evaluation of INNS risks, and appropriate consideration of mitigation. Further assessment work which may be required is summarised below, and by option in Table 7.1.

- SAI-RAT risk assessments should be updated as relevant options are developed and further information about options design and operation becomes available. Currently this is only considered to apply to options C-11 and R-07.
- SAI-RAT IRM assessments should be reviewed in light of any water quality or hydrological modelling which takes place, as this would increase confidence in the assessments of physical impacts. A more detailed analysis of potential INNS responses on a group or species basis may subsequently be required. This should take account of the generic 'species-specific approach' advocated for potential water quality changes within the SAI-RAT IRM.
- For options which have been identified as potentially interacting with others, in-combination and cumulative effects assessments should be reviewed in light of any water quality and hydrological modelling to increase confidence in the current assessments. A more detailed analysis of potential INNS responses may be required.
- INNS surveys where recent data (collected within the last three years) is currently lacking. These may be in source, pathway or receptor water bodies, or any other surface water habitats which may be physically impacted by drought options. Primarily any surveys should focus on water company assets where recent data (collected within the previous three years) is currently lacking. INNS surveys may not be required if other modelling or assessment work demonstrates a limited likelihood of INNS transfer, or that environment al changes which would risk the proliferation or spread of INNS are unlikely.
- The need for mitigation of INNS transfer risk or INNS population changes should be evaluated.

**Table 7.1: Further assessment required for all options**

| Option ID | Assessment work | Ecology survey |
|---|---|---|
| C-03 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Review in-combination/cumulative effects assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | INNS survey of Colliford Reservoir |
| C-04a | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | INNS survey of Stannon Lake |
| C-06 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Review in-combination/cumulative effects assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | INNS survey of Colliford Reservoir |
| C-07a | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Review in-combination/cumulative effects assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | INNS survey of Park Lake |

| Option ID | Assessment work | Ecology survey |
|---|---|---|
| C-10 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | INNS survey of Drift Reservoir |
| C-11 | ● Update SAI-RAT risk assessment as option develops<br>● Review IRM assessment in light of any water quality and hydrological modelling<br>● Review in-combination/cumulative effects assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | INNS survey of Hawk's Tor Pit |
| C-17 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | INNS survey of Colliford Reservoir |
| C-30 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Review in-combination/cumulative effects assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | INNS survey of Siblyback Lake |
| C-37 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | No ecology surveys identified |
| R-07 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Update SAI-RAT risk assessment as option develops<br>● Evaluate need to mitigate | INNS surveys of the Slade Higher Reservoir and Slade Lower Reservoir |
| R-11 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | INNS survey of Roadford Reservoir |
| R-20 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | INNS survey of Avon Reservoir |
| R-21 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | INNS survey of Burrator Reservoir |
| R-22 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | INNS survey of Fernworthy Reservoir |
| R-23 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | INNS survey of Trenchford Reservoir |
| R-24 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | INNS survey of Meldon Reservoir |
| R-25 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | INNS survey of Roadford Reservoir |
| R-26 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | INNS survey of Upper Tamar Lake |
| R-45 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | No ecology surveys identified |
| R-48 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | INNS survey of Roadford Reservoir |
| W-03 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Review in-combination/cumulative effects assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | INNS survey of Wimbleball Reservoir |
| W-06 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Evaluate need to mitigate | No ecology surveys identified |
| W-09 | ● Review IRM assessment in light of any water quality and hydrological modelling<br>● Review in-combination/cumulative effects assessment in light of any water quality and hydrological modelling | INNS survey of Wimbleball Reservoir |

