MOTT MACDONALD

SEA ER ANNEX 4: APPENDIX J Natural Capital and Biodiversity Net Gain Technical Note

South West Water: Updated Draft Water Resouces Management Plan 2024 (dWRMP24)

Project:	South West Water Updated Draft WRMP24: SEA Environmental Report ANNEX 4: APPENDIX J		
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Prepared by:	SS, HI	**Date:**	02/10/2023
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Subject:	Natural Capital Assessment (NCA) and Biodiversity Net Gain (BNG) Technical Note		

1 Introduction

1.1 South West Water updated dWRMP24

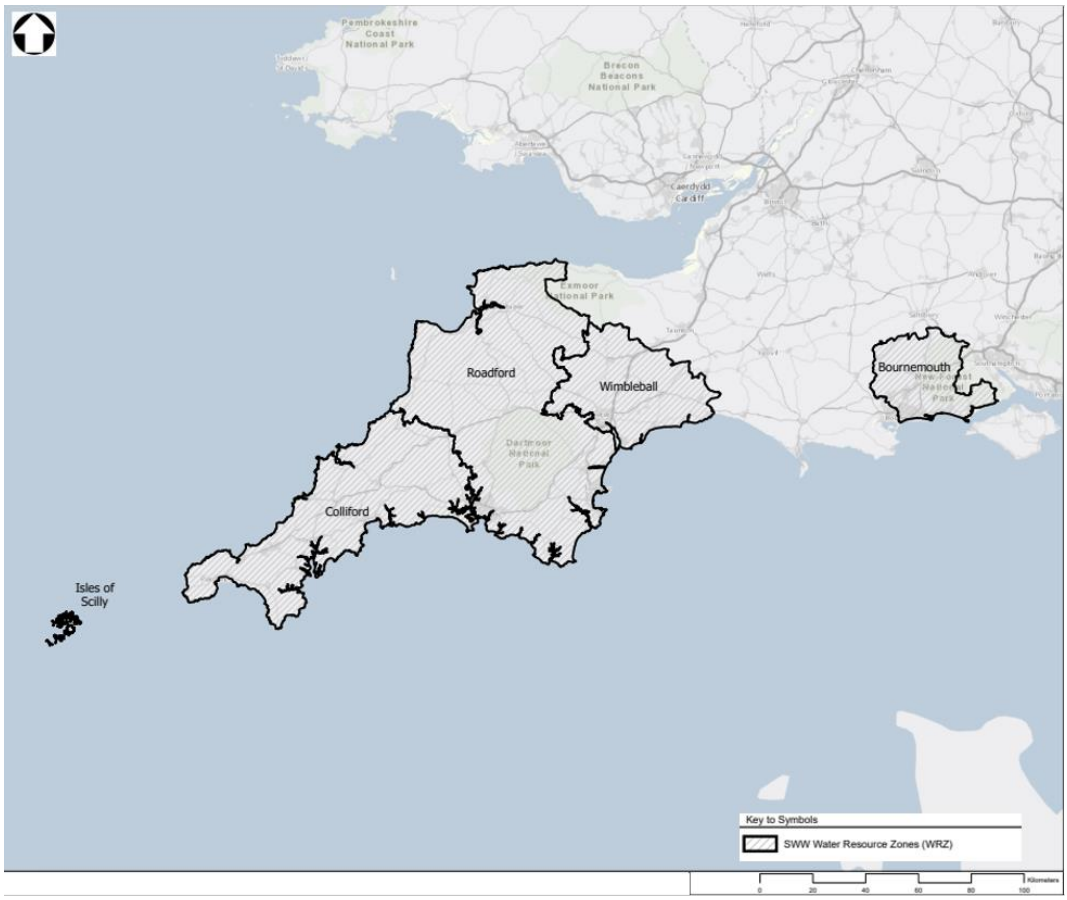
Water companies have a statutory obligation to produce a Water Resource Management Plan (WRMP), which sets out how a company intends to maintain the balance between supply and demand for water over a minimum 25-year period. The plans must be prepared every five years and reviewed annually. SWW issued the draft WRMP24 (dWRMP24) for public consultation in February 2023 with the Statement of Response (SoR) for that consultation published on 15th August 2023 in line with the requirements of the Water Resource Planning Guideline. The updated draft WRMP24 (dWRMP24) has been submitted in early October 2023 and is subject to an 8-week public consultation period between October and November 2023. Following consultation on the updated dWRMP24, it is anticipated that SWW will publish its updated SoR with inclusion of all the changes made in response to feedback received during the production of the plan and any outstanding environmental assessments. Further review, update and inclusion of the preferred plan and alternatives will be undertaken during this process to assess any changes to reported environmental effects. The new updated dWRMP24 is the subject of this natural capital and biodiversity net gain technical note. In the development of a WRMP, water companies must follow the Environment Agency (EA) Water Resources Planning Guideline (the 'Guidelines')[1] and consider broader government policy objectives. WRMPs should ensure a secure and sustainable supply of water, focus on efficiently delivering the outcomes that customers want, while reflecting the value that society places on the environment.

The SWW supply area covers Devon, Cornwall, the Isles of Scilly and parts of Dorset, Somerset, Wiltshire, and Hampshire, and provides drinking water to a population of 1.7 million. Water resources in the SWW supply area consist of three large reservoirs, several smaller reservoirs, river intakes, and some groundwater sources which are predominantly in East Devon.

[1] Environment Agency, Natural Resources Wales, Office for Water Services (2023). Water resources planning guideline (The Guidelines). Available at: Water resources planning guideline - GOV.UK (www.gov.uk)

The SWW supply area is split into five Water Resource Zones (WRZs) in total. Three WRZs are operated in conjunction with one another to maximise water availability, these are Colliford, Roadford, and Wimbleball WRZs. Bournemouth WRZ and Isles of Scilly WRZ operate independently. The five WRZs are outlined in Figure 1.1 below.

Figure 1-1: South West Water WRZs



Source: Copyright Esri, Intermap, NASA, NGA, USGS (2022), Mott MacDonald (2022).

1.2 Options Description

The updated dWRMP24 includes supply options. The broad supply option types that are being considered by SWW, which are also the focus of this technical note, include:

- Abstraction from rivers – including increases in existing abstraction licences; abstraction of compensation flows; or reuse of previously discussed water intake points.
- Reservoirs – reservoir options include the creation of new reservoirs, increases in abstraction limits for existing reservoirs, or the enhancement of existing reservoirs to increase their capacity e.g., by dam raising.
- Groundwater sources – including new boreholes or recharge of aquifers.
- Water treatment works (WTW) – including construction of new or replacement WTW, or improvements to efficiency or increased capacity of existing WTW.

The options assessed as part of this technical note are outlined in Table 1-1 below.

1.2.1 Options Overview

The options assessed as part of this technical note are outlined in Table 1-1 below. A total of 43 options were assessed including 3 Strategic Resource Options (SROs). A further three SROs have been identified as part of the updated dWRMP development, however a natural capital assessment (NCA) and biodiversity net gain (BNG) assessment have not been undertaken to date. The findings from the natural capital assessment and biodiversity net gain assessment for each assessed option are outlined in further detail in Section 3.

SWW have undertaken significant design, and in some cases construction, of a number of schemes as listed below. As such is it anticipated that these schemes will be delivered in AMP7 and will not be included within the updated dWRMP24. SWW will be regularly monitoring the design and construction progress of these schemes and will be progressing through the SWW capital project assurance process.

The following seven options have been removed from the dWRMP24 and included under AMP7:

COL11 – Hawks Tor Pit *(To be removed)*

COL12 – Stannon daily abstraction increase *(To be removed)*

COL18 – Porth Rialton – Coswarth WTW *(To be removed)*

ROA8 – Tottiford WTW Reduction of treatment capacity *(To be removed)*

ROA10 – Avon WTW Reduction of treatment capacity *(To be removed)*

ROA11 – Meldon WTW Reduction of treatment capacity *(To be removed)*

ROA25 – Challacombe (Not previously assessed)

COL7 – Blackpool Pit to Restormel WTW (Not previously assessed)

As part of the dWRMP24 these options have not been assessed and have subsequently been identified as AMP7 options.

ROA25 – Challacombe (Not previously assessed)

COL7 – Blackpool Pit to Restormel WTW (Not previously assessed)

Strategic Resource Options

There are currently six confirmed SROs within the updated dWRMP24, which are significant strategic options spanning across water companies. These SROs are as follows:

- BNW7 Mendip Quarries SRO ‐ Reservoir and water transfer; and
- BNW8 West Country South Poole Effluent Recycling & Transfer (PERT) SRO ‐ Poole Harbour effluent reuse.
- BNW17 Cheddar 2 to Summerslade
- WIM13 Cheddar 2 to Parsonage
- WIM18 Cheddar 2 to Bickham Moor
- ROA19 Cheddar 2 to Prewley

Cheddar Two (BNW17), although not located within SWW area, also has three further options for potential development including:

- WIM13: Cheddar 2 to Parsonage
- WIM18: Cheddar 2 to Bickham Moor
- ROA19: Cheddar 2 to Prewley

These options are at an early stage and under development which involve the transfer of water south-eastwards towards Wessex Water and onwards into SWW's region. At the time of writing no environmental assessments have been undertaken on these Cheddar 2 sub options.

SROs undergo a separate assessment process to the WRMP24 supply and demand options noted above. The results of the environmental assessments undertaken for the SROs for the RAPID Gate 1 submission have been used to inform the development of the SWW WRMP24, in addition to any early Gate 2 reporting that is available.

Options that have been scoped-out of assessment are further outlined in Table 2.2 below.

Table 1-1 updated dWRMP24 Supply Options

Option ID	Option	High-level description
BNW1	Borehole development, existing borehole remedial works - Ampress	Borehole development, existing borehole remedial works.
BNW3	Wimborne transfer to Longham – Licence change	Smarter conjunctive use of the Stour sources. Transfer of the current Wimborne groundwater licence (c.4Ml/d) to the Longham licence on the Stour. This is expected to occur in 2027 when the Longham licence is due to be cut. This would mean that no additional changes would be required on site at Longham.
BNW6	Longham Aquifer Recharge	Aquifer storage and recovery at Longham. Pumping and storage of water in winter months for subsequent abstraction.
BNW14	Ibsley Lake	The scheme is to establish an abstraction source at Ibsley lake to utilise an existing, seasonal licence and abstract up to 10Ml/d. To deliver the abstracted water to Knapp Mill for treatment via the river Avon. The water intake from Avon will be from existing Matchams intake, to supplement resources available for Knapp Mill and Longham.
COL2	Colliford PS Stage 2 – River Camel Abstraction	New abstraction licence.New river intake and pumping station at Nanstallon, for 90 Ml/d at 120 m head. ~9 mile of 900mm diameter pipeline, from the intake to Restormel WTW. Upgrade to existing Restormel WTW intake to pump 110 Ml/d (an increase of 15 Ml/d) Raw water is then pumped to Colliford Reservoir via existing main.
COL3	Abstraction of Colliford compensation flows when making supply releases	No infrastructure changes required.
COL4	Abstraction of Siblyback compensation flows when making supply releases	No infrastructure changes required.
COL5	Increase Wendron annual licence and de-couple from Stithians	No infrastructure changes required.
COL6	River Hayle Abstraction	Abstraction from River Hayle at existing, disused intake, treat abstracted water at new onsite treatment works.
COL9	Leswidden Pool	Transfer of former quarry water to Drift Reservoir via Sancreed stream. Distance from Leswidden Pool to (Sancreed stream – CH estimate 5km)
COL15	Restormel WTW	This option would take Restormel WTW up to its maximum licensed abstraction and enable more effective use to be made of the Colliford/River Fowey resources system.
COL19	Boswyn stream/Cargenwen Reservoir/Carwynnen stream	Re-introduce abstractions at Boswyn stream / Cargenwen Reservoir / Carwynnen stream.
COL20	River Fal new abstraction	New abstraction on the River Fal near Ruan Lanihorne. New intake, onsite WTW and connection to distribution system.
COL21	Alternative RWS – Cornish Metals, Crofty	Alternative RWS from Cornish Metals at Crofty – treatment of effluent from high density sludge plants to reach a suitable quality to then be discharged into the Stithians reservoir.
ROA2	River Erme	Intake relocation.
ROA3	River Yealm	Intake relocation.
ROA4	Abstraction of Roadford compensation flow at Gunnislake when making supply releases	No infrastructure changes required.
ROA6	Upper Tamar Lake increasing annual license	Increase daily abstraction limit, upgrades to WTW and distribution network.
ROA7	Expansion of Northcombe WTW to 60 Ml/d	Treatment works to be able to deliver a minimum of 60 Ml/d. Additional 10 Ml/d pumping capacity at Roadford reservoir.

Option ID	Option	High-level description
ROA12	Slade and Horedown WTW (GAC)	Installation of new pumping station at Slade reservoir and new 4 Ml/d GAC plant at Horedown WTW.
ROA13	Duckaller and Vennbridge	Changes to abstraction licences and 4 Ml/d nitrate removal plant installation at Duckaller pumping station to facilitate full use of sources.
ROA14	Raise Avon Dam	Raise dam by 2m. Subject to structural engineering approval.
ROA15	Gatherley Phase 2	Pipeline from abstraction point in River Lyd to Roadford Lake Reservoir. Completion of scheme to allow 125 Ml/d to be transferred to Roadford Reservoir. Dual main required between River Lyd and Roadford Reservoir.
WIM1	Abstraction of Wimbleball compensation flow at Northbridge when making supply releases	No infrastructure changes required.
WIM2	Sidford borehole commissioning	Equip and make operational existing borehole: Pump, Headworks, Control and monitoring system. Connecting pipework. New groundwater source treatment system including chlorination and, iron and manganese removal plant.
WIM4	Wilmington springs annual abstraction increase	No infrastructure changes required.
WIM5	Indirect potable reuse - stream support for Dotton WTW	Pump treated effluent from Sidmouth WWTW directly to the river Otter using a new pipeline (3 km) and outfall to augment the river during low flow periods.
WIM6	Increase Allers WTW capacity	Increase daily abstraction licence 36 Ml/d. Upgrade Bolham abstraction to pump an additional 4Ml/d. Upgrade WTW to treat an additional 4 Ml/d with distribution network improvements.
WIM7	Increase Pynes to licence limit 66.46 Ml/d	Upgrade WTW to treat an additional 6.5 Ml/d. with distribution network improvements.
WIM8	Brampford Speke borehole	Agree licence changes with EA. Site Commissioning.
WIM9	Stoke Canon borehole	Agree licence changes with EA. Install new power supply. Site Commissioning.
WIM11	Couchill Springs, Seaton	Supplement water supply from Souchill to Bovey Lane WTW.
WIM12	Allers Springs	Supplement raw water supply to Allers WTW.
ISMY1	St Mary's new borehole (location 1)	Drilling of new supply borehole 30m depth, 150mm diameter borehole / c. 1kW pump. Associated infrastructure (headworks, kiosk and pipework) wastewater piped via raw main (estimated 32mm diameter for 500m distance) to existing WTW. Assumes spare capacity at existing WTW. No additional requirement.
ISMY2	St Mary's new borehole (location 2)	Drilling of new supply borehole at 30m depth with 150mm diameter borehole / c. 1kW pump. Associated infrastructure (headworks, kiosk and pipework) and requiring standalone treatment, with water piped directly into supply network (estimated 32mm diameter for 500m distance).
ISMY4	St Mary's - Increase Existing Desalination Plant Capacity	Additional process stream at existing RO plant. New building required.
ISB4	Bryher – Increase Existing Desalination Plant Capacity	Additional process stream at existing RO plant plus increased borehole yield and/or new borehole source. New building required.
IST1	Tresco new borehole	Drilling of new supply borehole to South or east of island. Assumed 30m depth, 0.75kW pump, 100mm diameter borehole pipework, with associated infrastructure (headworks, kiosk and pipework) and on-site treatment (assume UV disinfection) wastewater piped via new raw main (estimated 40mm diameter for 500m distance) to existing WTW. Cost for new WTW and UV.

A new option, BNW17 Cheddar 2 new strategic regional reservoir and transfer has been identified as a future potential Strategic Resource Option (SRO). This option builds upon the concept design that has been developed for the Cheddar 2 reservoir and transfer SRO gate two submission to RAPID and will be included in future iterations of this report. An NCA and BNG assessment was not undertaken for the option BNW17 to date due to available information.

Table 1-2 Options scoped-in and -out for NCA, BNG assessment, and BNG opportunity mapping

Option ID	Option Name	NCA, BNG and Opportunity Mapping assessment	Justification for scoping out
BNW3	Wimborne transfer to Longham - Licence change	Scoped out	Further NCA and BNG assessment has been scoped out due to the option type being a licence change with no associated infrastructure changes required. No proposals for delivering new natural capital stocks have been specified as part of the option. Additional environmental impacts will be captured separately within the SEA report and associated environmental assessments.
BNW6	Longham ASR	Scoped in	
COL19	Boswyn stream/Cargenwen Reservoir/Carwynnen stream	Scoped in	
COL2	Colliford PS Stage 2 - River Camel Abstraction.	Scoped in	
COL20	River Fal new abstraction	Scoped in	
COL3	Abstraction of Colliford compensation flow when making supply releases	Scoped out	Further NCA and BNG assessment has been scoped out due to the option setting and available option information. The option is not expected to generate any land-use change and therefore will avoid direct impacts on natural capital stocks. No proposals for delivering new natural capital stocks have been specified as part of the option. Additional environmental impacts will be captured separately within the SEA report and associated environmental assessments. No new infrastructure.
COL4	Abstraction of Siblyback compensation flow when making supply releases	Scoped out	Further NCA and BNG assessment has been scoped out due to the option setting and available option information. The option is not expected to generate any land-use change and therefore will avoid direct impacts on natural capital stocks. No proposals for delivering new natural capital stocks have been specified as part of the option. Additional environmental impacts will be captured separately within the SEA report and associated environmental assessments. No new infrastructure, identical location to COL3.
COL5	Increase Wendron annual licence and de-couple from Stithians	Scoped out	Further NCA and BNG assessment has been scoped out due to the option setting and available option information. The option is not expected to generate any land-use change and therefore will avoid direct impacts on natural capital stocks. No proposals for delivering new natural capital stocks have been specified as part of the option. Additional environmental impacts will be captured separately within the SEA report and associated environmental assessments. No infrastructure changes required.
COL6	River Hayle Abstraction	Scoped in	
COL9	Leswidden Pool	Scoped in	
BNW14	Ibsley Lake	Scoped in	
COL15	Restormel WTW	Scoped in	
COL21	Alternative RWS - Cornish Metals, Crofty	Scoped in	
ROA12	Slade and Horedown WTW (GAC)	Scoped in	
ROA13	Duckaller and Vennbridge	Scoped in	

Option ID	Option Name	NCA, BNG and Opportunity Mapping assessment	Justification for scoping out
ROA2	River Erme - Relocation of intake	Scoped in	
ROA3	River Yealm - Relocation of intake	Scoped in	
ROA4	Abstraction of Roadford compensation flow at Gunnislake when making supply releases	Scoped out	Further NCA and BNG assessment has been scoped out due to the option type being a licence change with no associated infrastructure changes required. No proposals for delivering new natural capital stocks have been specified as part of the option. Additional environmental impacts will be captured separately within the SEA report and associated environmental assessments.
ROA14	Raise Avon Dam	Scoped in	
ROA15	Gatherley Phase 2	Scoped in	
ROA17	Littlehempston WTW - Increase water offsite to license maximum, offsite high lift pumping and main capacity	Scoped in	
ROA6	Upper Tamar Lake increasing annual licence	Scoped out	Further NCA and BNG assessment has been scoped out due to the option type being a licence change with no associated infrastructure changes required. No proposals for delivering new natural capital stocks have been specified as part of the option. Additional environmental impacts will be captured separately within the SEA report and associated environmental assessments.
WIM1	Abstraction of Wimbleball compensation flow at Northbridgewhen making supply releases	Scoped out	Further NCA and BNG assessment has been scoped out due to the option type being a licence change with no associated infrastructure changes required. No proposals for delivering new natural capital stocks have been specified as part of the option. Additional environmental impacts will be captured separately within the SEA report and associated environmental assessments.
WIM12	Allers Springs	Scoped in	
ROA7	Expansion of Northcombe WTW to 60 Ml/d	Scoped in	
WIM2	Sidford borehole commissioning	Scoped in	
WIM11	Couchill Springs, Seaton	Scoped in	
WIM4	Wilmington springs annual abstraction increase	Scoped out	Further NCA and BNG assessment has been scoped out due to the option type being a licence change with no associated infrastructure changes required. No proposals for delivering new natural capital stocks have been specified as part of the option. Additional environmental impacts will be captured separately within the SEA report and associated environmental assessments.
WIM6	Increase Allers WTW capacity - To cover East Devon and East coast in the winter, Dotton at a minimum in the winter. Will require an increase in the Bolham licence	Scoped in	

Option ID	Option Name	NCA, BNG and Opportunity Mapping assessment	Justification for scoping out
	(winter) and a reduction in the Dotton licence (winter)		
WIM7	Increase Pynes to licence limit 66.46 Ml/d	Scoped in	
WIM8	Brampford Speke borehole	Scoped out	Further NCA and BNG assessment has been scoped out due to the option updates to an existing pipeline, bringing an existing licence back in use with no associated infrastructure changes required. No proposals for delivering new natural capital stocks have been specified as part of the option. Additional environmental impacts will be captured separately within the SEA report and associated environmental assessments.
WIM9	Stoke Canon borehole	Scoped out	Further NCA and BNG assessment has been scoped out due to the option updates to an existing pipeline, bringing an existing licence back in use with no associated infrastructure changes required. No proposals for delivering new natural capital stocks have been specified as part of the option. Additional environmental impacts will be captured separately within the SEA report and associated environmental assessments.
BNW1	Borehole development, existing borehole remedial works - Ampress	Scoped in	
WIM5	Indirect potable reuse - stream support for Dotton WTW	Scoped in	
ISMY1	St Mary's new borehole (location 1)	Scoped out	Further NCA and BNG assessment has been scoped out due to the option updates to an existing pipeline, bringing an existing licence back in use with no associated infrastructure changes required. No proposals for delivering new natural capital stocks have been specified as part of the option. Additional environmental impacts will be captured separately within the SEA report and associated environmental assessments.
ISMY2	St Mary's new borehole (location 2)	Scoped out	Further NCA and BNG assessment has been scoped out due to the option updates to an existing pipeline, bringing an existing licence back in use with no associated infrastructure changes required. No proposals for delivering new natural capital stocks have been specified as part of the option. Additional environmental impacts will be captured separately within the SEA report and associated environmental assessments.
ISMY4	St Mary's - Increase Existing Desalination Plant Capacity	Scoped out	Further NCA and BNG assessment has been scoped out due to the option updates to an existing pipeline, bringing an existing licence back in use with no associated infrastructure changes required. No proposals for delivering new natural capital stocks have been specified as part of the option. Additional environmental impacts will be captured separately within the SEA report and associated environmental assessments.
ISB4	Bryher – Increase Existing Desalination Plant Capacity	Scoped out	Further NCA and BNG assessment has been scoped out due to the option updates to an existing pipeline, bringing an existing licence back in use with no associated infrastructure changes required. No proposals for delivering new natural capital stocks have been specified as part of the option. Additional environmental impacts will be captured separately within the SEA report and associated environmental assessments.
IST1	Tresco new borehole	Scoped out	Further NCA and BNG assessment has been scoped out due to the option updates to an existing pipeline, bringing an existing

Option ID	Option Name	NCA, BNG and Opportunity Mapping assessment	Justification for scoping out
			licence back in use with no associated infrastructure changes required. No proposals for delivering new natural capital stocks have been specified as part of the option. Additional environmental impacts will be captured separately within the SEA report and associated environmental assessments.

1.2.2 New supply and drought options

During development of the updated dWRMP24, 29 new options were identified including 15 new supply options (Table 1-3) and 14 new drought options (Table 1-3 below). A further six drought options have been identified as part of the SWW Drought Plan and have been assessed via Environmental Assessment Reports (EARs), as outlined in Table 1-3. To help inform decisions at a strategic level, an SEA High Level Screening (HLS), has been undertaken in accordance with SEA Scoping Report (Mott MacDonald, April 2022). However, due to limited data and time-constraints at the time of writing no technical assessments for NCA and BNG have been undertaken for these new options.

