

Technical Note

Project:	Havant Thicket Reservoir		
Subject:	Short-listing methodology		
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Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 1.0	Short-listing methodology	KSS	AB	PM	JF	09/03/21
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Client signoff

Client	Portsmouth Water
Project	Havant Thicket Reservoir
Project No.	5169117
Client signature / date	

1. Introduction

A Water Framework Directive (WFD) compliance assessment was undertaken for the proposed Havant Thicket Reservoir, as part of the Environmental Statement in 2020. The conclusions of which, was that the proposed reservoir was deemed to have the potential to cause deterioration of the impacted water body of the Riders Lane Stream which is part of the Hermitage Stream WFD water body (GB107042016370). An Article 4.7 derogation case was prepared and accepted by the Environment Agency to enable the project to proceed through the planning process. The derogation provided evidence to meet each of four conditions of the Article 4.7 as part of this process, namely:

- a. *all practicable steps are to be taken to mitigate the adverse impacts on the water body concerned;*
- b. *the reasons for modifications or alterations are specifically set out and explained in the RBMP;*
- c. *the reasons for those modifications or alterations are of overriding public interest and/or the benefits to the environment and to society of achieving the objectives set are outweighed by the benefits of the new modifications or alterations to human health, to the maintenance of human safety or to sustainable development, and;*
- d. *the beneficial objectives served by those modifications or alterations of the water body cannot for reasons of technical feasibility or disproportionate cost be achieved by other means, which are a significantly better environmental option.*

In the drafting of Article 4.7 a long list of practicable measures was developed to fulfil Article 4.7 condition (a) as detailed above. The long list of measures was agreed with the Environment Agency and was deemed sufficient for the purposes of fulfilling the Article 4.7 derogation. This was confirmed by the Environment Agency on 18/02/21. The long list agreed to fulfil test (a) of the Article 4.7 case is detailed in Appendix A.

This technical note charts the next phase of the process whereby a short-listing exercise was required to reduce the full list of practicable measures that fulfilled Article 4.7 condition (a) to a short list of deliverable options. The short-list can then be used to define the level of mitigation and compensation required for the watercourses impacted by the Scheme. The approach to short-listing of the options was discussed and agreed with the Environment Agency as part of this process. Revisions to the process have been made following Environment Agency feedback. Co-creation of the process was considered important, so that decision making was both transparent, and auditable. A worksheet charting this progress is detailed in Appendix B.

2. Objective setting and measure scoring process

Following feedback from the Environment Agency as part of the production of the long list for the Article 4.7 Test (a) derogation a revised long list was developed. This revised list was used as the starting point for the short-listing approach and formed the basis of the Article 4.7 objective setting and scoring process (see Figure 3-1).

The first stage of this process was to develop and agree assessment objectives. An expert workshop (no. 1) was used to agree objectives against which measures would be scored (see Appendix B). The objectives which were based on similar groupings were separated into sets accordingly, namely:

- Set 1 - Effectiveness of implementation (deliverability) – which included a total of three objectives, each scored on a scale of 1-3;
- Set 2 - Contribution to WFD quality elements; which included one objective, scored on a scale of 1-5;
- Set 3 - Alignment with project objectives; which included a total of eight objectives, each scored on a scale of 1-5; and,
- Set 4 - 'Additional' Assessment criteria; which included a total of four objectives, each scored on a scale of 1-5.

This approach allowed subsequent phases to focus on scoring of particular sets as well as generating a total package score. The maximum attainable score across the 16 objectives was 74.

Stage 2 involved an objective scoring assessment to rate each option against this scoring matrix. The scoring was agreed at an expert workshop (no. 2) to ensure a transparent and auditable process was followed. Feedback was also provided by the Environment Agency on any scores attributed to each objective, resulting in some amendments to the scoring of objectives (see Appendix B).

Scores of 1-3 were delineated for each objective in Set 1. For landownership, any score of 3 meant that there were 'No landowner constraints or a well, known landowner and likely to be amenable.' Any score of 1 meant that there was the 'Potential for significant land ownership constraints (e.g. private land ownership, gardens, (future) housing).' A score of 2 meant that the 'Land ownership unknown.' For conservation and heritage objectives a score of 3 meant no effect on conservation or heritage sites whereas a score of 1 meant that conservation or heritage sites could be negatively impacted.

For Set 2 on WFD quality elements scores of 1-5 were provided. Scores of 1 meant that the 'Measure does not contribute to WFD Water Quality Element' while scores of 5 meant that the 'Measure significantly contributes to catchment WFD objectives.' There was a range of scores in between these two extremes.

For Set 3, regarding alignment with project objectives there was a diverse range of objectives all based around a score of 1-5 with a score of 5 being a very positive value and contrastingly a score of 1 being a very negative value. Objectives focused on creation of high, quality habitats in comparable stream systems as close as to the impact as possible while improving connectivity and catchment resilience.

For Set 4, on additional assessment criteria, objectives were scored between 1-5 with a score of 5 being a very positive value and contrastingly a score of 1 being a very negative value. This was probably the most diverse set with focus on certainty of outcomes, longevity of measures, co-benefits of partnership projects and finally single or multiple benefits attained by a single measure.

At the end of this stage, it was determined that Set 1 and Set 2 were of paramount importance in determining whether a measure could be considered as a) 'practicable' in accordance with Article 4.7 i.e. it could be implemented successfully with no obvious constraints; and b) the ability of the measure to improve WFD Quality Elements affected by the scheme.

As a result, Sets 1 and 2 formed the cornerstone of the short-listing methodology set out in Section 3, whilst the total score for each measure (i.e. the sum of Set 1, 2, 3 and 4) was used to rank the different measures in terms of preference for implementation.

3. Agreed short-listing methodology

As detailed in Section 2, it was determined that key considerations for the short-listing exercise were Set 1 i.e. deliverability including land ownership, conservation sites and heritage constraints and Set 2 i.e. the ability of the measure to improve WFD Quality Elements affected by the scheme.

The seven-stage approach developed for short-listing is shown in a flow chart in Figure 3-2 and detailed further in Table 3-1. A formulaic approach was developed to ensure transparency and auditability.

The short-listing approach was agreed with the Environment Agency and Section 4 details the next phase of the work which outlined how the 31 options in the long list have been taken through Stage 1-4 of the shortlisting process shown in Figure 3-2. Within the short-listing process a measure of length of stream improved was considered to help the assessment on whether there was a sufficient overall length of improvement being offered to both mitigate and compensation for the length of watercourse lost by the scheme and also to support in achieving Biodiversity Net Gain for rivers. This quantum was not required for Article 4.7. An initial assessment of rivers for BNG was submitted as part of the planning process (Portsmouth Water, 2020).

Table 3-1: Description of short-listing stages shown in Figure 3-2.

Stage	Description	Considerations for 'parked' options
1	If a WFD score is greater than 2 it will be taken through to through to the next stage of the process. The stage effectively parks those measures that don't effectively deliver on significantly improving WFD Quality Elements.	Measures that are proposed to be 'parked' at this stage should be checked for in-combination benefits before a final decision is made. Where in-combination benefits are possible, consideration should be given to keeping this measure in the process or be one of the

Stage	Description	Considerations for 'parked' options
		first measures to be reconsidered as part of Stage 5.
2	If a WFD score is equal to 4 and 5 it gets taken through to the next stage. This stage takes through measures that effectively deliver on improving WFD Quality Elements. If equal to 3 the process takes the option to another part of the decision tree in Stage 3.	-
3	Stage 3 sorts out measures in a variety of ways. For those measures that have a WFD score of 4 or 5 and a deliverability score of 3 they get taken straight through to Stage 5. If measures have a WFD score of 4 or 5 but a lower deliverability score than 3 they will need further assessment on whether they should be taken through and assessed in Stage 4. For those measures that have a WFD score of 3 and a deliverability score of 3 they will also need further assessment of whether they should be taken through in Stage 4. Whereas, those measures that have a WFD score of 3 and a deliverability score of lower than 3 the measure will be parked at this stage of the process.	Measures that are proposed to be 'parked' at Stage 3 should be checked for in-combination benefits before final decision is made. Where in-combination benefits are possible consideration should be given to keeping this measure in the process or be one of the first measures to be reconsidered as part of Stage 5.
4	This stage distinguishes measures where there is some uncertainty on the measure on either through not scoring high enough on land ownership or WFD Quality Elements. Justifications to take through to the next stage should be based on the remainder of the criteria developed through the long-listing exercise. An expert workshop (no. 3) is undertaken at this stage of the process to determine if the measures that are taken through to this stage are sufficient for the mitigation and compensation package.	Those options that link well with project objectives and additional assessment criteria should be considered to go through to the next stage of the process. Measures within the highest overall scores (Set 1 + Set 2 + Set 3 + Set 4) should be prioritised.
5	Constraints check – A review of any utilities and potential contaminated land (at a high level) would be undertaken and measures that prove too challenging to deliver by virtue of these constraints should be ruled out at this stage. An expert workshop (no. 4) is undertaken at this stage of the process to agree whether some measures need to be removed and others brought back in. Decisions on which measures to be changed need agreement at this workshop.	If, at Stage 5, constraints are identified associated with utilities or contamination the next highest ranked option could be pulled through from the parked list and assessed for viability to ensure a sufficient level of mitigation is taken through to the next phase of the process.
6	Of those measures that are taken through to this stage conceptual designs would be developed for each option and a high-level cost and effectiveness assessment undertaken. This ultimately will lead to the final list of mitigation list that will get delivered as part of the scheme.	It was agreed that the overall package will be subject to cost-effectiveness assessment to identify measures where the cost may become disproportionate to the amount of benefit that it delivers. An alternative approach agreed with the Environment Agency on 5 March 2021 is that the overall price of package 2 can effectively become a price cap.
7	Final Stage – Detailed design of the final list of options would be delivered as part of the scheme following Section 106 agreement.	The short list of mitigation measures will deliver against the legal requirement for all practicable mitigation and be delivered as part of the overall mitigation and compensation strategy for the scheme.