| Option ID | Assessment work | Ecology survey |
|---|---|---|
| | • Evaluate need to mitigate | |
| W-22 | • Review IRM assessment in light of any water quality and hydrological modelling<br>• Review in-combination/cumulative effects assessment in light of any water quality and hydrological modelling<br>• Evaluate need to mitigate | INNS survey of Wimbleball Reservoir |
| BN-12 | • Review IRM assessment in light of any water quality and hydrological modelling<br>• Review in-combination/cumulative effects assessment in light of any water quality and hydrological modelling<br>• Evaluate need to mitigate | • INNS survey of Longham Lakes |
| BR-27a | • Review IRM assessment in light of any water quality and hydrological modelling<br>• Review in-combination/cumulative effects assessment in light of any water quality and hydrological modelling<br>• Evaluate need to mitigate | • INNS survey of Blagdon Reservoir |
| BR-27b | • Review IRM assessment in light of any water quality and hydrological modelling<br>• Review in-combination/cumulative effects assessment in light of any water quality and hydrological modelling<br>• Evaluate need to mitigate | • INNS survey of Blagdon Reservoir |
| BR-28a | • Review IRM assessment in light of any water quality and hydrological modelling<br>• Review in-combination/cumulative effects assessment in light of any water quality and hydrological modelling<br>• Evaluate need to mitigate | • INNS survey of Chew Valley Reservoir |
| BR-28b | • Review IRM assessment in light of any water quality and hydrological modelling<br>• Review in-combination/cumulative effects assessment in light of any water quality and hydrological modelling<br>• Evaluate need to mitigate | • INNS survey of Chew Valley Reservoir |
| BR-29 | • Review IRM assessment in light of any water quality and hydrological modelling<br>• Evaluate need to mitigate | • INNS survey of Chew Magna Reservoir |
| BR-30 | • Review IRM assessment in light of any water quality and hydrological modelling<br>• Evaluate need to mitigate | • INNS surveys of Cheddar Ponds |
| BR-31a | • Review IRM assessment in light of any water quality and hydrological modelling<br>• Review in-combination/cumulative effects assessment in light of any water quality and hydrological modelling<br>• Evaluate need to mitigate | • INNS survey of Cheddar Reservoir |
| BR-31b | • Review IRM assessment in light of any water quality and hydrological modelling<br>• Review in-combination/cumulative effects assessment in light of any water quality and hydrological modelling<br>• Evaluate need to mitigate | • INNS survey of Cheddar Reservoir |
| BR-47 | • Review IRM assessment in light of any water quality and hydrological modelling<br>• Review in-combination/cumulative effects assessment in light of any water quality and hydrological modelling<br>• Evaluate need to mitigate | • INNS survey of Cheddar Reservoir |
| BN-04 | • Review IRM assessment in light of any water quality and hydrological modelling<br>• Review in-combination/cumulative effects assessment in light of any water quality and hydrological modelling<br>• Evaluate need to mitigate | • INNS survey of Longham Lakes |
| BN-05 | • No further assessment work identified | • No ecology surveys identified |

| Option ID | Assessment work | Ecology survey |
|---|---|---|
| IS-13 | • No further assessment work identified | • No ecology surveys identified |
| IS-18 | • No further assessment work identified | • No ecology surveys identified |
| IS-20 | • No further assessment work identified | • No ecology surveys identified |

Source: Mott MacDonald, 2026.

## 7.2 Consultation

Throughout the development of the Drought Plan 2027, consultation with the Environment Agency and Natural England has been ongoing to ensure the Plan meets expectations. Workshops were held throughout 2025, primarily to present early SEA, HRA, WFD and INNS assessment findings, but also to identify key regulator concerns and insights on specific options. The consultation process aims to address and minimise any gaps in information or the assessments to ensure all potential environmental effects have been considered with regard to the SBB Drought Plan 2027.

The Environmental Report and Technical Appendices (including this report) will be issued for a 10-week consultation period from May to July 2026 to the statutory bodies: the EA, NE, and HE, as well as being available to wider stakeholders for comment.

Following receipt of comments, a Statement of Response (SoR) will be published, in line with the requirements of the Water Resource Planning Guidelines.