Table 1-3: New supply and drought options identified as part of the updated dWRMP24

Option ID	Option Type	Name	Description	Approx Yield (ML/D)
Supply Options				
BNW16	Supply	Christchurch and Holdenhurst WWTW IPR 3 - further treatment and transfer to Knapp Mill WTW	Replace some existing processes and infrastructure at existing WTW site. The option includes 10 initiatives covering both WTWs, each initiative aims to save between 0.05 - 4.5 ML/d of water. The land already owned by SWW and all works will take place on existing structures.	40Ml/d
BNW18	Supply	Alderney WTW - Reduce Treatment Losses	Water from Alderney WTW is obtained from the River Stour via Longham Lakes. The option includes 4 initiatives to reduce treatment losses. 40 existing pressure filters at Longham to be retained and ripening process water as part of the upgrade to the new WTW treatment process. The option aims to save between 0.05- 4.5ML/d of water.	1.5 – 2Ml/d
BNW19	Supply	Knapp Mill WTW - Reduce Treatment Losses	Provide equipment to intercept, collect and return SSF ripening water at existing WTW site. The option includes 6 initiatives aiming to save between 0.1- 4.5ML/d of water. The only losses expected after the new enhancements are introduced will be rinse water for newly- regnerated GAC and some chemical washing from membrane plant which will be directed to sewer. All other GAC washing and membrane cleansing water will be circulated to head of works for retreatment.	1.5 – 2Ml/d
COL16	Supply	College WTW Improvements - treatment and distribution system	Increased output of 2.5ML/d against current output of 7.5ML/d meaning if enhancements were determined the desired output would be 10ML/d from College WTW. The water is obtained from College and Argal reservoirs, located South- west of treatment works. The initiative would take place on land already owned by SWW with the idea of using existing equipment. Provide one additional Rapid Gravity Filter and refurbish two secondary filters in addition to making provision for the upgrade of other treatment stages.	2.5Ml/d

Option ID	Option Type	Name	Description	Approx Yield (ML/D)
COL22	Supply	Roadford to Colliford via Saltash	The initiative involves the transfer of water from Roadford to Colliford via Saltash following on through to Mayflower WTW (see below). Through pump installation/ upgrading existing newtork mains pipes with a max volume of 1-2ML/d. New pumping station at Winston Beacon to supply area in St Cleer.	2Ml/d
COL23	Supply	Mayflower WTW to Kit Hill (St. Cleer)	Water for Mayflower WTW is derived from Colliford and Roadford lake. With the installation/ upgrade of a 5ML/d pump station at Winston Beacon and utilisation of existing network mains pipework to supply area in St Cleer.	10Ml/d
COL24	Supply	Northcombe WTW to Launceston	The initiative involves the transfer of water from Northcombe WTW to Launceston (gravity flow) with no additonal pumping. Provide a treated water connection through approximately 25km of pipeline between the two locations.	5Ml/d
COL25	Supply	Brent Tor to Launceston		10Ml/d
COL26	Supply	Restormel WTW to East Cornwall		40Ml/d
COL28	Supply	Desalination Plant at Par	First part of the desal plant is being commissioned as part of baseline (not MM assessment). Second part of the plant is in WRMP24 and requires SEA by MM.	10Ml/d
ROA20	Supply	Mayflower WTW to South Devon TREATED (also known as: Mayflower WTW to Littlehempston, Mayflower WTW/Rodborough to Gallows Gate NRP)	Transfer of up to 40Ml/d of treated water from Mayflower WTW to Littlehempston WTW, through approximately 37.3km of existing pipeline. New pumping station on existing Littlehempston WTW site.	40Ml/d
ROA21	Supply	Rodborough to South Devon (Littlehempston WTW) RAW (also known as Rodborough Tank at Mayflower WTW to Littlehempston WTW)	Transfer of up to 40Ml/d of raw water from Roborough to Littlehempston WTW, through approximately 37.2km of existing pipeline. New pumping station on existing Littlehempston WTW site.	40Ml/d
WIM14	Supply	Whitecross distribution upgrade	Meeting Note: AF noted abandument of existing main and installation of new.	5Ml/d
WIM15	Supply	Northcombe to Allers	The initiative involves the transfer of water from Northcombe WTW to Allers WTW. Provide a treated water connection by 74km of pipeline through Central Devon with one 1100kw pumping station located halfway (near Eggesford). As well as multiple different road, railway, river and woodland crossings.	20Ml/d
WIM16	Supply	FE reuse Exmouth Maer Lane WWTW	As part of SWW Water Resources Management Plan (WRMP), works are planned for the transmission system from Countess Weir STW and Maer Lane STW, with the	10Ml/d

Option ID	Option Type	Name	Description	Approx Yield (ML/D)
			proposed Water Recycling Centre (WRC) Plant near the River Exe to provide resilience to Pynes WTW.	
Drought Options				
dB1	Drought	Wimborne Borehole	Connection disused source to existing WTW using a new pipeline. 2MLD benefit for 1-3months	
dB2	Drought	Stanbridge Licence	Increase abstraction from existing sources using existing assets. 12.5MLD for 2-6 weeks benefit	
dCS1/E	Drought	Colliford not releasing compensation flows when making supply releases	No carbon data for COL3 provided by Stantec. No infrastructure/build associated with this option. OPEX/Operational carbon inclusive in COL15 No CAPEX but license variation cost. No increase in OPEX. 5.7MLD benefit for 6months assumed from DP	2.3
dCS11/E	Drought	Siblyback not releasing compensation flows when making supply releases	No carbon data for COL4 provided by Stantec. No infrastructure/build associated with this option. OPEX/Operational carbon inclusive in COL15 No CAPEX but license variation cost. No increase in OPEX. 1.55MLD for 6months benefit from DP.	1.5
dR1	Drought	Lyd to Roadford winter pumped storage (Jan - Mar)	Increase abstraction to 40MLD using existing infrastructure. 20MLD benefit for 6months [Not taken forward to updated dWRMP24 - now superceded by dRS18/E Lyd April to May (confirmed by SWW 24/08/23)]	
dR2	Drought	Slade Reservoir	Civil CAPEX is 25% and MEICA is 50% of original estimate due to temporary solution (i.e. hire equipment, overground pipes etc). L&C CAPEX is assumed to increase by 50% due to time requirements. All CAPEX have OB applied. Assume that OPEX and Op carbon increases by 50%. Embodied carbon by Civil/M&E/ICA has been assumed by applying a percentage of total CAPEX. Same rules as CAPEX for embodied carbon reduction. L&C CAPEX was removed from embodied carbon. 1-2MLD for 6-12months benefit. Used 1MLD for consistency with WRMP costs	1
dR3	Drought	Challacombe Reservoir	Not scoped in WRMP. Re-instated water source connecting to existing WTW through existing pipework. 1-2MLD benefit for 2months	1-2MLD
dR4	Drought	Meldon/Vellake to Roadford	Use existing intakes and connect them to existing WTW with new pipeline. 3-5MLD benefit for 6 months	3-5
dR5	Drought	Lee Moor unused quarries	New intakes connected to a new WTW via a new pipeline and a new pipeline to existing distribution network. 2-4MLD for 3-6months	2-4
dRS15/E	Drought	Roadford not releasing compensation flows when making supply releases	No carbon data for ROA4 provided by Stantec. No infrastructure/build associated with this option. OPEX/Operational carbon inclusive in ROA7 No CAPEX but license variation cost. No increase in OPEX. 9MLD for 6 months assumed from DP	3.7
dRS18/E	Drought	Lyd April to May	Abstract from the River Lyd and transfer into Roadford Reservoir in November and December. Extend the Level 1 Drought Permit (January to March) abstraction period.	40 for 2 months
dW1	Drought	Brampford Speke and Stoke Canon	Combined WIM8 and WIM9. Civil CAPEX is 25% and MEICA is 50% of original estimate due to temporary solution (i.e. hire equipment, overground pipes etc). L&C CAPEX is assumed to increase by 50% due to time requirements. All CAPEX have OB applied. Assume that	4Ml/d

Option ID	Option Type	Name	Description	Approx Yield (ML/D)
		(North Exeter Boreholes)	OPEX & Op Carbon will increase by 50%. Embodied carbon by Civil/M&E/ICA has been assumed by applying a percentage of total CAPEX. Same rules as CAPEX for embodied carbon reduction. L&C CAPEX was removed from embodied carbon. 8MLD for for 4 months benefit assumed from DP. 4MLD WAFU from WRMP scopes used to align WRMP costs with benefit.	
dW2	Drought	Hook Springs Licence	Increase abstraction using existing assets. 0.4MLD benefit.	0.4Ml/d
dW3	Drought	Wilmington Springs Licence	No carbon data for WIM4 provided by Stantec. No infrastructure/build associated with this option. Inferred operational carbon from OPEX with 0.25 £/kWh and 0.211 kgCO2e/kWh for treatment/pumping power/chemical usage OPEX components. No CAPEX but license variation cost. DP benefit is assumed to be 0.4MLD. Used WRMP benefit of 0.2 MLD to align costs with benefit.	0.4
dW4	Drought	Wimbleball not releasing compensation flows when making supply releases	No carbon data for WIM1 provided by Stantec. No infrastructure/build associated with this option. OPEX/Operational carbon inclusive in WIM7 No CAPEX but license variation cost. No increase in OPEX. 9MLD benefit for 6 weeks from DP	1

2 Methodology

2.1 Overview

This technical note accompanies the SWW updated dWRMP24 SEA Environmental Report as an Annex. This Annex presents the findings of the Natural Capital Assessment (NCA), Biodiversity Net Gain (BNG) assessment and related opportunities identified for the options.

The quantitative natural capital assessments (NCAs) have been undertaken to understand the likely impacts on natural capital stocks, and resulting impacts on ecosystem services, and, in this way, inform the selection of options for the SWW updated dWRMP24. By reflecting the impacts associated with each option, the assessments have informed the decision-making process and resulted in a reduction of adverse impacts and increase in environmental benefits.

The majority of these options are at the concept stage of design and have not been informed by survey data. Therefore, it is not possible at this stage to develop quantitative mitigation and enhancement proposals for natural capital. The opportunities for mitigation and enhancement will be further identified and quantitatively developed in the later stages of design development for each option.

It will be important that the natural capital proposals align with both the local ecology (informed by survey data) and the biodiversity net gain proposals, for which opportunity areas have now been identified as part of the updated dWRMP24 reporting but similarly require further design development for detailed quantitative BNG proposals.

2.1.1 Natural Capital and Ecosystem Services

Natural capital refers to the elements of the natural world that provide benefits to society and includes aspects such as woodland, grassland, freshwater, marine, urban greenspace, and wetland habitats. Ecosystem services are benefits that are provided to humans by the natural environment and they vary from regulating services such as natural flood management to cultural services such as recreational value.

2.1.2 Biodiversity Net Gain

BNG refers specifically to the combination of habitats present within a site and their ability to support biodiversity. Each habitat is given a distinct score that relates to its area, condition, distinctiveness, and connectivity. The change in habitat due to the construction and operation of the regional plan options informs the overall BNG score and whether they are likely to contribute to a net gain in biodiversity.

2.2 Guidance

Water companies have a statutory obligation to produce a WRMP, which sets out how a company intends to maintain the balance between supply and demand for water over a minimum 25-year period. In the development of a WRMP, companies must follow the Environment Agency (EA) Water Resource Planning Guidelines ('Guidelines')[1] and consider broader government policy objectives. The Guidelines recommend that companies must consider the environment and society when developing the WRMP, stating that NCA and BNG assessments should be used to inform decision-making. The natural capital approach is similarly supported by the Government's ambition to deliver environmental net gain, as set out in the 25 Year Environment Plan and Department for Environment Food and Rural Affairs (Defra) Guiding Principles.

The NCA and BNG have been produced in line with best practise and guidance available at the time the assessments were undertaken, including:

- Defra (2023) Enabling a Natural Capital Approach[2]

[2] DEFRA 2023. Enabling a Natural Capital Approach (ENCA): Guidance. Available at: https://www.gov.uk/government/publications/enabling-a-natural-capital-approach-enca-guidance

- HM Treasury and government finance (2020) The Green Book: appraisal and evaluation in central government
- Natural England (2021) The Biodiversity Metric 3.1 auditing and accounting for biodiversity (JP039)
- Natural England (2020) NERR076 Natural Capital Indicators: for defining and measuring change in natural capital[3]
- Environment Agency, Natural Resources Wales, Ofwat (2023) Water Resources Planning Guidelines ('Guidelines')[1]
- Environment Agency (2020) Water resources planning guideline supplementary guidance – Environment and society in decision-making (ESDMSG)[4]

Since the assessments were undertaken, a number of the guidance documents listed above have been updated, including The Green Book[5] (2022), and The Biodiversity Metric 4.0[6] (2023). However, the guidance available at the time of the assessments is considered appropriate to inform SWW's updated dWRMP24 decision-making process.

2.3 Principles for the Natural Capital Assessment

In line with the ESDMSG[4], the NCA has been developed in accordance with the following principles:

- The assessment includes the valuation of natural capital assets and ecosystem services within the footprint of each option and their zone of influence (See Section 2.4.1).
- The assessment methodology uses the most relevant qualitative, quantitative and/or monetary valuation approaches for the NCA. The assessment of the option's impact on the natural capital metrics have been undertaken in a sequential manner with an initial qualitative assessment, followed by a quantitative analysis and finally a monetised assessment if enough confidence exists in the values.
- Not all ecosystem services can be monetised within the NCA however those that are have been assessed against a consistent methodology. The monetised natural capital metrics will be incorporated into the cost benefit ratio as a discreet input. This monetised value will be a single figure defined by the maximum natural capital benefit. The cost of the option will not be considered within this assessment as it is captured elsewhere within the multi-criteria assessment.
- Ecosystem services that are not monetised have been quantified and incorporated into the regional plan decision-making process within the SEA assessment.
- The NCA has been undertaken using open-source data in accordance with the guidance for regional assessments and to ensure that the approach is consistent across the entire operational area.
- The assessment criteria have been designed to optimise the potential benefits from the regional plan.

[3] Natural England 2020. Natural Capital Indicators: for defining and measuring change in natural capital (NERR076). Available at: https://publications.naturalengland.org.uk/publication/6742480364240896

[4] Environment Agency 2020. Water resources planning guideline supplementary guidance - Environment and society in decision-making (ESDMSG):

[5] HM Treasury and Government Finance Function 2020. Guidance, The Green Book: appraisal and evaluation in central government. Available at: https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-governent

[6] Defra and Natural England 2023. The Biodiversity Metric 4.0 (JP039). Available at: https://publications.naturalengland.org.uk/publication/6049804846366720

2.4 Methodology Overview

2.4.1 Stage 1: Defining the natural capital baseline

2.4.1.1 Zone of influence

The zone of influence (ZoI) for each option is defined as the area likely to be altered or changed as a result of the option, resulting in a potential change to the environmental benefits that are currently being provided. To assess the likely temporary impacts from construction within the ZoI, it has been assumed that below ground infrastructure will require a working width of approximately 10m from the option footprint to facilitate construction, while above ground infrastructure will require a working width of approximately 5m from the option footprint. It is assumed that the natural capital stocks located within the option footprint for above ground infrastructure will be permanently lost as a result of option construction.

2.4.1.2 Developing a natural capital baseline

As part of the NCA of the feasible options within the regional plan, a natural capital baseline was developed for the study area. This baseline was developed using open-source data as described in The National Natural Capital Atlas: Mapping Indicators (NECR285[7]) to generate a natural capital account of the stocks within the South West Water region. The list of stocks considered within the accounts and the methodology for mapping them are shown in the Appendix (Section 7 below). The methodology used to map natural capital utilises the same breakdown of stocks as the NECR285 where possible. However, the list was supplemented with additional abiotic stocks and key habitats that are vital to the South West Water region such as chalk streams and rivers. The natural capital baseline reported the total quantity of each stock within the study area.

2.4.2 Stage 2: Option Level Natural Capital Assessment

A natural capital assessment has been undertaken on the options in accordance with the Water Resources Planning Guideline[8] (Guidelines) and Enabling a Natural Capital Approach (ENCA) guidance. ENCA is recommended for use by the HM Treasury's Green Book: appraisal and evaluation in central government (2020)[9] and represents supplementary guidance to the Green Book.

In August 2021, ENCA updated its guidance. Therefore, the NCA were updated in line with the values used to quantify the provision of ecosystem services.

The August 2021 ENCA guidance[10] includes updated values within the Asset Databook and Service Databook. Within the Service Databook, the carbon reduction tab now includes BEIS (2022) carbon values - a set of values produced by the government to be used in policy appraisal and evaluation, reflecting the latest evidence. The climate regulation section of the assessment has been updated in line with this.

The impact of the options on the natural capital stocks was reported for each option quantitatively. This impact was reported for during construction and post construction to give an estimation of the impact of the

[7] Natural England, (2020) National Natural Capital Atlas: Mapping Indicators (NECR285). Available at: https://publications.naturalengland.org.uk/publication/4578000601612288

[8] Environment Agency, Natural Resources Wales, The Water Services Regulation Authority (2021). Water resources planning guideline. Available at: <https://www.gov.uk/government/publications/water-resources-planning-guideline>

[9] HM Treasury, Government Finance Function (2022). The Green Book: appraisal and evaluation in central government. Available at: <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/938046/The_Green_Book_2020.pdf> [Accessed 16 March 2022].

[10] GOV.UK. 2021. Enabling a Natural Capital Approach guidance. [online] Available at: <https://www.gov.uk/government/publications/enabling-a-natural-capital-approach-enca-guidance/enabling-a-natural-capital-approach-guidance> [Accessed 16 March 2022].

options' whole lifecycle. The results of the stock assessment were reported in total losses and gains within each option's zone of influence (ZoI).

The results of the change in natural capital stocks informed the assessment against the six natural capital metrics (ecosystem services) listed below using the Natural England logic chains (Figure 2-1). The cost / benefit assessment was informed by the option type, option description and any embedded mitigation. The outputs of the NCA were compared to the pre-construction provision of impacted services to assess the impact of the options. Five ecosystem services were monetised (subject to the screening process set out below), and the results of the assessment were reported as a discreet monetary figure, water purification and water regulation were assessed qualitatively, and biodiversity was assessed via the Biodiversity 3.1 Metric[11].

The methodology outlined above meets best practice for defining the natural capital assessment's company area, zone of influence and option footprint, in accordance with the ESDMSG[4].

Figure 2-1 Ecosystem Services valuation logic chain

The metrics used to assess the impact on natural capital include:

- Carbon sequestration (climate regulation)
- Natural hazard regulation
- Water purification
- Water regulation
- Biodiversity and habitats
- Air pollutant removal
- Recreation & amenity value
- Food production

Both natural capital assessment strategies, as outlined in the Guidelines and the ENCA guidance discuss taking a proportionate approach to the assessment. It is therefore important to accommodate this when integrating a natural capital approach within the options. A natural capital approach has the potential to inform concept design and aid decision making, by quantifying the relative cost benefits and disbenefits of the options to aid the initial assessment of the identified strategic solutions.

[11] Natural England, 2022. Available at ARCHIVE SITE for the Biodiversity Metric 2.0, 3.0, 3.1 and the beta test version of the Small Sites Metric (naturalengland.org.uk) [Accessed: August 2023]

2.4.3 Ecosystem Services screening

During the initial phase of the NCA, all the seven ecosystem services listed were reviewed (excluding Biodiversity and Habitat, assessed by the BNG 3.1 Metric) and scoped in or out due to the geographical or socio-economic context of the options and its zone of influence. Specific guidance on the screening process for individual metrics is provided below.

2.4.3.1 Climate regulation

The climate regulation metric focuses on carbon sequestration, which can be defined as the capture and secure storage of carbon that would otherwise be emitted to, or remain, in the atmosphere. The carbon sequestration NCA will be in addition to construction and operational carbon calculations and provides a holistic assessment of carbon emissions for the options.

The assessment was determined by land management within each option ZoI which influenced the carbon store for prolonged periods of time and results in a change in net emissions. The estimate of the carbon stocks for the options footprint was based on the area of broad land use types according to literature and research. The estimated carbon stocks for broad habitat types are listed below and the sequestration rates are show in Table 2-1.

Table 2-1: Carbon sequestration rates for broad habitat types (JBA Consulting) [12] [13]

Land use type	C Seq rate (tCO2e/ha/yr)
Woodland - (deciduous)	4.97
Woodland – (coniferous)	12.66
Arable Land	0.107
Pastoral land	0.397
Peatland - Undamaged	4.11
Peatland - Overgrazed	-0.1
Peatland - Rotationally burnt	-3.66
Peatland - Extracted	-4.87
Grassland	0.397
Heathland	0.7
Shrub	0.7
Saltmarsh	5.188
Urban	0
Green Urban	0.397

The carbon sequestration rates were converted to monetary values using standard methods by multiplying the estimated quantity of carbon sequestered by the monetary values and the Department for Business, Energy, and Industrial Strategy (BEIS) Interim Non-Traded Carbon Values from 2023 (Table 2-2) which sets out a revised approach to valuing greenhouse gas emissions in policy appraisal, following a cross-government review during 2020 and 2021. The NCA is based on a 2023 price year; however, it is assumed that adjustments for inflation from 2020 (year of BEIS publication) to 2023 have been accounted within the annual projections provided by BEIS and therefore the 2023 value presented below has not been adjusted. High series values were used to reflect a conservative estimate for the price of carbon.

[12] Alonso, I., Weston, K., Gregg, R. and Morecroft, M. 2012. Carbon storage by habitat - Review of the evidence of the impacts of management decisions and condition on carbon stores and sources. Natural England Research Reports, Number NERR043.

[13] The Environment Agency, (2020) Water resources planning guideline supplementary guidance – Environment and society in decision-making.

Table 2-2: BEIS updated short-term traded sector carbon values for policy appraisal, £/tCO2e (£2020)

Year	Low series	Central series	High series
2020	120	241	361
2021	122	245	367
2022	124	248	373
2023	126	252	378
2024	128	256	384
2025	130	260	390
2026	132	264	396
2027	134	268	402
2028	136	272	408
2029	138	276	414
2030	140	280	420
2031	142	285	427
2032	144	289	433
2033	147	293	440
2034	149	298	447
2035	151	302	453
2036	155	307	460
2037	156	312	467
2038	158	316	474
2039	161	321	482
2040	163	326	489
2041	165	331	496
2042	168	336	504
2043	170	341	511
2044	173	346	519
2045	176	351	527
2046	178	356	535
2047	181	362	543
2048	184	367	551
2049	186	373	559
2050	189	378	568

The methodology outlined above meets the minimum requirement for the qualitative and quantitative approach, respectively, and best practice for the monetisation approach in accordance with the ESDMSG[4].

2.4.3.2 Natural hazard regulation

Different habitat types have intrinsic flood risk management values by intercepting, storing, and slowing water flows. This is known as natural flood management (NFM) and is listed as a policy within the 25-year Environment Plan[14]. The capacity of habitats to achieve this can be quantified, and then a monetary value can be assigned based on the damage-costs avoided from flooding or replacement costs due to their capacity to regulate flood waters. The capacity for a given natural capital asset to provide a flood regulation service will depend on two factors:

[14] 25 Year Environment Plan - GOV.UK (www.gov.uk)

- Its capacity to slow overland flows
- Whether the asset is in an area of flood risk

This ecosystem service also applies in urban areas, where vegetation can reduce surface water flooding from heavy rainfall, with benefits to sewerage capacity. Coastal flood risk, which has been predicted to increase with future climate change, is reduced by coastal margin habitats such as saltmarsh.

The options were assessed on their ability to impact flood risk positively or negatively through the comparison of pre and post construction natural capital stocks and the catchment in which it is located. The assessment is restricted to catchment areas which drain to downstream communities impacted by flooding. These communities were identified using the Environment Agency's Indicative Flood Map[15], which overlays areas at risk of fluvial flooding and the National Receptor Database. The ecosystem service was scoped in for assessment as where it was identified that an option would have a temporary or permanent impact upon the relevant natural capital stocks, such as areas of woodland, located within the floodplain.

Reduced flood damage to downstream or coastal settlements because of reduced magnitude / frequency of flood / storm events; and / or lower sewer capacity or water storage costs was valued in line with Broadmeadow et al, 2018[16]. This assessment was developed to provide indicative national estimates of water regulation services of woodland to inform natural capital accounts, this is based on modelling to estimate the potential volume of flood water avoided by woodland ecosystems in flood risk catchment. The methodology adopts a replacement-cost (rather than damage cost) approach to valuing the flood regulation service of woodland by applying annualised average capital and operating costs of flood reservoir storage that would be required in the absence of the ecosystem service.

Central estimate of the average annual costs of reservoir floodwater storage is £0.42 /m^3. The range is from £0.10 to £1.19 /m^3 per year. The central estimate was used to derive an annual average estimate for the flood regulation service of woodland in Great Britain, which was then uplifted to a 2022 price year. These "replacement costs" were considered a lower bound of the benefit if it can be assumed that such expenditure would be deemed value for money by the flooding authorities within flood risk catchments in terms of avoided flood damage costs**.**

Within these assessments in this report, it has been assumed that such expenditure was deemed value for money by the flooding authorities within flood risk catchments in terms of avoided flood damage costs.

The methodology outlined above meets the minimum requirement for the qualitative approach and the quantitative approach in accordance with the ESDMSG[4].

2.4.3.3 Water purification

Based on their ecological functioning, different habitat types, have varying capacities for absorbing pollutants from a given water source. This service is dependent on the location of the natural capital asset and the nature of the surrounding area. If a natural capital asset has a high capacity to remove pollutants but is not close to a water source, the service will not be provided. Due to this, valuation of the static water purification services of different natural capital assets as part of the NCA was not considered appropriate. A common value for different habitat types could not be applied due to extensive variation in local factors which determine the provisioning of this service.

To account for the provision of this service within the NCA the impact of the options associated with the provision or removal of woodland and semi-natural grassland was assessed qualitatively and with

[15] https://flood-map-for-planning.service.gov.uk/

[16] Broadmeadow, S., Thomas, H., Nisbet, T. and Valatin, G., 2018. Valuing flood regulation services of existing forest cover to inform natural capital accounts. *Forest Research*.

consideration of the NEVO[17] tool. The tool defines the resulting changes for the following water quality variables:

- Dissolved oxygen concentration
- Nitrogen concentration (including organic nitrogen, nitrate, nitrogen dioxide, ammonium)
- Phosphorous concentration (including organic and mineral phosphorous)
- Pesticide concentration (for eighteen different pesticide types

This approach followed the methodology that if an area of woodland were to be lost, the resultant impacts on water quality were quantified within the option's zone of influence and qualitatively considered for their potential impact upon water purification services. Any negative changes to the natural capital stocks in theory, reflected the loss of this service within each option's ZoI.

The methodology outlined above meets the minimum requirement for the qualitative approach in accordance with the ESDMSG[4].

2.4.3.4 Water regulation

Water flow regulation is a key ecosystem service that can be directly impacted by both changes in land use and the implementation of supply options. Land uses such as agriculture are direct consumers of the water supply, while forests are known to promote higher rates of evapotranspiration and infiltration, which can affect local hydrologic cycles and change the amount of available water. The same natural capital stocks that provide the water supply, such as freshwater lakes and rivers, can also provide other services such as recreation and amenity, especially when near residential and urban communities. In addition to land use changes, water resource options both impact and benefit from water flow regulation. Options benefit by abstracting and providing water supply to customers, but they can also have varying effects on existing natural capital stocks, which in turn can affect the amount of available water. A qualitative assessment has been used to compare the positive and negative effect of each option on water flow regulation. Water regulation has only been considered qualitatively to avoid the potential double accounting of benefits with capacity-based and financial assessments, and to align with Environment Agency supplementary guidance[13] that recommends not including monetisation of water regulation benefits in decision making.

The key set out in Table 2-3 below is used to demonstrate the scale of effect caused by the option on the water regulation ecosystem service.

Table 2-3 Scale of effect key on water regulation ecosystem service

Colour	Scale of Effect	Description
+++	Major Positive	The option would result in a major improvement to the provision of water flow regulation.
++	Moderate Positive	The option would result in a moderate improvement to the provision of water flow regulation.
+	Minor Positive	The option would result in a minor improvement to the provision of water flow regulation.
0	Neutral	The option would not result in any effects on the provision of water flow regulation.
-	Minor Negative	The option would result in a minor decrease to the provision of water flow regulation.
--	Moderate Negative	The option would result in a moderate decrease to the provision of water flow regulation.
---	Major Negative	The option would result in a major decrease to the provision of water flow regulation.

[17] Luizzo, L., (2019) Natural Environment Valuation Online Tool - Chapter 6a: Water Quantity & Quality Model

?	Uncertain	From the level of information available, the effect that the option would have on the provision of water flow regulation us uncertain.

The methodology outlined above meets the minimum requirement for the qualitative approach in accordance with the ESDMSG[4].

2.4.3.5 Air pollutant removal

Air pollution presents a major risk to human health, resulting in premature deaths and reduced quality of life. By removing air pollution, habitats help to lessen these impacts on health and wellbeing. The provisioning of the service is positively related to several key aspects:

- The surrounding area of the natural capital assets with regards to background pollution, especially particulate pollutant
- The quantity and type of natural capital asset, woodland is the major service provider.
- The density of population potentially benefiting from reduced exposure. Because pollutants are transported, beneficiaries may be downwind of the ecosystem.

The options were screened against the provision of air pollutant removal according to its location. Air pollutant removal was only be considered within built up areas or when the zone of influence includes Air Quality Management Areas. The impact of the options was assessed according to changes in natural capital stocks.

The value provided by natural capital assets was taken from the UK government's air quality economic assessment methodology[18]. The assessment embeds these values (based on the damage cost approach, i.e., damage to health avoided from reductions in air pollution) and estimates the present value automatically based on the quantitative estimates provided.

Indicative average values for air pollution removal in 2015 for different habitats were calculated from aggregate UK values published in February 2019, as shown in Table2-4, uplifted for 2023.