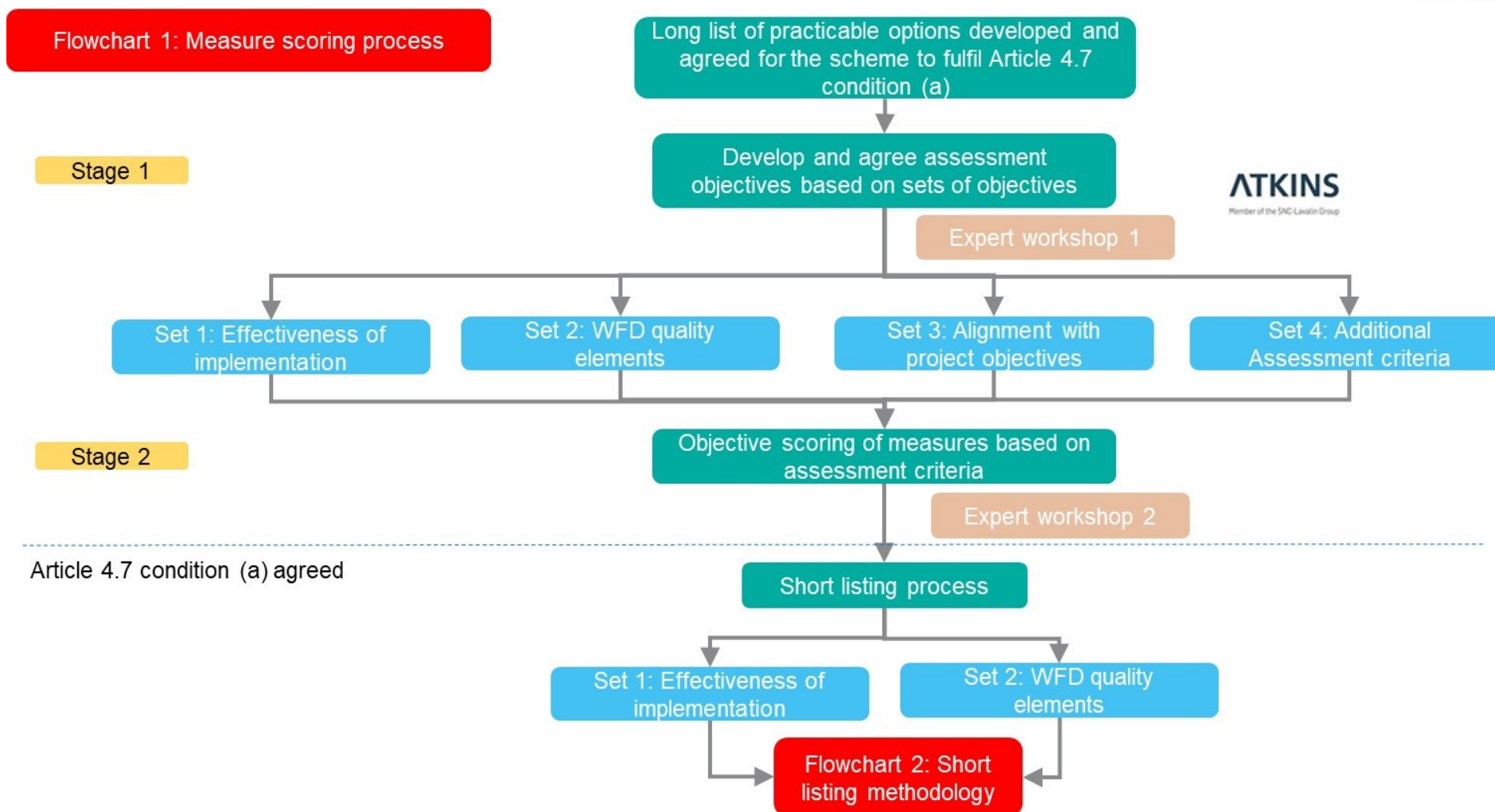


Figure 3-1: Article 4.7 objective development and scoring process used as part of initial stages of measure shortlisting

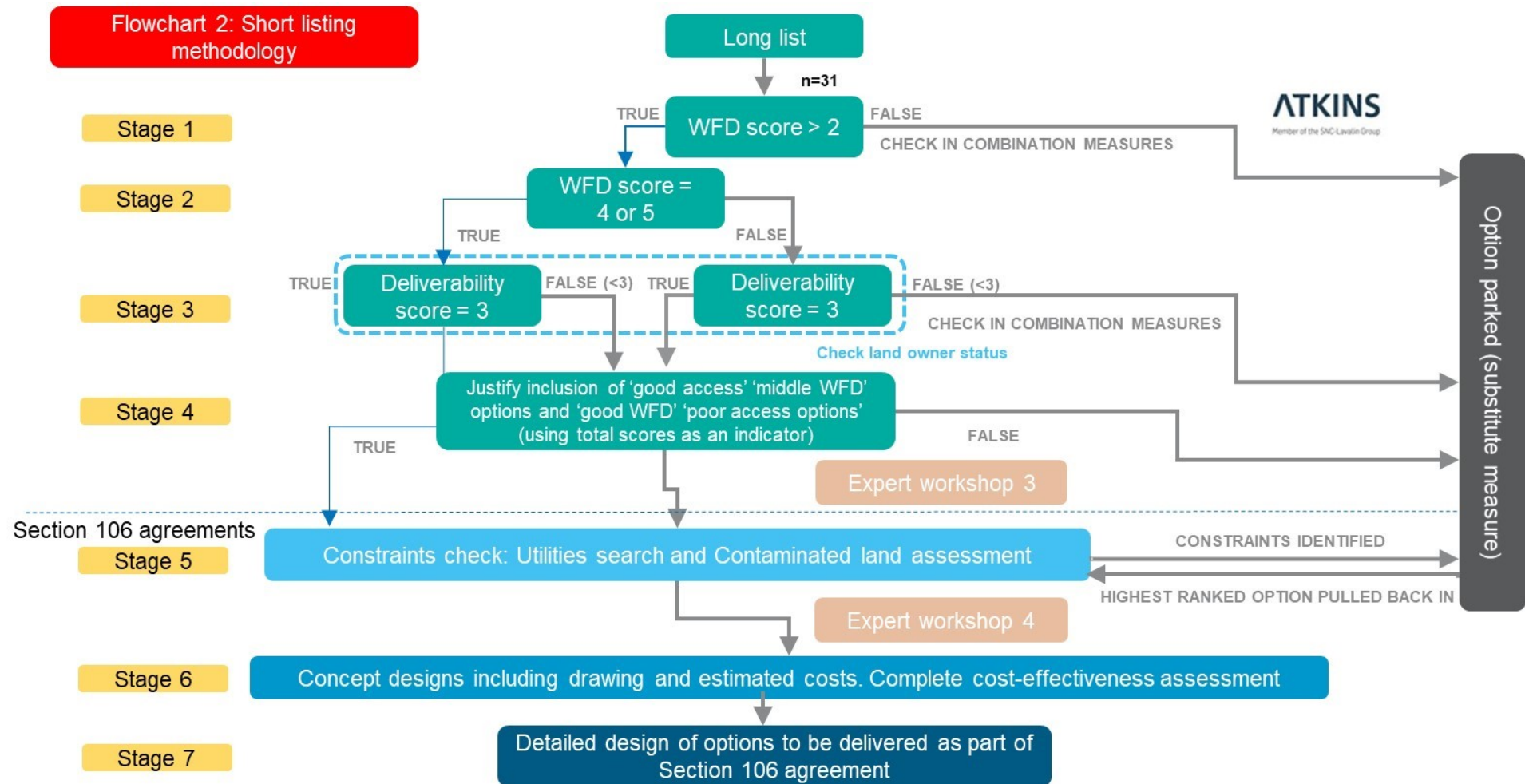


Figure 3-2: Short-listing methodology employed for the Article 4.7 Test a long list of practicable measures developed and scored as part of Flowchart 1

4. Short-listing process

The short-listing process has been undertaken according to the agreed methodology detailed in Section 2 and 3 and Figure 2-1, Figure 3-1 and Appendix B). The results of the scoring process are shown in stages up to Stage 4 in Table 4-1 and Appendix B. The scoring and outputs were discussed at an expert workshop (no. 3) on 05/03/21.