# 8 References

APEM. (2024). *SRO Aquatic INNS Risk Assessment Tool (SAI-RAT). Version 2 Guidebook.* Environment Agency.

Environment Agency. (2022). *Managing the risk of spread of Invasive Non-Native Species through raw water transfers. Position Statement.*

# Appendix A – Tables

## A.1 SAI-RAT (v.2.01) input data for option C-11

**Table A.1: SAI-RAT (v.2.01) asset input for option C-11**

| Input Variable | Hawk's Tor Pit | Colliford Reservoir |
|---|---|---|
| Asset easting | 215012 | 217441 |
| Asset northing | 074588 | 072197 |
| Asset Management Catchment | North Cornwall Seaton Looe and Fowey | North Cornwall Seaton Looe and Fowey |
| Asset Operational Catchment | Fowey | Fowey |
| Asset WFD waterbody | GB108048007630 | GB308462225 |
| List any designated and/ or priority habitats present at the asset | None identified | None identified |
| List invasive species present at the asset | None identified | *Crassula helmsii*, *Elodea canadensis, Elodea nuttallii* |
| Frequency of staff/contractors visits to asset | Unknown | Unknown |
| Frequency of staff/contractors entering raw water entry at the asset | Unknown | Unknown |
| Does vehicle access at the asset involve driving over soft surface/ substrate | Unknown | Yes - soft surface / substrate driving |
| Does angling take place at the asset | Unknown | Permit and day ticket holders |
| Do angling matches take place at the asset | Unknown | Yes |
| Is live bait permitted for use at the asset | Unknown | No / Not Applicable |
| Does fish stocking take place at the asset | Unknown | Yes - salmonids only |
| Are boats present at the asset | Unknown | No |
| Do water sports take place at the asset | Unknown | No |
| Is temporary water safety equipment present at the asset | Unknown | Unknown |
| Do mammals and waterfowl have access to riparian/ aquatic areas at the asset | Yes | Yes |
| Is untreated sludge and/ or sediment moved on/ off the asset | Unknown | Unknown |
| Does terrestrial recreation take place at the asset | Unknown | No |
| Are there other long-term activities that take place at the asset | Unknown | No |
| List of any biosecurity present at the asset | Unknown | Unknown |
| Extent of natural water bodies upstream of asset | 0km | 3km |
| Natural water bodies upstream of asset – broad habitat type (within 10km) | N/A | Predominantly upland |
| RWT Input Secondary Transfer/ Inherent Risk Score | N/A | N/A |

Source: South West Water, 2025; Mott MacDonald, 2026

**Table A.2: SAI-RAT (v.2.01) RWT input data for option C-11**

| Input variable | RWT1: Hawk's Tor Pit to Colliford Reservoir |
|---|---|
| Source name | Hawk's Tor Pit |
| Source type | Offline water body |
| Transfer route type | Pipeline (buried) |