The value of each habitat will be combined with the changes expected in natural capital stocks to provide a value for the change in service provision. The final impact will be reported as a single value that will be incorporated within the NCA metric.

Table 2-4: Air pollutant value by habitat type (£2023)

Habitat group	Value (£ per hectare per year)
Urban Woodland	990
Rural Woodland	315
Urban grassland	191
Enclosed farmland	18
Coastal margins	33

2.4.3.6 Recreation and amenity

The recreational value of green spaces can be significant. This value reflects both the natural setting and the facilities on offer at the site and often has a strong non-market element. It varies with the type and quality of habitat, location, local population density and the availability of substitute recreational opportunities. Recreational values can be beneficially affected by enhancements in green spaces, or adversely affected by new developments or infrastructure. The wider tourism and outdoor leisure sector are also dependent upon nature to varying degrees.

[18] Jones L., Vieno M., Morton Dan et al. (2019) Developing Estimates For The Valuation Of Air Pollution Removal In Ecosystem Accounts. Final Report For Office Of National Statistics - NERC Open Research Archive.

This metric depends on the extent to which the natural capital stocks the options provide will enhance the opportunity for recreation.

The key parameter needed to estimate in this category is the number of additional or enhanced recreational visits created because of the option. This was estimated using the Outdoor Recreation Valuation Tool (ORVal). ORVal[19] is referenced in the Green Book[20] and consists of a random utility/travel cost model of recreational demand for all sites in England and Wales, generating probabilistic predictions of visitor numbers for any publicly accessible outdoor recreation park, path, or beach. It takes account of scarcity of sites and substitution possibilities, as well as travel distances to sites and their attributes. This was useful for baseline initial assessment, accounting, and multiple sites. This was seen as an estimation in the absence of site-specific data on visitor numbers.

The change in natural capital stocks and the creation or removal of greenspace was entered into ORVal according to the NCA. The change in visitors and estimated change in value will be reported for using the ORVal online tool.

2.4.3.7 Food production

Food is produced by a range of ecosystems and in some cases, the food for human consumption is effectively the same as the ecosystem service (e.g., wild fruit, fishing). More often the provisioning service is a raw material (e.g., crops) that is harvested and processed by humans and produced capital into added value processed food (e.g., bread). The boundary between what is provided by natural capital and the contribution of other forms of capital is often a grey area, e.g., crops require agricultural management; livestock need grassland ecosystems.

Food production has been calculated using the Natural Environment Valuation Online Tool (NEVO) agricultural model. The NEVO Tool is a web application developed by the Land, Environment, Economics and Policy (LEEP) Institute at the University of Exeter with support from Department for Environment, Food & Rural Affairs (Defra) and Natural Environment Research Council (NERC). NEVO's primary purpose is to help explore, quantify, and make predictions about the benefits that are derived from existing and altered land use across England and Wales. This is a structural model of agricultural land use and production for Great Britain estimated using Farm Business Survey (2005 – 2011) and June Agricultural Census data (covering ten unevenly spaced years from 1972 to 2010). The agricultural land use component in NEVO builds upon the approach developed by Fezzi and Bateman[21].

NEVO was used to assess the impact of the creation or removal of agricultural land for the options. The change in value of food provision for the footprint of the options was calculated using this online tool and reported within the NCA.

2.4.3.8 Price uplifts

The monetary values used to report the quantitative impact on ecosystem services were adjusted using GDP deflators[22] to a consistent price reporting year of 2023. As stated previously, it has been assumed that the BEIS price projections used to value the change in carbon sequestration potential have already been adjusted for inflation, and therefore price projections have not been adjusted.

[19] ORVal | Land, Environment, Economics and Policy Institute | University of Exeter

[20] The Green Book: appraisal and evaluation in central government - GOV.UK (www.gov.uk)

[21] Fezzi, C., Bateman, I., Hadley, D. & Harwood, A. 2019. Natural Environment Valuation Online Tool - Chapter 1: Agriculture Model

[22] HM Treasury, 2022. GDP deflators at market prices, and money GDP June 2022 (Quarterly National Accounts). Available at: https://www.gov.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-june-2022-quarterly-national-accounts

2.4.4 Stage 3: Reporting of results

The results of the NCA will be summarised in the NCA report which will be produced at the end of the detailed assessment and appended to the WRSE environmental report. The baseline natural capital assets within the regional plan study area will be reported key benefits, issues and opportunities summarised.

The changes in natural capital stocks will be reported for each option with the results of the ecosystem services screening and detailed assessment. The separate natural capital metrics will be aggregated into a single metric that will be considered within the WRSE investment model. The impacts of each option against the individual natural capital metrics will also be reported to allow for further analysis and optimisation. The results for each option will be summarised in proforma that will demonstrate the results of the assessment and for the justification behind the assessment.

The results of the NCA and biodiversity net gain assessments will be incorporated into SWW's decision making process through the conversion of the results into metrics as described below:

- **Natural capital metric:** A single discreet monetised value reported in £2023/year generated by combining the outputs of each of the six monetised natural capital metrics to provide a single cost / benefit figure.
- **Biodiversity net gain metric**: A single score for each option showing the percentage change in biodiversity net gain units for each option according to the metric.

The results of the NCA and BNG assessments for the feasible options identified in the SWW updated dWRMP24 have been presented in Section 3.

2.4.4.1 Investment model

The outputs of the natural capital metric that were reported in £2023/year were included in the investment modelling as a present value over a 25-year period including changes in effects due to the OPEX and CAPEX of each option. These were only fed into the investment modelling and all results within the report and assessments are £2023/year.

2.4.5 Assumptions and limitations of the natural capital assessment

The following assumptions have been used within the natural capital assessments (NCAs) in this technical note:

- The costs for constructing, operating, and maintaining the options was not considered within the assessments.
- Natural capital stocks identified within the areas allocated for above ground permanent infrastructure that are associated with a change in land use have been assumed to be completely lost because of the option construction.
- Natural capital stocks presumed temporarily lost are expected to be reinstated/compensated.
- Where there is no change in existing land use associated with a supply-side option, the assessment has been scoped out.

2.5 Overview assessment methodology: BNG

The BNG requirement as outlined in the Guidelines stipulates that each option should look to maximise BNG. In April 2022, Defra and Natural England launched The Biodiversity Metric 3.1[23]. The Biodiversity Metric presents significant improvements for measuring and accounting for nature losses and gains. It encourages users to create and enhance habitats where they are most needed to help establish or improve ecological networks through rural and urban landscapes. By linking to current and future habitat plans and strategies, including the future Local Nature Recovery Strategies (LNRS), the Biodiversity Metric incentivises habitat

[23] Archive site for the BNG Metric 2.0 and 3.0 http://publications.naturalengland.org.uk/publication/5850908674228224

creation and enhancement where most needed. It also 'rewards' landowners who undertake work early, creating or enhancing habitats in advance, allowing them to generate more biodiversity units (BUs) from their land. Condition assessment approaches have also been significantly updated and simplified for Metric 3.1 and some key changes made.

The Biodiversity Metric 3.1 is the recommended approach to net gain assessments. The government anticipates the Biodiversity Metric to become the industry standard for biodiversity assessments for on-land and intertidal development types in England. As proposed in the Environment Act 2021[24] in November 2021, biodiversity net gain must be measured using a recognised biodiversity metric. The Metric essentially underpins the Environment Bill's provisions for mandatory biodiversity net gain in England, subject to any necessary adjustments for application to major infrastructure projects. The Act further specifies the requirement of biodiversity reports to include specified quantitative data relating to biodiversity, and as such any tool which evaluation is predominantly qualitative is not recommended. As such, all options have also been assessed using the Biodiversity Metric 3.1 metric.

Biodiversity net gain or net loss must be considered at both the option and programme level and a biodiversity optimised programme is suggested as part of the Guidelines. Each option should look to achieve the minimum 10% BNG and going above the minimum which should be included in the option cost. Ecological mitigation should be considered in parallel for each option and should also be included in the option cost. ESDMSG[4] states that if there would be a significant additional cost for an option to get significant extra benefit, this could be included as a separate option for consideration (Section 2.4.4).

A biodiversity baseline has been developed from spatial data sets of habitats inventories to calculate BNG change through land use. The Priority Habitat Inventory and sites with Site of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC), Special Protection Area (SPA) and Ramsar designations were used to identify areas with high biodiversity importance. Units have been assigned to the pre-construction land use according to the habitats present in the options boundary. The post construction land use including agreed mitigation has been used to calculate the post development biodiversity score of the predicted biodiversity unit outcomes from the development.

As this assessment was carried out using only open-source data a precautionary approach was applied, presuming that where not specifically known, habitats were assigned the moderate habitat score. This is considered to be a suitable methodology for the scale of the updated dWRMP24 methodology updates.

2.5.1 Assumptions and limitations of the BNG assessment

The following assumptions have been used within the biodiversity net gain (BNG) in this technical note:

- No enhancement of biodiversity post construction was considered apart from where this has been explicitly included in the option description/design, for example as part of the SRO Gate 2 designs. BNG habitat units were assigned to the pre-construction land use according to the habitats present within each option boundary. The post construction land use, including agreed mitigation, was used to calculate the post construction biodiversity score.
- The desk-based assessment was carried out using open-source data. As such, a precautionary approach was applied, presuming that where not specifically known, habitats were assigned the moderate habitat score. Habitat identification will need to be refined with habitat survey data at later stages to refine the accuracy of the BNG calculations for each option.
- The desk-based assessment was carried out using open-source data. The baseline map does not include the location of hedgerows. Therefore, hedgerow units have not been included at this stage. Habitat identification will need to be refined with habitat survey data at later stages of design to refine the accuracy of the BNG calculations for each option.

[24] Environment Act 2021 (legislation.gov.uk)

- The duration of disturbance and timeline for habitat creation has not been included in the assessment. Durations of disturbance, including proposals for creating habitats in advance of disturbance, will need to be refined with greater design detail at later stages to refine the accuracy of the BNG calculations for each option.
- Habitats are assumed to have a low/no strategic significance for the baseline and post development due to the limitation of the open data used to capture this information.
- There is no inclusion of the riparian zone (within 10m of the watercourse) in the watercourse BNG assessments.
- The open-source data used for watercourse assessments does not include canals, ditches, culverts and primary habitat hence there is a likeliness of underestimation of watercourse net gain. Industry best practice, including the use of directional drilling where possible, is assumed to mitigate and avoid the majority of temporary adverse effects on identified watercourses.
- Where there is no change in existing land use associated with the project the assessment has been scoped out.

2.6 BNG opportunity mapping

Following the assessment of BNG for each option, an opportunity mapping exercise was undertaken to understand the potential of each option to deliver off-site gains in biodiversity. The opportunity mapping exercise consisted of both a qualitative review of local planning authority aspirations and a quantitative review of conservation, restoration, and enhancement areas within the proximity of each option. The identification of BNG opportunities will be used to inform the development of habitat proposals for each option and ensure that those site-scale proposals contribute to broader gains in biodiversity across the SWW operational area, directly benefitting local strategies for nature recovery.

2.6.1 Qualitative review

A qualitative review was undertaken to outline the strategic priorities of local planning authorities for achieving BNG, including where local authorities have increased the percentage net gain required. The review allowed for each option to be compared against the BNG requirements for the associated local planning authority.

2.6.1.1 Local Planning Authority strategic priorities for delivering BNG.

A local planning authority (LPA) is the local government body that is empowered by law to exercise urban planning functions for a particular area. Under the Environment Act 2021, all planning permissions granted in England, with a few exemptions, will have to deliver at least 10% biodiversity net gain from November 2023. Increases over and above the required 10% net gain are then defined by the local authorities, with some requiring 20% net gain.

Mitigation and spatial hierarchies apply to the BNG metric, with on-site habitat delivery preferred. If on-site delivery is not feasible for an option, local delivery of nature strategies, such as Local Nature Recovery Strategies (LNRS), should be used to target gains in off-site areas. Links to local strategies are incentivised by the BNG metric's strategic significance multiplier. As such, it is important at an early stage to identify opportunities within the local strategies associated with each option. The purpose of this review is to produce a summary of key biodiversity aspirations from publicly available documents, namely local plans and Biodiversity Action Plans (BAPs). From this, SWW can begin to target areas for delivering gains in biodiversity and start early engagement with authorities and associated wildlife charities to ensure that those gains are aligned with local strategies as far as possible.

The planning system is designed to be applied by local government and communities. Many parts of England have 3 tiers of local government:

- County councils

- District, borough or city councils
- Parish or town councils

District councils are responsible for most planning matters, apart from transport, minerals and waste planning which are typically functions of the county council. Where they exist, parish and town councils play an important role in commenting on planning applications that affect their area. The government wants to see planning decisions taken at the lowest level possible and has introduced the ability for parish and town councils to produce neighbourhood plans which, once in force, will inform policies used to make decisions on planning applications, and will inform neighbourhood development orders which grant permission for development directly. Some councils, known as Unitary Councils, are not split into this three-tier system, and operate by one local authority carrying out all the functions of a county and district council.

The review has extracted the strategic BNG priorities for the local planning authorities relevant to the scoped-in options.

The review considered local strategies at a district council and unitary council level. These include:

Unitary Councils:

- Cornwall Council
- Bournemouth, Christchurch and Poole (BCP) Council
- Dorset Council

District-level Councils:

Devon County Council

- East Devon District Council
- Mid Devon District Council
- North Devon District Council
- South Hams District Council
- Teignbridge District Council
- Torridge District Council
- West Devon Borough Council

Somerset County Council

- Mendip District Council
- South Somerset District Council

Hampshire County Council

- New Forest District Council

2.6.2 Quantitative review

Open-source geospatial datasets were used to identify opportunity areas on-site and within proximity to each option, specifically within 100m of each option footprint. County Wildlife Site (CWS) information has been provided for Devon, Cornwall and Somerset County Councils and was received on the 14th of March 2022. At the time of writing no CWS information was available for Dorset Council and as such has not been included within the assessments. Only options that were scoped-in for the BNG assessments were included in the reporting of BNG opportunities. The options scoped-in for assessment are listed in Section 1.

The list of open-source geospatial datasets used for the BNG opportunity mapping were:

- Ancient Woodland (England), Natural England[25]
- Priority Habitat Inventory (England), Natural England[26]
- Sites of Special Scientific Interest (SSSI) England, Natural England[27]
- Special Area of Conservation (SAC) (England), Natural England[28]
- Special Protection Areas (SPA) (England), Natural England[29]
- Ramsar (England), Natural England[30]
- County Wildlife Sites
  - Cornwall County Wildlife Sites, ERCCIS[31]
  - Devon County Wildlife Sites, DBRC[32]
- National Nature Reserves (NNR) (England), Natural England[33]
- National Parks (England), Natural England[34]
- Local Nature Reserves (LNR) (England), Natural England[35]
- Habitat Networks (England), Natural England[36]

2.6.2.1 Habitat Networks

The Habitat Networks listed for each option are related to the National Habitat Network Maps Guide[37]:

Existing Habitat:

- Primary Habitat: Priority habitat which is the focus of the individual habitat network
- Associated Habitat: Other priority habitat types that form a mosaic or an ecologically coherent group within the landscape and may, for example, be essential for some species associated with the primary habitat
- Habitat Creation/Restoration: Areas where work is underway to either create or restore the primary habitat

[25] Natural England (2018). Ancient Woodland (England). Available at: < https://www.data.gov.uk/dataset/9461f463-c363-4309-ae77-fdcd7e9df7d3/ancient-woodland-england>

[26] Natural England (2023). Priority Habitats Inventory (England). Available at: < https://www.data.gov.uk/dataset/4b6ddab7-6c0f-4407-946e-d6499f19fcde/priority-habitats-inventory-england>

[27] Natural England (2023). Sites of Special Scientific Interest (England). Available at: <https://www.data.gov.uk/dataset/5b632bd7-9838-4ef2-9101-ea9384421b0d/sites-of-special-scientific-interest-england>

[28] Natural England (2022). Special Areas of Conservation. Available at: < https://www.data.gov.uk/dataset/a85e64d9-d0f1-4500-9080-b0e29b81fbc8/special-areas-of-conservation-england (England

[29] Natural England (2022). Special Protection Areas (England). Available at: < https://www.data.gov.uk/dataset/174f4e23-acb6-4305-9365-1e33c8d0e455/special-protection-areas-england

[30]Natural England (2021). Ramsar (England). Available at: < https://www.data.gov.uk/dataset/174f4e23-acb6-4305-9365-1e33c8d0e455/special-protection-areas-england

[31] The Environment Records Centre for Cornwall and the Isles of Scilly Data Search (ERCCIS). County Wildlife Sites. Received on 14th March 2022

[32] Devon Biodiversity Record Centre (DBRC). County Wildlife Sites. Received on 14th March 2022

[33] Natural England (2023). National Nature Reserves (England). Available at: < https://www.data.gov.uk/dataset/726484b0-d14e-44a3-9621-29e79fc47bfc/national-nature-reserves-england

[34] Natural England (2022). National Parks (England). Available at: < https://www.data.gov.uk/dataset/334e1b27-e193-4ef5-b14e-696b58bb7e95/national-parks-england

[35] Natural England (2023). Local Nature Reserves (England). Available at: < https://www.data.gov.uk/dataset/acdf4a9e-a115-41fb-bbe9-603c819aa7f7/local-nature-reserves-england

[36] Natural England (2021). Habitat Networks (England). Available at: < https://www.data.gov.uk/dataset/0ef2ed26-2f04-4e0f-9493-ffbdbfaeb159/habitat-networks-england

[37] Edwards J, Knight M, Taylor S & Crosher I. E (May 2020) 'Habitat Networks Maps, User Guidance v.2', Natural England.

- Restorable Habitat: Areas of land, predominantly composed of existing semi-natural habitat where the primary habitat is present in a degraded or fragmented form and which are likely to be suitable for restoration

Network Enhancement and Expansion:

- Network Enhancement Zone 1: Land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat. Factors affecting suitability include: proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast. Action in this zone to expand and join up existing habitat patches and improve the connections between them can be targeted here.
- Network Enhancement Zone 2: Land connecting existing patches of primary and associated habitats which is less likely to be suitable for creation of the primary habitat. Action in this zone that improves the biodiversity value through land management changes and/or green infrastructure provision can be targeted here.
- Fragmentation Action Zone: Land within Enhancement Zone 1 that connects existing patches of primary and associated habitats which are currently highly fragmented and where fragmentation could be reduced by habitat creation. Action in this zone to address the most fragmented areas of habitat can be targeted here.
- Network Expansion Zone: Land beyond the Network Enhancement Zones with potential for expanding, linking/joining networks across the landscape i.e. conditions such as soils are potentially suitable for habitat creation for the specific habitat in addition to Enhancement Zone 1. Action in this zone to improve connections between existing habitat networks can be targeted here.

2.6.3 Reporting results

The results of both the qualitative and quantitative review are reported as summary tables and include a qualitative description for each option scoped-in for assessment. The results of the BNG opportunity mapping exercise are set out in Section 5. Both the qualitative review of LPA strategic priorities for BNG and the quantitative review of areas for conservation, restoration and enhancement have been reported as summary tables, Table 5-1 to Table 5-30.

2.6.4 Assumption and limitations of the BNG opportunity mapping

The desk-based assessment was carried out using open-source datasets. The open-source datasets were used to map the potential BNG opportunities and whilst the most-up-to-date datasets were used, they may not be fully accurate. Habitat identification, and the associated opportunities for habitat creation and enhancement, will need to be refined with habitat survey data at later stages to refine the accuracy of the BNG calculations for each option. Opportunities to enhance river units and hedgerow units have not been considered as part of the BNG opportunity mapping exercise.

2.6.4.1 Achieving BNG

The Biodiversity Metric 3.1 used to undertake the BNG assessment is a tool underpinned by complex rules. The strategic nature of the BNG assessments mean that going forward, the options will require an appropriate level of BNG assessment, following site-visits by an appropriately trained ecologist to determine the baseline BNG, following trading rules, strategic significance, condition assessments, and appropriate river and hedgerow unit mitigation (where required). Therefore, when designing opportunities to deliver on net gain, it is important to consider the following:

- Satisfying the trading rules - to be compliant with the tool, habitat compensation must be like-for-like habitats or better. Delivering like-for-like habitats will depend on the value of that habitat, known as distinctiveness.
- Strategic significance - Designing opportunities to meet the objectives and goals set by the local strategy will positively influence a BNG score through a multiplier effect.

- Spatial risk multiplier - The location set to meet biodiversity net gain goals influences BNG score. Net gain located outside of the local planning authority boundaries (for habitat units), or outside the main water body (for river units), will be penalised by the multiplier effect.
- Conditions assessment - The desk-based assessment for this report has assumed a moderate condition for all identified habitats. Refining and validating the condition of existing habitats and habitat opportunity areas with a suitably trained ecologist will be essential for establishing the evidence base to support habitat proposals for each option.
- River units - River units consist of the watercourse and the riparian zone located 10m from the bank top of the watercourse. If a scheme impacts upon river units, similar to habitat units and hedgerow units, this triggers a separate requirement to achieve a 10% net gain in river units, independent of the net gains for habitat units and hedgerow units. When delivering net gain across the three types of biodiversity units, only the lowest percentage of net gain achieved can be claimed as the schemes overall net gain achievement. Impacting river units generates the requirement to achieve a separate 10% net gain, focussed on improving watercourses and the riparian zone. Only the lowest percentage of net gain achieved can be claimed as the schemes overall net gain achievement. Other mitigation measures such as water quality improvements can contribute to both BNG and WFD targets. By adopting a collaborative approach, design features can be developed that enhance traditional mitigation and complement both disciplines. Limitations on opensource data availability have excluded hedgerows from the BNG opportunity mapping exercise at this stage.
- Hedgerow units - Hedgerows are the third category of biodiversity unit, which consist of a hedge of shrubs and occasional trees or line of trees. If a scheme impacts upon hedgerow units, similar to habitat units and river units, this triggers a separate requirement to achieve a 10% net gain in hedgerow units, independent of the net gains for habitat units and river units. Limitations on opensource data availability have excluded hedgerows from the BNG opportunity mapping exercise at this stage. Habitat survey data will be required to identify existing hedgerows impacted by individual options and associated net gain opportunities and proposals will need to be developed in later stages of the project.

3 NCA and BNG Assessment Results

3.1 Natural Capital Assessment and Biodiversity Net Gain Assessments

The NCA and BNG results for the options are summarised in Table 3-1, Table 3-2, Table 3-3, and Table 3-4.

Mitigation has only been considered when outlined in the options description, or where standard mitigation must be applied.

A summary of what is included within each table is as follows:

- Table 3-1 shows the predicted impacts on natural capital during and post construction.

  Note: Only those options having stocks with predicted temporary and permanent impacts are listed.

  Some stocks reported in Table 3-1 are expected to be permanently lost. All woodland and high level stocks are expected to be reinstated on-site or off-site through re-planting scheme. These natural capital stocks include:

  - Arable
  - Ancient woodland *this habitat is presumed irreplaceable once lost.
  - Pastures
  - Other semi-natural grassland
  - Dwarf shrub heath
  - Active flood plain
  - Rivers
  - Greenspace
- Table 3-2 summarises the predicted impacts to the provision of ecosystem services screened in for detailed assessment.

  Note:

  - Carbon sequestration is scoped out when the option does not cause the temporary and/or permanent loss of associated stocks.
  - Natural hazard management is scoped out when the option does not cause the temporary and/or permanent loss of associated stocks within an active floodplain.
  - Air pollutant removal is scoped out when the option does not cause the temporary and/or permanent loss of associated stocks within an AQMA or urban area.
  - Recreation & amenity value is scoped out when the option does not cause the permanent loss of greenspace.
  - Food production is scoped out when the option does not cause the permanent loss of arable and pastoral land.
- Table 3-3Table 3-3 summarises the predicted impacts to the provision of water purification for the options screened in for qualitative assessment.
- Table 3-4 shows the unmitigated BNG outputs for the options which have been informed using the predicted permanent impacts on natural capital in Table 3-1.

  Note: At this stage the BNG only takes account reinstatement, not reprovision or additional habitat creation unless outlined in the options description.

The BNG assessments can be revisited, and mitigation or enhancement opportunities developed further to achieve the 10% BNG required within the options. Additionally, where possible, the options could aim to not only reinstate lost habitat, but also provide a greater or more diverse habitat than is lost, to achieve overall Biodiversity Net Gain in line with regulatory requirements for BNG (at the time of the project consenting) as

stated as a mandatory requirement within the Environment Act 2021. The latter could be achieved by identifying local sites of ecological interest and proposing measures which enhance these features.