From Stage 1, twenty-four options were taken through to Stage 2 as a result of having WFD scores of greater than two. Seven options were parked as a result of having WFD scores of two or below. In Stage 2, fifteen options had WFD scores of 4 or 5 and nine options had WFD scores equal to three. The options were taken through to Stage 3 in these two categories. Stage 3 is the most complicated part of the flow chart. Of those fifteen options that had WFD scores of 4 or 5 the options were assessed on whether they had a deliverability score of 3. In those options where this was the case, the options got taken straight through to Stage 5. Where deliverability scored less than 3 these options were taken through to Stage 4. This part of the process meant 13 options got taken through to Stage 5 directly and 2 options were taken through to Stage 4. In the other category that was assessed in Stage 3, nine options which had WFD scores equal to three were assessed. This category was also assessed on whether there was a deliverability score of 3. Where this was the case these options also got taken through to Stage 4 but where the deliverability score was lower these options were 'parked' as they had middle range WFD scores but low deliverability scores. From this category, a further four options were taken through to Stage 4 by virtue of having a WFD score of three and a deliverability score of three. Five options were 'parked' at this stage of the process. As a result, in summary from Stage 3, thirteen options were taken through directly to Stage 5, six options were taken through to Stage 4 and finally five options were 'parked.'

In Stage 4 of the process, there was a mix of six options that either had a combination of 'good deliverability' and 'middle WFD' scores or 'good WFD' scores but poor 'deliverability' scores. To assess which of the options could get taken through to Stage 5 these options are presented according to their overall score that they achieved in the long list matrix. This is summarised in Table 4-2. The lowest rank score of 45 is on the Riders Lane Stream which is the establishment of Eastern ditches to the east of the reservoir but as this is embedded mitigation in the scheme this measure gets taken through as part of the scheme. The remainder of the options were presented for discussion at the expert workshop (no. 3) to determine whether the list presented was deemed to be sufficient to form an appropriate scale of mitigation and compensation for the scheme.

Table 4-1: Short-listing results up to Stage 4

Stage	Optioneering	
1	WFD Score >2 ('To Stage 2') 1. RLS - Headwater Stream 1 (HS1) 2. RLS - Headwater Stream 2 (HS2) 3. RLS - Headwater Stream 3 (HS3) 4. RLS - Ponds in Long Wood 5. RLS - New channel near Rowlands Castle 6. RLS - Eastern ditches (flowing into River Lavant) 7. RLS - The Lake Stream - macrophyte work 8. RLS - New compensation flow channel 9. RLS - Sediment management 10. RLS - d/s reservoir embankment to Middle Park Way (stream management) 13. RLS - Dunsbury Way to Purbrook Way 14. RLS - Purbrook Way to Hermitage Stream 15. PLS - Tributary north golf course 16. PLS - Blendworth Common tributary	WFD Score <2 ('Parked') 11. RLS - Great Copse 12. RLS - Great Copse to Dunsbury Way 21. PLS - Bell's Copse 22. PLS - Bell's Copse to Warren Park culvert 24. Herm HW - Burnside to A3 25. Herm - A3 to Bushey Lease 31. Herm - New Road to Waterworks 2 Total = 7

Stage	Optioneering	
	17. PLS - Tributary south of golf course 18. PLS - Unnamed Tributary joining on LHB 19. PLS - Unnamed Tributary joining on RHB from A3 20. PLS - A3 to Bell's Copse 23. Herm HW - Queen's Inclosure to Burnside (road) 26. Herm - Bushey Lease to Park House Farm Way (Reach B) 27. Herm - Park House Farm Way to Middle Park Way (Reach C) 28. Herm - Middle Park Way to Riders Lane Stream (previously restored) 29. Herm - Riders Lane Stream to Barncroft Way (Reach D) 30. Herm - Barncroft Way to New Road (Reach E) Total = 24	
2	WFD Score = 4 or 5 ('To Stage 3') 1. RLS - Headwater Stream 1 (HS1) 2. RLS - Headwater Stream 2 (HS2) 3. RLS - Headwater Stream 3 (HS3) 4. RLS - Ponds in Long Wood 5. RLS - New channel near Rowlands Castle 7. RLS - The Lake Stream - macrophyte work 8. RLS - New compensation flow channel 15. PLS - Tributary north golf course 20. PLS - A3 to Bell's Copse 23. Herm HW - Queen's Inclosure to Burnside (road) 26. Herm - Bushey Lease to Park House Farm Way (Reach B) 27. Herm - Park House Farm Way to Middle Park Way (Reach C) 28. Herm - Middle Park Way to Riders Lane Stream (previously restored) 29. Herm - Riders Lane Stream to Barncroft Way (Reach D) 30. Herm - Barncroft Way to New Road (Reach E) Total = 15	WFD Score = 3 ('To Stage 3') 6. RLS - Eastern ditches (flowing into River Lavant) 9. RLS - Sediment management 10. RLS - d/s reservoir embankment to Middle Park Way (stream management) 13. RLS - Dunsbury Way to Purbrook Way 14. RLS - Purbrook Way to Hermitage Stream 16. PLS - Blendworth Common tributary 17. PLS - Tributary south of golf course 18. PLS - Unnamed Tributary joining on LHB 19. PLS - Unnamed Tributary joining on RHB from A3 Total = 9
3	WFD score = 4 or 5 and Deliverability Score = 3 taken straight through to Stage 5 1. RLS - Headwater Stream 1 (HS1) 2. RLS - Headwater Stream 2 (HS2) 3. RLS - Headwater Stream 3 (HS3) 4. RLS - Ponds in Long Wood 5. RLS - New channel near Rowlands Castle 7. RLS - The Lake Stream - macrophyte work 8. RLS - New compensation flow channel 23. Herm HW - Queen's Inclosure to Burnside (road)	WFD score = 3, Deliverability Score < 3 – (Parked) 13. RLS - Dunsbury Way to Purbrook Way 14. RLS - Purbrook Way to Hermitage Stream 16. PLS - Blendworth Common tributary 17. PLS - Tributary south of golf course

Stage	Optioneering	
	26. Herm - Bushey Lease to Park House Farm Way (Reach B) 27. Herm - Park House Farm Way to Middle Park Way (Reach C) 28. Herm - Middle Park Way to Riders Lane Stream (previously restored) 29. Herm - Riders Lane Stream to Barncroft Way (Reach D) 30. Herm - Barncroft Way to New Road (Reach E) Total = 13	19. PLS - Unnamed Tributary joining on RHB from A3 Total = 5 WFD score = 3, Deliverability Score = 3 taken through to Stage 4 6. RLS - Eastern ditches (flowing into River Lavant) (embedded) 9. RLS - Sediment management 10. RLS - d/s reservoir embankment to Middle Park Way (stream management) 18. PLS - Unnamed Tributary joining on LHB Total = 4 WFD score = 4 or 5, Deliverability Score < 3 taken through to Stage 4 15. PLS - Tributary north golf course 20. PLS - A3 to Bell's Copse Total = 2
4	List of 'Good deliverability' 'Middle WFD' Options 6. RLS - Eastern ditches (flowing into River Lavant) (embedded) 9. RLS - Sediment management 10. RLS - d/s reservoir embankment to Middle Park Way (stream management) 18. PLS - Unnamed Tributary joining on LHB	List of 'Good WFD' 'poor deliverability' options 15. PLS - Tributary north golf course 20. PLS - A3 to Bell's Copse

Note: The text on measure numbers refers to the actual measure number. It does not represent any ranking or has any other meaning attributed to the number.

Table 4-2 – Options in Stage 4

Option	Description	Overall score
15. PLS - Tributary north golf course	Remove bank protection and reprofile banks, tackle pollution sources to improve water quality downstream, improve fish passage through culvert	56
20. PLS - A3 to Bell's Copse	NFM, selective daylighting, removal of in-channel structures for fish passage	54
10. RLS - d/s reservoir embankment to Middle Park Way (stream management)	Fencing to protect against bank erosion, improved fish passage through culvert	52
18. PLS - Unnamed Tributary joining on LHB	River restoration	50
9. RLS - Sediment management	A mechanism will be provided in the reservoir design to be able to flush sediment downstream.	45
6. RLS - Eastern ditches (flowing into River Lavant) (embedded)	Creation of ditch habitat	44

Note: Overall score is the overall total for each objective summing up totals in Set 1, 2, 3 and 4.