| Input variable | RWT1: Hawk's Tor Pit to Colliford Reservoir |
|---|---|
| Permanent or Temporary Transfer | Temporary |
| Treatment level at Source | None |
| Location of Abstraction | Unknown |
| Depth of Abstraction | Unknown / multiple |
| Number of WFD UKTAG High impact INNS present at source | None |
| Number of WFD UKTAG Moderate impact INNS present at source | None |
| Number of WFD UKTAG Low impact INNS present at source | None |
| Number of WFD UKTAG Unknown impact INNS present at source | None |
| Receptor name | Colliford Reservoir |
| Receptor type | Online water body |
| Treatment level at Receptor | None |
| Highest order or designation at receptor | None |
| Presence of Priority Habitat(s) at Receptor | Not present |
| WFD Water body Status at Receptor | Poor |
| Isolated Receptor Catchment | No |
| Transfer Route Type | Pipeline (buried) |
| Transfer Volume – yearly licence limit (Ml/yr) | 724 |
| Transfer Frequency (days operated / yr) | 181 |
| Transfer Distance (km) | 2 |
| Source / Receptor Location | Receptor is not naturally hydrologically connected to the source |
| Other existing artificial raw water transfer(s) from source to receptor | Not present |
| Number of WFD UKTAG High impact INNS present along transfer route | None |
| Number of WFD UKTAG Moderate impact INNS present along transfer route | None |
| Number of WFD UKTAG Low impact INNS present along transfer route | None |
| Number of WFD UKTAG Unknown impact INNS present along transfer route | None |
| Highest order site designation along transfer route | National |
| Presence of Priority Habitat(s) along transfer route | Not present |
| Highest WFD Water body Status along transfer route | None / Not Applicable |
| Number of water bodies (excluding Source and Receptor) cross along the transfer route | None |
| Frequency of staff/contractors visits to the transfer route | Unknown |
| Frequency of staff/contractors entering raw water entry along the transfer route | Unknown |
| Does vehicle access along the transfer route involve driving over soft surface/ substrate | No external vehicles on site / Not Applicable |
| Does angling take place along the transfer route | No Angling / Not Applicable |
| Do angling matches take place along the transfer route | No / Not Applicable |
| Is live bait permitted for use along the transfer route | No / Not Applicable |
| Does fish stocking take place along the transfer route | No / Not Applicable |
| Are boats present along the transfer route | No / Not Applicable |
| Do water sports take place along the transfer route | No / Not Applicable |
| Is temporary water safety equipment present along the transfer route | No / Not Applicable |
| Do mammals and waterfowl have access to riparian/ aquatic areas along the transfer route | No / Not Applicable |
| Is untreated sludge and/or sediment moved on/ off the transfer route | Unknown |
| Does terrestrial recreation take place on the transfer route | No |

| Input variable | RWT1: Hawk's Tor Pit to Colliford Reservoir |
|---|---|
| Are there other long-term activities that take place on the transfer route | No |
| Extent of open water bodies adjoining the transfer route | None |
| Open water bodies adjoining the transfer route – broad habitat type (within 10km) | N/A |
| In-line Closed Asset Presence 1: Asset Likelihood Score | N/A |
| In-line Closed Asset Presence 2: Asset Likelihood Score | N/A |

Source: South West Water, 2025; Mott MacDonald, 2026

## A.2 SAI-RAT (v.2.01) input data for option R-07

**Table A.3: SAI-RAT (v.2.01) asset input data for option R-07**

| Input Variable | Slade Reservoirs | Hore Down WTW |
|---|---|---|
| Asset easting | 250562 | 252746 |
| Asset northing | 145300 | 144177 |
| Asset Management Catchment | North Devon | North Devon |
| Asset Operational Catchment | N/A | N/A |
| Asset WFD waterbody | GB30843794 | N/A |
| List any designated and/ or priority habitats present at the asset | None | None |
| List invasive species present at the asset | *Fallopia japonica*, *Cyprinus carpio* | None known |
| Frequency of staff/contractors visits to asset | Unknown | Unknown |
| Frequency of staff/contractors entering raw water entry at the asset | Unknown | Unknown |
| Does vehicle access at the asset involve driving over soft surface/ substrate | Unknown | Unknown |
| Does angling take place at the asset | Day ticket holders only | No Angling on site |
| Do angling matches take place at the asset | Yes | No |
| Is live bait permitted for use at the asset | No / Not Applicable | No / Not Applicable |
| Does fish stocking take place at the asset | Yes - coarse fish only | No fish stocking |
| Are boats present at the asset | No | No |
| Do water sports take place at the asset | No | No |
| Is temporary water safety equipment present at the asset | Unknown | No |
| Do mammals and waterfowl have access to riparian/ aquatic areas at the asset | Yes | No / Not Applicable |
| Is untreated sludge and/ or sediment moved on/ off the asset | Unknown | Unknown |
| Does terrestrial recreation take place at the asset | Unknown | No |
| Are there other long-term activities that take place at the asset | No | No |
| List of any biosecurity present at the asset | Unknown | Unknown |
| Extent of natural water bodies upstream of asset | 3km | 0km |
| Natural water bodies upstream of asset – broad habitat type (within 10km) | Predominantly lowland and flow through agricultural areas | N/A |
| RWT Input Secondary Transfer/ Inherent Risk Score | N/A | N/A |