All stocks reported in Table 3.1 are expected to be permanently lost. All woodland and high-level stocks are expected to be reinstated onsite or offsite through re-planting scheme. These natural capital stocks include:

- Coastal and floodplain grazing marsh
- Dwarf shrub heath
- Rivers
- Ponds and linear features
- Reservoirs
- Other-semi natural grassland
- Ancient woodland *this habitat is presumed irreplaceable once lost and therefore should be avoided
- Woodland priority habitat
- Broadleaved, mixed and yew woodland
- Coniferous woodland
- Urban woodland

Table 3-1: Predicted impacts on natural capital stocks

Natural capital stock	Area within option boundary pre-construction (Ha)	Stocks present during construction (Ha)	Stocks present post construction (Ha)	Change (Ha)
ROA13 - Duckaller and Vennbridge				
Pastoral	1.01	0.00	0.00	-1.01
ROA14 - Raise Avon Dam				
Other semi-natural grassland	7.80	0.00	0.00	-7.80
Dwarf Shrub Heath	5.38	0.00	0.00	-5.38
Active Flood Plain	0.21	0.00	0.00	-0.21
Rivers	0.97	0.00	0.00	-0.97
Modified Waters (Reservoirs)	14.48	14.48	14.48	0.00
ROA12 - Slade and Horedown WTW (GAC)				
Arable	0.25	0.00	0.25	0.00
Pastoral	6.62	0.00	6.32	-0.30
Broadleaved, Mixed and Yew Woodland	0.01	0.00	0.01	0.00
Woodland Priority Habitat	0.12	0.00	0.12	0.00
Coniferous Woodland	0.01	0.00	0.01	0.00
Active Flood Plain	0.03	0.03	0.03	0.00
Rivers	0.05	0.05	0.05	0.00
COL6 - River Hayle abstraction				
Broadleaved, Mixed and Yew Woodland	0.19	0.00	0.19	0.00
Woodland Priority Habitat	1.25	0.00	1.25	0.00
Coniferous Woodland	0.08	0.00	0.08	0.00
Greenspace	0.38	0.00	0.37	-0.01
Active Flood Plain	0.62	0.62	0.42	-0.20

Natural capital stock	Area within option boundary pre-construction (Ha)	Stocks present during construction (Ha)	Stocks present post construction (Ha)	Change (Ha)
Rivers	0.93	0.93	0.93	0.00
Ponds & Linear Features	0.02	0.02	0.02	0.00
COL2 - Colliford PS Stage 2 - River Camel Abstraction				
Arable	14.27	0.20	14.09	-0.18
Pastoral	7.01	0.00	7.01	0.00
Broadleaved, Mixed and Yew Woodland	0.09	0.00	0.09	0.00
Woodland Priority Habitat	0.50	0.00	0.50	0.00
Coniferous Woodland	0.14	0.00	0.14	0.00
Ancient Woodland	0.25	0.00	0.00	-0.25
Greenspace	0.17	0.00	0.17	0.00
Active Flood Plain	0.91	0.24	0.90	-0.01
Rivers	0.35	0.35	0.35	0.00
COL9 - Leswidden Pool				
Arable	2.89	0.00	2.89	0.00
Dwarf Shrub Heath	1.31	0.00	1.31	0.00
Woodland Priority Habitat	0.01	0.01	0.01	0.00
Lakes and Standing Waters	0.05	0.05	0.05	0.00
ROA15 - Gatherley Phase 2				
Arable	5.39	0.00	5.39	0.00
Pastoral	7.96	0.00	7.96	0.00
Other semi-natural Grassland	0.19	0.00	0.19	0.00
Broadleaved, Mixed and Yew Woodland	0.41	0.00	0.41	0.00
Woodland Priority Habitat	2.02	0.00	2.02	0.00
Active Flood Plain	1.58	1.58	1.58	0.00
Rivers	0.72	0.72	0.72	0.00
Ponds & Linear Features	0.01	0.01	0.01	0.00
WIM5 - Indirect potable reuse - stream support for Dotton WTW				
Pastoral	2.03	0.00	2.03	0.00
Coniferous Woodland	0.07	0.00	0.07	0.00
Greenspace	0.01	0.00	0.01	0.00
BNW6 – Longham ASR				
Pastoral	0.14	0.00	0.14	0.00
Active Flood Plain	0.52	0.52	0.52	0.00
Lakes & Standing Waters	0.03	0.03	0.03	0.00
COL19 – Boswyn stream/Cargenwen Reservoir/Carwynnen stream				
Arable	12.04	0.00	12.04	0.00
Pastoral	3.70	0.00	3.70	0.00
Broadleaved, Mixed and Yew Woodland	0.70	0.00	0.70	0.00

Natural capital stock	Area within option boundary pre-construction (Ha)	Stocks present during construction (Ha)	Stocks present post construction (Ha)	Change (Ha)
Woodland Priority Habitat	2.41	0.00	2.41	0.00
Coniferous Woodland	0.20	0.00	0.20	0.00
Active Flood Plain	1.76	1.76	1.76	0.00
Rivers	0.53	0.53	0.53	0.00
COL20 – River Fal new abstraction				
Arable	40.78	0.00	34.23	-6.55
Pastoral	5.72	0.00	5.72	0.00
Broadleaved, Mixed and Yew Woodland	<0.01	0.00	<0.01	0.00
Woodland Priority Habitat	0.24	0.00	0.24	0.00
Coniferous Woodland	0.02	0.00	0.02	0.00
Active Flood Plain	0.28	0.28	0.28	0.00
Rivers	0.16	0.16	0.16	0.00
BNW14 – Ibsley Lake				
Coastal and Floodplain Grazing Marsh	10.76	0.00	10.76	0.00
Arable	0.21	0.00	0.21	0.00
Pastoral	1.15	0.00	1.15	0.00
Broadleaved, Mixed and Yew Woodland	0.06	0.00	0.06	0.00
Woodland Priority Habitat	0.31	0.00	0.31	0.00
Greenspace	0.08	0.00	0.08	0.00
Urban Semi Natural Habitat	0.10	0.00	0.10	0.00
Urban Woodland	0.01	0.00	0.01	0.00
Active Flood Plain	3.40	3.40	3.40	0.00
Rivers	0.60	0.60	0.60	0.00
Ponds & Linear Features	0.04	0.04	0.04	0.00
COL15 – Restormel WTW				
Pastoral	0.05	0.00	0.00	-0.05
COL21 – Alternative RWS – Cornish Metals, Crofty				
Arable	16.14	0.00	16.14	0.00
Pastures	16.76	0.00	16.76	0.00
Other Semi-Natural Grassland	0.49	0.00	0.49	0.00
Broadleaved, Mixed and Yew Woodland	0.15	0.00	0.15	0.00
Woodland Priority Habitat	0.40	0.00	0.40	0.00
Coniferous Woodland	0.04	0.00	0.04	0.00
Greenspace	0.01	0.00	0.01	0.00
Active Flood Plain	2.92	2.92	2.92	0.00
Rivers	0.20	0.20	0.20	0.00
Modified Waters (Reservoirs)	0.27	0.27	0.27	0.00

Natural capital stock	Area within option boundary pre-construction (Ha)	Stocks present during construction (Ha)	Stocks present post construction (Ha)	Change (Ha)
Ponds & Linear Features	0.01	0.01	0.01	0.00
ROA2 – River Erme – Reloction of intake				
Pastoral	0.23	0.00	0.23	0.00
Broadleaved, Mixed and Yew Woodland	0.01	0.01	0.01	0.00
Woodland Priority Habitat	0.05	0.01	0.05	0.00
Greenspace	0.44	0.00	0.44	0.00
Active Flood Plain	1.77	1.73	1.73	-0.04
Rivers	0.23	0.23	0.23	0.00
ROA3 – River Yealm – Relocation of intake				
Arable	0.50	0.00	0.34	-0.16
Active Flood Plain	0.29	0.28	0.28	-0.01
ROA17 – Littlehempston WTW – Increase water offsite to licence maximum, offsite high lift pumping and main capacity				
Coastal and Floodplain Grazing Marsh	1.15	0.00	1.15	0.00
Arable	34.35	0.00	34.35	0.00
Pastoral	13.12	0.00	13.12	0.00
Orchards and Top Fruit	0.01	0.01	0.01	0.00
Broadleaved, Mixed and Yew Woodland	0.23	0.00	0.23	0.00
Woodland Priority Habitat	0.68	0.00	0.68	0.00
Coniferous Woodland	0.02	0.00	0.02	0.00
Ancient Woodland	0.01	0.01	0.01	0.00
Greenspace	0.08	0.00	0.08	0.00
Active Flood Plain	4.37	4.37	4.37	0.00
Rivers	0.70	0.70	0.70	0.00
Ponds & Linear Features	0.02	0.02	0.02	0.00
WIM12 – Allers Springs				
Pastoral	0.02	0.00	0.00	-0.02
ROA7 – Expansion of Northcombe WTW to 60 Ml/d				
Pastoral	0.10	0.00	0.00	-0.10
WIM2 – Sidford borehole commissioning				
Arable	0.23	0.00	0.16	-0.07
Woodland Priority Habitat	0.06	0.00	0.06	0.00
Active Flood Plain	0.34	0.04	0.04	-0.30
WIM11 – Couchill Springs, Seaton				
Pastoral	0.89	0.00	0.89	0.00
Other Semi-Natural Grassland	0.52	0.00	0.52	0.00
Woodland Priority Habitat	0.01	0.01	0.01	0.00
Coniferous Woodland	0.17	0.00	0.17	0.00
Greenspace	0.02	0.00	0.02	0.00

Natural capital stock	Area within option boundary pre-construction (Ha)	Stocks present during construction (Ha)	Stocks present post construction (Ha)	Change (Ha)
Active Flood Plain	0.11	0.11	0.11	0.00
WIM6 – Increase Allers WTW capacity				
Pastoral	0.04	0.00	0.00	-0.04
WIM7 – Increase Pynes to licence limit 66.46 Ml/d				
Coastal and Floodplain Grazing Marsh	0.05	0.00	0.05	0.00
Pastoral	0.01	0.00	0.00	-0.01
Active Flood Plain	0.13	0.00	0.00	-0.13

Table 3-2: Quantitative detailed assessment of the unmitigated predicted permanent impacts on the provision of ecosystem services

Ecosystem services	Baseline value (£/year)	Estimated value post construction (£/year)	Temporary impact from construction (£/year)	Total future value (£/year)	Overall change in value (£/year)
ROA13 - Duckaller and Vennbridge					
Carbon storage	£151.57	£0.00	-£151.57	£0.00	-£151.57
Food production	£79,968.53	£79,154.90	-£813.63	£79,154.90	-£813.73
Total	£80,120.10	£79,154.90	-£965.20	£79,154.90	-£965.20
ROA14 - Raise Avon Dam					
Carbon storage	£1,137.07	£0.00	-£1,137.07	£0.00	-£1,137.07
Total	£1,137.07	£0.00	-£1,137.07	£0.00	-£1,137.07
ROA12 - Slade and Horedown WTW (GAC)					
Carbon storage	£1,295.63	£0.00	-£1,295.63	£1,177.59	-£118.04
Natural hazard management	£14.42	£0.00	-£14.42	£10.81	-£3.60
Food production	£83,000.00	£82,700.00	-£300.00	£82,700.00	-£300.00
Total	£84,310.05	£82,700.00	-£1,610.05	£83,888.40	-£421.64
COL6 - River Hayle abstraction					
Carbon storage	£3,088.11	£0.00	-£3,088.11	£2,316.08	-£772.03
Natural hazard management	£156.53	£0.00	-£156.53	£117.40	-£39.13
Total	£3,244.64	£0.00	-£3,244.64	£2,433.38	-£811.16
COL2 - Colliford PS Stage 2 - River Camel Abstraction					
Carbon storage	£3,877.17	£8.09	-£3,869.08	£2,955.63	-£921.54
Natural hazard management	£100.92	£0.00	-£100.92	£56.38	-£44.54
Food production	£80,084.77	£79,736.07	-£348.70	£79,736.07	-£348.70
Total	£84,062.86	£79,744.16	-£4,318.70	£82,748.08	-£1,314.78
COL9 - Leswidden Pool					
Carbon storage	£135.68	£18.79	-£116.89	£130.98	-£4.70
Natural Hazard Management	£1.03	£1.03	£0.00	£0.77	-£0.26
Total	£136.71	£19.82	-£116.89	£131.75	-£4.95
ROA15 - Gatherley Phase 2					
Carbon storage	£6,006.19	£0.00	-£6,006.19	£4,864.90	-£1,141.29
Natural hazard management	£250.24	£0.00	-£250.24	£187.68	-£62.56
Total	£6,256.43	£0.00	-£6,256.43	£5,052.58	-£1,203.85

Ecosystem services	Baseline value (£/year)	Estimated value post construction (£/year)	Temporary impact from construction (£/year)	Total future value (£/year)	Overall change in value (£/year)
WIM5 - Indirect potable reuse - stream support for Dotton WTW					
Carbon storage	£612.26	£0.00	-£612.26	£601.49	-£10.76
Natural hazard management	£1.03	£0.00	-£1.03	£0.77	-£0.26
Food Production	£80,700.00	£80,400.00	-£300.00	£80,400.00	-£300.00
Total	£81,313.29	£80,400.00	-£913.29	£81,002.27	-£311.02
BNW6 – Longham Aquifer Recharge					
Carbon storage	£21.01	£0.00	-£21.01	£21.01	-£0.00
Total	£21.01	£0.00	-£21.01	£21.01	£0.00
BNW14 – Ibsley Lake					
Carbon storage	£909.97	£0.00	-£909.97	£731.49	-£178.47
Natural hazard management	£39.13	£0.00	-£39.13	£29.35	-£9.78
Air Pollutant Removal	£149.22	£0.00	-£149.22	£117.64	-£31.58
Total	£1,098.32	£0.00	-£1,098.32	£878.49	-£219.83
COL19 – Boswyn stream/Cargenwen Reservoir/Carwynnen stream					
Carbon storage	£7,841.94	£0.00	-£7,841.94	£6,142.01	-£1,699.93
Natural hazard management	£340.86	£0.00	-£340.86	£255.65	-£85.22
Air Pollutant Removal	£1,257.87	£0.00	-£1,257.87	£997.52	-£260.35
Total	£9,440.68	£0.00	-£9,440.68	£7,395.18	-£2,045.50
COL20 – River Fal new abstraction					
Carbon storage	£3,061.39	£0.00	-£3,061.39	£2,658.25	-£403.15
Natural hazard management	£27.16	£0.00	-£27.16	£20.37	-£6.79
Food Production	£104,493.77	£104,145.07	-£348.70	£104,145.07	-£348.70
Total	£107,582.32	£104,145.07	-£3,437.25	£106,823.68	-£758.64
COL15 – Restormel WTW					
Carbon storage	£7.50	£0.00	-£7.50	£0.00	-£7.50
Food Production	£89,383.43	£89,034.73	-£348.70	£89,034.73	-£348.70
Total	£89,390.94	£89,034.73	-£356.20	£89,034.73	-£356.20
COL21 – Alternative RWS – Cornish Metals, Crofty					
Carbon Storage	£4,466.12	£0.00	-£4,466.12	£4,159.95	-£306.17
Natural Hazard Management	£60.76	£0.00	-£60.76	£45.57	-£15.19
Air Pollutant Removal	£475.82	£0.00	-£475.82	£429.42	-£46.41
Total	£5,002.70	£0.00	-£5,002.70	£4,634.93	-£367.77
ROA2 – River Erme					
Carbon Storage	£147.23	£37.57	-£109.66	£119.05	-£28.18
Natural Hazard Management	£6.18	£2.06	-£4.12	£4.63	-£1.54
Total	£153.41	£39.63	-£113.78	£123.69	-£29.72
ROA3 – River Yealm					
Carbon Storage	£20.35	£0.00	-£20.35	£13.92	-£6.43
Food Production	£123,439.80	£123,091.10	-£348.70	£123,091.10	-£348.70
Total	£123,460.15	£123,091.10	-£369.05	£123,105.02	-£355.13
ROA17 – Littlehempston WTW – Increase water offsite to licence maximum, offsite high lift pumping and main capacity					
Carbon Storage	£5,182.26	£18.79	-£5,163.48	£4,712.15	-£470.11

Ecosystem services	Baseline value (£/year)	Estimated value post construction (£/year)	Temporary impact from construction (£/year)	Total future value (£/year)	Overall change in value (£/year)
Natural Hazard Management	£96.80	£1.03	-£95.77	£71.83	-£24.97
Air Pollutant Removal	£913.36	£3.15	-£910.21	£839.42	-£73.94
Total	£6,192.42	£22.96	-£6,160.46	£5,623.40	-£569.02
WIM12 – Allers Springs					
Carbon Storage	£3.00	£0.00	-£3.00	£0.00	-£3.00
Food Production	£85,896.43	£85,431.50	-£464.93	£85,431.50	-£464.93
Total	£85,899.43	£85,431.50	£467.93	£85,431.50	-£467.93
ROA7 – Expansion of Northcombe WTW to 60 Ml/d					
Carbon Storage	£15.01	£0.00	-£15.01	£0.00	-£15.01
Food Production	£12,088.27	£12,088.27	£0.00	£12,088.27	-£464.93
Total	£12,103.27	£12,088.27	-£15.01	£12,088.27	-£15.01
WIM2 – Sidford borehole commissioning					
Carbon Storage	£122.02	£0.00	-£122.02	£91.01	-£31.01
Natural Hazard Management	£6.18	£0.00	-£6.18	£4.63	-£1.54
Food Production	£93,800.30	£93,451.60	-£348.70	£93,451.60	-£348.70
Total	£93,928.50	£93,451.60	-£476.90	£93,547.25	-£381.26
WIM11 – Couchill Springs, Seaton					
Carbon Storage	£1,043.91	£18.79	-£1,025.12	£835.83	-£208.08
Natural Hazard Management	£18.54	£1.03	-£17.51	£13.90	-£4.63
Total	£1,062.45	£19.82	-£1,042.63	£849.73	-£212.71
WIM6 – Increase Allers WTW capacity					
Carbon Storage	£6.60	£0.00	-£6.60	£0.00	-£6.60
Food Production	£85,896.43	£85,431.50	-£464.93	£185,431.50	-£464.93
Total	£85,903.04	£85,431.50	-£471.54	£85,431.50	-£471.54
WIM7 – Increase Pynes to licence limit 66.46 Ml/d					
Carbon Storage	£1.50	£0.00	-£1.50	£0.00	-£1.50
Food Production	£61,022.50	£60,673.80	-£348.70	£60,673.80	-£348.70
Total	£61,024.00	£60,673.80	-£350.20	£60,673.80	-£350.20
BNW1 – Borehole development, existing borehole remedial works - Ampress					
Carbon Storage	£37.57	£0.00	-£37.57	£28.18	-£9.39
Natural Hazard Management	£2.06	£0.00	-£2.06	£1.54	-£0.51
Total	£39.63	£0.00	-£39.63	£29.72	-£9.91

Table 3-3: Qualitative assessment of the unmitigated predicted impacts on the provision of water purification

Option	Likely baseline provision	Construction impacts	Likely future provision	Overall change in provision
Water purification				
BNW1 - Borehole development, existing borehole remedial works – Ampress BNW14 - Ibsley Lake COL19 - Boswyn stream/Cargenwen Reservoir/Carwynnen stream COL2 - Colliford PS Stage 2 - River Camel Abstraction COL20 - River Fal new abstraction COL21 - Alternative RWS – Cornish Metals, Crofty COL6 - River Hayle abstraction ROA12 - Slade and Horedown WTW (GAC) ROA15 - Gatherley Phase 2 ROA17 - Littlehempston WTW ROA2 - River Erme WIM11 - Couchill Springs, Seaton WIM2 - Sidford borehole commissioning WIM7 - Increase Pynes to licence limit 66.46 Ml/d	The stocks likely provide a high provision of the ecosystem service due to the natural capital asset's high capacity to store and absorb pollutants and the proximity of the asset to a water source.	The provision of services will be lost during construction.	The future provision of the ecosystem service provided by the stocks will likely be reduced.	--
Water flow regulation				
BNW14 - Ibsley Lake BNW6 - Longham Aquifer Recharge COL19 - Boswyn stream/Cargenwen Reservoir/Carwynnen stream COL2 - Colliford PS Stage 2 - River Camel Abstraction COL20 - River Fal new abstraction COL21 - Alternative RWS – Cornish Metals, Crofty COL6 - River Hayle abstraction COL9 - Leswidden Pool ROA12 - Slade and Horedown WTW (GAC) ROA15 - Gatherley Phase 2 ROA17 - Littlehempston WTW	The stocks provide a regulation of water flow, both retaining water within the catchment and providing water to local communities. The preservation of stocks will reduce negative impacts to the ecosystem service.	The provision of services will be retained during construction.	The future provision of the ecosystem service provided by the stocks will likely remain.	0

Option	Likely baseline provision	Construction impacts	Likely future provision	Overall change in provision
WIM 5 - Indirect potable reuse - stream support for Dotton WTW				
ROA2 - River Erme	The stocks provide a regulation of water flow, both retaining water within the catchment and providing water to local communities. The preservation of stocks will reduce negative impacts to the ecosystem service.	The provision of services will be retained during construction of the pipeline, but there will be losses where the stocks overlap with aboveground infrastructure.	The loss of contributing stocks has the potential to impede water flow on site. The loss of existing stocks will require a Level 2 WFD to further assess the impact of the option on water flow regulation.	--
ROA14 - Raise Avon Dam	The stocks provide a regulation of water flow, both retaining water within the catchment and providing water to local communities. The loss of stocks will increase negative impacts to the ecosystem service.	The provision of water flow regulation services of contributing stocks will be lost during construction. However, the addition of a reservoir will bring additional water flow regulation to the environment.	The loss of contributing stocks has the potential to impede water flow on site. The addition of a reservoir will regulate flows, control water movement, and maintain water supplies in dry periods, enabling a resilient supply of water to consumers, however the loss of existing stocks will require a Level 2 WFD. As such, the impact of the option on water flow regulation cannot be assessed at this stage.	++

Table 3-4: Summary of the unmitigated BNG Metric outputs

Option	Option element	On-site Baseline (BU)	On-Site Post Intervention (BU)	Total Net Unit change (BU)	Total Percentage Change
BNWI	Borehole development, existing borehole remedial works - Ampress	0.16	0.09	-0.07	-41.40
BNW6	Longham Aquifer Recharge	0.64	0.63	-0.01	-1.53
BNW14	Ibsley Lake	146.66	43.10	-103.56	-74.26
COL2	Colliford PS Stage 2 - River Camel Abstraction	68.74	57.95	-10.79	-16.72
COL6	River Hayle abstraction	29.68	15.22	-14.46	-78.07
COL9	Leswidden Pool	22.22	8.84	-13.38	-60.21
COL15	Restormel WTW	0.20	0.00	-0.20	-100.00
COL19	Boswyn stream/Cargenwen Reservoir/Carwynnen stream	80.56	48.92	-31.64	-39.28
COL20	River Fal new abstraction	109.35	88.17	-21.18	-19.71
COL21	Alternative RWS – Cornish Metals, Crofty	116.04	96.58	-19.46	-17.12
ROA2	River Erme	6.12	5.33	-0.79	-23.37
ROA3	River Yealm	1.00	0.66	-0.34	-34.38
ROA7	Expansion of Northcombe WTW to 60 Ml/d	2.20	0.00	-2.20	-100.00
ROA12	Slade and Horedown WTW (GAC)	29.14	23.22	-5.92	-20.75
ROA13	Duckaller and Vennbridge	4.04	0.00	-4.04	-100.00
ROA14	Raise Avon Dam	241.18	115.84	-125.34	-51.97
ROA15	Gatherley Phase 2	81.14	51.74	-29.40	-40.55
ROA17	Littlehempston WTW	154.06	125.92	-28.14	-19.32
WIM2	Sidford borehole commissioning	1.18	0.38	-0.80	-67.39
WIM5	Indirect potable reuse - stream support for Dotton WTW	20.02	16.89	-3.13	-16.32
WIM6	Increase Allers WTW capacity	0.16	0.00	-0.16	-100.00
WIM7	Increase Pynes to licence limit 66.46 Ml/d	0.64	0.14	-0.50	-78.34
WIM11	Couchill Springs, Seaton	10.68	4.95	-5.73	-53.63
WIM12	Sidford borehole commissioning	0.08	0.00	-0.08	-100.00

The unmitigated BNG outputs have been informed using the predicted impacts on natural capital stocks listed in Table 3.1.

3.2 Summary of NCA and BNG assessments

3.2.1 Natural Capital Assessment

The options identified in Table 3.1 will likely cause temporary and permanent loss of stocks during construction.

Potential temporary loss of woodland stocks (broadleaved, yew, mixed, priority and coniferous) and other habitat stocks is expected during construction. However, best practice mitigation (such as directional drilling) and reinstatement/compensation of habitat means that most natural capital stocks post construction will have little change. Additionally, when habitat is destroyed during construction or implementation and then replaced it is unlikely to retain the same natural capital value.

Potential permanent loss of arable stocks, pastoral stocks, other semi-natural grassland stocks, dwarf heath shrub stocks, active floodplain stocks, river stocks, and greenspace stocks are expected to occur under the construction of some options considered. Priority habitats should be avoided whenever possible as certain

features within them are irreplaceable once destroyed. The COL2 supply-side option will likely cause the permanent loss of ancient woodland (as well as arable stocks and active flood plain). Ancient woodland is a high value natural capital stock that cannot be replaced or replicated once lost, therefore, future provision of stock presumed permanently lost. No other options are likely to cause the permanent loss of ancient woodland, however, ROA14 will likely cause the permanent loss of other semi-natural grassland stocks, dwarf heath shrub stocks, active flood plain, and river stocks.

3.2.2 Ecosystem Services

The options are likely to generate the temporary and permanent loss of natural capital stocks during construction. However, habitat expected to be reinstated/compensated to pre-construction conditions following best practice technique will likely have no permanent impact to the provision of ecosystem services. Broadleaved, mixed and yew, priority, coniferous and urban woodland have a significant maturity time with a delay of 30 years. Therefore, this delay is considered within potential future provision of this stock through the ecosystem services assessment. This can be accounted to the tree mortality rate presumed after woodland areas are replanted.

Construction impacts include the release of CO_2 due to habitat clearance, loss of natural hazard management, loss of removal of air pollutants and a reduction in water purification. However, it is not expected to affect the future value as temporarily affected stocks are expected to be reinstated. However, permanently impacted stocks will likely not be replaced post-construction hence construction impacts will lead to the permanent loss of the above-mentioned ecosystem services. Permanent loss of arable and pastoral stocks will likely result in the loss of food production.

Priority habitats such as ancient woodland are irreplaceable and once lost cannot be replaced. Therefore, the future provision of ecosystem services provided by ancient woodland, namely carbon sequestration, natural hazard management, water purification and air pollutant removal will be permanently lost.

The options present an opportunity to improve the existing habitats through post construction remediation and replacement of low value habitats with higher value habitats, discussed in further detail in Section 5. The scheme element crosses several priority habitats Network Enhancement Zones and is therefore suitable for the planting of new high value habitats.

3.2.3 Biodiversity Net Gain

Applying the methodology, the scheme element will result in the loss of BNG habitat units due to the temporary and permanent removal of habitats during construction.

4 Cumulative effects assessment

4.1 Introduction

The final task in SWW's option appraisal process is the programme appraisal. Fundamentally, the aim of the programme appraisal process is to find the 'best value' programme of supply and/or demand management options to secure a supply-demand balance across the SWW supply region.

This section provides a summary of the outputs of the NCA and BNG for SWW's programme appraisal for the constrained options that were considered to inform decisions on the development of the updated dWRMP24.

4.2 Methodology

For NCA and BNG, cumulative effects assessment only considers the Best Value Plan (BVP). The in-combination effects assessment for the Best Value Plan considers the option assessments as a whole and the habitat units that would be required to be purchased to achieve a 10% net gain in BNG. This provides an estimate of the value of the potential mitigation or enhancement opportunities that will need to be developed further to achieve the 10% BNG required within the options. Additionally, where possible, the Best Value Plan could aim to not only reinstate lost habitat, but also provide a greater or more diverse habitat than is lost, to achieve overall Biodiversity Net Gain in line with regulatory requirements for BNG (at the time of the project consenting) as stated as a mandatory requirement within the Environment Act 2021. The latter could be achieved by identifying local sites of ecological interest and proposing measures which enhance these features.

4.3 Best Value Plan

4.3.1 Options selected for the Best Value Plan

As stated in the introduction, the purpose of the update to this technical note is to reflect the updated selection of options for the BVP and to update the Natural Capital Assessment and Biodiversity Net Gain assessments accordingly.

The BVP proposed by SWW includes nine supply options, three of which are newly developed options which have not been assessed or included within this report. Table 1-1 details those options which have been fully assessed and are part of the currently defined BVP.

A cumulative effects assessment was only undertaken for those supply options which are identified in the current BVP, and those which have been fully assessed. As such, the following supply options are relevant to the cumulative effects assessment:

- BNW1 Borehole development, existing borehole remedial works
- BNW6 Longham Aquifer Recharge
- BNW7 Mendips Quarry – 30 Ml/d scheme option – Raw water transfer and augmentation of the River Stour SRO
- BNW8 Poole Effluent Recycling & Transfer (PERT) SRO
- BNW14 Ibsley Lake
- COL15 Restormel WTW

The following additional supply options have been identified as part of the current BVP but have not been assessed and therefore not mentioned up to this point. These additional three options are:

- ROA21 Roborough to Littlehempston WTW
- WIM14 Whitecross distribution upgrade

- WIM18 Cheddar 2 to Bickham Moor (still under development).