5. Packages of measures

At the expert workshop (no. 3), shortlisting results were discussed and portrayed in a series of packages of measures were discussed which could form a basis of the watercourse mitigation and compensation plan for the scheme. High level costs and lengths of mitigation are outlined in Appendix C. The measures were presented in three package combinations which are detailed below:

- 1) Package 1: The list included the highest ranked measures from the scoring assessment that made it through to Stage 3 and got taken directly to Stage 5 while delivering improvements (3.82 km) of just over the length of channel lost from the footprint of the scheme (3.7 km). This included most of the measures that got taken through directly to Stage 5. The advantages and disadvantages of this package are detailed below:

Advantages

- Delivers multiple WFD objectives for the Hermitage Stream water body
- It is fully deliverable
- Based on highest scoring of measures identified

Disadvantages

- With 3.7 km of stream lost, this only just delivers improvements (in terms of length).
- Most likely Biodiversity Net Gain (BNG) non-compliant (previous discussions with the EA deemed that 3.7km was likely to be too small a length whereas 7m was deemed likely to be too great a length).
- Does not deliver specific Headwater and/or Riders Lane Stream specific benefits.

- 2) Package 2: This included all measures that successfully made it through to stage 3 and moved directly to Stage 5 and the highest ranked measure in Stage 4. The total length of delivered improvements (5.48 km) is approximately 50% more length of channel lost from the footprint of the scheme (3.7 km). The advantages and disadvantages of this package are detailed below:

Advantages

- Meets the main criteria in WFD objectives and is largely deliverable.
- Provides around 5.5km so improves around 1.8km more of channel than lost under scheme footprint
- Could be considered a proportionate scale of mitigation for BNG

Disadvantages

- Possible deliverability constraints around option no. 15

- 3) Package 3: This included all measures that successfully made it through to Stage 3 that went directly to Stage 5 and the all the measures in Stage 4. The total length of delivered improvements (9.12 km) is approximately 150% more length of channel lost from the footprint of the scheme (3.7 km). The advantages and disadvantages of this package are detailed below:

Advantages

- Mix of headwater streams, Hermitage Stream restoration and delivery of WFD objectives.
- At a length of 9.12 km improved is well above the previously upper limit of 7 km of watercourse needing improvements agreed at a previous meeting with the Environment Agency
- Good chance of BNG as currently stands in BNG Metric 2.0

Disadvantages

- Possible deliverability constraints around some of the headwater options

These packages are detailed spatially in Figures 5.1-5.3 and in outlined in Tables 5.1-5.3. Any measures that get taken through in a package will still need to follow the other stages identified in the short-listing process (Figure 3.1) which includes:

- Constraints assessment – check on utilities and contaminated land assessment (indicative)
- Concept designs for each option and overall river length that will benefit from the improvements
- Development of specific costs
- Outline design and Detailed designs
- Consenting
- Construction

In the expert workshop (no. 3) the Environment Agency concluded that Package 2, which would deliver around 5.5km of watercourse improvement at an approximate cost of £2.65 million, was suitable to mitigate and compensate for the impacts on the water environment from the scheme. It was considered that the scale of mitigation was proportionate which was not achieved in Package 1 and considered unjustifiably large in Package 3. Package 1, at an approximate cost of £2.2 million, would deliver only 3.82km of watercourse improvement which just about exceeds the length of watercourse that would be lost from the scheme footprint (3.7km). Package 3, in contrast, at an approximate cost of £3.4 million, would deliver 9.12km of watercourse improvement and would by far exceed the length of watercourse that was lost from the scheme footprint (3.7km) and was thus considered disproportionate in comparison. The selection of Package 2 was determined through the agreed, transparent, auditable, scoring process (see Appendix B) and offered a balanced amount of mitigation and compensation when compared to the other packages. Package 2 will deliver an effective and robust level of mitigation and compensation while offering an overall value for money.

Outline, high-level costs were discussed as part of workshop no. 3, and these have been included in Appendix C. It was agreed that the costs estimated within which the measures should be delivered were realistic. In terms of delivery model, Portsmouth Water will be responsible for delivery. The Environment Agency is not opposed to an approach where Portsmouth Water and its contractors would deliver some of the improvements directly, notably those pertaining to receptors directly impacted by the scheme such as the sensitive macroinvertebrate and macrophyte communities whereas others could be delivered by third parties or in partnership with others. An opportunity for maximising benefits by aligning delivery with 'other' Section 106 agreements and existing local partnership groups was also welcomed. There may also be opportunity to deliver the project against an agreed cost ceiling once more detailed work has been undertaken on the costing.