Source: South West Water, 2025; Mott MacDonald, 2026

## Table A.4: SAI-RAT (v.2.01) RWT input data for option R-07

| Input variable | RWT1: Slade Reservoirs to Hore Down WTW |
|---|---|
| Source name | Slade Reservoir |
| Source type | Online water body |
| Transfer route type | Pipeline (buried) |
| Permanent or Temporary Transfer | Temporary |
| Treatment level at Source | Unknown |
| Location of Abstraction | Unknown |
| Depth of Abstraction | Unknown / multiple |
| Number of WFD UKTAG High impact INNS present at source | 1 |
| Number of WFD UKTAG Moderate impact INNS present at source | None |
| Number of WFD UKTAG Low impact INNS present at source | None |
| Number of WFD UKTAG Unknown impact INNS present at source | None |
| Receptor name | Hore Down WTW |
| Receptor type | Water treatment works |
| Treatment level at Receptor | Completely effective |
| Highest order or designation at receptor | None |
| Presence of Priority Habitat(s) at Receptor | Not present |
| WFD Water body Status at Receptor | None / Not Applicable |
| Isolated Receptor Catchment | Yes |
| Transfer Route Type | Pipeline (buried) |
| Transfer Volume – yearly licence limit (Ml/yr) | 92 |
| Transfer Frequency (days operated / yr) | 92 |
| Transfer Distance (km) | 2.5 |
| Source / Receptor Location | Receptor is not naturally hydrologically connected to the source |
| Other existing artificial raw water transfer(s) from source to receptor | Not present |
| Number of WFD UKTAG High impact INNS present along transfer route | None |
| Number of WFD UKTAG Moderate impact INNS present along transfer route | None |
| Number of WFD UKTAG Low impact INNS present along transfer route | None |
| Number of WFD UKTAG Unknown impact INNS present along transfer route | None |
| Highest order site designation along transfer route | None |
| Presence of Priority Habitat(s) along transfer route | Not present |
| Highest WFD Water body Status along transfer route | None / Not Applicable |
| Number of water bodies (excluding Source and Receptor) cross along the transfer route | None |
| Frequency of staff/contractors visits to the transfer route | Unknown |
| Frequency of staff/contractors entering raw water entry along the transfer route | Unknown |
| Does vehicle access along the transfer route involve driving over soft surface/ substrate | Unknown |
| Does angling take place along the transfer route | No Angling / Not Applicable |
| Do angling matches take place along the transfer route | No / Not Applicable |
| Is live bait permitted for use along the transfer route | No / Not Applicable |
| Does fish stocking take place along the transfer route | No / Not Applicable |
| Are boats present along the transfer route | No / Not Applicable |
| Do water sports take place along the transfer route | No / Not Applicable |

| **Input variable** | **RWT1: Slade Reservoirs to Hore Down WTW** |
|---|---|
| Is temporary water safety equipment present along the transfer route | No / Not Applicable |
| Do mammals and waterfowl have access to riparian/ aquatic areas along the transfer route | No / Not Applicable |
| Is untreated sludge and/or sediment moved on/ off the transfer route | Unknown |
| Does terrestrial recreation take place on the transfer route | No |
| Are there other long-term activities that take place on the transfer route | No |
| Extent of open water bodies adjoining the transfer route | None |
| Open water bodies adjoining the transfer route – broad habitat type (within 10km) | N/A |
| In-line Closed Asset Presence 1: Asset Likelihood Score | N/A |
| In-line Closed Asset Presence 2: Asset Likelihood Score | N/A |

Source: South West Water, 2025; Mott MacDonald, 2026