As part of the BVP, 10 drought options have been identified which have also not undergone technical assessments. These options include:

- L1 & L2 demand
- dC1 - Restormel licence
- dC2 - Stannon Lake licence
- dC3 - Porth Reservoir and Rialton Intake
- dR2 - Slade Reservoir
- dRS15/E - Roadford compensation flows
- dW1 - Brampford Speke & Stoke Canon
- dW4 - Wimbleball compensation flows
- dB2 - Stanbridge licence

Furthermore, the SRO options BNW7 and BNW8 undergo a separate environment assessment and have therefore not undergone a BNG/NCA assessment. Therefore, these options are also not included within the cumulative effects assessment.

For those options in the BVP which are not included within the cumulative effects assessment, cumulative effects cannot be ruled out at this stage. Further assessments will be undertaken on the outstanding BVP options, to provide an updated in-combination assessment, and two alternative plans, which will be provided within the next iteration of the updated dWRMP24 as part of the Statement of Response in December 2023.

Tables 4-1, 4-2, 4-3 and 4-4 outline the cumulative effects of the BVP on natural capital and biodiversity. Table 4-2 and 4-3 display the natural capital stocks impacted and the BNG assessment of the proposed Poole Effluent Recycling and Transfers (PERT) scheme at Gate 2. The assessment will be further updated at the subsequent Gate 3 stage when more data becomes available.

Table 4-1: Predicted temporary and permanent impacts on natural capital stocks for the BVP

Natural capital stock	Area within option boundary pre-construction (Ha)	Stocks present during construction (Ha)	Stocks present post construction (Ha)	Change (Ha)
Coastal and floodplain grazing marsh	10.76	0.00	10.76	0.00
Arable	0.21	0.00	0.21	0.00
Pastures	1.34	0.00	1.29	-0.05
Broadleaved, Mixed and Yew Woodland	0.07	0.00	0.07	0.00
Greenspace	0.08	0.00	0.08	0.00
Urban Semi Natural Habitat	0.10	0.00	0.10	0.00
Urban Woodland	0.02	0.00	0.02	0.00
Active floodplain	3.95	3.92	3.92	-0.03
Lakes and Standing Waters	0.03	0.03	0.03	0.00
Woodland Priority Habitat	0.31	0.00	0.31	0.00
Rivers	0.60	0.60	0.60	0.00
Ponds & linear features	0.04	0.04	0.04	0.00

Table 4-2: Quantitative detailed assessment of the unmitigated predicted permanent impacts on the provision of ecosystem services for the BVP

Ecosystem services	Baseline value (£/year)	Estimated value post construction (£/year)	Temporary impact from construction (£/year)	Total future value (£/year)	Overall change in value (£/year)
Carbon storage	£947.65	£0.00	-£947.65	£757.97	-£189.68
Natural hazard management	£41.19	£0.00	-£41.19	£30.89	-£10.30
Air Pollutant Removal	£149.22	£0.00	-£149.22	£117.64	-£31.58
Food Production	£89,383.43	£89,034.73	-£348.70	£89,034.73	-£348.70
Total	£90,521.49	£89,034.73	-£1,486.76	£89,941.23	-£580.26

Table 4-3: Qualitative assessment of the unmitigated predicted impacts on the provision of water purification and water flow regulation for the BVP

Option	Likely baseline provision	Construction impacts	Likely future provision	Overall change in provision
Water provision				
BVP	Scoped in as the option causes the temporary loss of associated stock. Stock is expected to be replaced/compensated through inset re-planting schemes. However broadleaved/coniferous/priority/urban woodland have significant maturity time with a delay of 30 years. As a result, the potential provision of these stocks will be reduced.	The provision of services will be lost during construction.	The future provision of the ecosystem service provided by the stock will likely be reduced	-
Water flow regulation				
BVP	The stocks provide a regulation of water flow, both retaining water within the catchment and providing water to local communities. The preservation of stocks will reduce negative impacts to the ecosystem service.	The provision of services will be retained during construction.	The future provision of the ecosystem service provided by the stock will likely remain.	0

Table 4-4: Summary of the unmitigated BNG Metric outputs for the BVP and the BNG habitat units required to be purchased to achieve 10% BNG

BVP	On-site Baseline (BU)	On-Site Post Intervention (BU)	Total Net Unit change (BU)	Total Percentage Change	BNG habitat unit purchase (BU)
BVP	140.74	36.84	-103.90	-73.83%	117.97

The BVP is expected to result in -73.83% net loss of biodiversity units (Table 4.4), as a result of a few options generating a net loss of biodiversity units in pastures and active floodplain. All ecosystem services experience a negative change in value (£2023/year), resulting in an overall loss in ecosystem services of -£580.26/year (see Table 4.2). The BVP provision of water services is likely to be lost during construction and its future provision is likely to be reduced whilst water flow regulation services are likely to be retained during construction and remain in the future (see Table 4.3).

4.4 SRO's

4.4.1 West Country South Poole Effluent Recycling & Transfer (PERT) SRO

The PERT SRO results have been summarised from the Gate 2 Submission[38]. A total of 15.64ha of temporary habitat loss and 5.61km of temporary hedgerow loss was calculated for the whole PERT scheme due to the construction of pipelines and construction compounds. In the absence of off-site mitigation this

[38] SWW & Wessex Water (2022). Strategic Regional Water Resource Solutions: Poole Effluent Recycling and Transfers, Standard Gate Two Submission. Available at: poole-sro-gate-2-report-nov-2022.pdf (wessexwater.co.uk)

would result in a net change of -57.69& BNG area units and -16.32% of hedgerow units. A total of 2.07ha of permanent habitat loss and 0.069km of permanent hedgerow loss is calculated for the whole PERT scheme, in the absence of off-site mitigation, which would result in a net change of -100% BNG area and hedgerow units. The proposed wetland area creation/enhancement would deliver an increase of 13.58 BNG area units which would equate to a 15.60% net gain for the permanent construction impact. The net gain achieved through the offsite mitigation, deficit from permanent habitat loss, and additional units from the proposed wetland creation would result in a net gain of 13.90% for the full PERT Scheme permanent and temporary impacts. Areas of land which may be suitable for mitigation have been identified using scoring criteria with the highest scoring sites potentially offering more effective, functioning mitigation.

The overall environmental benefits in relation to climate regulation, natural hazard regulation and agriculture ecosystem services over the 80-year lifespan of the scheme equate to £304,326.

4.4.2 Mendip Quarries SRO

The Mendips Quarry SRO results have been summarised from the Gate 2 Submission[39]. The assessment concluded that the scheme would cause both temporary and permanent loss of natural capital stocks although best practice mitigation methods, such as directional drilling and reinstatement/compensation of habitat would mean that most natural capital stocks would have little to no change post-construction. The NCA should be further refined at gate three, taking into account design development, finalised feasibility and planning investigations. The BNG assessment concluded that the reservoir component of the scheme would result in a BNG gain, but without mitigation the overall scheme would likely to result in a loss of BNG habitat units due to permanent loss of natural capital assets. Mitigation and enhancement opportunities for the scheme have been suggested to reduce loss of BNG habitat units and introduce net gain. A Phase 1 Habitat survey is likely to be required at later gate stages to determine an accurate baseline once the final scheme design is available, in order to determine the on-site and off-site mitigation, enhancement and creation required to achieve at least 10% net gain.

4.4.3 Cheddar 2 SRO

The Cheddar 2 SRO results have been summarised from the Gate 2 Submission[40]. A total of 210.75ha of temporary habitat loss and 10.23km of temporary hedgerow loss was calculated for the whole Cheddar 2 Source Scheme due to the construction of pipelines and construction compounds. In the absence of off-site mitigation this would results in a net change of -21.32% BNG area units and -16.32% pf hedgerow units.

A total of 7.00ha of permanent habitat loss and 1.01km of permanent hedgerow loss is calculated for the above ground infrastructure for the Cheddar 2 Source Scheme, in the absence of off-site mitigation, which would result in a net change of -100% BNG area and hedgerow units. The creation of the Cheddar 2 reservoir would result in the permanent loss of 99.72ha of habitats and 14.85km of hedgerows, creation of the reservoir would result in the addition of 99.72ha of reservoir habitat, in the absence of off-site mitigation this would result in a net change of -17.18% BNG and -100.00% of hedgerow units. Areas of land which may be suitable for mitigation have been identified using scoring criteria with the highest scoring sites potentially offering more effective, functioning mitigation.

The overall environmental benefits in relation to climate regulation, natural hazard regulation and agriculture ecosystem services over the 80-year lifespan of the scheme equate to £1,329,023.

[39] SWW & Wessex Water (2023). Strategic Regional Water Resource Solutions, Gate two submission, Mendip quarries. Available at: https://wwcorp-cms-pp.ytlukltd.co.uk/media/cswiottl/mendip-quarries-sro-gate-2-report-jul-2023.pdf

[40] Bristol Water & Wessex Water (2022). Strategic Regional Water Resource Solutions: Cheddar 2 Source and Transfer. Standard Gate Two Submission. Available at https://corporate.wessexwater.co.uk/media/3n0hq3ij/cheddar-sro-gate-2-report-nov-2022.pdf

4.5 Opportunities

Opportunities should be considered to ensure that the natural environment is left in a better condition than pre-construction conditions for the BVP. This should be achieved by one or both of the following:

- **Mitigation**: Opportunities to offset the net loss of biodiversity asset(s) and/or natural capital stock(s) (ecosystem service).
- **Enhancements**: Opportunities that, once introduced and established, would result in a net gain to a biodiversity asset and/or natural capital stock(s) (ecosystem service).

As a core principle, where possible, the BVP should aim to not only reinstate lost habitat, but also provide a greater or more diverse habitat than is lost, to achieve overall BNG. The latter could be achieved by identifying local sites of ecological interest and proposing measures. Any habitats that are created or enhanced to achieve BNG are required to be secured for 30 years, through management, maintenance, and monitoring. The natural capital map which is based on the methodology described in the NECR285 (see Section 2) should be utilised, where possible, to assist in identifying opportunities to improve natural capital.

There are limitations to the assessment, including the exact type and condition of habitats on site, the construction programme for the options, and which options are under mandatory BNG. While the unknowns reflect the early stages of the BVP option development for South West Water's updated dWRMP24, the assessment provides the information to develop a high-level strategy.

A summary of the potential NCA, BNG mitigation and enhancement measures for each sub-component type of the BVP are outlined in Table 4-5. Further explanation into the potential enhancement measures is provided within the sections below.

Table 4-5: Summary of potential net gain mitigation and enhancement opportunities

Option element	Mitigation opportunity	Enhancement opportunity
All option elements	Option layouts to be amended to avoid the permanent loss of high value natural capital assets that once lost, cannot be easily reinstated. Assets include ancient woodland and traditional orchards.	Creation of higher value habitat within grassland, arable and pasture natural capital assets onsite to achieve an increase in Biodiversity Units (BU) and work towards a 10% uplift in BNG.
	Options to identify area for the creation and/or reinstatement of high value natural capital assets, including: Coastal and floodplain grazing marsh Lowland fens Lowland raised bog Reedbeds Blanket bog Hay meadows Dwarf shrub heath Broadleaved, mixed and yew woodland Coniferous woodland Bluespace Greenspace	Habitat creation work within the adjacent priority habitats. Options fall within or are in the vicinity of habitat network zones[41]: Habitat restoration-creation Restorable habitat Fragmentation action zone Network enhancement zones 1 and 2 Expansion zone These areas identify specific locations for a range of actions to help improve the ecological resilience for each of the habitats/habitat networks. The options should look to identify habitat network zones and priority habitats within the near vicinity and look to improve/create/restore habitats which would help to work towards increasing BU and work towards a 10% uplift in BNG.

[41] Edwards J, Knight M, Taylor S & Crosher I. E (May 2020) 'Habitat Networks Maps, User Guidance v.2', Natural England

Option element	Mitigation opportunity	Enhancement opportunity
	Construction practices to be considered to reduce the amount of clearance required for, especially in areas that include high value natural capital assets (see above for list).	Increase the quality/quantity of freshwater assets, including lakes, ponds located in designated SSSIs, pending detailed assessment of local conditions and available space.
	Directional drilling to be used where possible to avoid loss of high value natural capital assets (see above for list).	Options to identify suitable areas offsite for the creation, enhancement and/or restoration to develop off-site net gains, working towards achieving a 10% uplift in BNG.
		Identify areas of local peatland restoration
Wastewater treatment works, abstraction and treatment works, and other option elements that contain above ground infrastructure		Seeding of grassland within footprints of the above ground infrastructure, where possible.

4.5.1 BNG Unit Purchase

BNG can be achieved via a new statutory biodiversity credits scheme. Credits can be bought by developers as a last resort when onsite and local offsite provision of habitat cannot deliver the BNG required. The price of biodiversity credits will be set higher than prices for equivalent biodiversity gain on the market and are expected to be purchased through a national register for net gain delivery sites. Natural England is in the process of running pilot schemes to provide a practical insight into the implications of the scheme, which is expected to go live spring 2023. The estimated BU credits that the BVP would be required to purchase to achieve a 10% BNG is 117.97BU.

Habitat creation possibilities, other than unit purchase, to achieve a 10% BNG gain include:

- On-site: Improve the existing habitats on-site through post construction remediation and replacement of low BNG value habitats with higher BNG value habitats
- Off-site: Purchase suitable areas of off-site land within the local area and/or at a regional scale to offset BNG decrease by improving the existing habitats within the off-site land and/or by replacing existing habitats with higher BNG value habitats.
- On-site and off-site: Improve existing habitats and/or replacement of low BNG value habitats with higher BNG value habitats as part of the catchment management options.

It is important that, where possible, SWW starts to consider reaching out to local non-government organisation and planning authorities who may potentially be able to carry out BNG both onsite and offsite. Early engagement may help to get the best ideas of local opportunities for enhancement, how this can be achieved, local priorities and limiting factors.

SWW and Mott MacDonald are looking at the BNG opportunities through Opensource spatial datasets to produce opportunity mapping for the SWW operational area and relevant Local Planning Authority. This will enable SWW to understand how they may provide 10% net gain in BNG for their options going forward.

5 BNG Opportunity Mapping

5.1 Local Planning Authority strategic priorities for delivering BNG

The results of the qualitative review of strategic priorities for LPAs that include an SWW updated dWRMP24 BVP option are set out in Table 5-1 below.

Table 5-1: Local Planning Authorities and their strategic priorities for delivering BNG

Council	Strategic Priorities for Biodiversity	BNG Requirement	SWW BVP Option
Dorset Council	Policy Env3 'Biodiversity and Net Gain' from Dorset Councils Local Plan[42] strategy focuses upon protecting and enhancing Dorset's unique environment by delivering sustainable development which respects the area's biodiversity and increases the natural capital value of these assets, in recognition of the benefits this will bring to the economy and wellbeing. Dorset Habitat Restoration sites have been mapped from habitat restoration, habitat re-creation and wetland creation data gathered from organisations including Dorset Wildlife Trust, Dorset County Council, Natural England, and Farming & Wildlife Advisory Group southwest (FWAG SW)[43]. Conservation practices such as the removal of invasive species, ploughing botanically poor grassland sites and re-seeding or covering with green hay or heather brashing can give sites a good start towards providing better habitat for native species. Many of the sites included in the habitat restoration layer are part of long-term projects, e.g., the restoration of an area after landfill or mineral workings; and landowners may have received funding to help with the restoration, e.g., through projects such as Pastures New or Tomorrow's Heathland Heritage. In general, types of Dorset Habitat Restoration sites include: ○ Arable conversion to permanent grassland, heathland, wetland or broadleaved woodland ○ Intensive grassland to permanent hay meadows e.g., green hay sites ○ Plantation on Ancient Woodland sites restored to mixed woodland ○ Post-1945 mineral site restoration ○ Green infrastructure provided by development ○ Removal of alien species that have replaced natural vegetation, e.g., Rhododendron on heathland ○ Removal of plantation pine forest or dense stands of self-sown pine over heathland ○ Orchard planting, including community orchards ○ Wetland creation including ponds, reedbeds and field scrapes ○ River restoration including realignment of the channel	10%	BNW6 BNW14

[42] Dorset Council (2021). Dorset Council Local Plan, Consultation January 2021. Volume 1. Available at: <https://www.dorsetcouncil.gov.uk/documents/35024/285538/DCLP-Jan-2021-DorsetCouncilLocalPlan-vol1.pdf/7e0ff0f0-426f-523d-bd45-cc1fe4d60fac>

[43] Dorset County Council. Natural Environment Team, Advice Notice, Habitat Restoration Sites Advice Note. Available at: https://www.dorsetcouncil.gov.uk/documents/35024/283707/Habitat_Restoration_Sites_Advice_Note_2.pdf/a44809bd-3877-e27c-d83e-cf22acb5da08. (Accessed 4th May 2023)

Council	Strategic Priorities for Biodiversity	BNG Requirement	SWW BVP Option
New Forest District Council	Within the New Forest District Council Local Plan[44], Policy STR1 aspires to achieve an environmental net gain, avoiding wherever possible development that may impact on the integrity of the New Forest, Solent, River Avon and other International Nature Conservation sites and Protection of the countryside. Policy STR2 aspires to protect the countryside, Cranborne Chase Area of Outstanding Natural Beauty and the adjoining New Forest National Park. The New Forest Biodiversity Action Plan in the New Forest has the following initiatives[45]: ○ River catchment management (e.g., Lymington and the Blackwater) ○ Re-introduction of grazing to commons and other suitable sites beyond the Perambulation of the Forest where appropriate ○ A programme to link the requirement for back up land for stock grazing the open forest, with land of nature conservation importance that would benefit from grazing in the forest fringe, coastal plain and Avon Valley ○ A programme of action for the maintenance and restoration of habitats in the forest fringe including ponds, road verges, hedges, and unimproved grassland ○ Review of key issues affecting habitat management in the Avon Valley and the contribution of past and current support schemes operating in the valley, and development of a co-ordinated land management strategy for the valley.	10%	BNW1 BNW14
Cornwall	Policy 23 in the Cornwall Local Plan[46], Natural Environment, states developments must conserve, protect and where possible enhance biodiversity and geodiversity interests and soils commensurate with their status and giving appropriate weight to their importance. The Council has produced the Cornwall Planning for Biodiversity guide[47] which contains guiding principles for developers. Cornwall was one of only 5 areas to test the creation of a draft Local Nature Recovery Strategy. In late 2020 to early 2021 they worked with local stakeholders to create a first draft of local opportunities, priorities, and a map of nature in Cornwall[48]. Cornwall's short-term priorities included: ○ Wetland and naturalised watercourses ○ Woodland and ancient woodland ○ Cornish hedges & edges ○ High nature value farmland & wildlife rich grassland ○ Our coastal fringe	10%	COL2 COL6 COL9 COL15 COL19 COL20 COL21

[44] New Forest District Council (2020). Local Plan 2016-2036, Park One: Planning Strategy. Available at: https://www.newforest.gov.uk/media/705/Local-Plan-Document-2016-2036/pdf/Local_Plan_2016-2036_Part_One_FINAL.pdf?m=637329191351130000

[45] New Forest National Park Authority (2018). Nature in the New Forest: action for biodiversity, Available at: https://www.newforestnpa.gov.uk/app/uploads/2018/05/Nature-in-the-New-Forest.pdf (

[46] Cornwall Council (Adopted 2016). Cornwall Local Plan, Strategic Policies 2010-2030. Available at: https://legacy.southsomerset.gov.uk/media/707200/south_somerset_local_plan_2006-2028_adoption_version_march_2015.pdf

[47] Cornwall Council (Adopted 2018). Cornwall Planning for Biodiversity guide. Available at: https://www.cornwall.gov.uk/media/v1roqk0x/planning-for-biodiversity-v14.pdf

[48] Cornwall & Isles of Scilly Local Nature Partnership. Cornwall Nature Recovery Pilot. Available at: https://naturecios.org.uk/blog/uncategorized/nature-recovery-pilot/ . Accessed 4th February 2023

Council	Strategic Priorities for Biodiversity	BNG Requirement	SWW BVP Option
	○ Soils Cornwall's medium-term priorities included: ○ Heathland mosaics ○ Urban green spaces ○ Reintroductions & threatened species ○ Pollinator habitats ○ Inshore habitats & marine protected areas		
South Hams	Policy SPT12, of the Plymouth & Southwest Devon Joint Local Plan[49], Strategic Approach to the Natural Environment, aims to protect, conserve, and enhance the distinctive characteristics, special qualities and important features of the natural environment. The strategic approach protects the hierarchy of international, national and locally designated sites, commensurate with their status, and takes account of the natural infrastructure functions of different sites, habitats and features. The adopted Joint Local Plan covers the administrative areas of Plymouth City, South Hams District and West Devon Borough and forms part of the Development Plan for this area. South Hams District Council Climate Change and Biodiversity Strategy[50] Objective 3 'Land Use and Biodiversity' refers the reader to apply findings from the Devon Nature Recovery Network process to restoration. The Devon Nature Recovery Network[51] and Rebuilding Devon's Nature Map[52] are resources comprising the best areas in Devon to maintain and expand habitats. These areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds) within the rest of the countryside is also critical to the survival of wildlife and supporting rare species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain[53]: ○ Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor ○ currently identified as within 20m either side of a larger river or 10m either side of a smaller water course ○ Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon).	10%	ROA2 ROA3 ROA14 ROA17

[49] West Devon Borough Council, South hams District Council and Plymouth City Council (Adopted 2019). Plymouth & South West Devon Joint Local Plan 2014-2034. Available at: https://www.plymouth.gov.uk/sites/default/files/JLPAdoptedVersion.pdf

[50] South Hams District Council (2020). South Hams District Council Climate Change and Biodiversity Strategy. Available at: https://www.climatechange.southhams.gov.uk/_files/ugd/faccb1_ed7c3cbc571a4e879957fe960907c0a2.pdf

[51] Devon Local Nature Partnership. Devon Nature Recovery Network. Available at: https://www.devonlnp.org.uk/our-work/nature-recovery-network/. (Accessed 4th February 2023)

[52] DBRC. Rebuilding Devon/s Nature Map. Available at: https://www.dbrc.org.uk/rebuilding-devons-nature-map/. (Accessed 4th February 2023)

[53] Devon County Council (2022). Devon Planning Guidance for Biodiversity Compensation and Net Gain. Available at: https://www.devon.gov.uk/environment/wp-content/uploads/sites/112/2022/07/Devon-BNG-Guidance-at-July-2022.pdf

Council	Strategic Priorities for Biodiversity	BNG Requirement	SWW BVP Option
	○ Habitats which fall within the biodiversity map (showing ecological networks, steppingstones, and local wildlife rich habitats) in the relevant Local Plan, where this exists.		
North Devon	Policy ST14 of The North Devon and Torridge Local Plan[54], Enhancing Environmental Assets, includes a target of providing a net gain in northern Devon's biodiversity where possible, through positive management of an enhanced and expanded network of designated sites and green infrastructure, including retention and enhancement of critical environmental capital. North Devon's Biosphere Reserve is jointly funded by Devon County Council, North Devon Council and Torridge District Council. The Biosphere is launching an ambitious new Nature Recovery Plan[55], aligning with the Government's 25 Year Environment Plan and the Prime Minister's pledge for 30% of the UK land to be protected by 2030. It sets out the priority actions required from 2021-2025, including: ○ Create a network of bigger, better and joined-up wildlife habitats ○ Improvements in both condition of existing nature-rich habitats, and restoration or creation of new areas of wildlife habitats ○ Rewilding, also known as re-naturalisation ○ Spatial targeting identified by Devon's Nature Recovery Network The Devon Nature Recovery Network and Rebuilding Devon's Nature Map identify the best areas in Devon to maintain and expand habitats. These areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds) within the rest of the countryside is also critical to the survival of wildlife and supporting rare species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain: ○ Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor – currently identified as within 20m either side of a larger river or 10m either side of a smaller water course ○ Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon). ○ Habitats which fall within the biodiversity map (showing ecological networks, steppingstones, and local wildlife rich habitats) in the relevant Local Plan, where this exists.	10%	ROA12
Torridge	*See description for North Devon above.*	10%	ROA15
Teignbridge	Policy EN8 in Teignbridge Councils Local Plan[56], Biodiversity Protection and Enhancement, including to seek net increases in biodiversity in association with new development through habitat enhancement and creation, and through the introduction of appropriate biodiversity offsetting measures. Teignbridge Council has a Connecting to Nature project whereby Phase 1 looked to review of existing	10%	ROA13

[54] Torridge District Council (Adopted 2018). North Devon and Torridge Local Plan 2011-2031. Available at: https://consult.torridge.gov.uk/kse/event/33615/section/

[55] Biosphere North Devon (2021). North Devon UNESCO Biosphere Reserve Nature Recovery Plan, 2021-25. Available at: https://www.northdevonbiosphere.org.uk/summary-and-introduction.html

[56] Teignbridge District Council South Devon (Adopted 2014). Teignbridge Local Plan 2013-2033. Available at: https://www.teignbridge.gov.uk/media/1669/local-plan-2013-33.pdf

Council	Strategic Priorities for Biodiversity	BNG Requirement	SWW BVP Option
	and proposed new green spaces[57]. Phase 2 (June 2022) will involve a more detailed review of the green spaces put forward from Phase 1, as well as of other suitable green spaces in the wider area (taking account of the Devon Nature Recovery Network mapping), to select and prioritise sites where biodiversity net gain can effectively be delivered, and to understand where this can include public access or not. This will feed into the Local Plan review as evidence to support good quality delivery of biodiversity net gain, which must ensure uplift for nature as the core outcome. The Devon Nature Recovery Network and Rebuilding Devon's Nature Map identify the best areas in Devon to maintain and expand habitats. These areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds) within the rest of the countryside is also critical to the survival of wildlife and supporting rare species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain: ○ Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor – currently identified as within 20m either side of a larger river or 10m either side of a smaller water course ○ Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon). ○ Habitats which fall within the biodiversity map (showing ecological networks, steppingstones, and local wildlife rich habitats) in the relevant Local Plan, where this exists.		
West Devon	Policy SPT12, of the Plymouth & Southwest Devon Joint Local Plan, Strategic Approach to the Natural Environment, aims to protect, conserve, and enhance the distinctive characteristics, special qualities and important features of the natural environment. This will be through a strategic approach which protects the hierarchy of international, national and locally designated sites, commensurate with their status, and takes account of the natural infrastructure functions of different sites, habitats and features. The adopted Joint Local Plan covers the administrative areas of Plymouth City, South Hams District and West Devon Borough and forms part of the Development Plan for this area. West Devon Borough Council Climate Change and Biodiversity Strategy[58] Objective 3 is 'Land Use and Biodiversity' refers the reader to the Devon Nature Recovery Network process to restoration. The Devon Nature Recovery Network and Rebuilding Devon's Nature Map identify the best areas in Devon to maintain and expand habitats. These areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds) within the rest of the countryside is also critical to the survival of wildlife and supporting rare species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain: ○ Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor – currently identified as within 20m either side of a larger river or 10m either side of a smaller water course	10%	ROA7 ROA15

[57] Newton Abbot & Kingsteignton Garden Community (2022). Connecting to nature – Enhancing habitats to benefit wildlife and local communities in the Heart of Teignbridge. Available at: https://storymaps.arcgis.com/stories/89de07e1f6ed411a8ebadd15e46c254d