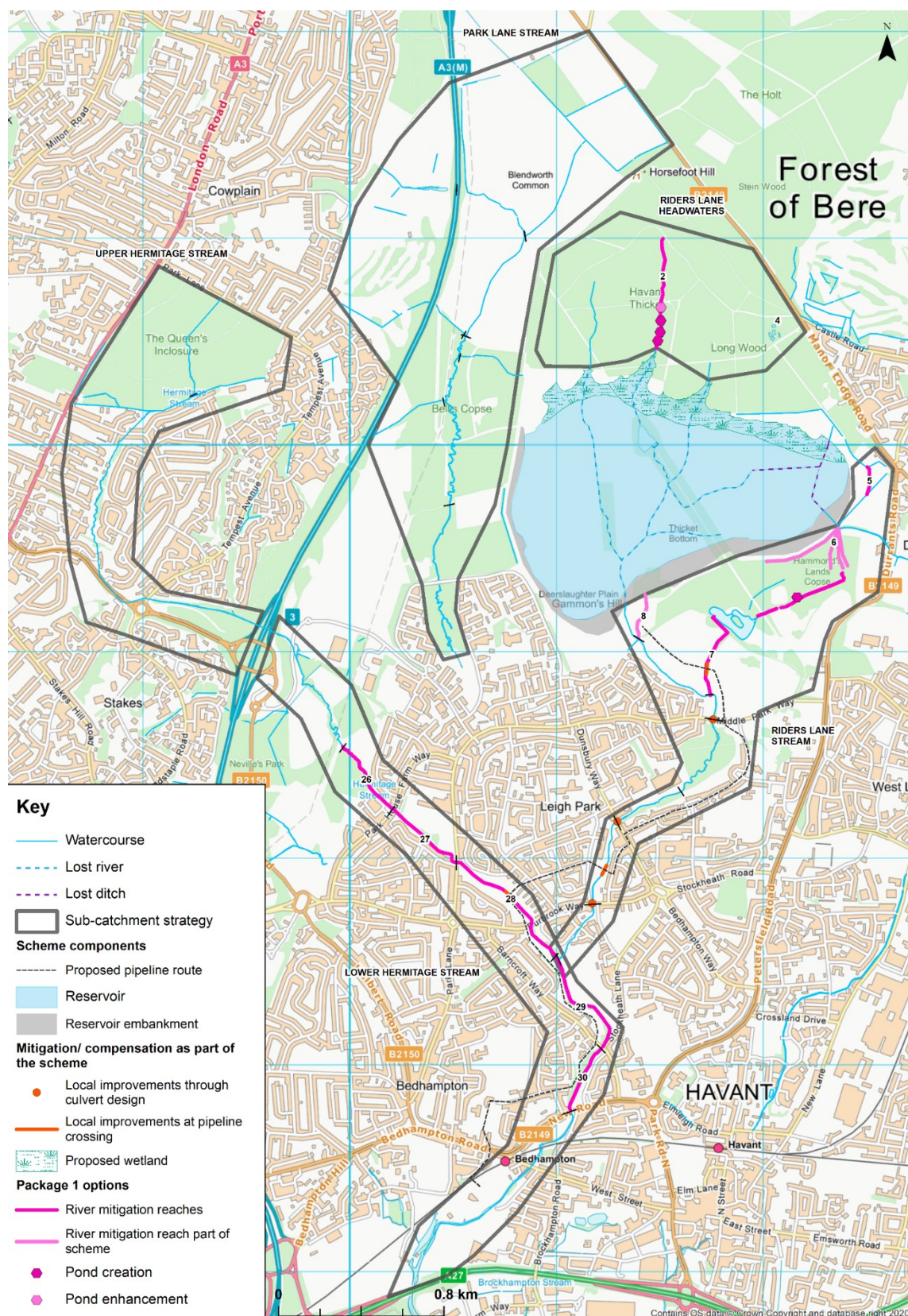


Figure 5.1 Package 1

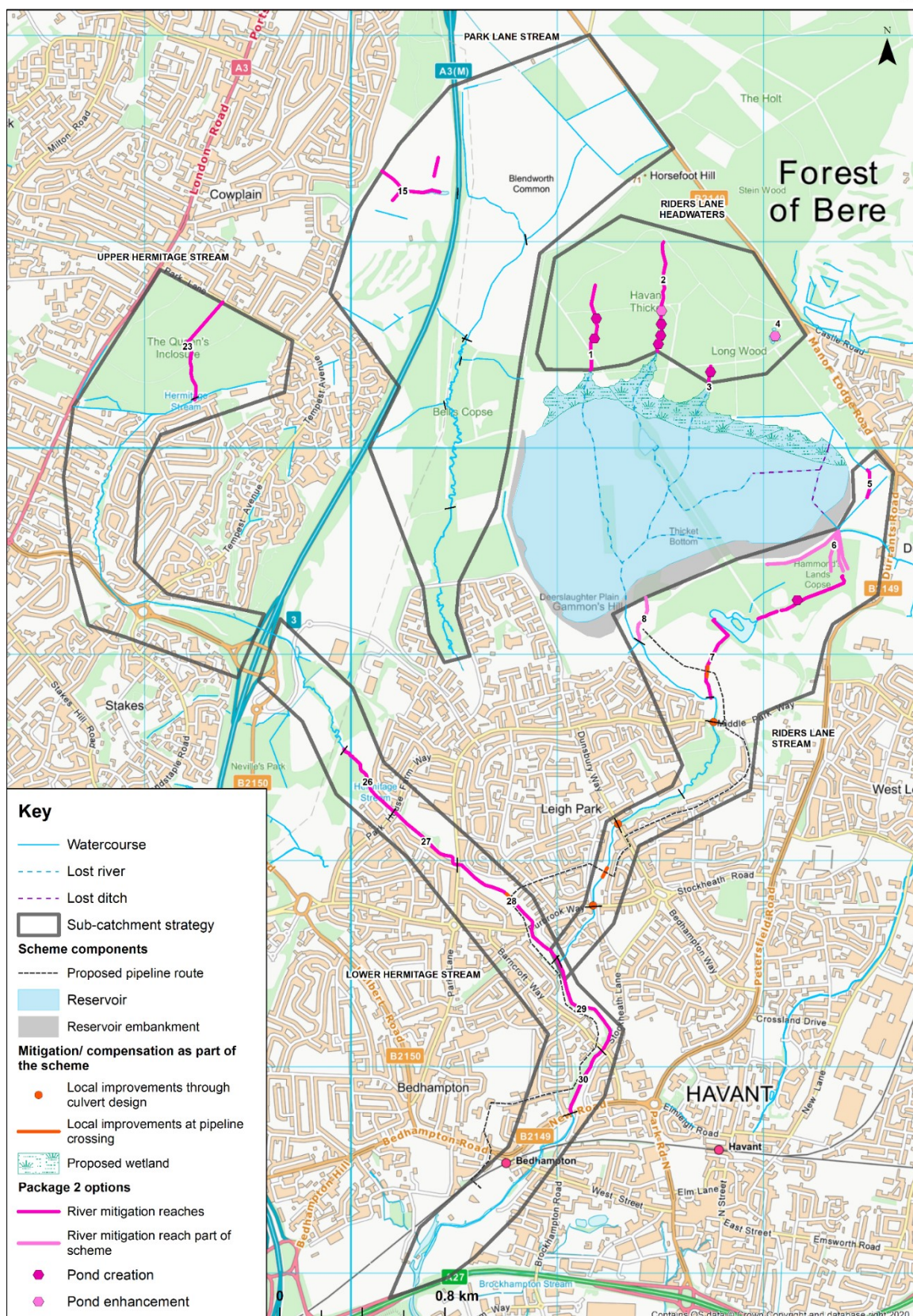


Figure 5.1 Package 2

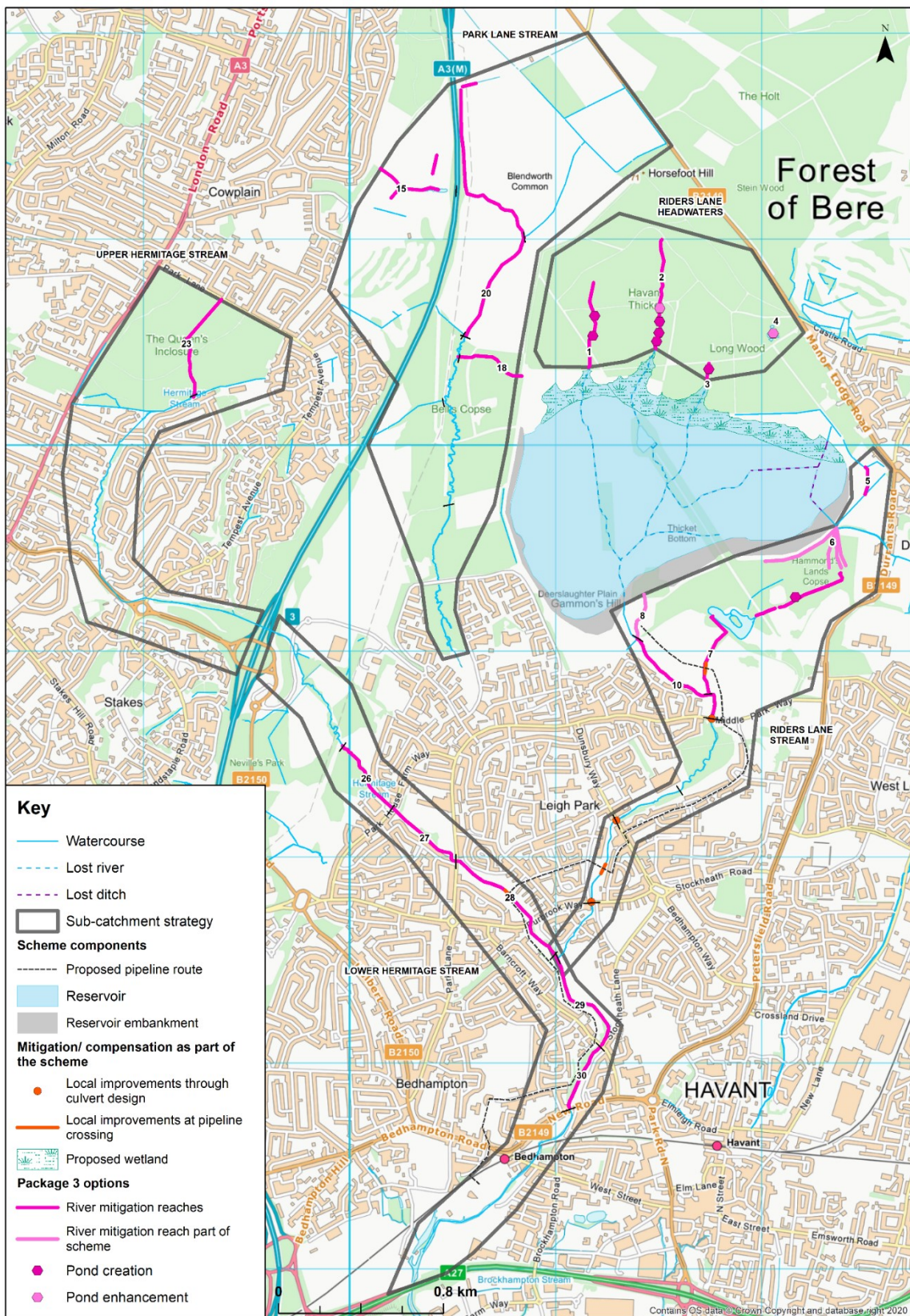


Figure 5.3: Package 3

Table 5.1: Measures included in Package 1

Main shortlisted options (Stages 1-3)	Length of Improvement (km)	Cumulative length of improvement (km)
8. RLS - New compensation flow channel	0.25	0.25
27. Herm - Park House Farm Way to Middle Park Way (Reach C)	0.41	0.66
29. Herm - Riders Lane Stream to Barncroft Way (Reach D)	0.57	1.23
5. RLS - New channel near Rowlands Castle	0.14	1.37
26. Herm - Bushey Lease to Park House Farm Way (Reach B)	0.42	1.79
7. RLS - The Lake Stream - macrophyte work	0.45	2.24
28. Herm - Middle Park Way to Riders Lane Stream (previously restored)	0.69	2.93
30. Herm - Barncroft Way to New Road (Reach E)	0.34	3.27
2. RLS - Headwater Stream 2 (HS2)	0.55	3.82

Table 5.2: Package 2

Main shortlisted options (Stages 1-3)	Length of Improvement (km)	Cumulative length of improvement (km)
8. RLS - New compensation flow channel	0.25	0.25
27. Herm - Park House Farm Way to Middle Park Way (Reach C)	0.41	0.66
29. Herm - Riders Lane Stream to Barncroft Way (Reach D)	0.57	1.23
5. RLS - New channel near Rowlands Castle	0.14	1.37
26. Herm - Bushey Lease to Park House Farm Way (Reach B)	0.42	1.79
7. RLS - The Lake Stream - macrophyte work	0.45	2.24
28. Herm - Middle Park Way to Riders Lane Stream (previously restored)	0.69	2.93
30. Herm - Barncroft Way to New Road (Reach E)	0.34	3.27
2. RLS - Headwater Stream 2 (HS2)	0.55	3.82
3. RLS - Headwater Stream 3 (HS3)	0.08	3.90
1. RLS - Headwater Stream 1 (HS1)	0.43	4.33
23. Herm HW - Queen's Inclosure to Burnside (road)	0.56	4.88
4. RLS - Ponds in Long Wood	0.13	5.01
15. PLS - Tributary north golf course	0.47	5.48