[58] West Devon Borough Council (2020). West Devon Borough Council Climate Change and Biodiversity Strategy. Available at: https://www.climatechange.westdevon.gov.uk/_files/ugd/faccb1_d1d90d0d37844545a0071109f3ed00df.pdf

Council	Strategic Priorities for Biodiversity	BNG Requirement	SWW BVP Option
	○ Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon). ○ Habitats which fall within the biodiversity map (showing ecological networks, steppingstones, and local wildlife rich habitats) in the relevant Local Plan, where this exists.		
East Devon	Strategy 5, Environment, of East Devon's Local Plan[59] states development proposals will contribute to the delivery of sustainable development, ensure conservation and enhancement of natural historic and built environmental assets, promote ecosystem services and green infrastructure and geodiversity. Targets include minimising the fragmentation of habitats, creation of new habitats and connection of existing areas to create an ecological network that is identified within the East Devon District Council Local Biodiversity Plan and Progress towards delivering the Biodiversity Action Plan targets and Local Nature Reserve Strategy. East Devon Council are striving to improve biodiversity and support nature recovery across their greenspaces, and have a number of Nature Recovery Sites[60] with the ambition to implement the following strategies: ○ Reduce the frequency, area and deck height when cutting grass ○ Establish ecologically appropriate plants across our green spaces to help wildlife ○ Transition away from carpet bedding towards more herbaceous and woody perennial plantings ○ Plant trees and hedgerows ○ Establish wildflower meadows ○ Create wetland areas ○ Install bird and bat boxes & bee and bug homes across the area The Nature Recovery Plan[61] from the East Devon AONB Partnership has the following initiatives: ○ East Devon Catchment Partnership ○ Saving Special Species ○ The Colchester Declaration East Devon notes it is important that local action complements the developing Devon-wide Local Nature Recovery approach that Devon LNP is developing with Devon Wildlife Trust and the Devon Biodiversity Record Centre. The Devon Nature Recovery Network and Rebuilding Devon's Nature Map are suggested resources to help identify the best areas in Devon to maintain and expand habitats. These areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds) within the rest of the countryside is also critical to the survival of wildlife and supporting rare	10%	WIM2 WIM7 WIM11

[59] East Devon District Council (Adopted 2016). East Devon Local Plan 2013 to 2031. Available at: https://eastdevon.gov.uk/media/1772841/local-plan-final-adopted-plan-2016.pdf

[60] East Devon District Council. Nature Recovery. Available at: https://eastdevon.gov.uk/parks-gardens-and-recreation/parks-and-gardens/nature-recovery/. (Accessed 4th February 2023)

[61] East Devon AONB Partnership (2020). Nature Recovery, Our commitment to nature. Available at: https://www.eastdevonaonb.org.uk/wp-content/uploads/2020/08/EDAONB_Nature-Recovery_compressed-1.pdf

Council	Strategic Priorities for Biodiversity	BNG Requirement	SWW BVP Option
	species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain: ○ Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor – currently identified as within 20m either side of a larger river or 10m either side of a smaller water course ○ Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon). ○ Habitats which fall within the biodiversity map (showing ecological networks, steppingstones, and local wildlife rich habitats) in the relevant Local Plan, where this exists.		
Mid Devon	Policy DM26 of the Mid Devon Local Plan[62], Green infrastructure in major development, states development proposals must demonstrate Biodiversity mitigation, resulting in a net gain in biodiversity. Strategic Nature Areas within Mid Devon include[63]: ○ Hence Moor ○ Dunkeswell ○ Hackpen Hill to North Hill ○ Witherirdge Moor ○ Rackenford Moor ○ Unnamed (5) Mid Devon Council has recently undertaken a 'call for sites' to find out where land is available across the district for potential strategic habitat creation or enhancement[64], such as part of Devon's Nature Recovery Network (explained in more detail later in this section) or for biodiversity net gain off-site habitat banking. Over the coming months, the land parcels raised will be assessed to gauge its suitability. The Devon Nature Recovery Network and Rebuilding Devon's Nature Map the best areas in Devon to maintain and expand habitats. These areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds) within the rest of the countryside is also critical to the survival of wildlife and supporting rare species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain: ○ Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor – currently identified as within 20m either side of a larger river or 10m either side of a smaller water course	10%	WIM12 WIM6

[62] Mid Devon District Council (Adopted 2020). Mid Devon Local Plan 2013 – 2033. Available at: https://www.middevon.gov.uk/media/350631/local-plan-review-final-adopted-version_accessible.pdf

[63] Devon Biodiversity Records Centre. Strategic Nature Areas within Mid Devon. Available at: https://www.dbrc.org.uk/mid-devon-snas/. (Accessed 4th February 2023)

[64] Mid Devon (2022). Plan Mid Devon 2023 – 2043 Regulation 18 Issues Paper. Our Natural and Historic Built Environment. Available at: https://www.middevon.gov.uk/media/353495/90-our-natural-and-historic-built-environment.pdf

Council	Strategic Priorities for Biodiversity	BNG Requirement	SWW BVP Option
	○ Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon). ○ Habitats which fall within the biodiversity map (showing ecological networks, steppingstones, and local wildlife rich habitats) in the relevant Local Plan, where this exists.		

5.2 Opportunity areas for conserving, restoring and enhancing habitats

The results of the quantitative review of areas for conserving, restoring and enhancing habitats located in proximity to SWW updated dWRMP24 BVP options are set out in Table 5.2 – Table 5.30 below.

5.2.1 BNW1

Table 5-2: BNW1 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (ha)
Ancient woodland	N/A	N/A
Priority habitats	Deciduous woodland	4.47
	Lowland fens	0.26
	Reedbeds	8.08
	No main habitat but additional habitats present	2.02
Sites of Special Scientific Interest (SSSI)	Lymington River	0.17
	Lymington River Reedbeds	1.78
Special Area of Conservation (SAC)	N/A	N/A
Special Protection Area (SPA)	Solent & Southampton Water	1.78
Ramsar	Solent & Southampton Water	1.78
County Wildlife Site	N/A	N/A
National Nature Reserve (NNR)	N/A	N/A
National Parks	New Forest	3.42
Local Nature Reserve (LNR)	N/A	N/A
Habitat Networks	Restorable Habitat	0.06
	Network Enhancement Zone 2	2.50
	Fragmentation Action Zone	1.04

BNW1 is located in proximity to 3.6ha habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including deciduous woodland, lowland fens and reedbeds. The habitat networks include:

- Restorable Habitat (0.06ha) - Areas of land, predominantly composed of existing semi-natural habitat where the primary habitat is present in a degraded or fragmented form and which are likely to be suitable for restoration
- Network Enhancement Zone 2 (2.5ha) - Land connecting existing patches of primary and associated habitats which is less likely to be suitable for creation of the primary habitat. Action in this zone that improves the biodiversity value through land management changes and/or green infrastructure provision can be targeted here.
- Fragmentation Action Zone (1.04ha) – Land within Enhancement Zone 1 that connects existing patches of primary and associated habitats which are currently highly fragmented and where fragmentation could be reduced by habitat creation. Action in this zone to address the most fragmented areas of habitat can be targeted here.

The NCA and BNG assessments for BNW1 identified that the option is presumed to cause the permanent loss of active floodplain and temporary loss of broadleaved, mixed and yew woodland and urban woodland. Therefore, there is an opportunity to improve the condition of these habitats once reinstated or re-created on-site and/or off-site, which will need to be informed by ecological surveys. BNW1 is also situated within Network Enhancement Zone 2 and therefore there is a potential opportunity to enhance primary habitat, as described above.

The option sits within New Forest District Council authority area and is surrounded by Lymington River SSSI, Lymington River Reedbeds SSSI, New Forest National Park, and Solent & Southampton Water SPA and

Ramsar - and as such there are further opportunities to support these designated sites by enhancing local biodiversity. Any future strategy should be aligned to the LPAs and designated sites aspirations, which New Forest District Council aims to achieve at least 10% BNG. The New Forest Biodiversity Action Plan has the following initiatives, which could align with the delivery of the option:

- Improve river catchment management at Lymington
- A programme to link the requirement for back up land for stock grazing the open forest, with land of nature conservation importance that would benefit from grazing in the forest fringe, coastal plain and Avon Valley
- A programme of action for the maintenance and restoration of habitats in the forest fringe including ponds, road verges, hedges, and unimproved grassland

5.2.2 BNW6

Table 5-3: BNW6 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (ha)
Ancient woodland	N/A	N/A
Priority habitats	Deciduous woodland	0.10
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	N/A	N/A
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	N/A	N/A
National Nature Reserve (NNR)	N/A	N/A
National Parks	N/A	N/A
Local Nature Reserve (LNR)	N/A	N/A
Habitat Networks	Network Expansion Zone	9.24

BNW6 is located in proximity to 9.24ha of habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including deciduous woodland. The habitat networks are:

- Network Expansion Zone (9.24ha) - Land beyond the Network Enhancement Zones with potential for expanding, linking/joining networks across the landscape i.e., conditions such as soils are potentially suitable for habitat creation for the specific habitat in addition to Enhancement Zone 1. Action in this zone to improve connections between existing habitat networks can be targeted here.

The NCA and BNG assessments for BNW6 identified that the option is presumed to cause temporary loss of pastures and no impact lakes and standing water and active floodplain. Therefore, there is an opportunity to improve the condition of these habitats once reinstated or re-created on-site, which will need to be informed by appropriate ecological surveys. BNW6 is also situated within the Network Expansion Zone and therefore there is a potential opportunity to improve connections between existing habitat networks.

The option sits within Dorset Council authority area. Any future strategy should be aligned to the LPAs and designated sites aspirations, which Dorset Council aims to achieve at least 10% BNG. Dorset Council's Local Plan strategy has the following initiatives which could align with the delivery of the option:

- Arable conversion to permanent grassland, heathland, wetland or broadleaved woodland
- Intensive grassland to permanent hay meadows e.g., green hay sites
- Green infrastructure provided by development
- Orchard planting, including community orchards
- Wetland creation, including ponds, reedbeds and field scrapes

5.2.3 COL2

Table 5-4: COL2 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (Ha)
Ancient woodland	Boscarne Wood	0.15
	Higginsmoor Wood	2.26
Priority habitats	Deciduous woodland	16.19
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	River Camel	1.15
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	N/A	N/A
National Nature Reserve (NNR)	N/A	N/A
National Parks	N/A	N/A
Local Nature Reserve (LNR)	N/A	N/A
Habitat Networks	Network Enhancement Zone 1	35.80
	Network Enhancement Zone 2	6.50
	Network Expansion Zone	26.80

COL2 is located in proximity to 69.10ha of habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including deciduous woodland. The habitat networks are:

- Network Enhancement Zone 1 (35.80ha) - Land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat. Factors affecting suitability include: proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast. Action in this zone to expand and join up existing habitat patches and improve the connections between them can be targeted here.
- Network Enhancement Zone 2 (6.50ha) - Land connecting existing patches of primary and associated habitats which is less likely to be suitable for creation of the primary habitat. Action in this zone that improves the biodiversity value through land management changes and/or green infrastructure provision can be targeted here.
- Network Expansion Zone (26.80ha) - Land beyond the Network Enhancement Zones with potential for expanding, linking/joining networks across the landscape i.e. conditions such as soils are potentially suitable for habitat creation for the specific habitat in addition to Enhancement Zone 1. Action in this zone to improve connections between existing habitat networks can be targeted here.

The NCA and BNG assessments for COL2 identified that the option is presumed to cause permanent loss of some arable, ancient woodland and active floodplain; temporary loss of arable, pastures, broadleaved, mixed and yew woodland, woodland priority habitat, coniferous woodland, greenspace; and no impact to active floodplain and rivers. Therefore, there is an opportunity to improve the condition of some of these habitats once reinstated or re-created on-site and/or off-site, which will need to be informed by appropriate ecological surveys. COL2 boundary contains 0.25ha of ancient woodland, which is presumed to be permanently lost due to the options because once this habitat is impacted and lost it cannot be replaced or replicated. SWW should look to avoid all ancient woodland in order to achieve BNG through potential option re-alignment and/or construction mitigation techniques following best practice to avoid the ancient woodland. The land to be purchased as part of the option is made up of arable land (0.2ha) and therefore, there may be potential to increase BNG through land management, which, again, will need to be informed by appropriate ecological surveys. COL2 is also situated within Restorable Habitat, Network Enhancement Zone 1, Network Enhancement Zone 2, and Network Expansion Zone and therefore there is a potential opportunity to create/restore or enhance primary habitat and build greater ecological resilience, as described above.

The option sits within Cornwall Council authority area and is surrounded by River Camel SAC and as such there are many opportunities to enhance local biodiversity. Any future strategy should be aligned to the LPAs and designated sites aspirations, and Cornwall Council aims to achieve at least 10% BNG. The Cornwall Local Plan has the following priorities, which could align with the delivery of the option:

Short-term priorities

- Wetland and naturalised watercourses
- Woodland and ancient woodland
- Cornish hedges & edges
- High nature value farmland & wildlife rich grassland
- Soils

Medium-term priorities

- Heathland mosaics
- Urban green spaces
- Reintroductions & threatened species

5.2.4 COL19

Table 5-5: COL19 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (ha)
Ancient woodland	N/A	N/A
Priority habitats	Deciduous woodland	22.63
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	N/A	N/A
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	Pendarves Wood and Trevoole Moor – Purple moor grass and rush pasture, wet woodland, hedgerow Crowan Reservoirs – Lowland Fen	0.13 <0.01
National Nature Reserve (NNR)	N/A	N/A
National Parks	N/A	N/A
Local Nature Reserve (LNR)	N/A	N/A
Habitat Networks	Network Expansion Zone	0.34

COL19 is located in proximity to 0.34ha of habitat networks where there is a potential opportunity to build greater ecological resilience, associated with improving connections between existing habitat networks. The habitat networks are:

- Network Expansion Zone (0.34ha) - Land beyond the Network Enhancement Zones with potential for expanding, linking/joining networks across the landscape i.e. conditions such as soils are potentially suitable for habitat creation for the specific habitat in addition to Enhancement Zone 1. Action in this zone to improve connections between existing habitat networks can be targeted here.

The NCA and BNG assessments for COL19 identified that the option is presumed to cause temporary loss of arable, pasture, broadleaved, mixed and yew woodland, woodland priority habitat, coniferous woodland; and no impact to active floodplain and rivers. Therefore, there is an opportunity to improve the condition of these habitats once reinstated or re-created on-site and/or off-site, which will need to be informed by ecological surveys. COL19 is also situated within the Network Expansion Zone and therefore there is a potential opportunity to improve connections between existing habitat networks, as described above.

The option sits within Cornwall Council authority area and is surrounded by Pendarves Wood and Trevoole Moor and Crowan Reservoirs - and as such there are opportunities to enhance local biodiversity of associated habitat (see Table 5.5 above). Any future strategy should be aligned to the LPAs and designated sites aspirations, which Cornwall Council aims to achieve at least 10% BNG. The Cornwall Local Plan has the following priorities, which could align with the delivery of the option:

Short-term priorities

- Wetland and naturalised watercourses
- Woodland and ancient woodland
- Cornish hedges & edges
- High nature value farmland & wildlife rich grassland
- Soils

Medium-term priorities

- Heathland mosaics
- Urban green spaces
- Reintroductions & threatened species

5.2.5 COL20

Table 5-6: COL20 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (ha)
Ancient woodland	Ladock, St Enoder & Trendeal Woods	4.88
Priority habitats	Deciduous woodland	8.51
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	N/A	N/A
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	Ladock, St Enoder & Trendeal Woods – Wet woodland, lowland fen	4.88
National Nature Reserve (NNR)	N/A	N/A
National Parks	N/A	N/A
Local Nature Reserve (LNR)	N/A	N/A
Habitat Networks	Network Enhancement Zone 1	16.54
	Network Enhancement Zone 2	12.87
	Network Expansion Zone	33.21

COL20 is located in proximity to 62.62ha of habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including deciduous woodland. The habitat networks are:

- Network Enhancement Zone 1 (16.54ha) - Land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat. Factors affecting suitability include: proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast. Action in this zone to expand and join up existing habitat patches and improve the connections between them can be targeted here.
- Network Enhancement Zone 2 (12.87ha) - Land connecting existing patches of primary and associated habitats which is less likely to be suitable for creation of the primary habitat. Action in this zone that improves the biodiversity value through land management changes and/or green infrastructure provision can be targeted here.

- Network Expansion Zone (33.21ha) - Land beyond the Network Enhancement Zones with potential for expanding, linking/joining networks across the landscape i.e., conditions such as soils are potentially suitable for habitat creation for the specific habitat in addition to Enhancement Zone 1. Action in this zone to improve connections between existing habitat networks can be targeted here.

The NCA and BNG assessments for COL20 identified that the option is presumed to cause the permanent loss of some arable; temporary loss of arable, pastures, broadleaved, mixed and yew woodland, woodland priority habitat, coniferous woodland; and no impact to active floodplain and rivers. Therefore, there is an opportunity to improve the condition of these habitats once reinstated or re-created on-site and/or off-site, which will need to be informed by ecological surveys. COL20 is also situated within Network Enhancement Zone 1, Network Enhancement Zone 2, Fragmentation Action Zone, and the Network Expansion Zone and therefore there is potential opportunity to create/restore and enhance primary habitat and build greater ecological resilience, as described above.

The option sits within Cornwall Council authority area and is surrounded by Ladock, St Enoder & Trendeal Woods - and as such there are many opportunities to enhance local biodiversity of associated habitat (see Table 5.6 above). Any future strategy should be aligned to the LPAs and designated sites aspirations, which Cornwall Council aims to achieve at least 10% BNG. The Cornwall Local Plan has the following priorities, which could align with the delivery of the option:

Short-term priorities

- Wetland and naturalised watercourses
- Woodland and ancient woodland
- Cornish hedges & edges
- High nature value farmland & wildlife rich grassland
- Soils

Medium-term priorities

- Heathland mosaics
- Urban green spaces
- Reintroductions & threatened species

5.2.6 COL6

Table 5-7: COL6 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (ha)
Ancient woodland	N/A	N/A
Priority habitats	Deciduous woodland	5.43
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	N/A	N/A
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	N/A	N/A
National Nature Reserve (NNR)	N/A	N/A
National Parks	N/A	N/A
Local Nature Reserve (LNR)	N/A	N/A
Network Enhancement Zones	Network Enhancement Zone 1	1.42
	Network Enhancement Zone 2	0.06
	Network Expansion Zone	13.37

COL6 is located in proximity to 14.85ha of habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including deciduous woodland. The habitat networks are:

- Network Enhancement Zone 1 (1.42ha) - Land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat. Factors affecting suitability include proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast. Action in this zone to expand and join up existing habitat patches and improve the connections between them can be targeted here.
- Network Enhancement Zone 2 (0.06ha) - Land connecting existing patches of primary and associated habitats which is less likely to be suitable for creation of the primary habitat. Action in this zone that improves the biodiversity value through land management changes and/or green infrastructure provision can be targeted here.
- Network Expansion Zone (13.37ha) - Land beyond the Network Enhancement Zones with potential for expanding, linking/joining networks across the landscape i.e., conditions such as soils are potentially suitable for habitat creation for the specific habitat in addition to Enhancement Zone 1. Action in this zone to improve connections between existing habitat networks can be targeted here.

The NCA and BNG assessments for COL6 identified that the option is presumed to cause the permanent loss of some greenspace and active floodplain; temporary loss of broadleaved, mixed and yew woodland, woodland priority habitat, coniferous woodland, greenspace; and no impact to active floodplain, rivers and ponds & linear features. Therefore, there is an opportunity to improve the condition of these habitats once reinstated or re-created on-site and/or off-site, which will need to be informed by ecological surveys. COL6 is also situated within the Network Expansion Zone and therefore there is a potential opportunity to improve connections between existing habitat networks, as described above.

The option sits within Cornwall Council authority area. Any future strategy should be aligned to the LPAs and designated sites aspirations, which Cornwall Council aims to achieve at least 10% BNG. The Cornwall Local Plan has the following priorities, which could align with the delivery of the option:

Short-term priorities

- Wetland and naturalised watercourses
- Woodland and ancient woodland
- Cornish hedges & edges
- High nature value farmland & wildlife rich grassland
- Soils

Medium-term priorities

- Heathland mosaics
- Urban green spaces
- Reintroductions & threatened species
- Pollinator habitats

5.2.7 COL9

Table 5-8: COL9 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (ha)
Ancient woodland	N/A	N/A
Priority habitats	Deciduous woodland	0.56
	Lowland heathland	7.00
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	Lower Bostraze & Leswidden	0.06

Potential BNG opportunity site	Name	Area (ha)
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	Busvargus & Tregeseal Common to Dowran Common & Bosworlas Moor – Lowland Heathland	8.30
National Nature Reserve (NNR)	N/A	N/A
National Parks	N/A	N/A
Local Nature Reserve (LNR)	N/A	N/A
Habitat Networks	Network Enhancement Zone 1 Network Expansion Zone	13.05 5.20

COL9 is located in proximity to 18.25ha of habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including deciduous woodland and lowland heathland. The habitat networks include:

- Network Enhancement Zone 1 (13.05ha) - Land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat. Factors affecting suitability include proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast. Action in this zone to expand and join up existing habitat patches and improve the connections between them can be targeted here.
- Network Expansion Zone (5.20ha) - Land beyond the Network Enhancement Zones with potential for expanding, linking/joining networks across the landscape i.e., conditions such as soils are potentially suitable for habitat creation for the specific habitat in addition to Enhancement Zone 1. Action in this zone to improve connections between existing habitat networks can be targeted here.

The NCA and BNG assessments for COL9 identified that the option is presumed to cause temporary loss of arable, dwarf shrub heath and woodland priority habitat, with no impact to lakes and standing waters. Therefore, there is an opportunity to improve the condition of these habitats once reinstated or re-created on-site and/or off-site, which will need to be informed by ecological surveys. COL9 is also situated within the Network Enhancement Zone 1, Fragmentation Action Zone and Network Expansion Zone and therefore there is a potential opportunity to create/restore and enhance primary habitat, as well as build greater ecological resilience, as described above.

The option sits within Cornwall Council authority area and is surrounded by Busvargus & Tregeseal Common to Dowran Common & Bosworlas Moor (see table 5-8 above). Any future strategy should be aligned to the LPAs and designated sites aspirations, which Cornwall Council aims to achieve at least 10% BNG. The Cornwall Local Plan has the following priorities, which could align with the delivery of the option:

Short-term priorities

- Wetland and naturalised watercourses
- Woodland and ancient woodland
- Cornish hedges & edges
- High nature value farmland & wildlife rich grassland
- Soils

Medium-term priorities

- Heathland mosaics
- Urban green spaces
- Reintroductions & threatened species
- Pollinator habitats

5.2.8 BNW14

Table 5-9: BNW14 BNG opportunity mapping

Potential BNG opportunity site	Name and Area (Ha)	Area (ha)
Ancient woodland	N/A	N/A
Priority habitats	Coastal and floodplain grazing marsh	97.39
	Deciduous woodland	13.37
	Good-quality semi-improved grassland	2.15
	Lowland dry acid grassland	0.51
	Lowland fens	0.13
	Lowland meadows	0.12
	No main habitat but additional habitats present	9.05
	Reedbeds	0.71
Sites of Special Scientific Interest (SSSI)	Avon Valley (Bickton to Christchurch)	105.67
Special Area of Conservation (SAC)	River Avon	9.11
Special Protection Area (SPA)	Avon Valley	96.32
Ramsar	Avon Valley	98.00
County Wildlife Site	N/A	N/A
National Nature Reserve (NNR)	N/A	N/A
National Parks	New Forest	2.54
Local Nature Reserve (LNR)	N/A	N/A
Habitat Networks	Habitat Restoration/Creation	5.98
	Restorable Habitat	99.18
	Network Enhancement Zone 1	18.42
	Network Enhancement Zone 2	10.23
	Fragmentation Action Zone	33.61

BNW14 is located in proximity to 28.65ha of habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including coastal and floodplain grazing marsh, deciduous woodland, good-quality semi-improved grassland, lowland dry acid grassland, lowland fens, lowland meadows and reedbeds. The habitat networks are:

- Habitat Creation/Restoration (5.98) - Areas where work is underway to either create or restore the primary habitat
- Restorable Habitat (99.18ha) - Areas of land, predominantly composed of existing semi-natural habitat where the primary habitat is present in a degraded or fragmented form and which are likely to be suitable for restoration
- Network Enhancement Zone 1 (18.42ha) - Land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat. Factors affecting suitability include proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast. Action in this zone to expand and join up existing habitat patches and improve the connections between them can be targeted here.
- Network Enhancement Zone 2 (10.23ha) - Land connecting existing patches of primary and associated habitats which is less likely to be suitable for creation of the primary habitat. Action in this zone that improves the biodiversity value through land management changes and/or green infrastructure provision can be targeted here.

The NCA and BNG assessments for BNW14 identified that the option is presumed to cause temporary loss of coastal and floodplain grazing marsh, arable, pastures, broadleaved, mixed and yew woodland, woodland priority habitat, greenspace, urban semi-natural habitat, urban woodland, with no impact to active floodplain, rivers and ponds & linear features. Therefore, there is an opportunity to improve the condition of these

habitats once reinstated or re-created on-site and/or off-site, which will need to be informed by ecological surveys. BNW14 is also situated within Network Enhancement Zone 2 and therefore there is a potential opportunity to enhance primary habitat, as described above.

The option sits within New Forest District Council and Dorset Council authority area and is surrounded by Avon Valley SSSI (Bickton to Christchurch), River Avon SAC and Avon Valley SPA and Ramsar, and New Forest National Park- and as such there are many opportunities to enhance local biodiversity. Any future strategy should be aligned to the LPAs and designated sites aspirations, which both aim to achieve at least 10% BNG.

The New Forest Biodiversity Action Plan has the following initiatives which could align with the delivery of the option:

- Re-introduction of grazing to commons and other suitable sites beyond the Perambulation of the Forest where appropriate
- A programme to link the requirement for back up land for stock grazing the open forest, with land of nature conservation importance that would benefit from grazing in the forest fringe, coastal plain and Avon Valley
- A programme to link the requirement for back up land for stock grazing the open forest, with land of nature conservation importance that would benefit from grazing in the forest fringe, coastal plain and Avon Valley
- A programme of action for the maintenance and restoration of habitats in the forest fringe including ponds, road verges, hedges, and unimproved grassland
- Review of key issues affecting habitat management in the Avon Valley and the contribution of past and current support schemes operating in the valley, and development of a co-ordinated land management strategy for the valley

Dorset Council's Local Plan strategy has the following initiatives which could align with the delivery of the option:

- Arable conversion to permanent grassland, heathland, wetland or broadleaved woodland
- Intensive grassland to permanent hay meadows e.g., green hay sites
- Green infrastructure provided by development
- Orchard planting, including community orchards
- Wetland creation, including ponds, reedbeds and field scrapes

5.2.9 COL21

Table 5-10: COL21 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (ha)
Ancient woodland	N/A	N/A
Priority habitats	Deciduous woodland	10.40
	Lowland heathland	1.47
	No main habitat but additional habitats present	1.04
	Purple moor grass and rush pastures	8.61
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	N/A	N/A
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	Lower Red River – Wet woodland, reedbed, lowland heathland, lowland fen	2.13

Potential BNG opportunity site	Name	Area (ha)
	Newton Moor – Wet woodland, lowland fen	1.60
	Carnmenellis Moor and Lancarrow Marsh – Wet woodland, purple moor grass and rush pasture, lowland fen, lowland heathland	9.82
	Stithians Reservoir – Wet woodland, lowland fen, lowland heathland	9.76
	Trewithen Moor – Wet woodland, lowland fen	3.90
	North Tresamble – Lowland fen	1.97
National Nature Reserve (NNR)	N/A	N/A
National Parks	N/A	N/A
Local Nature Reserve (LNR)	Red River Valley	2.05
Habitat Networks	Restorable Habitat	6.37
	Network Enhancement Zone 1	56.01
	Network Enhancement Zone 2	12.88
	Network Expansion Zone	148.01

COL21 is located in proximity to 223.27ha of habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including deciduous woodland, lowland heathland and purple moor grass and rush pastures. The habitat networks include:

- Restorable Habitat (6.37ha) - Areas of land, predominantly composed of existing semi-natural habitat where the primary habitat is present in a degraded or fragmented form and which are likely to be suitable for restoration.
- Network Enhancement Zone 1 (56.01ha) - Land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat. Factors affecting suitability include: proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast. Action in this zone to expand and join up existing habitat patches and improve the connections between them can be targeted here.
- Network Enhancement Zone 2 (12.88ha) - Land connecting existing patches of primary and associated habitats which is less likely to be suitable for creation of the primary habitat. Action in this zone that improves the biodiversity value through land management changes and/or green infrastructure provision can be targeted here.
- Network Expansion Zone (148.01ha) - Land beyond the Network Enhancement Zones with potential for expanding, linking/joining networks across the landscape i.e. conditions such as soils are potentially suitable for habitat creation for the specific habitat in addition to Enhancement Zone 1. Action in this zone to improve connections between existing habitat networks can be targeted here.

The NCA and BNG assessments for COL21 identified that the option is presumed to cause temporary loss of arable, pastures, broadleaved, mixed and yew woodland, woodland priority habitat, coniferous woodland, greenspace, and, no impact to active floodplain, rivers, modified waters (reservoirs) and ponds & linear features. Therefore, there is an opportunity to improve the condition of these habitats once reinstated or re-created on-site and/or off-site, which will need to be informed by ecological surveys. COL21 is also situated within the Restorable Habitat, Network Enhancement Zone 1, Network Enhancement Zone 2 and the Network Expansion Zone and therefore there is a potential opportunity to improve connections between existing habitat networks, restore primary habitats and improve the biodiversity value through land management changes and/or green infrastructure provision, as described above. Factors affecting suitability include proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast.

The option sits within Cornwall Council authority area and is surrounded by Lower Red River, Newton Moor, Carnmenellis Moor and Lancarrow Marsh, Stithians Reservoir, Trewithen Moor and North Tresamble County

Wildlife Sites, and Red River Valley LNR - and as such there are many opportunities to enhance local biodiversity of associated habitat (see Table 5.14 above). Any future strategy should be aligned to the LPAs and designated sites aspirations, which Cornwall Council aims to achieve at least 10% BNG. The Cornwall Local Plan has the following priorities, which could align with the delivery of the option:

Short-term priorities

- Wetland and naturalised watercourses
- Woodland and ancient woodland
- Cornish hedges & edges
- High nature value farmland & wildlife rich grassland
- Soils

Medium-term priorities

- Heathland mosaics
- Urban greenspaces
- Reintroductions & threatened species
- Pollinator habitats

5.2.10 ROA12

Table 5-11: ROA12 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (ha)
Ancient woodland	N/A	N/A
Priority habitats	Deciduous woodland	2.89
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	N/A	N/A
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	The Cairn and Old Railway - Unimproved neutral and acid grassland, bracken, scrub and semi-natural broadleaved woodland	1.74
National Nature Reserve (NNR)	N/A	N/A
National Parks	N/A	N/A
Local Nature Reserve (LNR)	N/A	N/A
Habitat Networks	Network Enhancement Zone 1	4.72
	Network Enhancement Zone 2	18.90

ROA12 is located in proximity to 23.62ha of habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including deciduous woodland. The habitat networks include:

- Network Enhancement Zone 1 (4.72ha) - Land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat. Factors affecting suitability include proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast. Action in this zone to expand and join up existing habitat patches and improve the connections between them can be targeted here.
- Network Enhancement Zone 2 (18.90ha) - Land connecting existing patches of primary and associated habitats which is less likely to be suitable for creation of the primary habitat. Action in this zone that

improves the biodiversity value through land management changes and/or green infrastructure provision can be targeted here.

The NCA and BNG assessments for ROA12 identified that the option is presumed to cause permanent loss of some pastures, temporary loss of arable, pastures, broadleaved, mixed and yew woodland, woodland priority habitat, coniferous woodland, and, no impact to active floodplain and rivers. Therefore, there is an opportunity to improve the condition of these habitats once reinstated or re-created on-site and/or off-site, which will need to be informed by ecological surveys. ROA12 is also situated within the Network Enhancement Zone 1 and Network Enhancement Zone 2 and therefore there is a potential opportunity to expand and join up existing habitat patches and improve the connections between them and improve the biodiversity value through land management changes and/or green infrastructure provision, as described above. Factors affecting suitability include proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast.

The option sits within North Devon authority area and is surrounded by The Cairn and Old Railway County Wildlife Site - and as such there are opportunities to enhance local biodiversity of associated habitat (see Table 5.15 above). Any future strategy should be aligned to the LPAs and designated sites aspirations, which North Devon and Torridge aims to achieve at least 10% BNG. The North Devon and Torridge Local Plan has the following priorities, which could align with the delivery of the option:

- Create a network of bigger, better and joined-up wildlife habitats
- Improvements in both condition of existing nature-rich habitats, and restoration or creation of new areas of wildlife habitats
- Rewilding, also known as re-naturalisation
- Spatial targeting identified by Devon's Nature Recovery Network

The Devon Nature Recovery Network and Rebuilding Devon's Nature Map identify the best areas in Devon to maintain and expand habitats. These areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds) within the rest of the countryside is also critical to the survival of wildlife and supporting rare species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain:

- Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor – currently identified as within 20m either side of a larger river or 10m either side of a smaller water course
- Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon).

5.2.11 ROA13

Table 5-12: ROA13 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (ha)
Ancient woodland	N/A	N/A
Priority habitats	Deciduous woodland	0.76
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	N/A	N/A
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	Langdon Fields (Secmaton) – Mixed farmland with bird interest	2.89
National Nature Reserve (NNR)	N/A	N/A
National Parks	N/A	N/A

Potential BNG opportunity site	Name	Area (ha)
Local Nature Reserve (LNR)	N/A	N/A
Habitat Networks	Network Expansion Zone	4.34

ROA13 is located in proximity to 4.34ha of habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including deciduous woodland. The habitat networks include:

- Network Expansion Zone (4.34ha) - Land beyond the Network Enhancement Zones with potential for expanding, linking/joining networks across the landscape i.e. conditions such as soils are potentially suitable for habitat creation for the specific habitat in addition to Enhancement Zone 1. Action in this zone to improve connections between existing habitat networks can be targeted here.

The NCA and BNG assessments for ROA13 identified that the option is presumed to cause permanent loss of pastures. Therefore, there is an opportunity to improve the BNG off-site, which will need to be informed by ecological surveys. ROA13 is also situated within the Network Expansion Zone and therefore there is a potential opportunity to improve connections between existing habitat networks, as described above.

The option sits within Teignbridge Council authority area and is surrounded by Langdon Fields (Secmaton) County Wildlife Site - and as such there are many opportunities to enhance local biodiversity of associated habitat (see Table 5.16 above). Any future strategy should be aligned to the LPAs and designated sites aspirations, which Teignbridge Council aims to achieve at least 10% BNG. The Teignbridge Councils Local Plan has the following priorities, which could align with the delivery of the option:

- Habitat enhancement and creation, through the introduction of appropriate biodiversity offsetting measures

Teignbridge Council has a Connecting to Nature project to select and prioritise sites where biodiversity net gain can effectively be delivered, and to understand where this can include public access or not. This will feed into the Local Plan review as evidence to support good quality delivery of biodiversity net gain, which must ensure uplift for nature as the core outcome.

The Devon Nature Recovery Network and Rebuilding Devon's Nature Map identify the best areas in Devon to maintain and expand habitats. These areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds) within the rest of the countryside is also critical to the survival of wildlife and supporting rare species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain:

- Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor – currently identified as within 20m either side of a larger river or 10m either side of a smaller water course.
- Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon)
- Habitats which fall within the biodiversity map (showing ecological networks, steppingstones, and local wildlife rich habitats) in the relevant Local Plan, where this exists.

5.2.12 ROA2

Table 5-13: ROA2 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (ha)
Ancient woodland	Drew/Westover woods	0.32
Priority habitats	Deciduous woodland	0.82
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	N/A	N/A

Potential BNG opportunity site	Name	Area (ha)
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	N/A	N/A
National Nature Reserve (NNR)	N/A	N/A
National Parks	N/A	N/A
Local Nature Reserve (LNR)	N/A	N/A
Habitat Networks	Restorable Habitat	3.44
	Network Enhancement Zone 2	17.40

ROA2 is located in proximity to 20.84ha habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including deciduous woodland and ancient woodland, the latter located at Drew/Westover woods. The habitat networks include:

- Restorable Habitat (3.44ha) - Areas of land, predominantly composed of existing semi-natural habitat where the primary habitat is present in a degraded or fragmented form and which are likely to be suitable for restoration.
- Network Enhancement Zone 2 (17.40ha) - Land connecting existing patches of primary and associated habitats which is less likely to be suitable for creation of the primary habitat. Action in this zone that improves the biodiversity value through land management changes and/or green infrastructure provision can be targeted here.

The NCA and BNG assessments for ROA2 identified that the option is presumed to cause permanent loss of some active floodplain, temporary loss of pastures, broadleaved, mixed and yew woodland, woodland priority habitat, greenspace, and no impact on the remainder of active floodplain and rivers. Therefore, there is an opportunity to improve the condition of these habitats once reinstated or re-created on-site and/or off-site, which will need to be informed by ecological surveys. ROA2 is also situated within the Restorable Habitat and Network Enhancement Zone 2 and therefore there is a potential opportunity to restore primary habitat and improve the biodiversity value through land management changes and/or green infrastructure provision, as described above.

The option sits within South Hams District Council authority area and is surrounded by Drew/Westover woods which contain ancient woodland (see Table 5-17 above) and as such there are many opportunities to enhance local biodiversity. Any future strategy should be aligned to the LPAs and designated sites aspirations, which South Hams District Council aims to achieve at least 10% BNG. The Plymouth & Southwest Devon Joint Local Plan has the following initiatives which could align with the delivery of the option:

- Areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds) within the rest of the countryside is also critical to the survival of wildlife and supporting rare species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain:
  - Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor – currently identified as within 20m either side of a larger river or 10m either side of a smaller water course.
  - Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon).
  - Habitats which fall within the biodiversity map (showing ecological networks, steppingstones, and local wildlife rich habitats) in the relevant Local Plan, where this exists.

5.2.13 ROA3

Table 5-14: ROA3 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (ha)
Ancient woodland	N/A	N/A
Priority habitats	Deciduous woodland	0.49
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	N/A	N/A
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	N/A	N/A
National Nature Reserve (NNR)	N/A	N/A
National Parks	N/A	N/A
Local Nature Reserve (LNR)	N/A	N/A
Habitat Networks	Restorable Habitat	1.57
	Network Enhancement Zone 2	7.02

ROA3 is located in proximity to 8.59ha habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including deciduous woodland. The habitat networks include:

- Restorable Habitat (1.57ha) - Areas of land, predominantly composed of existing semi-natural habitat where the primary habitat is present in a degraded or fragmented form and which are likely to be suitable for restoration.
- Network Enhancement Zone 2 (7.02ha) - Land connecting existing patches of primary and associated habitats which is less likely to be suitable for creation of the primary habitat. Action in this zone that improves the biodiversity value through land management changes and/or green infrastructure provision can be targeted here.

The NCA and BNG assessments for ROA3 identified that the option is presumed to cause permanent loss of some arable and active floodplain, and temporary loss of the remainder of arable and active floodplain. Therefore, there is an opportunity to improve the condition of these habitats once reinstated or re-created on-site and/or off-site, which will need to be informed by ecological surveys. ROA3 is also situated within the Restorable Habitat and Network Enhancement Zone 2 and therefore there is a potential opportunity to restore primary habitat and improve the biodiversity value through land management changes and/or green infrastructure provision, as described above.

The option sits within South Hams District Council authority area - and as such there are many opportunities to enhance local biodiversity. Any future strategy should be aligned to the LPAs and designated sites aspirations, which South Hams District Council aims to achieve at least 10% BNG. The Plymouth & Southwest Devon Joint Local Plan has the following initiatives which could align with the delivery of the option:

- Areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds) within the rest of the countryside is also critical to the survival of wildlife and supporting rare species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain:
  - Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor – currently identified as within 20m either side of a larger river or 10m either side of a smaller water course
  - Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon).

– Habitats which fall within the biodiversity map (showing ecological networks, steppingstones, and local wildlife rich habitats) in the relevant Local Plan, where this exists.

5.2.14 ROA14

Table 5-15: ROA14 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (ha)
Ancient woodland	N/A	N/A
Priority habitats	Grass moorland	15.40
	Upland heathland	10.51
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	N/A	N/A
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	N/A	N/A
National Nature Reserve (NNR)	N/A	N/A
National Parks	Dartmoor National Park	32.10
Local Nature Reserve (LNR)	N/A	N/A
Habitat Networks	Restorable Habitat	10.58
	Network Enhancement Zone 1	1.52
	Fragmentation Action Zone	7.74

ROA14 is located in proximity to 19.84ha habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including grass moorland and upland heathland. The habitat networks include:

- Restorable Habitat (10.58ha) - Areas of land, predominantly composed of existing semi-natural habitat where the primary habitat is present in a degraded or fragmented form and which are likely to be suitable for restoration.
- Network Enhancement Zone 1 (1.52ha) - Land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat. Factors affecting suitability include: proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast. Action in this zone to expand and join up existing habitat patches and improve the connections between them can be targeted here.
- Fragmentation Action Zone (7.74ha) – Land within Enhancement Zone 1 that connects existing patches of primary and associated habitats which are currently highly fragmented and where fragmentation could be reduced by habitat creation. Action in this zone to address the most fragmented areas of habitat can be targeted here.

The NCA and BNG assessments for ROA14 identified that the option is presumed to cause permanent loss of other semi-natural grassland, dwarf shrub heath, active floodplain, rivers, and no impact on the existing reservoir footprint. Therefore, SWW should look to re-create and compensate these permanently lost habitats on-site and/or off-site, where possible, which will need to be informed by ecological surveys. ROA14 is also situated within the Restorable Habitat, Network Enhancement Zone 2 and the Fragmentation Action Zone which is presumed to be permanently lost due to raising of the height of the reservoir levels. However, there is a potential opportunity to restore primary habitat, expand and join up existing habitat patches and improve the connections between them, and address the most fragmentated areas of habitat through habitat creation within the vicinity of the site, as described above. Factors affecting suitability include proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast.

The option sits within South Hams District Council authority area and is surrounded by Dartmoor National Park (see Table 5.19 above) - and as such there are many opportunities to enhance local biodiversity. Any

future strategy should be aligned to the LPAs and designated sites aspirations, which South Hams District Council aims to achieve at least 10% BNG. The Plymouth & Southwest Devon Joint Local Plan has the following initiatives which could align with the delivery of the option:

- Areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds) within the rest of the countryside is also critical to the survival of wildlife and supporting rare species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain:
  - Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor – currently identified as within 20m either side of a larger river or 10m either side of a smaller water course
  - Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon).
  - Habitats which fall within the biodiversity map (showing ecological networks, steppingstones, and local wildlife rich habitats) in the relevant Local Plan, where this exists.

5.2.15 ROA15

Table 5-16: ROA15 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (ha)
Ancient woodland	N/A	N/A
Priority habitats	Deciduous woodland	14.99
	No main habitat but additional habitats present	0.17
	Purple moor grass and rush pastures	1.88
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	N/A	N/A
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	Shallaford - Small culm grassland site with invading scrub. Glade open within the centre of the site	1.21
	Roadford Reservoir - Large reservoir with adjacent lowland meadow, fen, rush pasture and woodland habitats	0.79
National Nature Reserve (NNR)	N/A	N/A
National Parks	N/A	N/A
Local Nature Reserve (LNR)	N/A	N/A
Habitat Networks	Restorable Habitat	3.35
	Network Enhancement Zone 1	12.56
	Network Enhancement Zone 2	72.76
	Network Expansion Zone	54.93

ROA15 is located in proximity to 143.60ha of habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including deciduous woodland and purple moor grass and rush pastures. The habitat networks include:

- Restorable Habitat (3.35ha) - Areas of land, predominantly composed of existing semi-natural habitat where the primary habitat is present in a degraded or fragmented form and which are likely to be suitable for restoration.
- Network Enhancement Zone 1 (12.56ha) - Land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat. Factors affecting suitability include proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast. Action in this zone to expand and join up existing habitat patches and improve the connections between them can be targeted here.
- Network Enhancement Zone 2 (72.76ha) - Land connecting existing patches of primary and associated habitats which is less likely to be suitable for creation of the primary habitat. Action in this zone that improves the biodiversity value through land management changes and/or green infrastructure provision can be targeted here.
- Network Expansion Zone (54.93ha) - Land beyond the Network Enhancement Zones with potential for expanding, linking/joining networks across the landscape i.e., conditions such as soils are potentially suitable for habitat creation for the specific habitat in addition to Enhancement Zone 1. Action in this zone to improve connections between existing habitat networks can be targeted here.

The NCA and BNG assessments for ROA15 identified that the option is presumed to cause temporary loss of arable, pastures, other semi-natural grassland, broadleaved, mixed and yew woodland, woodland priority habitat, and no impact to active floodplain, rivers and ponds & linear features. Therefore, there is an opportunity to improve the condition of these habitats once reinstated or re-created on-site and/or off-site, which will need to be informed by ecological surveys. ROA15 is also situated within the Network Enhancement Zone 1, Network Enhancement Zone 2 and the Network Expansion Zone and therefore there is a potential opportunity to restore primary habitat, expand and join up existing habitat patches and improve the connections between them, improve the biodiversity value through land management changes and/or green infrastructure provision, and improve connections between existing habitat networks, as described above. Factors affecting suitability include proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast.

The option sits within Torridge District Council and West Devon Borough Council authority areas and is surrounded by Shallaford and Roadford Reservoir County Wildlife Sites - and as such there are many opportunities to enhance local biodiversity of associated habitat (see Table 5-20 above). Any future strategy should be aligned to the LPAs and designated sites aspirations, which both aim to achieve at least 10% BNG.

The North Devon and Torridge Local Plan has the following priorities, which could align with the delivery of the option:

- Create a network of bigger, better and joined-up wildlife habitats.
- Improvements in both condition of existing nature-rich habitats, and restoration or creation of new areas of wildlife habitats.
- Rewilding, also known as re-naturalisation.
- Spatial targeting identified by Devon's Nature Recovery Network.

Both local authority areas suggest the Devon Nature Recovery Network and Rebuilding Devon's Nature Map to identify the best areas in Devon to maintain and expand habitats. These areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds) within the rest of the countryside is also critical to the survival of wildlife and supporting rare species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain:

- Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor – currently identified as within 20m either side of a larger river or 10m either side of a smaller water course

- Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon).

5.2.16 ROA17

Table 5-17: ROA17 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (ha)
Ancient woodland	Ancient Woodland	2.30
Priority habitats	Coastal and floodplain grazing marsh	5.27
	Deciduous woodland	17.58
	Lowland meadows	1.29
	Traditional orchard	1.57
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	N/A	N/A
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	Ashwell Wood - Ancient semi-natural woodland	4.90
	Quarry Wood - Secondary broadleaved woodland	1.24
	Dart Estuary - Estuary and associated habitats	0.88
	The Weir- Wet woodland strip with some areas of grassland and tall herb vegetation	3.29
	Snipe Island - Reedbed & marshy grassland	0.01
	Compton - Mixed farmland with bird interest	3.38
National Nature Reserve (NNR)	N/A	N/A
National Parks	N/A	N/A
Local Nature Reserve (LNR)	N/A	N/A
Habitat Networks	Restorable Habitat	2.56
	Network Enhancement Zone 1	84.76
	Network Enhancement Zone 2	28.45
	Network Expansion Zone	98.54

ROA17 is located in proximity to 214.31ha habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including coastal and floodplain grazing marsh, deciduous woodland, lowland meadows and traditional orchards. The habitat networks include:

- Restorable Habitat (2.56ha) - Areas of land, predominantly composed of existing semi-natural habitat where the primary habitat is present in a degraded or fragmented form and which are likely to be suitable for restoration.
- Network Enhancement Zone 1 (84.76ha) - Land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat. Factors affecting suitability include: proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast. Action in this zone to expand and join up existing habitat patches and improve the connections between them can be targeted here.
- Network Enhancement Zone 2 (28.45ha) - Land connecting existing patches of primary and associated habitats which is less likely to be suitable for creation of the primary habitat. Action in this zone that

improves the biodiversity value through land management changes and/or green infrastructure provision can be targeted here.

- Network Expansion Zone (98.54ha) - Land beyond the Network Enhancement Zones with potential for expanding, linking/joining networks across the landscape i.e., conditions such as soils are potentially suitable for habitat creation for the specific habitat in addition to Enhancement Zone 1. Action in this zone to improve connections between existing habitat networks can be targeted here.

The NCA and BNG assessments for ROA17 identified that the option is presumed to cause temporary loss of coastal floodplain and grazing marsh, arable, pastures, orchards and top fruit, broadleaved, mixed and yew woodland, woodland priority habitat, coniferous woodland, greenspace, and no impact to active floodplain, rivers, ponds & linear features and ancient woodland (following best practice mitigation to avoid small area within the option footprint). Therefore, there is an opportunity to improve the condition of these habitats once reinstated or re-created on-site and/or off-site, which will need to be informed by ecological surveys. ROA17 is also situated within the Restorable Habitat, Network Enhancement Zone 1, Network Enhancement Zone 2 and the Network Expansion Zone and therefore there is a potential opportunity to restore primary habitat, expand and join up existing habitat patches and improve the connections between them, improve the biodiversity value through land management changes and/or green infrastructure provision and improve connections between existing habitat networks, as described above.

The option sits within South Hams District Council authority area and is surrounded Ashwell Wood, Quarry Wood, Dart Estuary, The Weir, Snipe Island and Compton County Wildlife Sites (see Table 5.21 above) - and as such there are opportunities to enhance local biodiversity. Any future strategy should be aligned to the LPAs and designated sites aspirations, which South Hams District Council aims to achieve at least 10% BNG. The Plymouth & Southwest Devon Joint Local Plan has the following initiatives which could align with the delivery of the option:

- Areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds) within the rest of the countryside is also critical to the survival of wildlife and supporting rare species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain:
  - Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor – currently identified as within 20m either side of a larger river or 10m either side of a smaller water course.
  - Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon).
  - Habitats which fall within the biodiversity map (showing ecological networks, steppingstones, and local wildlife rich habitats) in the relevant Local Plan, where this exists.

5.2.17 WIM5

Table 5.18: WIM5 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (Ha)
Ancient woodland	N/A	N/A
Priority habitats	Deciduous Woodland	1.50
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	N/A	N/A
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	N/A	N/A
National Nature Reserve (NNR)	N/A	N/A

National Parks	N/A	N/A
Local Nature Reserve (LNR)	N/A	N/A
Network Enhancement Zones	Network Enhancement Zone 1	6.42
	Network Enhancement Zone 2	8.60
	Network Expansion Zone	67.91

WIM5 is located in proximity to 82.98ha of habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including coastal and floodplain grazing marsh and deciduous woodland. The habitat networks include:

- Network Enhancement Zone 1 (6.42ha) - Land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat. Factors affecting suitability include: proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast. Action in this zone to expand and join up existing habitat patches and improve the connections between them can be targeted here.
- Network Enhancement Zone 2 (8.60ha) - Land connecting existing patches of primary and associated habitats which is less likely to be suitable for creation of the primary habitat. Action in this zone that improves the biodiversity value through land management changes and/or green infrastructure provision can be targeted here.
- Network Expansion Zone (67.91ha) - Land beyond the Network Enhancement Zones with potential for expanding, linking/joining networks across the landscape i.e., conditions such as soils are potentially suitable for habitat creation for the specific habitat in addition to Enhancement Zone 1. Action in this zone to improve connections between existing habitat networks can be targeted here.

The NCA and BNG assessments for WIM5 identified that the option is presumed to cause permanent loss of some arable land and temporary loss of coastal and floodplain grazing marsh, pasture, and woodland priority habitat. WIM5 is also situated within the Network Enhancement Zone 1, Network Enhancement Zone 2 and the Network Expansion Zone. Therefore, there is a potential opportunity to improve the biodiversity value through land management changes and/or green infrastructure and improve connections between existing habitat networks, a described above. Factors affecting suitability include proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast.

The option sits within East Devon District Council authority area - and as such there are many opportunities to enhance local biodiversity. Any future strategy should be aligned to the LPAs and designated sites aspirations, which East Devon District Council aims to achieve at least 10% BNG. The East Devon Local Plan has the following initiatives which could align with the delivery of the option:

East Devon Council are striving to improve biodiversity and support nature recovery across their greenspaces, and have a number of Nature Recovery Sites with the ambition to implement the following strategies:

- Transition away from carpet bedding towards more herbaceous and woody perennial plantings
- Plant trees and hedgerows
- Establish wildflower meadows
- Install bird and bat boxes & bee and bug homes across the area

The Nature Recovery Plan from the East Devon AONB Partnership has the following initiatives:

- East Devon Catchment Partnership
- Saving Special Species
- The Colchester Declaration

The local authority suggests that the Devon Nature Recovery Network and Rebuilding Devon's Nature Map are used to identify the best areas in Devon to maintain and expand habitats. These areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds)

within the rest of the countryside is also critical to the survival of wildlife and supporting rare species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain:

- Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor – currently identified as within 20m either side of a larger river or 10m either side of a smaller water course
- Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon).

Habitats which fall within the biodiversity map (showing ecological networks, steppingstones, and local wildlife rich habitats) in the relevant Local Plan, where this exists.