Table 5.2: Package 3

Main shortlisted options (Stages 1-3)	Length of Improvement (km)	Cumulative length of improvement (km)
8. RLS - New compensation flow channel	0.25	0.25
27. Herm - Park House Farm Way to Middle Park Way (Reach C)	0.41	0.66
29. Herm - Riders Lane Stream to Barncroft Way (Reach D)	0.57	1.23
5. RLS - New channel near Rowlands Castle	0.14	1.37
26. Herm - Bushey Lease to Park House Farm Way (Reach B)	0.42	1.79
7. RLS - The Lake Stream - macrophyte work	0.45	2.24
28. Herm - Middle Park Way to Riders Lane Stream (previously restored)	0.69	2.93
30. Herm - Barncroft Way to New Road (Reach E)	0.34	3.27
2. RLS - Headwater Stream 2 (HS2)	0.55	3.82
3. RLS - Headwater Stream 3 (HS3)	0.08	3.90
1. RLS - Headwater Stream 1 (HS1)	0.43	4.33
23. Herm HW - Queen's Inclosure to Burnside (road)	0.56	4.88
4. RLS - Ponds in Long Wood	0.13	5.01
15. PLS - Tributary north golf course	0.47	5.48
20. PLS - A3 to Bell's Copse	1.52	7.00
10. RLS - d/s reservoir embankment to Middle Park Way (stream management)	0.80	7.80
18. PLS - Unnamed Tributary joining on LHB	0.34	8.14
9. RLS - Sediment management	0	8.14
6. RLS - Eastern ditches (flowing into River Lavant)	0.98	9.12

6. Conclusions

At the expert workshop (no. 3) held on 5 March 2021, the Environment Agency confirmed that they were content that Package 2 had sufficient mitigation and compensation for the scheme and that this package should form the basis of Section 106 funding. It was deemed that this package provided sufficient length of watercourse improvement (5.5km) and an appropriate balance of measures to satisfy Biodiversity Net Gain commitments and also provide a joined up network of quality habitat improvements that will mitigate against the high conservation habitat lost from the scheme. This package is being progressed. The progression of this package of works is on the proviso that Ofwat would allow for sufficient additional funding to be released to deliver this package of works.

7. References

Portsmouth Water, 2020, Environmental Statement Volume 4 – Appendices, Appendix A15 Water, A15.4 Biodiversity Net Gain for Rivers.

Appendices

Appendix A. Revised long list of catchment measures

Sub-catchment	Reach	Natural Flood risk Management (NFM)	Increase light in channel	Riparian zone protection	Remove bank/bed protection	Restoration opportunities	Remove in-channel structures	Improve connectivity (fish)	Channel creation	Pond creation	Pond enhancement	Water quality improvement	Flow improvements	Sediment continuity	Translocation of macroinvertebrates	Translocation of macrophytes	INNS management
Riders Lane Stream	1. Headwater Stream 1 (HS1) Opportunities exist to slow flow (NFM), create ponds for translocation and restore the channels through opening up the canopy and restoring form and function.	✓	✓	-	-	✓	-	-	-	✓	✓	-	-	-	-	✓	-
	2. Headwater Stream 2 (HS2) Opportunities exist to slow flow (NFM), create ponds for translocation and restore the channels through opening up the canopy and restoring form and function.	✓	✓	-	-	✓	-	-	-	✓	✓	-	-	-	✓	✓	-
	3. Headwater Stream 3 (HS3) Opportunities exist to slow flow (NFM), create ponds for translocation and restore the channels through opening up the canopy and restoring form and function.	✓	✓	-	-	✓	-	-	-	✓	✓	-	-	-	-	✓	-
	4. Ponds in Long Wood Opportunities exist to improve pond habitat and translocation of acidic macrophyte species in the Upper Lake (providing water quality conditions are suitable).	-	-	-	-	-	-	-	-	-	✓	-	-	-	-	✓	✓
	5. New channel near Rowlands Castle A new channel will be created to the east of the site.	-	-	-	-	✓	-	-	✓	-	-	-	-	-	-	-	-
	6. Eastern ditches (flowing into River Lavant)	-	-	-	-	-	-	-	✓	-	-	-	-	-	-	-	-

Sub-catchment	Reach	Natural Flood risk Management (NFM)	Increase light in channel	Riparian zone protection	Remove bank/bed protection	Restoration opportunities	Remove in-channel structures	Improve connectivity (fish)	Channel creation	Pond creation	Pond enhancement	Water quality improvement	Flow improvements	Sediment continuity	Translocation of macroinvertebrates	Translocation of macrophytes	INNS management
	New ditch habitat will be created to the east of the site to aid drainage and mitigate for ditch length lost through the footprint.																
	7. The Lake Stream Opportunities exist to create ponds for translocation and restore the channels through opening up the canopy and restoring form and function.	-	-	-	-	✓	-	-	-	✓	-	✓	✓	-	-	✓	-
	8. New compensation flow channel New channel will be created to connect Havant Thicket reservoir to Riders Lane Stream.	-	-	-	-	-	-	-	✓	-	-	✓	✓	-	✓	-	-
	9. Sediment management Options could consider a mechanism to flush reservoir sediments or introduce new sediments at the top of Riders Lane Stream.	-	-	-	-	-	-	-	-	-	-	-	-	✓	-	-	-
	10. d/s reservoir embankment to Middle Park Way Opportunities exist to restore the channels through opening up the canopy and restoring form and function. Flow can also be enhanced in this reach offering water quality improvements. Culverts could also be improved as part of the scheme's embedded mitigation.	-	✓	✓	-	✓	-	✓	-	-	-	✓	✓	-	-	-	✓
	11. Great Copse Opportunities exist to improve the channels through opening up the canopy. Flow can also be enhanced in this reach offering water quality improvements.	✓	✓	✓	-	✓	-	-	-	-	-	✓	✓	-	-	-	-
	12. Great Copse to Dunsbury Way	✓	-	-	-	✓	-	✓	-	-	-	✓	✓	-	-	-	✓

Sub-catchment	Reach	Natural Flood risk Management (NFM)	Increase light in channel	Riparian zone protection	Remove bank/bed protection	Restoration opportunities	Remove in-channel structures	Improve connectivity (fish)	Channel creation	Pond creation	Pond enhancement	Water quality improvement	Flow improvements	Sediment continuity	Translocation of macroinvertebrates	Translocation of macrophytes	INNS management
	Opportunities exist to enhance flow in this reach offering water quality improvements. Culverts could also be improved within embedded mitigation.																
	13. Dunsbury Way to Purbrook Way Opportunities exist to restore the channel at the pipeline crossing; opening up the canopy; restoring form and function. Flow can also be enhanced in this reach offering water quality improvements. Culverts could also be improved as part of the scheme's embedded mitigation.	✓	-	-	-	✓	-	✓	-	-	-	✓	✓	-	-	-	✓
	14. Purbrook Way to Hermitage Stream Opportunities exist to restore the channel via opening up of the canopy and restoring form and function through localised removal of bed and bank protection. Flow can also be enhanced in this reach offering water quality improvements.	✓	-	-	✓	✓	-	-	-	-	-	✓	✓	-	-	-	✓
Park Lane Stream	15. Tributary north golf course Opportunities exist to restore the channel via restoring form and function.	✓	-	-	✓	✓	-	✓	-	-	-	✓	-	-	-	-	-
	16. Blendworth Common tributary Opportunities exist to restore the channel via opening up of the canopy and restoring form and function.	-	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-
	17. Tributary south of golf course Opportunities exist to restore the channel via opening up of the canopy and restoring form and function.	-	-	-	-	✓	-	✓	-	-	-	-	-	-	-	-	-

Sub-catchment	Reach	Natural Flood risk Management (NFM)	Increase light in channel	Riparian zone protection	Remove bank/bed protection	Restoration opportunities	Remove in-channel structures	Improve connectivity (fish)	Channel creation	Pond creation	Pond enhancement	Water quality improvement	Flow improvements	Sediment continuity	Translocation of macroinvertebrates	Translocation of macrophytes	INNS management
	18. Unnamed Tributary joining on LHB Opportunities exist to restore the channel via opening up of the canopy and restoring form and function.	-	-	-	-	✓	-			-	-	-	-	-	-	-	-
	19. Unnamed Tributary joining on RHB from A3 Opportunities exist to restore the channel via opening up of the canopy and restoring form and function.	-	-	-	-	✓	-			-	-	-	-	-	-	-	-
	20. A3 to Bell's Copse Opportunities exist to restore the channel via opening up of the canopy and restoring form and function and removal of structures. There also exists potential NFM opportunities to slow the flow of water.	✓	✓	-	-	✓	✓	-	-	-	-	✓	-	-	-	-	-
	21. Bell's Copse Opportunities exist to improve the channels through opening up the canopy.	✓	✓	-	-	✓	-	-	-	-	-	✓	-	-	-	-	-
	22. Bell's Copse to Warren Park culvert Opportunities exist to enhance the channel via opening up of the canopy.	-	-	-	-	✓	-	✓	-	-	-	-	-	-	-	-	-
Hermitage Stream	23. Queen's Inclosure to Burnside (road) Opportunities exist to restore the channels through opening up the canopy and restoring form and function. Opportunities also exist to slow flow (NFM).	✓	✓	✓	-	✓	-	-	-	-	-	-	-	-	-	-	-
	24. Burnside to A3 Limited options to undertake restoration or NFM.	✓	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-
	25. A3 to Bushey Lease Limited options to undertake restoration or NFM.	✓	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-