5.2.18 WIM6

Table 5-19: WIM6 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (ha)
Ancient woodland	N/A	N/A
Priority habitats	N/A	N/A
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	N/A	N/A
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	N/A	N/A
National Nature Reserve (NNR)	N/A	N/A
National Parks	N/A	N/A
Local Nature Reserve (LNR)	N/A	N/A
Habitat Networks	Network Enhancement Zone 1	2.26

WIM6 is located in proximity to 2.26ha habitat networks where there is potential for action to be undertaken to build greater ecological resilience. The habitat networks include:

- Network Enhancement Zone 1 (2.26ha) - Land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat. Factors affecting suitability include: proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast. Action in this zone to expand and join up existing habitat patches and improve the connections between them can be targeted here.

The NCA and BNG assessments for WIM6 identified that the option is presumed to cause permanent loss of pastures. WIM6 is also situated within the Network Enhancement Zone 1. Therefore, SWW should look to re-create and compensate these permanently lost habitats off-site, where possible, which will need to be informed by ecological surveys.

The option sits within Mid Devon District Council authority area - and as such there are opportunities to enhance local biodiversity. Any future strategy should be aligned to the LPAs and designated sites aspirations, which Mid Devon District Council aims to achieve at least 10% BNG. The Mid Devon Local Plan has the following initiatives which could align with the delivery of the option:

Strategic Nature Areas:

- Hence Moor
- Dunkeswell
- Hackpen Hill to North Hill

- Witherirdge Moor
- Rackenford Moor
- Unnamed (5)

The local authority suggests that the Devon Nature Recovery Network and Rebuilding Devon's Nature Map are used to identify the best areas in Devon to maintain and expand habitats. These areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds) within the rest of the countryside is also critical to the survival of wildlife and supporting rare species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain:

- Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor – currently identified as within 20m either side of a larger river or 10m either side of a smaller water course.
- Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon)
- Habitats which fall within the biodiversity map (showing ecological networks, steppingstones, and local wildlife rich habitats) in the relevant Local Plan, where this exists

5.2.19 WIM7

Table 5-20: WIM7 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (ha)
Ancient woodland	N/A	N/A
Priority habitats	Coastal and floodplain grazing marsh Deciduous woodland	2.26 0.50
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	N/A	N/A
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	N/A	N/A
National Nature Reserve (NNR)	N/A	N/A
National Parks	N/A	N/A
Local Nature Reserve (LNR)	NA	NA
Habitat Networks	Network Enhancement Zone 2	10.13

WIM7 is located in proximity to 10.13ha of habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including coastal and floodplain grazing marsh and deciduous woodland. The habitat networks include:

- Network Enhancement Zone 2 (10.13ha) - Land connecting existing patches of primary and associated habitats which is less likely to be suitable for creation of the primary habitat. Action in this zone that improves the biodiversity value through land management changes and/or green infrastructure provision can be targeted here.

The NCA and BNG assessments for WIM7 identified that the option is presumed to cause permanent loss of pastures and active floodplain, and temporary loss of coastal and floodplain grazing marsh. WIM7 is also situated within the Network Enhancement Zone 2. Therefore, there is a potential opportunity to improve the biodiversity value through land management changes and/or green infrastructure, as described above.

The option sits within East Devon District Council authority area - and as such there are many opportunities to enhance local biodiversity. Any future strategy should be aligned to the LPAs and designated sites aspirations, which East Devon District Council aims to achieve at least 10% BNG. The East Devon Local Plan has the following initiatives which could align with the delivery of the option:

East Devon Council are striving to improve biodiversity and support nature recovery across their greenspaces, and have a number of Nature Recovery Sites with the ambition to implement the following strategies:

- Transition away from carpet bedding towards more herbaceous and woody perennial plantings
- Plant trees and hedgerows
- Establish wildflower meadows
- Install bird and bat boxes & bee and bug homes across the area

The Nature Recovery Plan from the East Devon AONB Partnership has the following initiatives:

- East Devon Catchment Partnership
- Saving Special Species
- The Colchester Declaration

The local authority suggests that the Devon Nature Recovery Network and Rebuilding Devon's Nature Map are used to identify the best areas in Devon to maintain and expand habitats. These areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds) within the rest of the countryside is also critical to the survival of wildlife and supporting rare species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain:

- Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor – currently identified as within 20m either side of a larger river or 10m either side of a smaller water course.
- Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon).

Habitats which fall within the biodiversity map (showing ecological networks, steppingstones, and local wildlife rich habitats) in the relevant Local Plan, where this exists.

5.2.20 WIM11

Table 5-21: WIM11 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (ha)
Ancient woodland	N/A	N/A
Priority habitats	Deciduous woodland	0.70
	Lowland calcareous grassland	4.47
	No main habitat but additional habitats present	0.08
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	N/A	N/A
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	Beer Fields - Unimproved calcareous grassland, semi-improved neutral grassland, scrub and broadleaved woodland	0.32

	Bovey Lane Fields - Species-rich grassland neutral and calcareous. Woodland and scrub are also present	3.61
	Bovey Lane Quarries - Species-rich calcareous grassland, neutral grassland, semi-improved grassland, scrub and woodland	0.78
National Nature Reserve (NNR)	N/A	N/A
National Parks	N/A	N/A
Local Nature Reserve (LNR)	N/A	N/A
Habitat Networks	Habitat Restoration/Creation	0.04
	Network Enhancement Zone 1	7.33
	Network Enhancement Zone 2	0.89
	Fragmentation Action Zone	10.64
	Network Expansion Zone	6.90

WIM11 is located in proximity to 25.8ha of habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including deciduous woodland and lowland calcareous grassland The habitat networks include:

- Habitat Creation/Restoration (0.04ha) - Areas where work is underway to either create or restore the primary habitat
- Network Enhancement Zone 1 (7.33ha) - Land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat. Factors affecting suitability include: proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast. Action in this zone to expand and join up existing habitat patches and improve the connections between them can be targeted here.
- Network Enhancement Zone 2 (0.89ha) - Land connecting existing patches of primary and associated habitats which is less likely to be suitable for creation of the primary habitat. Action in this zone that improves the biodiversity value through land management changes and/or green infrastructure provision can be targeted here.
- Fragmentation Action Zone (10.64ha) - Land within Enhancement Zone 1 that connects existing patches of primary and associated habitats which are currently highly fragmented and where fragmentation could be reduced by habitat creation. Action in this zone to address the most fragmented areas of habitat can be targeted here.
- Network Expansion Zone (67.91ha) - Land beyond the Network Enhancement Zones with potential for expanding, linking/joining networks across the landscape i.e., conditions such as soils are potentially suitable for habitat creation for the specific habitat in addition to Enhancement Zone 1. Action in this zone to improve connections between existing habitat networks can be targeted here.

The NCA and BNG assessments for WIM11 identified that the option is presumed to cause temporary loss of pastures, other semi-natural grassland, woodland priority habitat, coniferous woodland, greenspace, and no impact presumed to active floodplain. WIM11 is also situated within the Network Enhancement Zone 1, Fragmentation Action Zone and the Network Expansion Zone. Therefore, there is a potential opportunity to expand and join up existing habitat patches and improve the connections between them, address the most fragmentation area of habitat through habitat creation, and to improve connections between existing habitat networks, as described above.

The option sits within East Devon District Council authority area and is surrounded by Beer Fields, Bovey Lane Fields and Bovey Lane Quarries County Wildlife Sites - and as such there are opportunities to enhance local biodiversity. Any future strategy should be aligned to the LPAs and designated sites aspirations, which

East Devon District Council aims to achieve at least 10% BNG. The East Devon Local Plan has the following initiatives which could align with the delivery of the option:

East Devon Council are striving to improve biodiversity and support nature recovery across their greenspaces, and have a number of Nature Recovery Sites with the ambition to implement the following strategies:

- Transition away from carpet bedding towards more herbaceous and woody perennial plantings
- Plant trees and hedgerows
- Establish wildflower meadows
- Install bird and bat boxes & bee and bug homes across the area

The Nature Recovery Plan from the East Devon AONB Partnership has the following initiatives:

- East Devon Catchment Partnership
- Saving Special Species
- The Colchester Declaration

The local authority suggests that the Devon Nature Recovery Network and Rebuilding Devon's Nature Map are used to identify the best areas in Devon to maintain and expand habitats. These areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds) within the rest of the countryside is also critical to the survival of wildlife and supporting rare species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain:

- Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor – currently identified as within 20m either side of a larger river or 10m either side of a smaller water course.
- Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon).
- Habitats which fall within the biodiversity map (showing ecological networks, steppingstones, and local wildlife rich habitats) in the relevant Local Plan, where this exists.

5.2.21 WIM12

Table 5-22: WIM12 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (ha)
Ancient woodland	N/A	N/A
Priority habitats	N/A	N/A
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	N/A	N/A
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	N/A	N/A
National Nature Reserve (NNR)	N/A	N/A
National Parks	N/A	N/A
Local Nature Reserve (LNR)	N/A	N/A
Habitat Networks	Network Enhancement Zone 1	2.53

WIM12 is located in proximity to 2.53ha of habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including frass moorland and upland heathland. The habitat networks include:

- Network Enhancement Zone 1 (2.53ha) - Land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat. Factors affecting suitability include: proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast. Action in this zone to expand and join up existing habitat patches and improve the connections between them can be targeted here.

The NCA and BNG assessments for WIM12 identified that the option is presumed to cause permanent loss of pastures. WIM12 is also situated within the Network Enhancement Zone 1. Therefore, therefore SWW should look to re-create and compensate these permanently lost habitats off-site, where possible, which will need to be informed by ecological surveys.

The option sits within Mid Devon District Council authority area - and as such there are many opportunities to enhance local biodiversity. Any future strategy should be aligned to the LPAs and designated sites aspirations, which Mid Devon District Council aims to achieve at least 10% BNG. The Mid Devon Local Plan has the following initiatives which could align with the delivery of the option:

Strategic Nature Areas:

- Hence Moor
- Dunkeswell
- Hackpen Hill to North Hill
- Witherirdge Moor
- Rackenford Moor
- Unnamed (5)

The local authority suggests that the Devon Nature Recovery Network and Rebuilding Devon's Nature Map are used to identify the best areas in Devon to maintain and expand habitats. These areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds) within the rest of the countryside is also critical to the survival of wildlife and supporting rare species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain:

- Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor – currently identified as within 20m either side of a larger river or 10m either side of a smaller water course.
- Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon).
- Habitats which fall within the biodiversity map (showing ecological networks, steppingstones, and local wildlife rich habitats) in the relevant Local Plan, where this exists.

5.2.22 ROA7

Table 5-23: ROA7 BNG opportunity mapping

Potential BNG opportunity site	Name	Area (ha)
Ancient woodland	N/A	N/A
Priority habitats	Purple moor grass and rush pastures	0.14
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	N/A	N/A

Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	Little Northcombe – Culm grassland and some scrub	0.19
National Nature Reserve (NNR)	N/A	
National Parks	N/A	
Local Nature Reserve (LNR)	N/A	
Habitat Networks	Network Enhancement Zone 1	2.42
	Fragmentation Action Zone	5.47
	Network Expansion Zone	0.19

ROA7 is located in proximity to 8.08ha of habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including purple moor grass and rush pastures. The habitat networks include:

- Network Enhancement Zone 1 (2.42ha) - Land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat. Factors affecting suitability include proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast. Action in this zone to expand and join up existing habitat patches and improve the connections between them can be targeted here.
- Fragmentation Action Zone (5.47ha) – Land within Enhancement Zone 1 that connects existing patches of primary and associated habitats which are currently highly fragmented and where fragmentation could be reduced by habitat creation. Action in this zone to address the most fragmented areas of habitat can be targeted here.
- Network Expansion Zone (0.19ha) - Land beyond the Network Enhancement Zones with potential for expanding, linking/joining networks across the landscape i.e., conditions such as soils are potentially suitable for habitat creation for the specific habitat in addition to Enhancement Zone 1. Action in this zone to improve connections between existing habitat networks can be targeted here.

The NCA and BNG assessments for ROA7 identified that the option is presumed to cause permanent loss of pastures. Therefore, there is an opportunity to increase BNG off-site, which will need to be informed by ecological surveys.

The option sits within West Devon Borough Council authority area and is surrounded by Little Northcombe - and as such there are many opportunities to enhance local biodiversity of associated habitat (see Table 5.29 above). Any future strategy should be aligned to the LPAs and designated sites aspirations, which West Devon Borough Council aims to achieve at least 10% BNG. The Plymouth & Southwest Devon Joint Local Plan has the following priorities, which could align with the delivery of the option:

- Aims to protect, conserve, and enhance the distinctive characteristics, special qualities and important features of the natural environment. This will be through a strategic approach which protects the hierarchy of international, national and locally designated sites, commensurate with their status, and takes account of the natural infrastructure functions of different sites, habitats and features.

West Devon Borough Council Climate Change and Biodiversity Strategy refers readers to the Devon Nature Recovery Network and Rebuilding Devon's Nature Map to identify the best areas in Devon to maintain and expand habitats. These areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds) within the rest of the countryside is also critical to the survival of wildlife and supporting rare species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain:

- Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor – currently identified as within 20m either side of a larger river or 10m either side of a smaller water course

- Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon).
- Habitats which fall within the biodiversity map (showing ecological networks, steppingstones, and local wildlife rich habitats) in the relevant Local Plan, where this exists.

5.2.23 WIM2

Table 5-24: WIM2 BNG opportunity mapping

Potential BNG opportunity site	Name and Area (Ha)	Area (ha)
Ancient woodland	N/A	N/A
Priority habitats	Deciduous woodland	0.20
Sites of Special Scientific Interest (SSSI)	N/A	N/A
Special Area of Conservation (SAC)	N/A	N/A
Special Protection Area (SPA)	N/A	N/A
Ramsar	N/A	N/A
County Wildlife Site	N/A	N/A
National Nature Reserve (NNR)	N/A	N/A
National Parks	N/A	N/A
Local Nature Reserve (LNR)	N/A	N/A
Network Enhancement Zones	Network Enhancement Zone 1	0.27
	Network Expansion Zone	0.58

WIM2 is located in proximity to 0.85ha of habitat networks where there is a potential opportunity to build greater ecological resilience for the associated primary habitats, including deciduous woodland and lowland calcareous grassland. The habitat networks include:

- Network Enhancement Zone 1 (0.27ha) - Land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat. Factors affecting suitability include: proximity to primary habitat, land use (urban/rural), soil type, slope and proximity to coast. Action in this zone to expand and join up existing habitat patches and improve the connections between them can be targeted here.
- Network Expansion Zone (0.58ha) - Land beyond the Network Enhancement Zones with potential for expanding, linking/joining networks across the landscape i.e., conditions such as soils are potentially suitable for habitat creation for the specific habitat in addition to Enhancement Zone 1. Action in this zone to improve connections between existing habitat networks can be targeted here.

The NCA and BNG assessments for WIM2 identified that the option is presumed to cause permanent loss of some arable and active floodplain, temporary loss of arable and woodland priority habitat, and no impact presumed to active floodplain.

The option sits within East Devon District Council authority area and is surrounded by Beer Fields, Bovey Lane Fields and Bovey Lane Quarries County Wildlife Sites- and as such there are many opportunities to enhance local biodiversity. Any future strategy should be aligned to the LPAs and designated sites aspirations, which East Devon District Council aims to achieve at least 10% BNG. The East Devon Local Plan has the following initiatives which could align with the delivery of the option:

East Devon Council are striving to improve biodiversity and support nature recovery across their greenspaces, and have a number of Nature Recovery Sites with the ambition to implement the following strategies:

- Transition away from carpet bedding towards more herbaceous and woody perennial plantings
- Plant trees and hedgerows

- Establish wildflower meadows
- Install bird and bat boxes & bee and bug homes across the area

The Nature Recovery Plan from the East Devon AONB Partnership has the following initiatives:

- East Devon Catchment Partnership
- Saving Special Species
- The Colchester Declaration

The local authority suggests that the Devon Nature Recovery Network and Rebuilding Devon's Nature Map are used to identify the best areas in Devon to maintain and expand habitats. These areas include river corridors and Strategic Nature Areas. A matrix of habitats (such as hedges, woods, grasslands and ponds) within the rest of the countryside is also critical to the survival of wildlife and supporting rare species. Conservation should be focused on high strategic significance habitats, as per the Devon Planning Guidance for Biodiversity Compensation and Net Gain:

- Any habitats within the areas identified on the Rebuilding Devon's Nature Map i.e., within a Strategic Nature Area or river corridor – currently identified as within 20m either side of a larger river or 10m either side of a smaller water course.
- Any habitats which support or could support greater horseshoe bats within Sustenance Zones and cirl buntings within 250m breeding zones (zones for Bechstein's bat, lesser horseshoe bat and grey long eared bat are being developed and will be added soon).
- Habitats which fall within the biodiversity map (showing ecological networks, steppingstones, and local wildlife rich habitats) in the relevant Local Plan, where this exists.

6 Conclusions and Next Steps

6.1 Overall Conclusion

The NCA, BNG and ecosystem services outputs identified the following:

- **Natural Capital**: The options will cause the temporary and permanent loss of natural capital stocks.
- **Ecosystem services**: The scheme presents opportunities to improve the existing habitats along the route through post construction remediation and replacement of low value habitats with higher value habitats. The potential permanent loss of ancient woodland, river stocks and active flood plain, could result in the permanent loss of several ecosystem services that the stocks provide in synergy, including water purification, carbon sequestration, natural hazard management and air pollutant removal. The potential permanent loss of pastoral stock could result in the permanent loss of food production.
- **BNG**: The options are likely to result in a loss of biodiversity units due to the permanent loss of natural capital assets during construction. Mitigation and enhancement opportunities for the scheme have been suggested within Section 4, which can work in tandem to reducing the loss of BNG and introducing net gain. The BVP would require the purchase of 117.97BU habitat units, respectively, to achieve a 10% BNG.

6.2 Next Steps

The opportunities identified in the BNG/NC assessment for the BVP have the potential to contribute to government ambitions for environmental net gain. This could take the form of habitat compensation, creation and/or species relocation schemes. Any options would need to be taken forward based on a comprehensive understanding on the interaction between natural systems and between natural systems and social uses of land.

The options, through the BNG Opportunity Mapping, could consider some opportunities to create and improvement habitat on-site and off-site through local schemes, nature recovery networks (NRNs) and wildlife corridors to achieve a 10% net gain in BNG units and increase the provision of ecosystem services, therefore aiding in developing more resilient options for the future provision of water for SWW updated dWRMP24.

7 Appendix

7.1 Natural capital stocks and mapping methodology

Table 7-1: Sources for the mapping methodology of natural capital stocks.

Broad Natural Group	Subgroup	Mapping Methodology
Freshwater	Active flood plain	Areas at high or medium risks within the Environment Agency (EA)'s Risk of Flooding from Rivers and Sea dataset.
	Blanket Bog	Area of blanket bog mapped using Natural England's Priority Habitat Inventory.
	Chalk Rivers*	Mapped using the EA chalk rivers dataset and mapping intersections with OS watercourse polygons
	Coastal and floodplain grazing marsh	Area of coastal floodplain and grazing marsh mapped using Natural England's Priority Habitat Inventory
	Lakes and standing waters	Area of lakes and reservoirs mapped using the Centre for Ecology and Hydrology (CEH)'s UK Lakes Portal dataset.
	Lowland Fens	Area of lowland fens mapped using Natural England's Priority Habitat Inventory.
	Lowland raised bog	Area of lowland raised bog mapped using Natural England's Priority Habitat Inventory
	Modified waters e.g., reservoirs	Area of reservoirs mapped by selecting Ordnance Survey (OS) surface water polygons (VectorMap District) that coincide with CEH's Inventory of UK reservoirs (points).
	Other semi-natural habitats	Area of other semi-natural habitat mapped using Natural England's Priority Habitat Inventory (including upland and lowland grasslands, heathland and saltmarsh).
	Ponds and ditches	Mapped by selecting surface waterbodies (from OS VectorMap District) that do not intersect rivers, are smaller than 2ha in size.
	Reedbeds	Area of reedbed habitat mapped using NE's Priority Habitat Inventory
	Rivers	Length of rivers mapped using EA's Water Framework Directive (WFD) river waterbodies dataset (cycle 1, to include coastal streams
Mountain, Moor and Heath	Blanket bog	Area of blanket bog mapped using Natural England's Priority Habitat Inventory.
	Dwarf shrub heath	Mapped using Natural England's Priority Habitat Inventory ('fragmented heath', 'lowland heathland' and 'upland heathland')
	Inland rock, scree and pavement (AML*)	Area of inland rock and limestone pavement above the moorland line, mapped using CEH's LCM2015 ('inland rock'), Natural England's Priority Habitats Inventory ('limestone pavement') and the Rural Payment Agency (RPA)'s Moorland Line dataset.
	Lakes and Reservoirs	Area of lakes and reservoirs above the moorland line, mapped using CEH's UK Lakes dataset, CEH's Inventory of UK reservoirs dataset and RPA's Moorland Line dataset.
	Mountain heath and willow scrub	Area of mountain heath and willow scrub mapped using Natural England's Priority Habitat Inventory.
	Rivers (AML)	Length of rivers mapped using EA's WFD river waterbodies dataset and RPA's Moorland Line dataset.
	Semi-natural grassland (AML*)	Area of semi-natural grassland above the moorland line, mapped using Natural England's Priority Habitat Inventory and RPA's moorland line dataset.
	Upland flushes fens and swamps	Area of upland flushes, fens and swamps, mapped using Natural England's Priority Habitat Inventory.
	Wood pasture (AML*)	Area of wood pasture above the moorland line, mapped using Natural England's provisional Wood-Pasture and Parkland BAP Priority Habitat Inventory and RPA's Moorland line dataset.

Broad Natural Group	Subgroup	Mapping Methodology
	Woodland (AML*)	Area of woodland above the moorland line, mapped using FC's National Forest Inventory and RPA's moorland line dataset.
Urban	Blue space	Mapped by intersecting OS VectorMap District Surface Water with the Office for National Statistic (ONS)'s Built-Up areas dataset.
	Green space - not semi-natural	Area of urban green space (not semi-natural), mapped using the OS Open Greenspace Layer.
	Open mosaic habitats	Area of open mosaic habitats on previously developed land, mapped using Natural England's draft Open Mosaic Habitat dataset
	Woodland, scrub and hedge	While urban scrub and hedge are difficult to map at a national scale, the area of urban woodland is mapped here by intersecting FC's National Forest Inventory with ONS Built-Up Areas.
	Semi-natural habitats	Mapped by intersecting Natural England's Priority Habitat Inventory habitats (excluding woodland, good quality semi-improved grassland and traditional orchards) with ONS Built-Up Areas
Farmland	Arable and rotational leys	Area of arable and rotational leys, and horticulture individually, this map shows the area of arable and horticulture combined. Mapped using UK Land Cover 2018 Sub Classes.
	Horticulture	Area of arable and rotational leys, and horticulture individually, this map shows the area of arable and horticulture combined. Mapped using CEH's Land Cover Map 2015 (LCM2015).
	Improved grassland	Area of improved grassland mapped using CEH's LCM2015.
	Orchards and top fruit	Area of orchards and top fruit mapped using Natural England's Priority Habitat Inventory ('traditional orchards')
Woodland	Ancient Woodland	Mapped using Natural England's Ancient Woodland dataset.
	Broadleaved, mixed and yew woodland	Mapped using FC's National Forest Inventory.
	Coniferous woodland	Area of coniferous woodland mapped using FC's National Forest Inventory
	Woodland priority habitats	Mapped using Natural England's Priority Habitat Inventory ('deciduous woodland').
Grasslands	Hay meadows	Area of hay meadow mapped using Natural England's Priority Habitat Inventory ('upland meadow' and 'lowland meadow').
	Other semi-natural grasslands	Area of other semi-natural grassland, mapped using Natural England's Priority Habitat Inventory ('upland calcareous', 'lowland calcareous', 'lowland dry acid', 'good quality semi-improved', 'grass moorland' and 'purple moor grass and rush pasture').
Coastal	Beach	Area of beach mapped using OS VectorMap District ('foreshore'). Note that this dataset includes areas of intertidal sediment as well as beaches.
	Coastal lagoons	Area of coastal lagoons mapped using Natural England's Priority Habitat Inventory ('saline lagoons').
	Mudflats	Area of intertidal mudflats mapped using the EMODnet (Natural England) Intertidal Mudflats dataset.
	Salt marsh	Area of saltmarsh mapped using EA's Saltmarsh Extent dataset.
	Sand dunes	Area of sand dunes mapped using Natural England's Priority Habitat Inventory ('coastal dunes')
	Sea Cliff	Area of sea cliff habitat mapped using Natural England's Priority Habitat Inventory ('maritime cliff and slopes').
	Shingle	Area of shingle mapped using Natural England's Priority Habitat Inventory ('coastal vegetated shingle').
Marine	Intertidal rock	Area of intertidal rock mapped using Natural England's Open Marine Evidence Base (EUNIS code A1).
	Maerl beds	Area of maerl beds mapped using Natural England's Open Marine Evidence Base (EUNIS code A5.51).
	Reefs	Area of potential reefs mapped using JNCC's Potential Annex 1 Reefs

Broad Natural Group	Subgroup	Mapping Methodology
	Sea grass beds	Area of seagrass beds mapped using Natural England's Open Marine Evidence Base (EUNIS code A2.61)
	Shallow subtidal sediment	Area of shallow subtidal sediment mapped using JNCC's UKSea Map 2018 (biozone = shallow circalittoral or infralittoral and substrate = sediment, sand or mud).
	Shelf subtidal sediment	Area of shelf subtidal sediment mapped using JNCC's UKSea Map 2018 (biozone = deep circalittoral and substrate = sediment, sand or mud).
	Subtidal rock	Area of subtidal rock mapped using JNCC's UKSea Map 2018 (substrate = rock).
Soils	Nutrient Status of Soil	Mean estimates of total nitrogen concentration in topsoil (0-15cm depth) - % dry weight of soil, mapped using data produced from Natural England and CEH's 'Mapping Natural Capital' project (2016).
	Soil Carbon/Organic Matter	Mean estimates of carbon density in topsoil (0-15cm depth) – tonnes per hectare, mapped using data produced from Natural England and CEH's 'Mapping Natural Capital' project (2016)
	Soil Biota	Mean estimates of total abundance of invertebrates in topsoil (0-8 cm depth), mapped using data produced from Natural England and CEH's 'Mapping Natural Capital' project (2016)
Indicators of condition	Natural Aquifer Function	Area of groundwater catchment with 'good' quantitative status for WFD 2016, mapped using EA's WFD data and groundwater catchment boundaries (C2).
	Naturalness of Flow Regime	The WFD hydrological regime classification describe the naturalness of river flows. This map shows the length of river with 'high' WFD hydrological status in 2016, mapped using EA's WFD data and river water bodies (C2)
	Lack of Physical Modifications of Water Bodies	Lack of physical modification of rivers, mapped using EA's Reasons for Not Achieving Good Status data (SWMI = 'physical modification'), 2013-2016.
	Presence and Frequency of Pollinator Food Plants	Mean estimates of number of nectar plant species for bees per 2x2m plot, mapped using data produced from Natural England and CEH's 'Mapping Natural Capital' project (2016)
	Chemical status of water bodies	River chemical status for WFD 2016, mapped using EA's WFD data and river water bodies (C2)

* The list of natural capital stocks as described in NERC285 have been supplemented with additional abiotic stocks and key habitats that are vital to the SWW region.