Sub-catchment	Reach	Natural Flood risk Management (NFM)	Increase light in channel	Riparian zone protection	Remove bank/bed protection	Restoration opportunities	Remove in-channel structures	Improve connectivity (fish)	Channel creation	Pond creation	Pond enhancement	Water quality improvement	Flow improvements	Sediment continuity	Translocation of macroinvertebrates	Translocation of macrophytes	INNS management
	26. Bushey Lease to Park House Farm Way (Reach B) Significant opportunities exist to restore the channel via removal of bed and bank protection and restoring form and function.	-	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	✓
	27. Park House Farm Way to Middle Park Way (Reach C) Significant opportunities exist to restore the channel via removal of bed and bank protection and restoring form and function.	-	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	✓
	28. Middle Park Way to Riders Lane Stream (previously restored) Some opportunities exist to further enhance the channel via removal of bed protection to support in restoring form and function.	-	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	✓
	29. Riders Lane Stream to Barncroft Way (Reach D) Significant opportunities exist to restore the channel via removal of bed and bank protection and restoring form and function.	-	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	✓
	30. Barncroft Way to New Road (Reach E) Significant opportunities exist to restore the channel via removal of bed and bank protection and restoring form and function.	-	-	-	✓	✓	-	✓	-	-	-	-	-	-	-	-	✓
	31. New Road to Waterworks 2 Opportunities exist to improve fish passage around the structure.	-	-	-	✓	✓	-	✓	-	-	-	-	-	-	-	-	✓

Appendix B. Short-listing process

Short listing criteria and description of the scores is presented below followed by the agreed scoring, including the overall totals.

		Description of scores			
		Short listing scoring criteria	Low score (1)	2	High score (3)
Set 1	A	Land ownership	Potential for significant land ownership constraints (e.g. private land ownership, gardens, (future) housing)	Land ownership unknown	No land ownership constraints or land owner well known and likely to be amenable (e.g. FE, Country Park)
	B	Conservation interest (notably Habitats Directive sites, Site of Special Scientific Interest (SSSI))	Conservation site/feature may be affected negatively		No effect on designated site(s)
	C	Heritage interest	Heritage site/feature may be affected negatively		No effect on heritage site(s)
Set 2	D	Mitigation measures will be linked directly to WFD Quality Elements affected by the scheme	Measure does not contribute to WFD Quality Element		Measure significantly contributes to catchment WFD objective
Set 3	E	There is a preference to create new habitats, which may be main channels, tributaries, backwaters or ponds. Where this is not possible, enhancements to existing habitats will be made.	No new habitats are created.		New habitats are created.
	F	There is a preference to undertake mitigation as close to the affected habitats as possible, which aligns with the accepted principle of mitigation at, or near to the source as possible.	Work is undertaken on the lower Hermitage Stream.		Work is undertaken in the Riders Lane Stream catchment.
	G	Mitigation measures will be linked directly to WFD objectives for the Hermitage Stream WFD catchment	Measure does not contribute to catchment WFD objective		Measure significantly contributes to catchment WFD objective
	H	Measures will contribute to catchment resilience	Measure does not contribute to catchment resilience.		Measure significantly improves catchment resilience.
	I	There is a preference for measures which improve catchment connectivity between existing 'good' quality habitats	Measure does not improve catchment connectivity.		Measure significantly improves catchment connectivity.
	J	Mitigation measures should provide amenity value and enhance the visual quality	Measure does not provide/improve amenity value.		Measure significantly provides/improves amenity value.

		Description of scores		
Short listing scoring criteria		Low score (1)	2	High score (3)
	of the landscape (providing this doesn't compromise more sensitive ecology)			
K	Mitigation will target key species/communities of importance/high quality which may be 'lost' locally (e.g. acid pond plant community, macroinvertebrates indicative of 'good' water quality and/or springs).	Measure does not support key species/communities		Measure significantly supports key species/communities
L	Measures cannot compromise the HMWB designations of the WFD water body, notably flood risk, which have important socio-economic benefits.	Measure increases flood risk issues in catchment		Measure provides a significant benefit to flood risk

Set 4	M	Certainty of outcomes	Uncertain if the measure will deliver environmental outcomes		Very certain if the measure will deliver environmental outcomes
	N	Longevity of measures	Short term feature (< 5 years)		Long term feature (>30 years)
	O	Co-benefits of working near projects undertaken by environmental groups	No work being conducted by environmental groups in vicinity		Adjoining work being conducted by environmental groups
	P	Benefits attained by a single measure	Single benefit attained through a single measure		Multiple benefits attained by a single measure

		Set 1 - effectiveness of implementation ('deliverability'):			Set 2 - WFD quality elements	Set 3 – alignment with project objectives							
		A	B	C	D	E	F	G	H	I	J	K	L
		Land ownership	Conservation interest (notably Habitats Directive sites, Site of Special Scientific Interest (SSSI))	Heritage interest	Mitigation measures will be linked directly to WFD Quality Elements affected by the scheme	There is a preference to create new habitats, which may be main channels, tributaries, backwaters or ponds. Where this is not possible, enhancements to existing habitats will be made.	There is a preference to undertake mitigation as close to the affected habitats as possible, which aligns with the accepted principle of mitigation at, or near to the source as possible.	Mitigation measures will be linked directly to WFD objectives for the Hermitage Stream WFD catchment	Measures will contribute to catchment resilience	There is a preference for measures which improve catchment connectivity between existing 'good' quality habitats	Mitigation measures should provide amenity value and enhance the visual quality of the landscape (providing this doesn't compromise more sensitive ecology)	Mitigation will target key species/communities of importance/high quality which may be 'lost' locally (e.g. acid pond plant community, macroinvertebrates indicative of 'good' water quality and/or springs).	Measures cannot compromise the HMWB designations of the WFD water body, notably flood risk, which have important socio-economic benefits.
Riders Lane Stream	1.RLS- Headwater Stream 1 (HS1)	3	3	3	4	3	5	3	3	1	5	4	3
	2.RLS- Headwater Stream 2 (HS2)	3	3	3	5	3	5	3	3	1	5	5	3
	3.RLS- Headwater Stream 3 (HS3)	3	3	3	4	3	5	3	3	1	5	4	3
	4.RLS- Ponds in Long Wood	3	3	3	5	1	5	3	2	1	3	4	3
	5.RLS- New channel near Rowlands Castle	3	3	3	4	5	5	3	3	2	3	3	3
	6.RLS- Eastern ditches (flowing into River Lavant)	3	3	3	3	5	5	1	1	1	1	3	3
	7.RLS- The Lake Stream- macrophyte work	3	3	3	5	3	5	3	3	1	3	5	3
	8. RLS- New compensation flow channel	3	3	3	5	5	5	5	5	2	1	4	3
	9. RLS- Sediment management	3	3	3	3	2	5	2	4	4	1	3	3
	10. RLS- d/s reservoir embankment to Middle Park Way (stream management)	3	3	3	3	3	5	3	4	5	1	3	3
	11. RLS- Great Copse	2	1	3	2	1	5	1	1	1	3	1	3
	12. RLS- Great Copse to Dunsbury Way	1	3	3	1	2	5	2	2	5	1	1	3

		Set 1 - effectiveness of implementation ('deliverability'):			Set 2 - WFD quality elements	Set 3 – alignment with project objectives							
		A	B	C	D	E	F	G	H	I	J	K	L
		Land ownership	Conservation interest (notably Habitats Directive sites, Site of Special Scientific Interest (SSSI))	Heritage interest	Mitigation measures will be linked directly to WFD Quality Elements affected by the scheme	There is a preference to create new habitats, which may be main channels, tributaries, backwaters or ponds. Where this is not possible, enhancements to existing habitats will be made.	There is a preference to undertake mitigation as close to the affected habitats as possible, which aligns with the accepted principle of mitigation at, or near to the source as possible.	Mitigation measures will be linked directly to WFD objectives for the Hermitage Stream WFD catchment	Measures will contribute to catchment resilience	There is a preference for measures which improve catchment connectivity between existing 'good' quality habitats	Mitigation measures should provide amenity value and enhance the visual quality of the landscape (providing this doesn't compromise more sensitive ecology)	Mitigation will target key species/communities of importance/high quality, which may be 'lost' locally (e.g. acid pond plant community, macroinvertebrates indicative of 'good' water quality and/or springs).	Measures cannot compromise the HMWB designations of the WFD water body, notably flood risk, which have important socio-economic benefits.
	13. RLS- Dunsbury Way to Purbrook Way	2	3	3	3	3	5	3	3	2	5	3	4
	14. RLS- Purbrook Way to Hermitage Stream	2	3	3	3	4	5	3	4	3	5	3	4
Park Lane Stream	15. PLS- Tributary north golf course	1	3	3	5	4	3	4	5	3	1	5	4
	16. PLS- Blendworth Common tributary	1	3	3	3	1	3	3	3	3	1	4	4
	17. PLS- Tributary south of golf course	1	3	3	3	2	3	3	3	3	4	4	4
	18. PLS- Unnamed Tributary joining on LHB	3	3	3	3	1	3	3	3	3	4	4	4
	19. PLS- Unnamed Tributary joining on RHB from A3	2	3	3	3	1	3	3	3	3	4	4	4
	20. PLS- A3 to Bell's Copse	2	3	3	4	1	3	4	4	5	4	4	4
	21. PLS- Bell's Copse	3	3	3	2	1	3	2	1	1	3	2	1
	22. PLS- Bell's Copse to Warren Park culvert	3	3	3	2	2	3	3	3	3	4	3	4
Hermitage Stream	23. Hermitage- Queen's Inclosure to Burnside (road)	3	3	3	4	1	2	4	4	1	4	4	

		Set 1 - effectiveness of implementation ('deliverability'):			Set 2 - WFD quality elements	Set 3 – alignment with project objectives							
		A	B	C	D	E	F	G	H	I	J	K	L
		Land ownership	Conservation interest (notably Habitats Directive sites, Site of Special Scientific Interest (SSSI))	Heritage interest	Mitigation measures will be linked directly to WFD Quality Elements affected by the scheme	There is a preference to create new habitats, which may be main channels, tributaries, backwaters or ponds. Where this is not possible, enhancements to existing habitats will be made.	There is a preference to undertake mitigation as close to the affected habitats as possible, which aligns with the accepted principle of mitigation at, or near to the source as possible.	Mitigation measures will be linked directly to WFD objectives for the Hermitage Stream WFD catchment	Measures will contribute to catchment resilience	There is a preference for measures which improve catchment connectivity between existing 'good' quality habitats	Mitigation measures should provide amenity value and enhance the visual quality of the landscape (providing this doesn't compromise more sensitive ecology)	Mitigation will target key species/communities of importance/high quality which may be 'lost' locally (e.g. acid pond plant community, macroinvertebrates indicative of 'good' water quality and/or springs).	Measures cannot compromise the HMWB designations of the WFD water body, notably flood risk, which have important socio-economic benefits.
	24. Herm HW- Burnside to A3	1	3	3	2	1	2	3	3	3	3	3	2
	25. Herm - A3 to Bushey Lease	1	3	3	2	1	2	3	3	3	3	3	2
	26. Herm - Bushey Lease to Park House Farm Way (Reach B)	3	3	3	5	4	2	5	5	1	4	1	3
	27. Herm - Park House Farm Way to Middle Park Way (Reach C)	3	3	3	5	4	2	5	5	3	4	1	3
	28. Herm - Middle Park Way to Riders Lane Stream (previously restored)	3	3	3	5	3	2	5	5	1	4	1	3
	29. Herm - Riders Lane Stream to Barncroft Way (Reach D)	3	3	3	5	4	1	5	5	3	4	1	3
	30. Herm - Barncroft Way to New Road (Reach E)	3	3	3	5	4	1	5	5	1	4	1	3
	31. Herm - New Road to Waterworks 2	2	3	3	2	2	1	3	3	1	1	1	3

		Set 4 – additional assessment criteria				Total of each set				
		M	N	O	P					
		Certainty of outcomes	Longevity of measures	Co-benefits of working near projects undertaken by environmental groups	Benefits attained by a single measure	Set 1	Set 2	Set 3	Set 4	Grand Total
Riders Lane Stream	1.RLS - Headwater Stream 1 (HS1)	3	3	1	4	9	4	27	11	51
	2.RLS - Headwater Stream 2 (HS2)	3	3	1	4	9	5	28	11	53
	3.RLS - Headwater Stream 3 (HS3)	3	3	1	4	9	4	27	11	51
	4.RLS - Ponds in Long Wood	3	3	1	1	9	5	22	8	44
	5.RLS - New channel near Rowlands Castle	5	5	1	4	9	4	27	15	55
	6.RLS - Eastern ditches (flowing into River Lavant)	5	5	1	1	9	3	20	12	44
	7.RLS - The Lake Stream - macrophyte work	4	5	1	4	9	5	26	14	54
	8. RLS - New compensation flow channel	4	5	1	5	9	5	30	15	59
	9. RLS - Sediment management	3	2	1	3	9	3	24	9	45
	10. RLS- d/s reservoir embankment to Middle Park Way (stream management)	4	5	1	3	9	3	27	13	52
	11. RLS - Great Copse	3	1	2	1	6	2	16	7	31
	12. RLS - Great Copse to Dunsbury Way	4	4	1	1	7	1	21	10	39
	13. RLS - Dunsbury Way to Purbrook Way	4	4	1	5	8	3	28	14	53
	14. RLS - Purbrook Way to Hermitage Stream	4	4	1	4	8	3	31	13	55
Park Lane Stream	15. PLS - Tributary north golf course	4	5	1	5	7	5	29	15	56
	16. PLS - Blandworth Common tributary	4	4	1	4	7	3	22	13	45
	17. PLS- Tributary south of golf course	4	4	5	5	7	3	26	18	54
	18.PLS - Unnamed Tributary joining on LHB	4	4	1	4	9	3	25	13	50
	19.PLS - Unnamed Tributary joining on RHB from A3	4	4	1	4	8	3	25	13	49
	20. PLS - A3 to Bell's Copse	4	4	1	4	8	4	29	13	54

		Set 4 – additional assessment criteria			
		M	N	O	P
		Certainty of outcomes	Longevity of measures	Co-benefits of working near projects undertaken by environmental groups	Benefits attained by a single measure
Hermitage Stream	21. PLS - Bell's Copse	4	1	2	1
	22. PLS - Bell's Copse to Warren Park culvert	4	4	1	4
	23. Herm HW - Queen's Inclosure to Burnside (road)	4	4	2	4
	24. Herm HW - Burnside to A3	4	4	1	4
	25. Herm - A3 to Bushey Lease	4	4	1	4
	26. Herm - Bushey Lease to Park House Farm Way (Reach B)	4	5	1	5
	27. Herm - Park House Farm Way to Middle Park Way (Reach C)	4	5	1	5
	28. Herm - Middle Park Way to Riders Lane Stream (previously restored)	4	5	1	5
	29. Herm - Riders Lane Stream to Barncroft Way (Reach D)	4	5	1	5
	30. Herm - Barncroft Way to New Road (Reach E)	4	5	1	5
	31. Herm - New Road to Waterworks 2	4	5	1	1

Total of each set				
Set 1	Set 2	Set 3	Set 4	Grand Total
9	2	14	8	33
9	2	25	13	49
9	4	24	14	51
7	2	20	13	42
7	2	20	13	42
9	5	25	15	54
9	5	27	15	56
9	5	24	15	53
9	5	26	15	55
9	5	24	15	53
8	2	15	11	36

Appendix C. High level outline costs for different measures

Main shortlisted options (Stages 1-3)	Length of Improvement (km)	Cumulative length of improvement (km)	High level Outline cost (£)	High level cumulative cost (£)
8. RLS - New compensation flow channel	0.25	0.25	£0	£0
27. Herm - Park House Farm Way to Middle Park Way (Reach C)	0.41	0.66	£400,000	£400,000
29. Herm - Riders Lane Stream to Barncroft Way (Reach D)	0.57	1.23	£500,000	£900,000
5. RLS - New channel near Rowlands Castle	0.14	1.37	£100,000	£1,000,000
26. Herm - Bushey Lease to Park House Farm Way (Reach B)	0.42	1.79	£400,000	£1,400,000
7. RLS - The Lake Stream - macrophyte work	0.45	2.24	£200,000	£1,600,000
28. Herm - Middle Park Way to Riders Lane Stream (previously restored)	0.69	2.93	£200,000	£1,800,000
30. Herm - Barncroft Way to New Road (Reach E)	0.34	3.27	£350,000	£2,150,000
2. RLS - Headwater Stream 2 (HS2)	0.55	3.82	£50,000	£2,200,000
3. RLS - Headwater Stream 3 (HS3)	0.08	3.90	£50,000	£2,250,000
1. RLS - Headwater Stream 1 (HS1)	0.43	4.33	£50,000	£2,300,000
23. Herm HW - Queen's Inclosure to Burnside (road)	0.56	4.88	£50,000	£2,350,000
4. RLS - Ponds in Long Wood	0.13	5.01	£100,000	£2,450,000
15. PLS - Tributary north golf course	0.47	5.48	£200,000	£2,650,000
20. PLS - A3 to Bell's Copse	1.52	7.00	£600,000	£3,250,000
10. RLS - d/s reservoir embankment to Middle Park Way (stream management)	0.80	7.80	£100,000	£3,350,000
18. PLS - Unnamed Tributary joining on LHB	0.34	8.14	£50,000	£3,400,000
9. RLS - Sediment management	0	8.14	£0 (but very high Opex)	£3,400,000
6. RLS - Eastern ditches (flowing into River Lavant)	0.98	9.12	£0	£3,400,000

Note: Package 1 is highlighted in yellow; Package 2 is highlighted in yellow and orange; Package 3 is highlighted in yellow, orange and blue